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**GELOTOFOBIA: EVALUACIÓN, CORRELATOS DE  
PERSONALIDAD Y PROCESAMIENTO DE LA  
INFORMACIÓN SOCIOAFECTIVA DEL ROSTRO**

**GELOTOPHOBIA: ASSESSMENT, PERSONALITY CORRELATES AND THE  
PROCESSING OF SOCIOAFFECTIVE FACIAL INFORMATION**

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# Resumen

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La gelotofobia (*gelos* significa *risa* en griego antiguo) es un rasgo de personalidad que describe las diferencias individuales en el miedo a ser objeto de burla y ridiculización (Ruch & Proyer, 2008). Estudios sobre las características centrales de este constructo señalan que las personas con elevada gelotofobia muestran reacciones afectivas negativas desproporcionadas ante situaciones en las que otras se ríen de ellas, y una sensibilidad cercana a lo paranoide que les lleva a anticipar su ridiculización (i.e., cuando otras personas ríen en su presencia sospechan que se están burlando de ellos; Platt, Ruch, Hofmann, & Proyer, 2012). Por otro lado, la gelotofobia ha sido asociada positivamente a rasgos básicos de personalidad como la introversión y el neuroticismo, así como con las manifestaciones clínicas de la sub-escala de psicoticismo rasgo (Đurka & Ruch, 2015; Ruch & Proyer, 2009b). También se ha estudiado su solapamiento y diferenciación con fenómenos similares como la ansiedad social (Carretero-Dios, Ruch, Agudelo, Platt, & Proyer, 2010).

A pesar de estos avances en el estudio de la gelotofobia, su consolidación como temática psicológica de interés requiere de nuevas evidencias empíricas, guiadas por el modelo teórico de referencia de esta disposición (Ruch, Hofmann, Platt, & Proyer, 2014), que refuercen su conceptualización, modos de evaluación e implicaciones, poniendo un especial énfasis en su diferenciación respecto a otros constructos con manifestaciones similares.

La presente tesis doctoral, que incluye diez capítulos, tuvo como *objetivo fundamental* analizar empíricamente la entidad del constructo gelotofobia mediante el uso de distintas metodologías y procedimientos, buscando de esta forma realizar una contribución relevante a su conceptualización. En el Capítulo I se revisa la literatura sobre esta disposición de manera exhaustiva, describiendo detenidamente tanto el modelo teórico de referencia de la gelotofobia como las evidencias empíricas relativas a

su evaluación y red nomológica (Ruch et al., 2014). En el segundo, se presentan de manera detallada los objetivos y motivaciones de cada capítulo empírico realizado. En total, se describen once estudios ( $N = 2.447$ ) que pueden vertebrarse en tres líneas específicas de investigación.

En los Capítulos III y IV, se describen los estudios dirigidos a desarrollar la validación de la versión española de la PhoPhiKat-45 (Ruch & Proyer, 2009a). Este autoinforme permite la evaluación de la gelotofobia y dos disposiciones adicionales vinculadas al afrontamiento de la burla y la ridiculización, a saber: gelotofilia (i.e., alegría al ser objeto de las risas-burlas de otras personas) y katagelasticismo (i.e., alegría al reírse de otras personas). En el primero de estos dos capítulos se examinan las propiedades métricas de los ítems, la estructura factorial (mediante técnicas exploratorias y confirmatorias) y la consistencia interna de las puntuaciones de la versión española de la PhoPhiKat-45. Como indicadores de validez externa, nuestra investigación buscó replicar correlatos previos entre las disposiciones de la PhoPhiKat-45 y variables de distinta naturaleza: (a) estilos conductuales de humor (Dursun, Dalğar, Brauer, Yerlikaya, & Proyer, in press); (b) ansiedad-rasgo (Ruch, 2009); (c) rasgos autistas (Wu et al., 2015); y (d) dimensiones básicas de personalidad del *Five-Factor Model* (FFM: Ďurka & Ruch, 2015). De manera complementaria, en el segundo de estos capítulos, se amplían las evidencias de validez de constructo de la versión española de la PhoPhiKat-45. Para ello, analizamos la localización —no estudiada hasta la fecha— de la gelotofobia, gelotofilia y katagelasticismo en dos modelos alternativos de personalidad: el *HEXACO model* (Ashton & Lee, 2007) y la Triada Oscura (Paulhus & Williams, 2002).

En conjunto, nuestros resultados sugieren que la versión española de la PhoPhiKat-45 posee unas adecuadas propiedades psicométricas y, por consiguiente, constituye una

herramienta de evaluación apropiada para estudiar estas disposiciones en muestras españolas y ser utilizada en futuros estudios transculturales. Por otro lado, nuestros hallazgos sobre la localización de la gelotofobia en el FFM (i.e., generalización de resultados previos: Ďurka & Ruch, 2015) y en el HEXACO *model* pusieron de manifiesto que en torno al 45—50% de la varianza inter-individual en gelotofobia puede ser explicada por niveles elevados de introversión y neuroticismo/emocionalidad, y bajos de apertura a la experiencia y honestidad-humildad. Estos datos sirvieron como base empírica para nuestros siguientes estudios.

En lo que atañe a nuestra segunda línea de investigación, descrita en los Capítulos V, VI y VII de la tesis, examinamos el grado de solapamiento *vs.* diferenciación de la gelotofobia frente a constructos preexistentes definidos a partir de manifestaciones similares. En primer lugar, estudiamos si la gelotofobia presentaría validez incremental sobre los rasgos básicos del FFM (Capítulo V) y del HEXACO *model* (Capítulo VI) en la predicción de distintas dimensiones vinculadas con la imagen corporal. Nuestros resultados pusieron de manifiesto que la gelotofobia incrementó la cantidad de varianza explicada en las dimensiones de (alta) vergüenza corporal y (bajas) creencias de control de la apariencia física tras controlar la influencia de los rasgos del FFM (principalmente neuroticismo y extraversión). Estos hallazgos fueron replicados controlando la varianza compartida entre la gelotofobia y los rasgos del HEXACO *model* (principalmente extraversión, emocionalidad y honestidad-humildad), y se extendieron a otras dimensiones de imagen corporal como una evaluación negativa de la apariencia e insatisfacción con las áreas del cuerpo, así como con una mayor orientación a la apariencia y preocupación por el sobrepeso. Adicionalmente, en este estudio evaluamos la ansiedad social de los participantes a fin de, por un lado, examinar posibles correlatos convergentes-discriminantes de la gelotofobia y la ansiedad social con las distintas

medidas de imagen corporal y, por otro, comparar la validez predictiva de ambas disposiciones tras controlar las dimensiones del HEXACO *model*. Nuestros resultados indicaron que, si bien estos constructos mostraron un patrón de correlaciones similar, la gelotofobia, en comparación con la ansiedad social, mostró una mayor capacidad predictiva incremental sobre las dimensiones de imagen corporal tras controlar la influencia de los rasgos del HEXACO *model*. Este dato puede ser interpretado como una evidencia adicional de la diferenciación entre ambos fenómenos.

En el Capítulo VII de la tesis doctoral se incluye un estudio, con metodología multirrasgo-multimétodo (Campbell & Fiske, 1959), sobre la estructura latente y las evidencias de validez convergente-discriminante de las escalas de gelotofobia, ansiedad social e ideación paranoide, evaluadas a través de puntuaciones auto y heteroinformadas. La aplicación de análisis factoriales confirmatorios multinivel, considerando ambos tipos de puntuaciones, reveló que estos constructos son empíricamente homogéneos y suficientemente distintos entre sí. Además, centrándonos específicamente en la gelotofobia, el grado de solapamiento entre sus puntuaciones auto y heteroinformadas (i.e., validez convergente) fue adecuado teniendo en cuenta la naturaleza afectiva de esta dimensión (Watson, Hubbard, & Wiese, 2000). En lo que respecta a las evidencias de validez discriminante, nuestros resultados replicaron la fuerte conexión de la gelotofobia con la ansiedad social, revelando también una asociación positiva de moderada a fuerte entre la gelotofobia y la ideación paranoide.

En conjunto, estos hallazgos refuerzan la diferenciación de la gelotofobia frente a constructos de personalidad similares, habida cuenta de que (a) sus efectos en la predicción de las dimensiones de imagen corporal fueron más allá de la varianza compartida con rasgos básicos de personalidad como la introversión y el neuroticismo/emocionalidad; y (b) presentó características únicas frente a la ansiedad

social y la ideación paranoide. Esta línea de investigación centrada en el solapamiento *vs.* diferenciación de la gelotofobia fue complementada en los siguientes capítulos empíricos.

En lo concerniente a la tercera línea de investigación, recogida en los Capítulos VIII y IX de la tesis, estudiamos las posibles modulaciones ejercidas por la gelotofobia en el procesamiento de la expresión facial emocional y la mirada. En el Capítulo VIII, comparamos participantes con elevada *vs.* baja gelotofobia en una tarea de discriminación de la mirada (i.e., directa al observador/evitación-lateral: Cañadas & Lupiáñez, 2012) en rostros con diferentes cargas afectivas (i.e., alegría, ira, miedo, tristeza y rostro neutro). También comparamos a estos grupos en relación con sus juicios en la categorización de la expresión emocional, y en sus atribuciones de dimensiones afectivas como la valencia, intensidad y arousal de los rostros. Nuestros resultados sugieren que la gelotofobia se asocia a mayores tasas de error en la tarea de discriminación de la mirada, siendo este efecto independiente de la emoción que expresaba el rostro. Este efecto emergió incluso tras controlar las puntuaciones en ansiedad social de los participantes. Por el contrario, no encontramos diferencias entre los grupos con alta y baja gelotofobia ni en la tarea de categorización emocional ni en las atribuciones de las características afectivas de los rostros.

En el Capítulo IX, comparamos dos grupos con puntuaciones extremas en gelotofobia (altos *vs.* bajos) en sus tomas de decisiones (i.e., cooperar/no cooperar) en un juego de confianza (Berg, Dickhaut, & McCabe, 1995). En esta tarea, los participantes interactuaban con individuos desconocidos que expresaban distintas emociones (i.e., alegría, ira, o rostro neutro) y orientaciones de mirada (al frente, directa y de evitación). En contra de nuestras predicciones, los resultados en los tiempos de reacción no mostraron que las caras alegres desencadenaran un coste en la respuesta de

cooperación, o una facilitación de la respuesta de no-cooperación, en las personas con elevada gelotofobia. Sin embargo, estos participantes sí tendieron a cooperar menos con individuos con caras alegres en comparación con aquellos con baja gelotofobia. Esto parece indicar que las personas con elevada gelotofobia (*vs.* baja) tenderían a anticipar con menor frecuencia intenciones positivas (*i.e.*, respuesta de cooperación recíproca) en el juego de confianza cuando interactúan con alguien que expresa un estado afectivo alegre. Por otra parte, no se observaron diferencias entre estos grupos a la hora de cooperar con rostros que manifestaban ira o un estado afectivo neutro. Además, en este estudio, se obtuvo evidencia adicional para las dificultades en la discriminación de la mirada entre las personas con elevada gelotofobia. Estos efectos fueron investigados controlando las puntuaciones en ansiedad social de los participantes.

En suma, los resultados de estos dos capítulos parecen sugerir que la gelotofobia no estaría estrechamente vinculada con déficits en la identificación o en el procesamiento *bottom-up* de la alegría, sino más bien con alteraciones en procesos más globales, de tipo inferencial, a la hora de juzgar la intencionalidad de personas que muestran un rostro alegre. Esto es consistente con investigaciones previas que relacionan los niveles elevados de esta disposición con un desarrollo atípico de habilidades de mentalización-teoría de la mente (Samson, Huber, & Ruch, 2011; Ruch, 2009).

Por último, en el capítulo X, se discuten de manera integrada los resultados principales de todas las investigaciones, se establecen algunas de sus limitaciones y se proponen nuevos retos de investigación.



# Overview

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Gelotophobia (*gelos* means *laughter* in Greek) is a personality trait that refers to individual differences in the fear of being laughed at (Ruch & Proyer, 2008a). Studies on the core characteristics of this construct indicate that those with high gelotophobia exhibit exaggerated, negative affective reactions to situations where others laugh at them, and a near-paranoid sensitivity to anticipated ridicule (i.e. they suspect that people are making fun of them when others laugh in their presence; Platt, Ruch, Hofmann, & Proyer, 2012). Furthermore, gelotophobia has been positively linked to higher-order personality traits such as introversion and neuroticism, as well as elevated expressions of the clinical manifestations of the psychoticism scale (Ďurka & Ruch, 2015; Ruch & Proyer, 2009b). Its overlap with and differentiation from similar phenomena such as social anxiety has been also investigated (Carretero-Dios, Ruch, Agudelo, Platt, & Proyer, 2010b).

Despite the progress made in the study of gelotophobia, its consolidation as a research topic requires the further empirical evidence, guided by the referential framework of this disposition (Ruch, Hofmann, Platt, & Proyer, 2014a), which would cement gelotophobia's conceptualization, assessment and implications, with special emphasis on its differentiation from other similar constructs.

The *primary aim* of the present doctoral dissertation, which consists of ten chapters, was to empirically strengthen, through distinct methodological approaches, the entity of the gelotophobia construct, thereby seeking to make a meaningful contribution to its conceptualization. In Chapter I, we comprehensively review the research literature on this construct, describing gelotophobia's theoretical model and the empirical evidence for its assessment and nomological network. In Chapter II, we thoroughly describe our objectives and motivations for each empirical chapter. Altogether, this doctoral

dissertation involves eleven studies ( $N = 2.447$ ) that can be divided into three specific research paths.

In Chapters III and IV, we describe the investigations aiming at developing a comprehensive psychometric validation of the Spanish form of the PhoPhiKat-45 (Ruch & Proyer, 2009a). This instrument allows assessment of gelotophobia and two further dispositions toward ridicule and being laughed at, namely gelotophilia (i.e. joy in being laughed at) and katagelasticism (i.e. joy in laughing at others). In the first chapter, we examined the metric properties of the items, the factorial structure (through exploratory and confirmatory techniques) and the scores' internal consistency for the Spanish form of the PhoPhiKat-45. As indicators of external validity, we seek to replicate previous correlates of the PhoPhiKat-45's dispositions and diverse variables: (a) humor styles (Dursun, Dalğar, Brauer, Yerlikaya, & Proyer, in press); (b) trait anxiety (Ruch, 2009); (c) autistic traits (Wu et al., 2015); and (d) higher-order personality dimensions of the Five-Factor Model (FFM: Ďurka & Ruch, 2015). Additionally, in the second chapter of this research path, we expand the evidence for the construct validity of the Spanish form of the PhoPhiKat-45. For this purpose, we analyze the location of gelotophobia, gelotophilia, and katagelasticism within two alternative personality models: the HEXACO model (Ashton & Lee, 2007) and the Dark Triad (Paulhus & Williams, 2002). Note that these associations have not yet been investigated.

To conclude, our results seem to suggest that the Spanish form of the PhoPhiKat-45 shows good psychometric properties and, thus, represents an adequate assessment tool for studying these laughter-related dispositions in Spain and for future cross-cultural research. Furthermore, our findings in this research path regarding the location of gelotophobia within the FFM (generalization of prior results: Ďurka & Ruch, 2015) and the HEXACO model revealed that around 45–50% of the overall variance in

gelotophobia can be mainly accounted for by heightened levels of introversion and neuroticism/emotionality, and lower levels of openness to experience and honesty-humility. These data formed the empirical base for our subsequent investigations.

Regarding our second line of research, which is described in Chapters V, VI, and VII of the dissertation, we examine the degree of redundancy-differentiation of gelotophobia from preexisting phenomena with similar manifestations. We first investigate whether gelotophobia would have incremental validity over the basic personality traits of the FFM (Chapter V) and the HEXACO model (Chapter VI) in the prediction of inter-individual variance in diverse body image-related dimensions. Our results indicate that gelotophobia increases the amount of explained variance in (high) body shame and (low) appearance control beliefs beyond the influence of FFM traits (predominantly neuroticism and extraversion). These findings were replicated controlling for the shared variance between gelotophobia and the HEXACO traits (predominantly extraversion, emotionality and honesty-humility), and they extend to alternative body image-related variables such as a negative appearance evaluation and body areas dissatisfaction, as well as a greater appearance orientation and overweight preoccupation. Moreover, in this study, we assess participants' scores on social anxiety in order to: (a) examine putative convergent-discriminant associations between gelotophobia and social anxiety for diverse body image-related indicators; and (b) investigate the predictive validity of both dispositions beyond the HEXACO traits. Our results show that, although both constructs show a highly comparable pattern of correlations, gelotophobia had stronger values than social anxiety in the prediction of body image variation. This finding can be interpreted as further evidence for the differentiation between gelotophobia and social anxiety.

In Chapter VII of this doctoral dissertation, we include a multitrait-multimethod study focused on the latent structure and convergent-discriminant validity evidence of the measures of gelotophobia, social anxiety and paranoid ideation, which were assessed through self- and peer ratings. The implementation of multilevel confirmatory factorial analyses showed that these personality constructs are empirically homogeneous and sufficiently independent of each other, considering both self- and peer reports. Moreover, regarding gelotophobia, the overlapping between its self- and peer ratings (i.e. convergent validity) was satisfying on the basis of its affective nature (Watson, Hubbard, & Wiese, 2000). In terms of discriminant validity, our results replicate the robust connection between gelotophobia and social anxiety, and reveal a moderate-to-strong association between this laughter-related disposition and paranoid ideation.

Altogether, these findings strengthen the distinctiveness of gelotophobia from similar personality constructs, considering both (a) its incremental validity over higher-order traits such as introversion and neuroticism/emotionality in the prediction of body image; and (b) its unique characteristics regarding social anxiety and paranoid ideation. This research path on gelotophobia's independence is further extended in the following empirical chapters.

In our third line of research, which consists of Chapter VIII and IX of the doctoral dissertation, we investigate the possible modulation of gelotophobia over affective facial expressions and gaze processing. In Chapter VIII, we compare individuals high (*vs.* low) in gelotophobia in a gaze discrimination task (i.e. direct to the observer/lateral-averted: Cañadas & Lupiáñez, 2012) with faces portraying diverse affective expressions (i.e. joyful, angry, fearful, sad or neutral faces). We also compared these gelotophobia-based groups in their categorizations of the affective facial expressions, and in their judgements of the valence, intensity and arousal of faces. Our results showed that

gelotophobia was associated with greater error rates in the gaze discrimination task, regardless of the emotional expression. This effect was significant even after controlling for participants' scores on social anxiety. By contrast, no gelotophobia-based differences emerged for either the emotional categorization or the evaluation of the affective features of other faces.

In Chapter IX, we compare two groups with extreme scores on gelotophobia (i.e. high *vs.* low) in their decisions (i.e. cooperation/non-cooperation) in a Trust Game (TG: Berg, Dickhaut, & McCabe, 1995). In this task, participants interacted with anonymous individuals displaying diverse affective facial expressions (joy, anger and neutral in this case) and gaze directions (i.e. straight, direct and averted). Our results showed that joyful faces triggered neither a cost for cooperation response, nor a facilitation of non-cooperation responses in terms of reaction times among participants high in gelotophobia. However, we did observe that these individuals were less likely to cooperate with a trustee with a joyful face, as compared to their low gelotophobia counterparts. This suggests that people scoring high in gelotophobia (*vs.* low) anticipate positive intentions in the TG (i.e. reciprocating cooperation) less frequently when interacting with an individual exhibiting a joyful emotional state. We did not observe differences between these groups in terms of their cooperation rates with angry and neutral faces. Moreover, in this study, we provided further support for the difficulties in gaze discrimination among those high in gelotophobia. These effects emerged even after controlling for individuals' scores on social anxiety.

In summary, our results in these empirical chapters seem to suggest that gelotophobia would not be closely linked to deficits in the identification or bottom-up processing of joyful faces, but rather to abnormalities in higher-order inferential processes when judging the intentionality of individuals with a joyful face. This fits

## OVERVIEW

well with earlier studies describing a relationship between gelotophobia and atypical development of mentalizing/theory of mind abilities (Samson, Huber, & Ruch, 2011; Ruch, 2009).

Finally, in Chapter X, we discuss our main findings in an integrative manner, emphasizing certain limitations and providing future avenues for research. It is worth mentioning that the reader will likely find repetitive the information which appears more than once across the doctoral dissertation. This is because the empirical chapters were drafted as independent articles to be submitted for publication.



# **Chapter I**

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*Introduction/Introducción*



Tradicionalmente, el estudio científico del humor y de la risa ha estado centrado en conocer las implicaciones más beneficiosas y adaptativas de estas manifestaciones, enfatizando su importancia para la mejora de las relaciones interpersonales y como estrategias de *reappraisal* ante situaciones de estrés (Lefcourt, 1997, Lefcourt, Davidson, Prkachin, & Mills, 2001; Martin, 20007). No obstante, ciertas expresiones humorísticas aversivas, como la burla, la ridiculización o la risa despectiva, constituyen una vía para avergonzar a los demás, controlar sus comportamientos y mantener la jerarquía dentro de un grupo (Bergson, 1900/1914; Ruch, 2008; Titze & Kühn, 2014).

Si bien manifestaciones como la ridiculización son conceptualizadas como inherentemente negativas, otras como la burla también pueden responder a estados afectivos positivos, siendo utilizada en contextos lúdicos o en conflictos interpersonales de baja gravedad (Bishop & Muckleroy, 2009; Keltner, Capps, Kring, Young, & Heerey, 2001; Kowalski, 2000). Investigaciones recientes han demostrado que mientras que algunas personas discriminan con mayor facilidad la intencionalidad de estas expresiones (prosocial *versus* aversiva), otras parecen ser más susceptibles a su potencial carga agresiva, interpretando con mayor frecuencia estas situaciones como hostiles, mostrando reacciones negativas más pronunciadas y anticipando de manera infundada intenciones hostiles por parte del emisor (véase Ruch, 2009).

La presente tesis doctoral se encuadrada en este área de estudio, teniendo como objetivo fundamental reforzar empíricamente la entidad del constructo *gelotofobia*. De acuerdo con su conceptualización más extendida, la gelotofobia es un rasgo de personalidad que describe las diferencias individuales en el miedo excesivo a ser el objetivo de las risas (burlas-ridiculización) de los demás (Ruch & Proyer, 2008a, 2009a).

Antes de entrar en los capítulos empíricos que fundamentan la presente tesis doctoral, describiremos la literatura científica que da soporte al estudio de esta disposición relativa al afrontamiento de la burla y ridiculización (*Capítulo I: introducción*). En concreto, comenzaremos resumiendo los postulados teóricos e investigaciones empíricas que precedieron al estudio de la gelotofobia, haciéndose un recorrido desde la teoría general de la superioridad-denigración en el humor hasta los primeros estudios sobre la burla y la ridiculización como precursores más cercanos del estudio científico de la gelotofobia. Posteriormente, describiremos la evolución terminológica del constructo, su marco teórico de referencia, incluyendo causas, factores relacionados y consecuencias, así como los instrumentos de evaluación y los niveles de prevalencia subclínica característicos de la gelotofobia. Tras esto, detallaremos los principales correlatos de la gelotofobia con variables de personalidad, poniendo especial énfasis en las evidencias relativas a su diferenciación frente a constructos similares (p.ej., ansiedad social). Por último, recapitularemos los datos más relevantes en lo que respecta a las modulaciones observadas para esta disposición en el procesamiento de información socioafectiva, para lo que se prestará especial atención al procesamiento de la risa y la sonrisa de otras personas en demandas de identificación y atribución de estados afectivos.

### **1. El lado oscuro del humor y de la risa**

El estudio de la gelotofobia encuentra en la teoría de la *superioridad-denigración* (Bremmer & Roodenburg, 1999; Gruner, 1978, 1997; Hobbes, 1840; Morreall, 1987) el marco conceptual de referencia a partir del cual desarrollar la investigación empírica. Esta teoría fue considerada como la corriente dominante en el estudio del humor y de la risa hasta inicios del siglo XVIII (Critchley, 2010).

El origen de la teoría de superioridad-denigración puede situarse hace aproximadamente 2.400 años en la Grecia clásica. En este periodo, autores como Platón, en su obra *Philebus*, o Aristóteles, en *Poetics*, sugerían que el humor y la risa presentaban estrechos vínculos con sentimientos de desaprobación y superioridad sobre otras personas. Más específicamente, la ocurrencia del humor se produciría por el placer que proporciona visualizar los infortunios y debilidades de los demás, siendo la risa la manifestación conductual más usual del humor, y que serviría como una forma de expresar desprecio hacia los menos afortunados. Su naturaleza estaría, por tanto, fundamentada en la malicia, sintiendo gozo y diversión, en lugar de piedad, al contemplar la esencia débil de personas que son consideradas como inferiores en términos intelectuales, físicos, o en cualquier otro atributo. Sin lugar a dudas, esto confería al humor y a la risa una cualidad negativa, siendo estas expresiones valoradas como catalizadores de violencia y características no deseables entre las personas virtuosas de una sociedad (Ferguson & Ford, 2008; Martin, 2007; Morreall, 1987).

En una línea similar, el filósofo inglés Thomas Hobbes continuó reforzando las bases de la conexión entre humor-risa y agresión en sus escritos durante el siglo XVII. En concreto, la perspectiva *hobbesiana* postulaba el humor y la risa en términos de vencedores y vencidos, estableciendo orígenes específicos para su aparición. Por un lado, y al igual que sus predecesores griegos, este autor defendió que estas manifestaciones se desprenderían de los sentimientos de supremacía o “gloría súbita” que se producen al obtener una comparación favorable con respecto a otros individuos. Además, Hobbes señaló que el humor y la risa podrían producirse como resultado del resentimiento hacia uno mismo, esto es, una comparación favorable con nuestro pasado (i.e., autodenigración a través del humor: Goldstein & McGhee, 1972; Hobbes, 1840; Morreall, 1987; Valbuena, 2002).

Otros autores clásicos también han abordado las conexiones entre el humor-risa y la agresión u hostilidad. Por ejemplo, Sigmund Freud afirmaba que el humor hostil representaba un medio para escapar de las ataduras impuestas por la sociedad y, de esta manera, satisfacer impulsos socialmente inaceptables. De acuerdo con esta idea, el humor hostil tendría un impacto positivo en nuestro funcionamiento psicológico ya que nos ayudaría a canalizar nuestra ira y frustración mediante alternativas más benignas (Freud, 1905/1960; Singer, 1968; Ferguson & Ford, 2008). Otro autor coetáneo a Freud, el filósofo francés Henri Bergson, discutió las implicaciones agresivas del humor y de la risa en circunstancias interpersonales en su libro *Laughter*. Este autor postuló que el miedo a ser ridiculizado por los demás actúa como un mecanismo correctivo a nivel grupal. A fin de evitar ser objeto de ridiculización, las personas asumen ciertas ideas y comportamientos como propios, lo que favorece la homogeneización del grupo. En otras palabras, promover este miedo a la burla sería una forma de controlar ciertas desviaciones que no se ajustan a los estándares establecidos por el colectivo. La utilización de la burla y la ridiculización podría ser, por tanto, una herramienta dirigida a mantener la disciplina y jerarquía dentro de un grupo (Bergson, 1900/1914; Billing, 2005; Davies, 2009).

Alrededor de la década de los 50 del pasado siglo, diversos autores llevaron a cabo investigaciones dirigidas a respaldar empíricamente la conexión entre agresividad y humor-risa (Brenman, 1952; Epstein & Smith, 1956; Singer, Gollob, & Levine, 1967). En estrecha conexión con los postulados de la teoría de la superioridad-denigración, se encontró que la presencia de niveles moderados de agresión (*vs.* nulos o excesivos) incrementaba la diversión percibida de ciertas situaciones humorísticas interpersonales (Zillmann & Bryant, 1974). Sin embargo, esta asociación estaba moderada por las creencias y sentimientos hacia el receptor del comentario humorístico (p.ej., antipatía)

y/o por su pertenencia a determinadas categorías sociales (p.ej., endogrupo *vs.* exogrupo), entre otras variables (Zillmann & Bryan, 1980).

También se ha demostrado que ciertas características personales como ser varón o poseer un estatus socioeconómico superior son indicativas de un mayor uso de formas agresivas de humor (Keltner et al., 2001; Martin, Puhlik-Doris, Larsen, Gray, & Weir, 2003; Navarro-Carillo, Torres-Marín, & Carretero-Dios, 2020). Otras características asociadas a la emisión de humor agresivo son la presencia de niveles elevados de ira-rasgo, psicoticismo o psicopatía subclínica, así como bajos de amabilidad-rasgo y de empatía afectiva disposicional (Georgesén, Harris, Milich, & Bosko-Young, 1999; Hampes, 2010; Keltner et al., 1998; Veselka, Schermer, Martin, & Vernon, 2010). Más allá de estas variables, se ha demostrado que ciertas actitudes ideológicas también contribuyen a predecir el empleo de formas específicas de humor hostil, por ejemplo, las fundamentadas en una visión denigrante hacia un colectivo por razones de género o raza (p.ej., Romero-Sánchez, Carretero-Dios, Megías, Moya, & Ford, 2016). En línea con esto último, se ha encontrado que el humor de denigración contribuye a normalizar prejuicios e incrementa la legitimación de comportamientos discriminatorios hacia el receptor que sufre este tipo de manifestaciones humorísticas (Mallett, Ford, & Woodzicka, 2016; Mendiburo-Seguel & Ford, 2019; Romero-Sánchez et al. 2016).

Antes de seguir, cabe mencionar que si bien la teoría de la superioridad-denigración ha demostrado ser un anclaje válido para explicar los procesos de agresión (sutil) a través del humor y de la risa, su extrapolación a fenómenos humorísticos de valencia positiva o neutra ha suscitado un menor apoyo empírico (véase para una discusión más detallada Martin, 2007).

### *1.1. El estudio de la burla y la ridiculización*

Una cuestión controvertida en el estudio del lado oscuro del humor y de la risa es la distinción entre los conceptos de burla (*teasing*) y ridiculización. Si bien en ocasiones la literatura científica ha tratado estos fenómenos como intercambiables, existen matices sustanciales que recomiendan su diferenciación (Bishop & Muckleroy, 2009; Platt, 2008, Proyer, 2017).

La burla es una forma específica de comunicación que combina elementos de agresión, humor y ambigüedad (Shapiro, Baumeister, & Kessler, 1991). En concreto, esta manifestación ha sido definida como una provocación intencional, caracterizada por la presencia de indicadores lúdicos-humorísticos, que puede responder tanto a intenciones prosociales como aversivas por parte de un emisor (Keltner et al., 2001). De esta forma, el receptor debe inferir la motivación afectiva que desencadena dicha expresión, basándose en ciertos marcadores externos, como la prosodia o el tono de voz, y en su conocimiento previo sobre el emisor (Keltner et al., 2001; Kowalski, 2000). Por otro lado, la ridiculización haría referencia a las expresiones más hostiles de burla, en las que se busca humillar y/o mostrar una posición de superioridad-rechazo sobre otros bajo la apariencia de la mera diversión (Bishop & Muckleroy, 2009; Martin, 2007).

En base a lo descrito, se ha propuesto que estos fenómenos pueden ser representados en un *continuum* que oscilaría desde situaciones de burla lúdica hasta escenarios de burla hostil-ridiculización (Shapiro et al., 1991; Kowalski, 2000). La burla lúdica, por ejemplo, fundamentada en una intención prosocial del emisor, desempeña funciones interpersonales positivas como mostrar cercanía e intimidad, plantear una confrontación de manera menos agresiva, y minimizar la gravedad percibida de eventos adversos (Bishop & Muckleroy, 2009; Eder, Evans, & Parker, 1995; Mills & Babrow, 2003). Por el contrario, la burla hostil, fundamentada en intenciones agresivas y más



cercana al concepto de ridiculización, estaría dirigida a mostrar superioridad (i.e., mejorar el *self* a expensas de otros), controlar desviaciones sociales en un grupo y herir a otros en conflictos interpersonales severos como situaciones de acoso-maltrato (Hoover & Stenhjem, 2003; Keltner et al., 2001; Martin et al., 2003).

El estudio empírico ha permitido mejorar nuestra comprensión sobre estos fenómenos. Por ejemplo, la delimitación de los contenidos más frecuentes de ambas manifestaciones sugiere que ciertas características personales del receptor como la apariencia física (p.ej., sobrepeso), el rendimiento intelectual-físico, o las desviaciones en el comportamiento social son asiduamente señaladas como focos centrales de burla y ridiculización (Aronson et al., 2007; Kowalski, 2000; Shapiro et al., 1991).

En lo concerniente a las consecuencias de estas manifestaciones, Keltner Young, Heerey, Oemig y Monarch (1998) hallaron que, en una situación de burla hostil, los receptores (*vs.* emisores) experimentaban más emociones negativas como la ira y la vergüenza a nivel experiencial-subjetivo y expresivo-motor. Además, existen evidencias de que el mero hecho de presenciar una situación en la que se ridiculiza a alguien, sin necesidad de ser el receptor, provoca la inhibición de comportamientos no afines al grupo y aumentaba el miedo al fracaso (Janes & Olson, 2002). Por otro lado, se ha demostrado que sufrir reiteradamente episodios de ridiculización durante la infancia y adolescencia se vincula con niveles elevados de depresión y ansiedad (Roth, Coles, & Heimberg, 2000) así como con el desarrollo de percepciones negativas del propio cuerpo (Cash, 1995; Menzel et al., 2010; Shapiro et al., 1991) en edad adulta.

Otros autores, sin embargo, han demostrado que es posible disociar las reacciones afectivas derivadas de la exposición a situaciones de burla lúdica *versus* ridiculización. En concreto, Platt (2008, 2019) encontró que mientras que la ridiculización se asociaba a episodios afectivos negativos como la vergüenza, el miedo o la ira, la burla lúdica se

vinculó con otras emociones como la alegría y la sorpresa (i.e., respuestas afectivas experienciales).

En conjunto, estas investigaciones muestran que la burla y la ridiculización pueden tener un impacto negativo en las personas que lo sufren. No obstante, sabemos que no todas las expresiones de burla están motivadas por estados afectivos negativos. En este sentido, es necesario estudiar características personales que expliquen cómo difieren las personas a la hora de afrontar situaciones de humor más ambiguas, como la burla lúdica, especialmente aquellas que implican un mayor grado de susceptibilidad ante estas claves potencialmente aversivas. La inclusión del constructo gelotofobia (Ruch & Proyer, 2008a), objeto central de investigación de la presente tesis doctoral, ha permitido establecer un marco general de referencia para estudiar estos aspectos.

## **2. Sobre la gelotofobia**

### *2.1. Evolución terminológica*

El concepto gelotofobia (*gelos* significa *risa* en griego antiguo) fue introducido por el psicoterapeuta alemán Michel Titze en las postrimerías del siglo XX. En sus primeros escritos sobre el fenómeno, derivados de estudios de casos clínicos, Titze (1995, 1996) describió que algunos de sus pacientes manifestaban un miedo grave o preocupación excesiva a ser el objetivo de las risas de los demás. Este temor, además, iba acompañado por la firme creencia de ser involuntariamente ridículos ante los demás y, por consiguiente, un objetivo fácil de las burlas de otras personas (Titze, 2009). Estos pacientes mostraban, siguiendo con Titze, un estado general que definió como “*agelotic*”, esto es, la incapacidad de experimentar y considerar el humor y la risa como experiencias afectivas positivas o socialmente agradables. En contraposición, tendían a interpretar estas manifestaciones como expresiones potencialmente amenazantes (Ruch,

2009; Titze, 2009). Como resultado, estos pacientes mostraban ser especialmente sensibles a las posibles burlas u ofensas de los demás, y tendían a anticipar de manera infundada que las risas y sonrisas de los demás estaban dirigidas hacia ellos y pretendía ridiculizarles (Ruch & Proyer, 2008a; Titze, 2009).

Otra característica de estos pacientes era su escasa expresividad facial al confrontar el humor y la risa de los demás, mostrando, en términos generales, un rictus rígido y dificultades ostensibles para desplegar con naturalidad ciertas expresiones faciales afectivas. Esto confería a estas personas una apariencia inusual y poco natural, dando una impresión robótica o similar a la de una marioneta de madera. Esta apariencia fue denominada por Titze (1996) como el “*Pinocchio-complex*”. Por último, este autor señaló que, como consecuencia de todas estas alteraciones, en situaciones sociales e interpersonales donde el humor y la risa están presentes, estos pacientes tendían a escrutar minuciosamente a todas las personas de su entorno inmediato con la expectativa de encontrar señales de rechazo social (p.ej., sonrisas-risas despectivas) y trataban de evitar estos contextos a fin de no ser ridiculizados (Titze, 2009).

La naturaleza clínica de estos hallazgos motivó que la gelotofobia fuera conceptualizada, inicialmente, como un trastorno psicopatológico vinculado a la vergüenza extrema, y caracterizado por un miedo grave a ser el objetivo de las risas de los demás y por la firme convicción de ser involuntariamente ridículo (Titze, 2009).

Las primeras investigaciones empíricas sobre la gelotofobia, iniciadas hace una década por el profesor austriaco Willibald Ruch y colaboradores, comportó una modificación sustancial en la manera de conceptualizar y abordar el estudio de este fenómeno. Si bien el enfoque clínico tuvo una importancia central en la conformación del marco teórico-conceptual del constructo (definición, factores asociados y consecuencias), el estudio empírico de la gelotofobia se formalizó desde paradigmas

más próximos a la psicología de las diferencias individuales (Ruch, 2009; Ruch, Hofmann, Platt, & Proyer, 2014a). Este cambio de paradigma perseguía, entre otras cosas, que la gelotofobia trascendiera una visión más restrictiva, exclusiva del ámbito clínico, y pasara a estudiarse como una disposición o rasgo de personalidad con una esperable variabilidad en el rango de lo subclínico (véase Ruch & Proyer, 2008a).

El asentamiento de la conceptualización “rasgo” de la gelotofobia estuvo precedida por el desarrollo de un instrumento de medida con garantías psicométricas suficientes como para estudiar esta disposición en muestras no-clínicas (véase apartado específico sobre la evaluación de la gelotofobia). La administración de estos instrumentos, conformados por una serie de ítems-descriptores derivados de las características prototípicas de la gelotofobia clínica, permitió, en primer lugar, confirmar la existencia de distintos niveles (representadas en un continuum) de gelotofobia a nivel subclínico. En segundo lugar, puso a prueba la idoneidad de ciertos ítems-indicadores para discriminar dichos niveles de gelotofobia, contribuyendo a afianzar las manifestaciones centrales de este fenómeno en su variante rasgo. Entre las características más relevantes señaladas para la gelotofobia-rasgo, cabe destacar: (a) sospechar-desconfiar cuando otras personas ríen alrededor, (b) referir las risas de otras personas a uno mismo con independencia del verdadero destinatario, (c) estar convencido de dar un impresión involuntariamente ridícula, (d) esforzarse con la finalidad de no llamar la atención de manera negativa y hacer el ridículo, y (e) mostrar una apariencia física inusual. Por último, estos estudios psicométricos confirmaron la naturaleza unidimensionalidad de la gelotofobia (Ruch & Proyer, 2008a).

Años después, Platt, Ruch, Hofmann y Proyer (2012) investigaron la dimensionalidad de la gelotofobia seleccionando subgrupos de individuos con distintos niveles de este rasgo. Si bien la unidimensionalidad de la gelotofobia emergía de

manera robusta cuando se consideraba la totalidad de variaciones en las puntuaciones rasgo, los análisis de estructura interna realizados exclusivamente sobre las puntuaciones elevadas arrojaron la presencia de tres subcomponentes estrechamente interrelacionados pero independientes: (a) respuestas negativas exageradas al hecho de que se rían de uno mismo; (b) sensibilidad rayana a lo paranoide que lleva a la anticipación de situaciones de burla y ridiculización, y (c) modos de afrontamiento específicos ante estas situaciones: control-inhibición de conductas, aislamiento social y/o aceptación de ser un objeto válido de ridiculización. Estos mismos autores propusieron que, si bien los dos primeros subcomponentes podrían representar características distintivas o, al menos, más directamente relacionadas con la gelotofobia, el tercero, relativo a los modos de afrontamiento ante situaciones de ridiculización, podría resultar común a otros constructos de naturaleza similar como la ansiedad social.

En conjunto, estas evidencias llevaron a los investigadores a conceptualizar la gelotofobia como un rasgo de personalidad representado en un continuum que oscila desde la ausencia de miedo (polo inferior) hasta el miedo extremo (polo superior) a ser el objetivo de las risas o burlas de los demás, caracterizándose los niveles más elevados de esta disposición por la presencia de respuestas negativas desproporcionadas ante el hecho de que se rían de uno mismo y una anticipación infundada de situaciones de burla y ridiculización por parte de otros individuos (Ruch et al., 2014a). Hasta la fecha, la conceptualización “rasgo” de la gelotofobia se ha consolidado como la más extendida en el estudio empírico de esta disposición.

## *2.2. Modelo teórico-empírico del constructo*

Una vez asentadas las particularidades de las diferentes conceptualizaciones de la gelotofobia (trastorno psicopatológico vs. rasgo de personalidad), y con el propósito de

dotar a este constructo de un marco de trabajo más exhaustivo, destacados investigadores de esta disposición (Ruch, 2009; Ruch et al., 2014a; Ruch & Proyer, 2008a; Titze, 2009) procedieron a establecer un modelo teórico-explicativo de referencia que, además de incorporar las características centrales de su conceptualización, incluyera una serie de teorizaciones sobre sus potenciales causas y consecuencias, así como factores relacionados con esta disposición (véase Figura 1). El desarrollo de este modelo perseguía, en esencia, establecer una base teórica lo suficientemente sólida como para generar un conjunto de hipótesis y predicciones sobre el fenómeno que pudieran ser, posteriormente, testadas empíricamente (Ruch, 2009).

### *2.2.1. Etiología*

Sobre los posibles factores etiológicos de la gelotofobia, el modelo teórico de Ruch et al. (2014a) recoge dos vías centrales de exploración. En primer lugar, se argumentó que el origen de este miedo excesivo a ser objeto de ridiculización podría estar motivado por un déficit en el desarrollo de ciertas habilidades interpersonales, adquirido como consecuencia de una inadecuada interacción con las figuras de referencia de la infancia (Titze, 2009). Más específicamente, se planteó que haber experimentado episodios de vergüenza extrema durante esta etapa del desarrollo, siendo ésta inducida por padres, madres y/o cuidadores, podría potenciar algunas de las manifestaciones centrales de la gelotofobia (e.g., respuestas negativas exageradas en situaciones de burla y ridiculización). Por otro lado, también se planteó que la falta de hilaridad y la interpretación negativa de ciertas expresiones de humor y risa de otras personas, podrían estar vinculadas a que las figuras de referencia durante la infancia no expresaban habitualmente estas manifestaciones o las expresaban de manera poco natural (Ruch et al., 2014a; Titze, 2009). No obstante, cabe subrayar que estos

postulados sobre la etiología de la gelotofobia no han sido demostrados empíricamente hasta la fecha.

Otra de las posibles causas esgrimidas para el desarrollo de la gelotofobia ha sido el hecho de haber sufrido experiencias intensas y reiteradas de ridiculización, o de no ser tomado en serio, durante etapas clave de la socialización del individuo (Titze, 2009). No obstante, cabe destacar que el apoyo empírico obtenido para este factor etiológico solo ha sido parcial. Más específicamente, ciertos estudios han demostrado que haber vivenciado experiencias de ridiculización con mayor frecuencia no supone una característica concluyente para el desencadenamiento de la gelotofobia, ya que las diferencias en esta variable no permiten distinguir a individuos diagnosticados con gelotofobia clínica de personas con síndrome de Asperger (Samson, Huber, & Ruch, 2011) o de personas que padecen manifestaciones clínicas de vergüenza severa (Ruch, Proyer, & Ventis, 2010). Por el contrario, la gelotofobia sí parece estar diferencialmente asociada con la forma en la que se vivencian dichas situaciones de burla y ridiculización, de manera que la elevada intensidad percibida ante estos eventos, más que la frecuencia de los mismos, resultaría indicativa del miedo grave a ser el objetivo de las risas y burlas de los demás (Edward, Martin, & Dozois, 2010; Proyer, Hempelmann, & Ruch, 2009; Ruch et al., 2010).

Por otro lado, también se ha considerado como apoyo empírico indirecto de este factor etiológico la asociación, ampliamente replicada, entre la gelotofobia y haber sufrido episodios reiterados de *bullying* en diferentes edades (Führ, 2010; Platt, Proyer, & Ruch, 2009; Proyer, Meier, Platt, & Ruch, 2013; Proyer, Neukom, Platt, & Ruch, 2012).

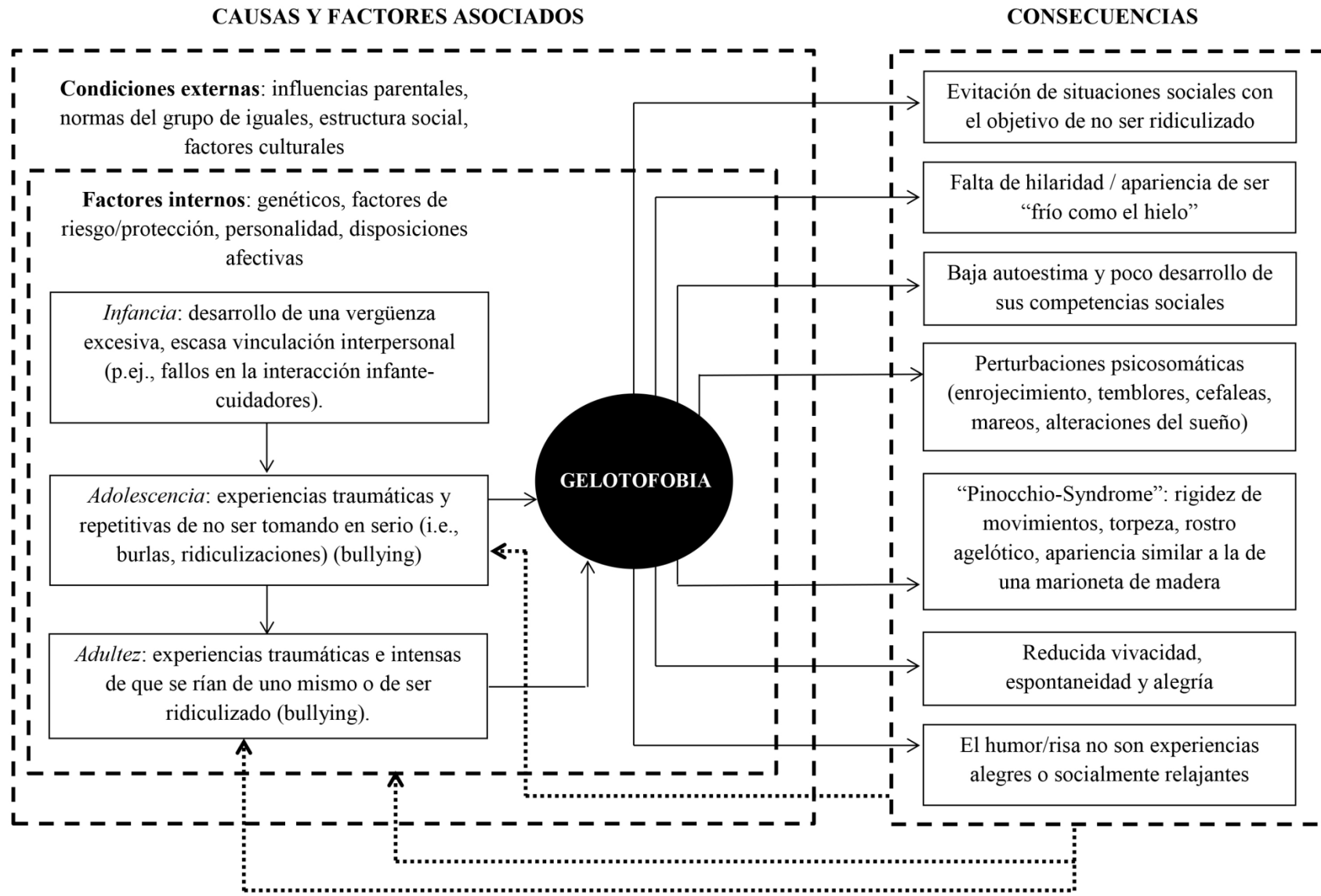


Figura 1. Modelo de causas posibles, factores asociados y consecuencias posibles de la gelotofobia propuesto por Ruch et al. (2014a).



### 2.2.2. Factores internos y externos relacionados con la gelotofobia

En estrecha conexión con los factores etiológicos, el modelo de Ruch et al. (2014a) también incluye una serie de factores internos y externos que podrían asociarse con la aparición y mantenimiento de las manifestaciones centrales de la gelotofobia. Como factores internos, se han propuesto los siguientes: (a) herencia genética, (b) presencia *vs.* ausencia de factores protectores (o de riesgo) que modulen la probabilidad de ser ridiculizado, y, por último, (c) la elevada (*versus* baja) inclinación a ciertos rasgos de personalidad y/o a disposiciones afectivas específicas. En lo que respecta al respaldo empírico de estos factores, existe, por ejemplo, un apoyo muy reducido para el posible papel de la herencia genética en la gelotofobia. En concreto, se han encontrado datos poco concluyentes en términos de correlación entre las puntuaciones en gelotofobia de progenitores e hijos. Mientras que Proyer, Estoppey y Ruch (2012b) encontraron una correlación positiva, reflejando un tamaño del efecto moderado, para esta relación con hijos adultos, Proyer y Neukom (2013) no observaron dicha relación (i.e. coeficientes de correlación en torno a cero) con hijos de edades comprendidas entre los 7-8 años.

En lo que se refiere a los factores protectores *versus* de riesgo asociados a la gelotofobia, el modelo de Ruch et al. (2014a) sugiere que ciertas características personales, como tener una apariencia física inusual (i.e., desviaciones de lo normativo), podrían incrementar la probabilidad de ser ridiculizado y contribuir al desencadenamiento de este fenómeno. En este sentido, en una investigación con metodología cuantitativa y cualitativa, se encontró que las personas con elevada gelotofobia (*vs.* baja) recordaban con mayor frecuencia haber vivenciado experiencias reiteradas de ridiculización con motivo de su apariencia física durante su infancia y adolescencia (Kohlmann et al., 2018). De hecho, estas mismas personas afirmaban que estas experiencias habían incrementado su temor a ser ridiculizados y que, en cierto

modo, podrían considerarse como uno de los posibles desencadenantes de su miedo grave a ser objeto de ridiculización (Ruch et al., 2014a).

En cuanto a las características de personalidad de aquellos con niveles elevados de gelotofobia, conocemos que esta disposición se asocia, principalmente, con puntuaciones altas de introversión y neuroticismo (Ďurka & Ruch, 2015; Ruch & Proyer, 2009b). También sabemos que la gelotofobia ha sido vinculada a niveles elevados de ira-rasgo (Weiss et al. 2012). En un estudio sobre las asociaciones de la gelotofobia con ciertas características psicopáticas, Proyer, Flisch, Tschupp, Platt y Ruch (2012) encontraron que las puntuaciones altas en gelotofobia eran indicativas de un estilo de vida errático, de compartimentos manipulativos e impulsivos, y de una baja compasión por los demás. Con respecto a disposiciones afectivas específicas, la literatura sobre emoción señala que las personas con elevada gelotofobia se caracterizan por una cierta predisposición a estados afectivos negativos y una cierta minimización (en términos de intensidad y frecuencia) de estados afectivos positivos (Platt & Ruch, 2009).

Por otro lado, como posibles factores externos asociados a la gelotofobia, este modelo propone los siguientes: estilos de crianza parental, normas del grupo de pares, jerarquización social, y factores culturales. En lo concerniente a los estilos de crianza parental, la gelotofobia ha sido relacionada con prácticas de crianza sobreprotectoras donde la vergüenza constituye un mecanismo válido de control y corrección de la conducta (Proyer et al., 2012b). Por otro lado, desde una perspectiva macro-social, Davies (2009) postuló que el miedo a ser ridiculizado podría ser más pronunciado en aquellas estructuras sociales fuertemente jerarquizadas. En estos contextos, avergonzarse a otros suele ser una estrategia válida para mantener el estatus quo sobre personas de rango inferior. En lo que se refiere a las posibles influencias culturales, sabemos que

existen diferencias notables entre países en términos de prevalencia de la gelotofobia. Sin embargo, no existen estudios específicos sobre cómo ciertas características culturales de agrupación (colectivismo vs. individualismo) podrían modular la expresión de este rasgo.

### 2.2.3. Consecuencias

El modelo de Ruch et al. (2014a) también postula una serie de consecuencias ligadas a la gelotofobia. Si bien los autores del modelo reconocen que algunas de estas consecuencias resultan comunes a otros fenómenos similares como la ansiedad social, a saber: tendencia al aislamiento social, baja autoestima y escasas habilidades sociales, perturbaciones psicósomáticas severas y falta de vivacidad-jovialidad; otras son planteadas como potencialmente específicas o, al menos, más directamente relacionadas con una expresión elevada de gelotofobia, como son: falta de hilaridad y humor, manifestaciones reducidas de alegría, expresión facial hierática y poco natural ante las expresiones alegres de otras personas (i.e., *Pinocchio-syndrome*), y dificultades para apreciar el humor y la risa como experiencias afectivas positivas o socialmente agradables (i.e., estado general *agelotic*).

En relación con el primer grupo de consecuencias, catalogadas como comunes a otros constructos, se ha encontrado que la gelotofobia se asocia a niveles bajos de felicidad (Blasco-Belled, Rogoza, Torrelles-Nadal, & Alsinet, 2019), satisfacción personal (Proyer, Ruch, & Chen, 2012) y autoestima disposicional (Hiranandani & Yue, 2014). Con respecto a su comportamiento social, se ha hallado que las personas con una elevada gelotofobia son más tendentes a presentar un estilo de interacción con otros basado en la auto-protección, mostrando una elevada sensibilidad a la comparación

social y dificultades para modificar su estilo de presentación en función del contexto (Renner & Heydasch, 2010).

También se ha puesto de manifiesto que niveles elevados de esta disposición son indicativos de ciertas vulnerabilidades personales como la soledad, bajo atractivo físico percibido, menor auto-aceptación y la tendencia a mostrar expectativas de vida negativas (Führ, Platt, & Proyer, 2015). Por último, estudios recientes sugieren que las personas con elevada gelotofobia manifiestan dificultades específicas en el ámbito de las interacciones románticas o de pareja. Por ejemplo, se ha evidenciado que esta disposición se relaciona con una menor satisfacción de pareja en ambos sexos (Brauer & Proyer, 2018) y con estilos de apego de pareja negativos, basados en sentimientos de ansiedad y evitación en el marco de una relación romántica (Brauer, Proyer, & Ruch, 2019).

Por otro lado, en lo que atañe al respaldo empírico de las consecuencias teóricamente más específicas de la gelotofobia, sabemos que, por ejemplo, las personas con elevada gelotofobia parecen presentar, por lo general, una baja producción de humor (Miczo, 2017), especialmente el de naturaleza más adaptativa como el humor prosocial, dirigido a fortalecer vínculos interpersonales, o el humor como estrategia de *reappraisal*, fundamentado en el mantenimiento de una perspectiva humorística en momentos de adversidad (Dursun, Dalğar, Brauer, Yerlikaya, & Proyer, in press; Hiranandani & Yue, 2014; Ruch, Beermann, & Proyer, 2009a). De manera similar, en lo tocante a su proclividad a reír y sonreír, la gelotofobia se caracteriza por la presencia de un umbral alto para manifestar este tipo de expresiones, así como por un escaso interés por participar y promover el humor y la risa en sus interacciones cotidianas (i.e., bajo *cheerfulness* y alto *bad mood*: Ruch et al., 2009a).

En referencia a las expresiones reducidas de alegría, conocemos que la gelotofobia se asocia a episodios menos frecuentes, duraderos e intensos de esta emoción (Platt & Ruch, 2009). Consistentemente, las personas con elevada gelotofobia tienden a mostrar un menor activación de los marcadores asociados a la sonrisa de Duchenne ante los rostros alegres de otras personas (Hofmann, Platt, Ruch, & Proyer, 2015), lo que parece confirmar su escasa expresividad facial ante señales afectivas positivas. Por último, en lo que respecta al estado general *agelotic*, estudios empíricos sugieren que las personas con elevada gelotofobia tienden a atribuir estados mentales negativos a risas desencadenadas por una motivación afectiva positiva (Ruch, Altfreder, & Proyer, 2009b) y a manifestar dificultades a la hora de discriminar entre situaciones de burla lúdica y ridiculización (Platt, 2008, 2019). Estas personas también muestran un menor contagio-inducción de estados afectivos positivos tras ser expuestos a estímulos alegres (Ruch et al., 2009b; Hofmann et al., 2015).

### **3. Evaluación y prevalencia de la gelotofobia**

#### *3.1. Instrumentos de evaluación*

##### *3.1.1. Diagnóstico clínico*

La evaluación de la gelotofobia ha estado, como no podía ser de otra forma, estrechamente vinculada a la evolución de su comprensión psicológica. Por consiguiente, las primeras evaluaciones, fundamentadas en su conceptualización inicial como trastorno psicopatológico (Titze, 1995,1996), estaban dirigidas a diagnosticar la gelotofobia basándose en la presencia o ausencia de manifestaciones relativas a su sintomatología diferencial y a sus factores etiológicos (Titze, 2009). Este diagnóstico clínico era exclusivamente realizado por psicoterapeutas con experiencia contrastada en el fenómeno, y se derivaba de la observación y entrevistas con los pacientes.

Entre las bondades de este juicio clínico, cabe destacar que permitían ofrecer un diagnóstico diferencial de la gelotofobia respecto a otras manifestaciones clínicas ligadas a la vergüenza extrema (Ruch & Proyer, 2008b). No obstante, esta aproximación evaluativa también presentaba limitaciones evidentes. En primer lugar, los riesgos clásicos derivados de cualquier evaluación subjetiva. En segundo, su implementación resultaba muy costosa en términos de tiempo y esfuerzo, lo que dificultaba obtener información procedente de muestras amplias. Por último, su uso estaba ciertamente restringido, ya que solo podían llevarla a cabo aquellos expertos clínicos familiarizados con la gelotofobia (Ruch & Proyer, 2008a, 2008b; Titze, 2009).

### *3.1.2. GELOPH-46*

El asentamiento de la conceptualización rasgo de la gelotofobia fue acompañado por la creación del primer test psicométrico dirigido a evaluar las diferencias individuales en este constructo en población no-clínica: la GELOPH-46 (Ruch & Titze, 1998). Este instrumento, compuesto por 46 ítems, se deriva de las características prototípicas de la gelotofobia clínica. Esta medida permite computar, además de un indicador global de gelotofobia, puntuaciones en una serie de subcomponentes/facetos del constructo, a saber: (a) sensibilidad paranoide hacia las burlas de otras personas (compuesta por 11 ítems); (b) miedo al humor de otras personas (6 ítems); (c) conciencia crítica del propio cuerpo (8 ítems); (d) conciencia crítica de sus capacidades de comunicación verbal y no verbal (5 ítems); (e) aislamiento social (4 ítems); (f) respuesta general a las sonrisas y risas de otras personas (3 ítems); (g) sentimientos de envidia y pesar al comparar sus habilidades humorísticas con las de otras personas (4 ítems) y (h) experiencias traumáticas con la risa de otros en el pasado (5 ítems) (Ruch, 2009; Ruch & Proyer, 2008a, 2008b; Ruch & Titze, 1998). Todos los ítems están

formulados afirmativamente y son presentados con una escala de respuesta tipo Likert de 4 alternativas: siendo 1 (*totalmente en desacuerdo*), 2 (*moderadamente en desacuerdo*), 3 (*moderadamente de acuerdo*) y 4 (*totalmente de acuerdo*).

La aplicabilidad de la GELOPH-46 ha sido estudiada en varios trabajos. En dos investigaciones, el análisis discriminante de las puntuaciones de este instrumento permitió distinguir a individuos con gelotofobia clínica con respecto a personas con otras manifestaciones de vergüenza severa y de participantes control (Ruch & Proyer, 2008a, 2008b). Por otro lado, en lo relativo al comportamiento psicométrico de la GELOPH-46, si bien los datos respaldaron una estructura interna unidimensional e índices de discriminación adecuados para todos los ítems ( $\geq .34$ ), algunos de estos indicadores saturaban con cargas factoriales bajas en el factor objetivo (i.e., rango en población no-clínica entre .23/.74 tras aplicar un análisis de componentes principales [ACP]) o, incluso, presentaban su carga principal en factores secundarios. Por último, los análisis de la consistencia interna de las puntuaciones de esta medida evidenciaron coeficientes alfa de Cronbach muy elevados (p.ej.,  $\alpha = .97$ ; Ruch & Proyer, 2008a).

Teniendo en cuenta el carácter unidimensional de la gelotofobia, las bajas propiedades métricas de determinados ítems de la GELOPH-46, y la escasa heterogeneidad (validez discriminante) de las diferentes facetas que ofrece este instrumento en sus asociaciones con otros rasgos de personalidad (véase Ruch, Proyer, & Popa 2008), Ruch y Proyer (2008a) plantearon una versión reducida de este instrumento de medida.

Para ello, establecieron una serie de criterios de selección de ítems basados tanto en argumentos teórico-conceptuales como en la evaluación de la calidad métrica individual de cada ítem. Esto permitió, en esencia, depurar aquellos indicadores con un mal ajuste

métrico, y/o que resultaran reiterativos o excesivamente solapados con manifestaciones de constructos similares.

Siguiendo esta estrategia, Ruch y Proyer (2008a) sometieron los ítems de la GELOPH-46, en primer lugar, a un juicio de validez de contenido a fin de evaluar el grado de pertenencia/representatividad de cada ítem a la dimensión objetivo (gelotofobia). Este juicio fue realizado por clínicos familiarizados con este constructo, evaluando los ítems de la GELOPH-46 en una escala de 0 (*nada adecuado*) hasta 9 (*perfectamente adecuado*). Para su selección definitiva, se estableció un criterio mínimo inter-jueces por ítem ( $\geq 6.5$ ). Además de esto, la carga factorial de cada ítem en el factor objetivo debía situarse en el rango de .40-.50 y no tener una carga sustancial en factores secundarios. Por otro lado, la media del ítem, atendiendo exclusivamente al grupo de personas con gelotofobia clínica, debía ser mayor a 2.50, lo que sugeriría que el ítem describe una característica relevante para este grupo. Además, la puntuación media del ítem, atendiendo exclusivamente al grupo control, debía ser inferior a 2.00, sugiriendo que el ítem describe una característica no distintiva de este grupo. Por otro lado, se estableció que la puntuación en el ítem debía maximizar la distinción entre personas con gelotofobia clínica e individuos de un grupo control. Los índices de discriminación de los ítems debían estar por encima de .40 en población no-clínica. Por último, como criterio adicional, se buscó el equilibrio entre los valores de fiabilidad ( $\alpha \geq .80$ ) y la extensión del instrumento (máximo de 20 ítems).

Como resultado de la aplicación de todos estos criterios, emergió un nuevo instrumento de medida conocido como GELOPH-15 (Ruch & Proyer, 2008a).



### 3.1.3. GELOPH-15

La GELOPH-15 (Ruch & Proyer, 2008a) es una medida de autoinforme compuesta por 15 ítems que recogen las características más distintivas de la gelotofobia a nivel subclínico, a saber: sospechar ante las risas de personas de alrededor, referir las risas de otras personas hacia uno mismo, estar convencido de dar un impresión involuntariamente cómica y ridícula a otras personas, controlarse uno mismo con la finalidad de no llamar la atención de manera negativa y parecer ridículo, y, por último, presentar ciertas particularidades comportamentales y físicas (p.ej., mostrarse rígido y/o perder la capacidad de comportarse adecuadamente cuando se es [o después de ser] objeto de las risas o burlas de los demás).

Este instrumento presenta el mismo formato de presentación que la GELOPH-46. Sin embargo, a diferencia de la versión anterior, la GELOPH-15 solo ofrece una puntuación global en gelotofobia (Ruch & Proyer, 2008a). En el estudio original de la escala, la GELOPH-15 mostró un ajuste psicométrico superior a la GELOPH-46, observándose una robusta estructura unifactorial (i.e., saturación de los ítems en el factor principal tras aplicación de ACP  $\geq .48$ ), valores más elevados en los índices de discriminación de los ítems ( $\geq .54$ ) y una alta consistencia interna de sus puntuaciones ( $\alpha = .95$ ).

Desde las primeras administraciones de la GELOPH-15 (versión original en alemán; Ruch & Proyer, 2008a), este instrumento ha sido paulatinamente validado en distintas lenguas (véase Tabla 1). Estos estudios psicométricos replicaron una clara estructura unifactorial para las puntuaciones de la GELOPH-15, utilizando tanto ACPs como análisis factorial confirmatorios (AFCs), y una elevada consistencia interna de sus puntuaciones ( $\alpha \geq .80$ ), con la única excepción de la versión tailandesa (véase Virangkur & Chantagul, 2015). Este instrumento también ha sido utilizado con éxito en

investigación transcultural, obteniéndose datos procedentes de 73 países ( $N = 22,610$ ; Proyer et al., 2009). Este estudio encontró variaciones sustanciales entre países en las puntuaciones medias de los ítems. De acuerdo con los autores de este trabajo, estas diferencias estuvieron basadas en aspectos culturales y no en el lenguaje de presentación de la escala. Además, se hallaron puntuaciones similares en la GELOPH-15 entre las muestras pertenecientes a un mismo país. En suma, la GELOPH-15 parece ser un instrumento adecuado para la evaluación de la gelotofobia en distintos contextos culturales, siendo la gelotofobia un fenómeno global con variaciones significativas a lo largo del mundo.

En lo que atañe específicamente al estudio de la gelotofobia en España, la versión validada de Carretero-Dios, Proyer, Ruch y Rubio (2010a) replicó la estructura unidimensional de la versión alemana original (i.e., ajuste modelo con AFC:  $\chi^2_{(90)} = 389.46$ ; RMSEA = .07/GFI = .98/AGFI = .97/ NNFI = .96), mostrando buenos índices de discriminación de los ítems ( $\geq .34$ ) y una adecuada consistencia interna de sus puntuaciones ( $\alpha = .85$ ). Cabe señalar que esta versión española ha sido utilizada con éxito en muestras colombianas, arrojando resultados comparables a los de su administración en muestras españolas (Carretero-Dios et al., 2010a).

Por último, las evidencias de validez externa obtenidas en aquellas investigaciones posteriores en las que se administró la GELOPH-15, contribuyeron a establecer un entramado teórico estructural y funcional más amplio sobre la gelotofobia, reforzando, en definitiva, su entidad como constructo psicológico.

**Tabla 1.** Resumen de las versiones traducidas y validadas de la GELOPH-15

<b>Idioma</b>	<b>Año</b>	<b>Autores</b>	<b>Estructura Interna</b>	<b><math>\alpha</math></b>	<b>Evidencias de Validez Externa</b>
Alemán	2008	Ruch & Proyer	1-Factor	.95	Diferenciación grupo gelotofobia-clínica vs. participantes control
Rumano	2008	Ruch, Proyer & Popa	1-Factor	.82	Sociodemográficos
Inglés	2009	Platt, Proyer & Ruch	1-Factor	.89	Patrones afectivos tras exposición a escenarios de <i>bullying</i> vs. burla lúdica
Árabe	2009	Kazarian, Ruch, & Proyer	1-Factor	.82	Relaciones con depresión, satisfacción con la vida & estilos de humor
Danés	2009	Führ, Proyer, & Ruch	1-Factor	.84	Relaciones con sociodemográficos
Checo & Eslovaco	2009	Hrebickova, Fickova, Klementova, Ruch, & Proyer	1-Factor	.87	Relaciones con rasgos básicos de personalidad (Five-Factor-Model)
Italiano	2009	Forabosco, Dore, Ruch, & Proyer	1-Factor	.82	Relaciones con sociodemográficos
Español	2010	Carretero-Dios, Proyer, Ruch & Rubio	1-Factor	.81	Relaciones con sociodemográficos
Francés	2010	Samson, Thibault, Proyer, & Ruch	1-Factor	.87	Relaciones con sociodemográficos
Polaco	2010	Chłopicki, Radomska, Proyer, & Ruch	1-Factor	.87	Relaciones con sociodemográficos
Chino	2010	Chen, Liao, Proyer, & Ruch	1-Factor	.82	-
Hebreo	2011	Sarid, Ruch, & Proyer	1-Factor	.89	Relaciones con sociodemográficos
Ruso	2011	Stefanenko, Ivanova, Enikopolov, Proyer, & Ruch	1-Factor	.83	Relaciones con sociodemográficos
Húngaro	2012	Ujlaky, Proyer, & Ruch	1-Factor	.86	Relaciones con sociodemográficos
Hindi	2014	Kamble, Proyer, & Ruch	1-Factor	.81	Relaciones con sociodemográficos
Tailandés	2015	Virangkur & Chantagul	3-Factores	.62	Relaciones con autoestima & satisfacción con la vida

*Nota:*  $\alpha$  = Alfa de Cronbach (coeficiente mínimo obtenido en los estudios de validación).

#### 3.1.4. *PhoPhiKat-45*

Poco tiempo después del desarrollo de la GELOPH-15, y ante la necesidad de medir e investigar empíricamente otros roles presentes en situaciones de burla y ridiculización, se desarrolló la PhoPhiKat-45 (Ruch & Proyer, 2009a). Esta medida de autoinforme incorpora los 15 ítems de la GELOPH-15 y agrega 30 ítems adicionales para evaluar dos disposiciones (15 ítems por dimensión) complementarias: la gelotofilia, o alegría-gozo al ser el objetivo de las risas y burlas de otras personas, y el katagelasticismo, o alegría-gozo al reírse de otras personas o al exponerlas a situaciones donde terceros puedan ridiculizarlas. Al igual que los ítems relativos a la gelotofobia, los 30 ítems adicionales de la gelotofilia y katagelasticismo están formulados afirmativamente y son presentados en un formato tipo Likert con las 4 alternativas de respuestas anteriormente descritas.

Ruch y Proyer (2009a) llevaron a cabo un ACP con los ítems de la PhoPhiKat-45 y encontraron apoyo para una estructura interna de 3-factores, claramente identificables con las dimensiones objetivo del instrumento, con un rango de cargas factoriales adecuadas para los ítems de la gelotofobia (rango .37—.75), gelotofilia (.37—.74) y katagelasticismo (.38—.68). Asimismo, estos ítems también mostraron adecuados índices de discriminación (i.e, gelotofobia  $\geq$  .21; gelotofilia  $\geq$  .40; katagelasticism  $\geq$  .35). Los índices de consistencia interna de las puntuaciones en gelotofobia, gelotofilia y katagelasticismo fueron adecuados ( $\alpha$ s  $\geq$  .84), así como la estabilidad temporal de las tres dimensiones (gelotofobia/gelotofilia/katagelasticismo = tras tres meses .86/.87/.77 y seis meses .80/.73/.75). Por último, consistentemente con su operacionalización, las intercorrelaciones descritas fueron las siguientes: la gelotofilia correlacionó positivamente con el katagelasticismo y negativamente con la gelotofobia, mientras que la correlación entre gelotofobia y katagelasticismo estuvo en torno a cero.

La PhoPhiKat-45 también ha sido validada, si bien en menor medida que la GELOPH-15, en diferentes lenguas (véase Tabla 2). Estos estudios psicométricos han respaldado la estructura interna de 3-factores, así como una adecuada consistencia interna para las puntuaciones de las tres disposiciones ( $\alpha_s \geq 80$ ). Asimismo, estos estudios han aportado evidencias que apoyan la validez externa de la PhoPhiKat-45, habida cuenta de sus asociaciones, teóricamente consistentes, con otras variables (p.ej., rasgos básicos de personalidad: Ďurka & Ruch, 2015). En relación con esto último, resulta necesario destacar que, si bien la gelotofobia y la gelotofilia son dos disposiciones interrelacionadas conceptual y empíricamente, estas disposiciones no deben considerarse redundantes. En otras palabras, la gelotofilia no describe el polo inferior-opuesto a la gelotofobia (Ruch & Proyer, 2009a), ya que ambas dimensiones presentan asociaciones y cargas predictivas diferenciadas con respecto a otros criterios externos y no simplemente de signo opuesto (p.ej., Brauer & Proyer, 2018).

Para finalizar, cabe señalar que existen dos versiones reducidas de la PhoPhiKat-45. La PhoPhiKat-30 (Ruch & Proyer, 2009a), compuesta por 30 ítems (10 ítems por dimensión evaluada) seleccionados de la PhoPhiKat-45 atendiendo al grado de representatividad del ítem con la definición semántica de la disposición correspondiente. Esta selección, por tanto, priorizó criterios teórico-conceptuales sobre aspectos relativos a la calidad métrica de los ítems. No obstante, el ajuste psicométrico de la PhoPhiKat-30 resulta adecuado y, en términos generales, comparable al de la versión de 45 ítems (i.e., ACP = cargas ítems por factor  $\geq .37$ ; índices de discriminación por dimensiones  $\geq .21$ ;  $\alpha_s \geq .79$ ; test-retests (3 meses/6 meses)  $\geq .68/.70$ ; intercorrelaciones con sentido y magnitud similar). Por consiguiente, esta versión puede ser adecuada en contextos prácticos donde resulta aconsejable una administración de menor duración.

**Tabla 2.** Resumen de las versiones traducidas y validadas de la PhoPhiKat-45

Idioma	Año	Autores	EI	$\alpha$	EVE
Alemán	2009	Ruch & Proyer	3-factores	.84	Relaciones con recuerdos de haber sido ridiculizado durante la infancia y adolescencia
Inglés	2010	Platt & Ruch	3-factores	.78	Relaciones con vulnerabilidades asociadas al envejecimiento
Chino	2011	Chen, Chan, Ruch, & Proyer	3-factores	.85	Relaciones con estilos de humor, agresividad, personalidad, estilos de apego y autoestima
Eslovaco	2015	Ďurka & Ruch, 2015	-	.81	Relaciones con rasgos básicos de personalidad (Five-Factor-Model)
Ruso	2016	Ivanova, Makogon, Stefanenko, Enikolopov, Proyer, & Ruch	3-factores	.77	Relaciones con agresión, culpa, vergüenza, ansiedad social y afrontamiento a través del humor
Turco	2019	Dursun, Dalğar, Brauer, Yerlikaya, & Proyer	3-factores	.66	Relaciones con estilos de humor, autoestima y malestar psicológico

Nota. EI = Estructura Interna;  $\alpha$  = Alfa de Cronbach (valor mínimo obtenido en los estudios de validación); EVE = Evidencias de Validez Externa

Por otro lado, más recientemente, también se ha desarrollado la PhoPhiKat-9 (Hofmann, Ruch, Proyer, Platt, & Gander, 2017). En el estudio de validación de esta versión ultra-corta (3-ítems por dimensión), los datos obtenidos mostraron un ajuste aceptable para la estructura de tres factores ( $\chi^2_{(23)} = 301.99$ /CFI = 0.91/TLI = 0.87/RMSEA = 0.083/SRMR = 0.06) e índices de discriminación satisfactorios de los ítems ( $\geq .28$ ). No obstante, la consistencia interna de sus puntuaciones es sensiblemente inferior a la de otras versiones ( $\alpha \geq .56$ ).

### 3.1.5. Entrevista y test semi-proyectivo

Para finalizar este apartado relativo a la evaluación de la gelotofobia, debemos señalar la existencia de otros métodos alternativos de evaluación. En primer lugar, se ha desarrollado la “*Structured Gelotophobia Interview*” (Platt et al., 2012). Esta entrevista consiste en un total de 20 cuestiones relacionadas con las manifestaciones centrales de la gelotofobia. En concreto, se incluyen preguntas sobre el origen del miedo a ser ridiculizado, formas de afrontamiento en situaciones de burla y ridiculización, así como descripción de pensamientos, emociones y acciones cuando estas situaciones suceden. Además, se incluyen preguntas sobre información de índole personal como datos sociodemográficos.

Otro instrumento dirigido a la evaluación de la gelotofobia es el test *Picture-Geloph* (Ruch, Platt, Bruntsch, & Ďurka, 2017). Este test semi-proyectivo consta de 9 viñetas-escenas en las que se representan diferentes interacciones sociales, deliberadamente ambiguas, en las que una persona está realizando alguna acción que podría desencadenar las risas-burlas de los demás. Después de visualizar las viñetas, las personas que realizan el test deben rellenar un espacio vacío con los pensamientos o frases que creen que se derivan de esas situaciones. Se utiliza un formato de respuesta abierta y se abarcan ambos roles (ridiculizador/ridiculizado). Posteriormente, estas respuestas son categorizadas por expertos, en un continuum que oscila de -2 hasta +2, en función de si las respuestas de los participantes estaban relacionadas con sentimientos de diversión ante la situación o de miedo a ser ridiculizado. Este test muestra una adecuada validez convergente con otros instrumentos dirigidos a evaluar la gelotofobia como, por ejemplo, la GELOPH-15 ( $r_s \geq .50/.66$ ).

### *3.2. Prevalencia de la gelotofobia en el rango de lo subclínico*

Uno de los hitos estrechamente ligado a la evaluación de la gelotofobia ha sido poder determinar los niveles de prevalencia de este rasgo a nivel subclínico. Para ello, en el estudio original de la GELOPH-15, Ruch y Proyer (2008a) establecieron empíricamente cinco categorías o puntos de corte que representan los diferentes niveles en los que se manifiesta la gelotofobia: “sin” [1.0-1.99], “cercana al límite” [2.00-2.49], “ligera” [2.50-2.99], “pronunciada” [3.00-3.49] y “extrema” [3.50-4.00] expresión de gelotofobia (Ruch, 2009; Ruch & Proyer, 2008a; Proyer et al., 2009). La lógica de establecer el valor de 2.50 como límite para manifestar, al menos, una ligera expresión de gelotofobia estuvo basada en los siguientes criterios: (a) se trata del valor medio de la escala de acuerdo con el formato de respuesta (1-4); (b) ostentar esta puntuación requiere que el participante responda positivamente (i.e., estar moderada- o totalmente de acuerdo con la afirmación) al menos la mitad de los ítems de la escala; (c) este valor estuvo dos desviaciones típicas por encima de la puntuación media obtenida por el grupo de participantes control; y (d) se situó en el intersección de las distribuciones del grupo control y la del grupo de persona diagnosticados con gelotofobia clínica (Ruch & Proyer, 2008b).

La aplicación de estos puntos de corte en diferentes investigaciones en las que se administraron la GELOPH-15 o la PhoPhiKat-45 ha permitido detectar, en términos porcentuales, una marcada variabilidad entre países en las expresiones de gelotofobia a nivel subclínico (véase Tabla 3).



**Tabla 3.** Prevalencia subclínica de la gelotofobia

<b>País</b>	<b>Año</b>	<b>Autores</b>	<b>PR</b>
Alemania	2009	Ruch, Beermann, & Proyer	10-12%
Austria	2012	Proyer, Ruch, & Chen	5.80%
Colombia	2010	Carretero-Dios, Proyer, Ruch & Rubio	8.53%
Dinamarca	2009	Führ, Proyer, & Ruch	1.61%
Eslovaquia	2009	Hrebickova, Fickova, Klementova, Ruch, & Proyer	6.14%
Eslovaquia	2015	Ďurka & Ruch, 2015	14.35%
España	2010	Carretero-Dios, Proyer, Ruch, & Rubio	11.61%
Estados Unidos	2010	Lampert, Isaacson, & Lyttle, 2010	11-24%
(-)	2008	Ruch & Proyer	11.65%
Hungría	2012	Ujlaky, Proyer, & Ruch	7.30%
India	2014	Kamble, Proyer, & Ruch	27.70%
Israel	2011	Sarid, Ruch, & Proyer	5.91%
Italia	2009	Forabosco, Dore, Ruch, & Proyer	7.12%
Líbano	2009	Kazarian, Ruch, & Proyer	7.07%
Polonia	2010	Chłopicki, Radomska, Proyer, & Ruch	7.30%
Quebec	2010	Samson, Thibault, Proyer, & Ruch	8.57%
Reino Unido	2009	Platt, Proyer & Ruch	≈13%
Republica Checa	2009	Hrebickova, Fickova, Klementova, Ruch, & Proyer	6.29%
Rumanía	2008	Ruch, Proyer & Popa	≈13%
Rusia	2011	Stefanenko, Ivanova, Enikopolov, Proyer, & Ruch	7.41%
Rusia	2016	Ivanova, Makogon, Stefanenko, Enikolopov, Proyer, & Ruch	14.9%
Suiza (F)	2010	Samson, Thibault, Proyer, & Ruch	6.88%
Suiza	2011	Samson, Proyer, Ceschi, Pedrini, & Ruch, 2011	4-7%
Turquía	2019	Dursun, Dalğar, Brauer, Yerlikaya, & Proyer	31.40%
Ucrania	2014	Nosenko & Opykhailo	14.40%

Nota. PR = Prevalencia a nivel subclínico. (-) = muestra compuesta por germano-parlantes. (F) = francófona. Se incluyen estudios de presentación de la GELOPH-15 y la PhoPhiKat-45 por país con datos específicos sobre prevalencia.

#### 4. Correlatos de personalidad de la gelotofobia

##### 4.1. Gelotofobia en el *Five-Factor Model* y en el *Eysenck PEN Model*

Una cuestión fundamental en el estudio de la gelotofobia ha sido conocer las asociaciones de esta disposición con dimensiones de orden superior pertenecientes a modelos tradicionales de personalidad. El interés por conocer estas conexiones obedece a un doble objetivo. En primer lugar, corroborar empíricamente asociaciones de la gelotofobia, conceptualmente plausibles, con el objetivo de reforzar su validez de constructo (p.ej., correlación fuerte con la introversión). En segundo lugar, verificar que la gelotofobia incorpora varianza no representada en rasgos básicos de personalidad ya existentes (Ruch et al., 2014a). Diferentes estudios han tratado de dilucidar estas cuestiones, diferenciándose entre ellos por la manera de estructurar-organizar (clasificación) y evaluar (instrumento de medida) la personalidad del individuo.

Entre los modelos de personalidad que han suscitado mayor atención en el estudio de la gelotofobia cabe destacar el *Five-Factor Model* (FFM). Este modelo estructura la personalidad del individuo en torno a cinco dimensiones básicas ortogonales: extraversión, neuroticismo (referido también como inestabilidad emocional), amabilidad, responsabilidad y apertura a la experiencia (Costa & McCrae, 1992).

El primer estudio empírico que investigó las asociaciones de la gelotofobia con los rasgos del FFM fue el realizado por Ruch et al. (2008) utilizando la GELOPH-46. Sus resultados, tanto los relativos a la media global como a las puntuaciones en los diferentes subcomponentes de esta medida, evidenciaron asociaciones negativas entre la gelotofobia y dimensiones básicas como la extraversión ( $r_s \leq -.33$ ) y la estabilidad emocional ( $r_s \leq -.36$ ). Por el contrario, las asociaciones de la gelotofobia con el resto de rasgos del FFM fueron menos estables en términos de significación estadística y magnitud del efecto: amabilidad ( $r_s = -.16/- .31$ ), responsabilidad ( $r_s = -.02/- .19$ ) y

apertura a la experiencia ( $r_s = -.09/-.24$ ). Consistentemente, la inclusión de la totalidad de los rasgos del FFM en un análisis de regresión múltiple mostró que únicamente los niveles bajos de extraversión y de estabilidad emocional fueron predictores significativos de la varianza en gelotofobia, reflejando un coeficiente de correlación múltiple de .67.

Investigaciones posteriores han obtenido resultados similares con independencia del contexto cultural y de los instrumentos de medida empleados para evaluar la gelotofobia y el FFM (véase Tabla 4). No obstante, algunas diferencias merecen ser mencionadas.

En un estudio transcultural, Hrebickova, Fickova, Klementova, Ruch y Proyer (2009) encontraron que la cantidad de varianza en gelotofobia explicada por los rasgos del FFM difería entre muestras checas (41%) y eslovacas (23%). De manera similar, también hallaron que, además de por un elevado neuroticismo y una baja extraversión, los niveles elevados de gelotofobia rasgo eran predichos por una baja amabilidad-rasgo, aunque esta asociación solo se obtuvo al analizar los datos con muestras checas.

En otro estudio, Rawlings, Tham y Milner-Davies (2010) compararon las asociaciones de la GELOPH-46 y de la GELOPH-15 con los rasgos del FFM. Si bien las puntuaciones globales en gelotofobia obtenidas a través de ambas medidas mostraron asociaciones substanciales con niveles elevados de neuroticismo ( $r_s \geq .49$ ) y reducidos de extraversión ( $r_s \leq -.52$ ) y apertura a la experiencia ( $r_s \leq -.24$ ), la gelotofobia solo se asoció significativamente con los niveles bajos de amabilidad y responsabilidad utilizando la GELOPH-46 ( $r_s \leq -.20$ ). A pesar de estos hallazgos correlacionales, y en línea con las investigaciones anteriormente descritas, los análisis de regresión múltiple revelaron que solo la baja extraversión y el elevado neuroticismo fueron predictores significativos de la varianza interindividual en gelotofobia considerando ambas medidas.

**Tabla 4.** Asociaciones entre gelotofobia y rasgos básicos de la personalidad

<b>Autores</b>	<b>Modelo</b>	<b>Año</b>	<b>País</b>	<b>Medidas gelotofobia y personalidad</b>	<b>Predictores de la varianza en gelotofobia</b>
Ruch, Proyer, & Popa	FFM	2008	(-)	<ul style="list-style-type: none"> <li>- GELOPH-46 (Ruch &amp; Titze, 1998)</li> <li>- Big Five Questionnaire (BFQ; Caprara, Barbaranelli, Borgogni &amp; Perugini, 1993)</li> </ul>	<ul style="list-style-type: none"> <li>- Baja extraversión</li> <li>- Baja estabilidad emocional</li> </ul>
Hrebickova, Fickova, Klementova, Ruch, & Proyer	FFM	2009	República Checa & Eslovaquia	<ul style="list-style-type: none"> <li>- GELOPH-15 (Ruch &amp; Proyer, 2008)</li> <li>- NEO-FFI Inventory (Ruisel &amp; Halama, 2007)</li> </ul>	<ul style="list-style-type: none"> <li>- Elevado neuroticismo</li> <li>- Baja extraversión</li> <li>- Baja amabilidad (únicamente en población checa)</li> </ul>
Rawlings, Tham & Milner	FFM	2010	Australia	<ul style="list-style-type: none"> <li>- GELOPH-15 &amp; GELOPH-46</li> <li>- Big Five Inventory (BFI; John &amp; Srivastava, 1999)</li> </ul>	<ul style="list-style-type: none"> <li>- Baja extraversión</li> <li>- Elevado neuroticismo</li> </ul>
Ruch, Harzer & Proyer	FFM	2013	Alemania	<ul style="list-style-type: none"> <li>- PhoPhiKat-45 (Ruch &amp; Proyer, 2009)</li> <li>- Bipolar Adjective Rating Scale (BARS179; Ostendorf, 1990)</li> </ul>	<ul style="list-style-type: none"> <li>- Elevado neuroticismo</li> <li>- Baja extraversión</li> <li>- Baja apertura a la experiencia</li> <li>- Baja responsabilidad</li> </ul>
Đurka & Ruch	FFM	2015	Eslovaquia	<ul style="list-style-type: none"> <li>- PhoPhiKat-45</li> <li>- NEO Five-Factor Inventory (NEO-FFI: Costa &amp; McCrae, 1992)</li> </ul>	<ul style="list-style-type: none"> <li>- Elevado neuroticismo</li> <li>- Baja extraversión</li> <li>- Baja apertura a la experiencia</li> </ul>
Ruch & Proyer	PEN model	2009	Alemania	<ul style="list-style-type: none"> <li>- GELOPH-15</li> <li>- The Eysenck Personality Questionnaire-Revised (EPQ-R; Eysenck, Eysenck, &amp; Barret, 1985)</li> </ul>	<ul style="list-style-type: none"> <li>- Elevado neuroticismo</li> <li>- Baja extraversión</li> <li>- Elevado psicoticismo</li> </ul>
Proyer & Ruch	PEN model	2010	Suiza	<ul style="list-style-type: none"> <li>- PhoPhiKat-45</li> <li>- Versión reducida del Eysenck Personality Questionnaire-Revised (EPQ-R; Eysenck, &amp; H. J. Eysenck, 1991)</li> </ul>	<ul style="list-style-type: none"> <li>- Elevado neuroticismo</li> <li>- Baja extraversión</li> </ul>

Nota. (-) = muestra de germano parlantes. No se especifica el país en el que se ha realizado la recogida de datos.

De manera similar, aquellas investigaciones que exploraron estas relaciones usando la PhoPhiKat-45 hallaron una adecuada replicación y generalización a otras muestras de estos resultados (Đurka & Ruch, 2015; Ruch, Harzer, & Proyer, 2013). En concreto, el elevado neuroticismo y la baja extraversión fueron los principales predictores de la gelotofobia. Adicionalmente, en ambos estudios, una parte adicional de la varianza en esta disposición fue explicada por niveles bajos de apertura a la experiencia. En conjunto, los rasgos del FFM predijeron en torno al 45-49% de la varianza en gelotofobia evaluada a través de la PhoPhiKat-45.

El FFM no ha sido el único modelo de personalidad que ha suscitado interés en el estudio de la gelotofobia. En concreto, la incorporación del PEN *model*, basado en la teoría de la personalidad de Hans Eysenck (1990), permitió explorar los correlatos de esta disposición con una estructuración jerárquica de la personalidad basada únicamente en tres rasgos de orden superior: extraversión, neuroticismo y psicoticismo (para una revisión véase Furnham, Eysenck, & Saklofske, 2008). En dos investigaciones diferentes se obtuvieron resultados claramente comparables en la localización de la gelotofobia en el Eysenck PEN *model* (Proyer & Ruch, 2010; Ruch & Proyer, 2009b). Más específicamente, y al igual que en los estudios con el FFM, la gelotofobia resultó indicativas de niveles inferiores de extraversión ( $r_s \leq -.44$ ) y elevados de neuroticismo ( $r_s \geq .48$ ). Adicionalmente, en el estudio de Ruch y Proyer (2009b) se encontró que la gelotofobia correlacionaba positivamente con las variantes de la sub-escala de psicoticismo-rasgo más vinculadas a la presencia de manifestaciones clínicas ( $r_s = .20/.33$ ). Por último, estos estudios revelaron que, en términos de capacidad predictiva, las dimensiones del Eysenck PEN *model* explicaron entorno a un 37-41% de la varianza en gelotofobia.

En conjunto, estos hallazgos ayudaron a esclarecer las características de personalidad más distintivas de las personas con elevada gelotofobia. De acuerdo con los hallazgos con el FFM, estas personas podrían ser caracterizadas como neuróticos introvertidos con niveles bajos de apertura a la experiencia. Estos resultados son consistentes con la conceptualización de la gelotofobia y supusieron, además, apoyo empírico indirecto para algunas de las implicaciones centrales del constructo, como son: la falta de hilaridad y jovialidad, reacciones emocionales exageradas a la burla y a la ridiculización de otras personas y la tendencia al aislamiento social. Complementariamente, los datos del PEN *model* sugieren que las personas con elevada gelotofobia muestran, además, una ligera inclinación a manifestaciones psicóticas o paranoides, lo cual es consistente con la tendencia de estas personas a anticipar de manera infundada intenciones hostiles por parte de los demás (Ruch & Proyer, 2009b; Ruch et al., 2009b).

Por último, considerando que los rasgos del FFM y del PEN *model* solo permitieron explicar en torno el 35-50% de la varianza interindividual en gelotofobia, estos datos fueron interpretados como evidencia de su no-solapamiento frente a estas dimensiones, concluyendo que esta disposición incorpora elementos o características personales no adecuadamente representadas en estos modelos tradicionales de personalidad (Ruch et al., 2014a).

#### *4.2. Gelotofobia en el Character Strengths model*

Al margen de las asociaciones con rasgos básicos de personalidad, el estudio de la gelotofobia ha sido extendido a otras variables que recogen un rango más específico de experiencias internas y comportamientos. Un ejemplo de ello es el estudio de las conexiones de esta disposición con variables tradicionalmente investigadas en la

psicología positiva como las que recoge el modelo de *Character Strengths and Virtues* (CSV) propuesto por Christopher Peterson y Martin Seligman (2004). Este modelo incluye una serie de atributos personales definidos como socialmente admirables.

En dos investigaciones distintas, en las que se obtuvieron puntuaciones autoinformadas y heteroinformadas en las diferentes fortalezas del carácter y virtudes, se halló que las personas con elevada gelotofobia mostraban y eran percibidas, de manera general, como personas con bajas fortalezas de carácter o de bajo virtuosismo (Proyer, Wellenzohn & Ruch, 2014; Proyer & Ruch, 2009). Más concretamente, en lo que respecta a las puntuaciones de autoinforme, la gelotofobia correlacionó negativamente con variables como la curiosidad, el valor, el entusiasmo, el cariño, la esperanza, el humor, la misericordia y la amabilidad ( $r_s = -.24/-.35$ ). En contraposición, se encontró una asociación positiva entre la gelotofobia y la modestia ( $r_s \geq .14$ ). Consistentemente, las personas con gelotofobia tendían a ser evaluadas por sus pares como menos curiosas, valientes, entusiastas o esperanzadas ( $r_s = -.21/-.27$ ). Sin embargo, al igual que en el caso de las puntuaciones autoinformadas, las personas con expresiones elevadas de este rasgo fueron evaluadas como más modestas ( $r_s \geq .14$ ). No obstante, la comparación pormenorizada de los coeficientes de correlación obtenidos con las puntuaciones auto y heteroinformadas sugirió que las personas con elevada gelotofobia tendían a infravalorar sus propias fortalezas de carácter (Proyer et al., 2014; Proyer & Ruch, 2009a). Notablemente, esta tendencia a subestimar sus propias capacidades ha sido extrapolada a otros ámbitos personales, habiéndose encontrado resultados claramente comparables en investigaciones sobre ciertas habilidades intelectuales (Proyer & Ruch, 2009b) y relativas a la producción de humor (Ruch et al, 2009a).

## 5. Diferenciación de la gelotofobia frente a constructos similares

### 5.1. Gelotofobia y ansiedad social

Como señalamos al inicio de esta introducción, la inclusión de una temática de investigación emergente supone, indefectiblemente, demostrar que ese fenómeno es lo suficientemente novedoso, así como distinto de otros constructos ya existentes, como para justificar su estudio pormenorizado e independiente. En este sentido, considerando la semejanza de sus manifestaciones, no resulta extraño que una de las preocupaciones centrales en el estudio de la gelotofobia haya sido clarificar su nivel de solapamiento *vs.* diferenciación con la ansiedad social.

Los primeros escritos teóricos sobre la gelotofobia (Titze, 1996, 2009) ya subrayaron la presencia de manifestaciones comunes entre la gelotofobia y la ansiedad social. En concreto, se señaló al miedo a la evaluación negativa, la timidez excesiva, la existencia de perturbaciones psicósomáticas severas, o la propensión al aislamiento social, como características compartidas entre ambos fenómenos. No obstante, otras características, vinculadas al afrontamiento de situaciones humorísticas, como el *Pinocchio-syndrome* o el estado general *agelotic*, podían constituir manifestaciones distintivas o más directamente relacionadas con la gelotofobia. Además, el propio Michael Titze postuló, en lo relativo a su etiología, que la gelotofobia, a diferencia de la ansiedad social, no estaría esencialmente ligada a un temor grave por el rendimiento manifestado en ciertos contextos sociales, sino a una creencia sesgada del propio *self* que llevaría a las personas con gelotofobia a considerarse como inherentemente ridículas.

Al margen de distinciones de corte teórico, también se han realizado investigaciones empíricas dirigidas específicamente a esclarecer esta cuestión. En un investigación de Carretero-Dios, Ruch, Agudelo, Platt y Proyer (2010b) se recabaron las puntuaciones de un grupo de participantes en la GELOPH-15 (Ruch & Proyer, 2008a) y



en dos medidas concernientes a características nucleares de la ansiedad social: el miedo a la evaluación negativa (*Fear of Negative Evaluation scale* [FNE]) y la tendencia a sentir ansiedad, malestar y miedo ante situaciones sociales, así como a evitar dichos contextos (*Social Anxiety and Distress scale* [SAD]; Watson & Friend, 1969). El objetivo de esta investigación fue testar las intercorrelaciones entre estas dimensiones y examinar, a través de distintos procedimientos psicométricos, el grado de redundancia-independencia entre las mismas. Sus resultados indicaron que, a pesar de una fuerte intercorrelación ( $r_s = .47/.64$ ), estas dimensiones no presentaban un solapamiento total. La inspección de las distribuciones obtenidas en los diagramas de dispersión mostró, por ejemplo, que solo la mitad de los participantes con elevadas puntuaciones en la escala SAD excedieron el punto de corte para una ligera expresión de gelotofobia. También se observaron participantes con puntuaciones altas en la escala de miedo a la evaluación negativa (FNE) que no presentaban expresiones elevadas de gelotofobia. Además de esto, la realización de una serie de AFCs, que consideraban la totalidad de los ítems recogidos en estas tres medidas, reveló que el modelo de tres factores, en contraposición al modelo de un factor, o a diferentes combinaciones de dos factores, presentaba un mejor ajuste, lo que se interpretó como un indicador de la presencia de particularidades únicas para cada fenómeno.

Ese mismo año, Edwards, Martin y Dozois (2010) replicaron las asociaciones entre la gelotofobia y estas medidas vinculadas con la ansiedad social ( $r_s = .67-.70$ ). Adicionalmente, su investigación mostró que la inclusión, individual o en combinación, de las medidas de ansiedad social en un análisis de regresión no permitía explicar completamente la varianza en gelotofobia. Asimismo, en este estudio, se encontró que las asociaciones de la gelotofobia con haber sufrido experiencias recurrentes de ridiculización por comportamientos sociales o por rendimiento académico durante la

infancia-adolescencia, permanecían significativas, incluso tras controlar la influencia de las medidas de ansiedad social. Estos resultados, de nuevo, sugieren una posible independencia entre ambos constructos respecto a su etiología.

En otra investigación, Ritter, Brück, Jacob, Wildgruber y Kreifelts (2015) comprobaron si la ansiedad social, con independencia de la gelotofobia, modulaba las evaluaciones de valencia de diferentes tipos de risas: alegre-amigable, de cosquilleo y burlona-desagradable. Cada una de las risas fue presentada en dos modalidades distintas con el objetivo de manipular su nivel de ambigüedad: presentación auditiva frente a audiovisual. Por otro lado, también se manipularon las instrucciones de la tarea a fin de presentar distintas motivaciones afectivas para las risas: dirigidas hacia sí mismo (condición “*self*”) o una recreación por parte de un actor/ actriz en un ensayo (condición “*otros*”). Los resultados obtenidos señalaron que las personas con altas (*vs.* bajas) puntuaciones en ansiedad social eran más propensas a evaluar negativamente tanto las risas alegres-amigables como las burlonas-desagradables con independencia del nivel de ambigüedad y de las instrucciones con las que eran presentadas, aunque este efecto fue más potente en la modalidad auditiva (condición de alta ambigüedad) que en la audiovisual. Sin embargo, estos efectos desaparecieron al controlar la influencia de la gelotofobia, lo cual indica que esta disposición es esencial para explicar la relación entre ansiedad social y la percepción de la risa de otras personas.

Más recientemente, en una investigación de Havranek et al. (2017), se compararon las puntuaciones en la GELOPH-15 de pacientes diagnosticados con distintos trastornos psicopatológicos, entre ellos, la ansiedad social. Sus resultados revelaron que la prevalencia de niveles elevados de gelotofobia fue mayor en pacientes con ansiedad social, seguido por pacientes con un trastorno de la personalidad por evitación. Es más, aquellos pacientes diagnosticados con ambas patologías mostraron, en todos los casos,

puntuaciones elevadas de gelotofobia. Considerando esto último, estos autores sugirieron que la gelotofobia podía constituir, más que un subtipo de estas patologías, un criterio/síntoma clínico adicional para el diagnóstico de la ansiedad social y el trastorno de la personalidad por evitación. Por otro lado, los datos de Weiss et al. (2012) revelaron que solo el 36% de una muestra de personas con elevada gelotofobia cumplían los requisitos clínicos del trastorno de ansiedad social.

En definitiva, estos datos refuerzan la estrechamente conexión, con una base importante de varianza común, entre la gelotofobia y la ansiedad social. No obstante, estos fenómenos no parecen estar indefectiblemente ligados, por lo que es necesario sumar evidencias adicionales que justifiquen y respalden su diferenciación.

### *5.2. Gelotofobia y otros constructos de naturaleza clínica*

Al margen de la ansiedad social, la gelotofobia también ha sido relacionada con otros fenómenos de naturaleza clínica. En una de las investigaciones más reseñables sobre esta cuestión, Forabosco, Ruch y Nucera (2009) estudiaron los niveles de prevalencia ( $\geq 2.5$ ; Ruch & Proyer, 2008a) de esta disposición entre pacientes con diversos trastornos psicopatológicos. Las mayores expresiones de este rasgo fueron encontradas en personas con un trastorno de personalidad, ya sea paranoide, límite o esquizoide (50%), así como entre aquellas personas con esquizofrenia (50%) o con trastornos de la conducta alimentaria (40%). Por otro lado, la prevalencia con la que se manifestó la gelotofobia fue sensiblemente inferior en personas diagnosticadas con un trastorno de ansiedad (14%) o con un trastorno del estado de ánimo (19%).

Investigaciones posteriores han obtenido resultados similares, encontrando niveles elevados de gelotofobia en personas diagnosticadas con trastornos de personalidad del grupo A (paranoide, esquizoide y esquizotípico [ $\approx 60\%$ ]; Weiss et al., 2012), y en

personas diagnosticadas con un trastorno de personalidad límite (87%; Brück, Derstroff, & Wildgruber, 2018). El hecho de que personas con un trastorno de personalidad, especialmente aquellos que engloban sintomatología paranoide, presenten, expresiones elevadas de gelotofobia converge ampliamente la operacionalización de esta disposición, ya que la sospecha y desconfianza infundada ante las bromas y risas de los demás representa una característica central de este constructo (Ruch et al., 2014a; Ruch & Proyer, 2009b). No obstante, no existen, hasta donde llega nuestro conocimiento, evidencias sobre la relación de la gelotofobia y la paranoia en el ámbito subclínico.

Por otro lado, también se ha puesto de manifiesto la existencia de expresiones elevadas de gelotofobia en personas con autismo ( $\approx 40\%$ ; Wu et al., 2015) y con síndrome de Asperger ( $\approx 45\%$ ; Samson, Huber, & Ruch, 2011), lo que, de acuerdo con esto autores, podría explicarse por la presencia de características comunes entre estos trastorno del desarrollo y la gelotofobia. Entre los aspectos comunes destacados, se han señalado ciertos déficits en la decodificación de claves sociales, o un desarrollo anómalo en la adquisición de habilidades de mentalización o teoría de la mente.

## **6. Gelotofobia y procesamiento de información emocional**

Otra línea de investigación fundamental en el estudio de la gelotofobia ha sido conocer si esta disposición facilita o entorpece el procesamiento de información socioafectiva relacionada con el humor, la risa y la sonrisa de otras personas. Tal y como señalamos con anterioridad, la gelotofobia esta conceptualmente vinculada con la dificultad para acceder al significado real de manifestaciones afectivas teóricamente positivas (Ruch, 2009). Así pues, y a fin de validar esta cuestión, numerosos estudios han explorado posibles modulaciones de la gelotofobia en el procesamiento emocional, especialmente de estímulos de naturaleza positiva/señales alegres.

### *6.1. Sesgos en la identificación, percepción e interpretación de estímulos afectivos relacionados con el humor y la risa-sonrisa*

En uno de los primeros estudios dirigidos a examinar la relación entre gelotofobia y emoción, Platt (2008) expuso a un grupo de personas con diferentes niveles de gelotofobia (sin, ligera, y pronunciada gelotofobia) a una serie de viñetas-escenarios en las que se describían dos tipos de situaciones interpersonales: de burla lúdica vs. de ridiculización. La tarea demandaba a los participantes que respondieran, mediante una escala de autoinforme, en qué grado creían haber experimentado ciertas emociones como alegría, miedo, ira, etcétera., tras la exposición a cada uno de los escenarios. Los resultados mostraron que mientras las personas con baja gelotofobia presentaban un patrón emocional claramente diferenciado entre las situaciones de burla lúdica y las de ridiculización, con niveles inferiores de felicidad y mayores de miedo, vergüenza, ira y tristeza ante el segundo tipo de escenarios, las personas con alta gelotofobia presentaban un patrón afectivo muy similar para ambas situaciones. Más específicamente, las personas con alta gelotofobia afirmaban experimentar niveles bajos de alegría y altos de vergüenza y miedo ante ambas situaciones, lo que se interpretó como una evidencia de las dificultades de estos sujetos para discriminar situaciones humorísticas motivadas por estados afectivos diferentes. Este efecto, además, fue más pronunciado conforme se consideraban expresiones más elevadas de gelotofobia. Estos datos han sido posteriormente replicados en una muestra con una mayor representación de personas con niveles extremos de gelotofobia, observándose, además, un incremento lineal entre el nivel de gelotofobia y el grado de vergüenza experimentado en situaciones de ridiculización (Platt, 2019). Adicionalmente, esta última investigación evidenció que al ser preguntados por los síntomas físicos experimentados durante situaciones en las que se es objeto de las risas-burlas de los demás, las personas con elevada gelotofobia

indicaban la tensión muscular, sudoración y ruborizarse como manifestaciones más frecuentes.

En otra investigación, Ruch et al. (2009b) expusieron a individuos con distintos niveles de gelotofobia (i.e., sin, cercana al límite, y con una ligera tendencia a este rasgo) a un total de 20 risas grabadas cuya motivación afectiva había sido manipulada y pilotada previamente. En concreto, el estado afectivo que desencadenaba estas risas podía ser positivo (p.ej., alegría, amabilidad, cordialidad) o negativo (p.ej., desdén, desprecio o vergüenza). Cada una de las risas era presentada de manera individual. Para realizar la tarea, los participantes debían, en primer lugar, categorizar cada risa en función del estado afectivo que las motivaba y, posteriormente, evaluarla en una serie de dimensiones afectivas: valencia, poder y autenticidad. Adicionalmente, también se preguntaba al participante por su estado afectivo al inicio y al final de la tarea. Los resultados evidenciaron que las personas con elevadas (*vs.* bajas) puntuaciones en gelotofobia tendían a valorar más frecuentemente que las risas positivas eran suscitadas por un estado afectivo negativo, esto es, que estaban desencadenadas por sentimientos de vergüenza y no de alegría. Consistentemente, también tendían a evaluar estas risas positivas como menos agradables en términos de valencia. Por otro lado, mientras que la participación en esta tarea experimental inducía un estado de afectivo positivo entre las personas con baja gelotofobia, las de alta no mostraban diferencias en sus estados pre-post tarea.

En otra investigación, Ruch et al. (2014b) diseñaron una tarea en la que se utilizaba una serie de avatares (i.e., representación gráfica del rostro de un ser humano) a fin de estudiar si la gelotofobia podría modular el procesamiento de ciertas características de la risa. Los resultados revelaron que aquellas cualidades de la risa que denotaban una modulación voluntaria o intencional, como, por ejemplo, una intensidad baja-moderada,

reducida expresividad facial y la presencia de movimientos corporales exagerados, eran interpretados por las personas con alta (vs. baja) gelotofobia como indicadores de falta de naturalidad e intención más maliciosa o negativa.

Siguiendo con datos relativos a la inducción afectiva de la alegría, Papousek et al. (2009) llevaron a cabo un estudio con el fin de conocer el grado de contagio emocional de las personas con alta (vs. baja) gelotofobia tras la exposición a una serie de clips de vídeo en los que se mostraba a un actor o a una actriz manifestando distintos estados emocionales. Contrariamente a sus expectativas, estos autores no hallaron diferencias en la inducción de alegría entre los grupos de diferente nivel de gelotofobia. Sin embargo, en otro estudio, Platt y Ruch (2009) encontraron que las personas con alta (vs. baja) gelotofobia describían sus episodios de alegría como poco intensos y de corta duración, afirmando, además, que dichas experiencias de alegría podían considerarse como muy poco frecuentes en su vida cotidiana.

Además de los datos derivados de medidas autoinforme o aspectos subjetivos-experienciales de la emoción, también se han examinado la posible influencia de la gelotofobia sobre manifestaciones comportamentales-expresivas. Por ejemplo, Platt, Hofmann, Ruch y Proyer (2013) diseñaron una tarea experimental en la que individuos con altas y bajas puntuaciones en gelotofobia eran expuestos a una serie de escenarios basados en el trabajo de Ekman (1994, 2003) para la inducción de emociones positivas. Entre estas se distinguía entre emociones que podían suscitar risa (p.ej., diversión o *schadenfreude*) y otras emociones, también positivas, no directamente asociadas con la evocación de la risa (p.ej., sentimientos de elevación u orgullo). Mientras que los participantes leían en voz alta las descripciones relativas a cada escenario, sus respuestas faciales eran grabadas en vídeo de manera no intrusiva. Posteriormente, esta actividad muscular facial era codificada en términos de frecuencia, intensidad y

duración utilizando los criterios establecidos en el Sistema de Codificación Facial (FACS; Ekman, Friesen, & Hager, 2002). En línea con lo esperado, las personas con altas (*vs.* bajas) puntuaciones en gelotofobia manifestaron, por lo general, una menor expresividad facial vinculada a la alegría, esto es, la presencia de marcadores más bajos en términos de intensidad y frecuencia para aquellas regiones asociadas a la sonrisa de Duchenne. Adicionalmente, los resultados de esta investigación mostraron que las diferencias entre altos y bajos en gelotofobia, en términos de marcados de Duchenne, fueron más pronunciadas en la inducción de emociones directamente asociadas a la aparición de la risa. Posteriormente, Ruch, Hofmann y Platt (2015) extendieron estos resultados utilizando, en lugar de escenarios, grabaciones en las que personas recordaban momentos de su vida en los que habían experimentado ciertas emociones positivas, en este caso, exclusivamente ligadas a la aparición de la risa. Replicando los resultados anteriormente descritos, las personas con elevadas (*vs.* bajas) expresiones de gelotofobia mostraron menos marcadores vinculados a la sonrisa de Duchenne al visualizar las grabaciones con los recuerdos positivos de otros y, en este estudio, mayores expresiones de desprecio en comparación a las personas con baja gelotofobia. En la misma línea, Hofmann et al. (2015) corroboraron estos resultados utilizando fotografías de rostros que desplegaban sonrisas de alegría, desprecio o asignadas a otra categoría (p.ej., risa fingida-impostada). Al igual que en los estudios anteriores, los resultados de esta investigación pusieron de relieve que las personas con alta (*vs.* baja) gelotofobia mostraban marcadores de la sonrisa de Duchenne con menor frecuencia ante estas imágenes, así como expresiones de desprecio más marcadas. No obstante, cabe hacer explícito que estas diferencias solo emergieron ante las sonrisas que reflejaban alegría y no ante las de desprecio o las asignadas a otras categorías.



Otras investigaciones han analizado las respuestas psicofisiológicas de naturaleza periférica y central entre individuos con distintos grados de gelotofobia. Por ejemplo, Papousek et al. (2014) llevaron a cabo un estudio en el que expusieron a individuos con alta (vs. baja) gelotofobia a un contexto socialmente realista en el que eran interrumpidos por sonidos con distinta carga afectiva mientras realizaban una tarea aritmética. Durante todas las condiciones del experimento, se registraba la tasa cardiaca de los participantes utilizando el electrocardiograma (ECG). En una de las condiciones experimentales, la interrupción era provocada por las carcajadas de los experimentadores. Estas risas habían sido previamente grabadas y categorizadas como alegres-benignas, pero su presentación era ambigua al no hacerse explícito el motivo que las desencadenaba. Las respuestas del ECG mostraron que las personas con alta (vs. baja) gelotofobia mostraron una mayor desaceleración de la tasa cardiaca tras la aparición de las risas de los experimentadores, lo que, de acuerdo con estos autores, puede interpretarse como una respuesta de paralización o *“freezing-like response”*. En otra investigación, Papousek, Schuster, Rominger, Fink y Weiss (2016), registraron la actividad bioeléctrica cerebral (EEG) de personas con alta (vs. baja) gelotofobia al confrontar diferentes estímulos afectivos (sonidos alegres vs. de ira). El análisis de la actividad cerebral durante el procesamiento de estímulos alegres indicó que las personas con elevada (vs. baja) gelotofobia mostraban un mejor acoplamiento funcional entre las regiones de la corteza prefrontal y corteza posterior durante el procesamiento de sonidos de risas, lo que podría sugerir un mayor control o modulación al confrontar este tipo de señales alegres. En otro estudio, Chan (2016) investigó los correlatos neurales relacionados con la exposición a chistes de naturaleza hostil y no-hostil entre personas con distintos niveles de gelotofobia. Sus resultados indicaron que las personas con altas (vs. bajas) puntuaciones en esta disposición presentaban una mayor activación ante

ambos estímulos humorísticos en regiones como la corteza dorsolateral prefrontal y el estriado dorsal, lo que se interpretó como un indicador de mayor control cognitivo (*top-down*) voluntario de las reacciones emocionales que desencadenaban estos estímulos. Además, en el mismo estudio, se observó que la presencia de niveles elevados de gelotofobia también se asociaba a una menor activación del sistema mesocorticolímbico ventral tras la exposición a estos estímulos humorísticos. Esto se interpretó como un indicador de un potencial déficit en la activación de estructuras neurales ligadas al sistema de recompensa al confrontar eventos asociados al humor.

En suma, la información expuesta en este apartado converge ampliamente con las teorizaciones iniciales de la gelotofobia, reforzando la idea de que esta disposición estaría estrechamente vinculada con la presencia de alteraciones en el procesamiento de información afectiva positiva como la que deviene del humor y la risa-sonrisa de otras personas (Ruch, 2009; Titze, 2009). De manera más concreta, estos datos sugieren que las personas con elevada gelotofobia tienden a experimentar y mostrar alegría con menor frecuencia e intensidad, teniendo, además, dificultades a la hora de discriminar correctamente la motivación afectiva que desencadena las bromas, risas y sonrisas de los demás. Esto les llevaría a interpretar y reaccionar de manera similar a ciertas manifestaciones alegres-prosociales y ofensivas-hostiles de humor y risa, especialmente en situaciones ambiguas (Platt, 2008, 2019; Ruch et al., 2009b; Papousek et al., 2014). Además, estas personas muestran un control excesivo de sus reacciones emocionales al ser expuestos a las bromas y risas de los demás, así como una ausencia de contagio-inducción emocional al confrontar estas señales alegres (Hofmann et al., 2015; Papousek et al., 2016; Ruch et al., 2009b; Ruch et al., 2015). Estos hallazgos son consistentes con la operacionalización actual del fenómeno, ofreciendo apoyo empírico a características distintas como la falta de hilaridad, expresión reducidas de alegría, y

dificultades para percibir el humor y la risa como manifestaciones positivas o socialmente agradables (Ruch, 2009; Ruch, 2014a; Titze, 2009).

### *6.2. Procesamiento de estímulos afectivos negativos y regulación emocional*

Además de las posibles peculiaridades en la percepción e interpretación de señales afectivas positivas como la risa y la sonrisa de otras personas, también se ha investigado si los niveles elevados de gelotofobia podrían favorecer las reacciones emocionales negativas y/o estar asociados a déficits en la regulación emocional como ocurre con otras disposiciones similares como la ansiedad-rasgo o la ansiedad social (véase, por ejemplo, Goldin, Jazaieri, & Gross, 2014).

En la tarea de inducción emocional de Papousek et al. (2009) descrita anteriormente, los participantes con una elevada gelotofobia presentaban una inducción emocional de intensidad más elevada tras ser expuestos a emociones negativas como la ira, la ansiedad y la tristeza, en comparación con las personas con niveles bajos de este rasgo. También experimentaron una mayor excitación-agitación, exclusivamente, ante emociones negativas como el miedo y la ira. Otro hallazgo de este estudio fue que las personas con alta gelotofobia afirmaron sentir más tristeza, ansiedad, ira, asco y envidia que las personas con baja gelotofobia tras la exposición a rostros neutros, reforzando, una vez más, la tendencia ligada a esta disposición a atribuir a otras personas estados afectivos negativos.

En otros estudios, se han encontrado resultados similares, tanto en relación con esos estados emocionales de valencia negativa como de otros distintos. Por ejemplo, Rawlings et al. (2010) encontraron que las personas con alta (*vs.* baja) gelotofobia experimentaban mayores niveles de miedo, culpa, tristeza y vergüenza al ser expuestos a escenarios que describían situaciones interpersonales vergonzosas o que denotaban

timidez. En la misma línea, Platt y Ruch (2009) hallaron que las personas con elevada (*vs.* baja) gelotofobia tienen a describir sus episodios de miedo y vergüenza como muy intensos y de larga duración, además de muy habituales en sus experiencias cotidianas y de lenta recuperación afectiva. También se ha encontrado que la gelotofobia está relacionada con emociones autoconscientes como la vergüenza-disposicional, pero no a otras como la propensión a la culpa (Proyer, Platt & Ruch, 2010). Por otro lado, en otro estudio que encontró que los niveles de ira-rasgo y de comportamiento agresivos eran más acusados en el grupo de alta (*vs.* baja) gelotofobia (Weiss et al., 2012).

En cuanto a otros componentes de la emoción, cabe destacar los hallazgos en las medidas de ECG del estudio de Papousek et al. (2014) descrito anteriormente. Además de la condición en la que se presentaba la risa de los experimentadores para interrumpir la tarea, se incluyó también una condición experimental de interrupción que pretendía “provocar ira”. Uno de los experimentadores profería una frase previamente categorizada como ofensiva-insultante (p. ej., “no tengo ni idea de por qué estás tardando tanto en hacer esto; de hecho estas tareas son un juego de niños”). Las personas con alta puntuaciones en gelotofobia, a diferencia de aquellas personas con puntuaciones bajas, manifestaron una aceleración pronunciada de su tasa cardiaca tras la presentación de este tipo de comentarios, lo que se sugiere, según estos autores, una mayor propensión a respuestas de ira y/o reacciones agresivas entre aquellas personas con elevada gelotofobia. En una condición experimental similar (*i.e.*, exposición a sonidos de ira-agresión), descrita en el estudio de Papousek et al. (2016) en que se registró la actividad EEG, se encontró que el grupo con alta (*vs.* baja) gelotofobia presentaba un peor acoplamiento funcional entre diversas áreas de la corteza prefrontal posterior durante el procesamiento de estas claves agresivas. Esto se interpretó como un indicador de que esta disposición estaría asociada a una menor capacidad para controlar-

modular el impacto de claves sociales hostiles o, en otras palabras, como una cierta desprotección neural ante estas señales. Nótese que este patrón fue el opuesto al descrito anteriormente para la condición de alegría-risas. En línea con estos hallazgos, Wu et al. (2016) observaron en imágenes de tensor de difusión (DTI; *Diffusion Tensor Imaging*) que las personas con alta (*vs.* baja) gelotofobia presentaban una conectividad local y global menos eficiente (atendiendo a las fibras de sustancia blanca) entre ciertas estructuras neurales involucradas en el procesamiento de información emocional. En concreto, en este estudio, la gelotofobia se relacionó con una atenuación en la conexión del giro frontal superior, la corteza cingulada anterior, el giro parahippocampal y el giro temporal medio.

Algunos autores han sugerido que el patrón emocional descrito en este apartado y el anterior, esto es, minimización de lo positivo y maximización de lo negativo, podría obedecer, entre otras posibles causas, a déficits en la regulación emocional entre las personas con elevadas expresiones de gelotofobia. En este sentido, Papousek et al. (2009) hallaron, usando autoinformes, que la gelotofobia estaba vinculada con la percepción subjetiva de tener un pobre manejo de ciertas habilidades emocionales. Más específicamente, esta disposición se asoció a dificultades en la regulación de las propias emociones, a la tendencia a controlar excesivamente la expresión emocional y, en menor medida, a problemas en el reconocimiento-percepción de los propios estados afectivos. Estas limitaciones no se extendían a las habilidades emocionales de carácter más interpersonal, ya que las personas con elevada gelotofobia no diferían de las personas con baja gelotofobia en la percepción subjetiva de su habilidad para percibir correctamente las emociones de los demás o, incluso, regular las emociones de otros. Weiss et al. (2012) replicaron y extendieron estos resultados. En su investigación, los participantes con elevada (*vs.* baja) gelotofobia tendían a evaluarse a sí mismos como

menos capaces a la hora de controlar sus emociones negativas. En la misma línea, también se encontró que las descripciones que hacían las personas con alta (*vs.* baja) gelotofobia de su comportamiento habitual en ciertas situaciones afectivas eran consideradas como poco eficientes por expertos. Por otro lado, en lo que respecta a estrategias específicas de regulación emocional, se ha encontrado que las personas con altas puntuaciones en gelotofobia, en contraposición a sus homólogos con puntuaciones bajas, son más tendentes al uso de la supresión emocional. Sin embargo, no se observaron diferencias entre ambos grupos (altos *vs.* bajos en gelotofobia) para la utilización de *reappraisal* cognitivo. A pesar del innegable interés que subyace a estos hallazgos, cabe subrayar que estas evidencias fueron obtenidas exclusivamente a través de datos de autoinforme, por lo que no disponemos, a diferencia de otras disposiciones relativas al humor y la risa (p.ej., *cheerfulness*; López-Benítez, Lupiáñez, Carretero-Dios, & Acosta, 2020), de conocimiento empírico sobre el uso de estrategias de regulación emocional en un contexto socialmente más relevante y ecológico.

En suma, las investigaciones recogidas en este apartado sugieren, por un lado, que la gelotofobia se vincula con experimentar más frecuentemente episodios emocionales negativos-desagradables (y a vivenciarlos con mayor intensidad), y, por otro, que esto puede deberse a su dificultad para regular-modular (con evidencias en términos subjetivos y de sustrato neural) el impacto de estas manifestaciones. Estos datos son congruentes con algunas de las características centrales de este constructo, como son las reacciones emocionales negativas desproporcionadas al ser objeto de burla, anticipación de estados afectivos negativos por parte de otros individuos, y retraimiento-aislamiento social a fin de no ser ridiculizado (Platt et al., 2012; Ruch, 2009; Ruch et al., 2014a).

# **Chapter II**

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*Objectives & Motivations*





## **1. Background and aims of the doctoral dissertation**

Gelotophobia is a personality trait describing how individuals differ in their fear of being laughed at (Ruch & Proyer, 2008a). When an emerging construct as gelotophobia arises, researchers must offer theoretical and empirical evidence supporting its existence, conceptualization, assessment and implications, with special emphasis on its differentiation from other similar, preexisting phenomena (Ruch, Hofmann, Platt, & Proyer, 2014; Singh, 1991). Indeed, there exists a theoretical framework covering the definition, putative causes, internal and external moderating factors, and consequences of gelotophobia (see Ruch, 2009 and Ruch et al., 2014). The empirical validation of this model has gradually progressed over the last decade. Studies focused on the components of gelotophobia have shown that heightened levels of this laughter-related disposition encompass exaggerated, negative responses to being laughed at, along with near-paranoid anticipations to be ridiculed as core, more specifically related characteristics (Platt, Ruch, Hofmann & Proyer, 2012). Psychometric and cross-cultural studies have yielded valid and reliable assessment tools for measuring this disposition (i.e., GELOPH-15 or PhoPhiKat-45: Ruch & Proyer, 2008a, 2009a) and have also captured meaningful interindividual variations in the subclinical range on the basis of the gelotophobia scores across numerous cultural backgrounds (see Proyer et al., 2009).

Considering the nomological validity of this construct, the location of gelotophobia in high-order personality classifications has revealed that this disposition is (mainly) associated with greater expressions of neuroticism and introversion (Ďurka & Ruch, 2015; Ruch & Proyer, 2009; Proyer & Ruch, 2010). There are also robust supports for its strong associations with similar narrow-traits such as social anxiety and the fear of negative evaluation, but without being fully overlapped (Carretero-Dios, Ruch, Agudelo, Platt, & Proyer, 2010b; Edwards, Martin, & Dozois, 2010). Furthermore,

experimental research on gelotophobia and emotion has empirically validated essential postulates of this construct. For instance, people scoring high in gelotophobia (or gelotophobes) are likelier to display similar affective reactions to ridicule and playful teasing, which suggests that they have difficulties in discriminating the real socioemotional meanings of others' humor and laughter (Platt, 2008, 2019). They are also more likely to attribute negative affective states to ambiguous and good-natured laughs from others compared to their low gelotophobia counterparts (Papousek et al., 2014; Ruch, Altfreder, & Proyer, 2009). Moreover, gelotophobes tend to exhibit reduced facial joy and more contempt markers when they are exposed to others' smiles (i.e., impaired facial mimicry of joyful faces: Hofmann, Platt, Ruch, & Proyer, 2015).

Altogether, consistent empirical evidence supports the existence of gelotophobia and its current operationalization. However, considering its young nature, critical aspects of this construct remain to be investigated. For instance, replications in a different cultural setting (generalization) and extensions of certain findings, adding new research variables and procedures, are still needed. In particular, further research, guided by the theoretical model of the gelotophobia (see Ruch et al., 2014), would contribute to cement the validity of gelotophobia as a psychological construct. Hence, the *general aim* of the present doctoral thesis was to strengthen, throughout distinct methodological approaches, the empirical entity of the construct gelotophobia.

With that purpose in mind, we carried out a set of 11 studies ( $N = 2.447$ ) that can be divided into three different specific objectives/research paths of this doctoral thesis. These are described in more detail below.

### 1.1. *The Spanish version of the PhoPhiKat-45*

There exist already several instruments aiming at assessing gelotophobia in the subclinical range. As outlined in the introduction section, one of this assessment tools is the PhoPhiKat-45 (Ruch & Proyer, 2009a). This instrument assesses three intercorrelated, but distinct, dispositions, namely: the fear of being laughed at (i.e., gelotophobia), the joy in being laughed at (i.e., gelotophilia), and the joy in laughing at others (i.e., katagelasticism).

Previous investigations have supported the good psychometric properties of both the original and validated versions of the PhoPhiKat-45. This instrument has been translated and validated in various languages, including German (Ruch and Proyer 2009), English (Platt and Ruch 2010), Chinese (Chen et al. 2011), Russian (Ivanova et al. 2016) and Turkish (Dursun, Dalğar, Brauer, Yerlikaya, & Proyer, in press). However, to the best of our knowledge, there was no psychometric validation of this instrument in the Spanish-context. Therefore, the *first specific objective* of the present doctoral thesis was to develop a comprehensive assessment of the PhoPhiKat-45 in independent large samples of the Spanish population. This research path enabled us to make available to the scientific community an alternative assessment tool for gelotophobia and to extend cross-cultural evidence of the existence of gelotophobia in relation to gelotophilia and katagelasticism. This first objective was developed through Chapter III and IV.

In *Chapter III*, we analyzed the factorial structure, internal consistency and external validity of the Spanish version of the PhoPhiKat-45. After performing back-translation processes and obtaining validity evidence-based test content of items, we administered the Spanish version of the PhoPhiKat-45 to three independently collected samples of Spanish adults. Then, we applied traditional psychometric analyses to

examine: (a) the metric properties of the items (i.e., adequate scores distributions); (b) the expected 3-factor internal structure; and (c) the internal consistency scores ( $\alpha \geq .80$ ). Furthermore, intercorrelations, as well as gender- and age-based effects were analyzed across diverse socio-demographics samples. Furthermore, as indicators of external validity, we sought the replication of earlier associations of gelotophobia, gelotophilia and katagelasticism with humor styles (Dursun et al., in press), subclinical variables such as trait-anxiety and autistic traits (Ruch, 2009; Wu et al., 2015), and broad Five-Factor Model (FFM) traits (Ďurka & Ruch, 2015).

**In Chapter IV**, we extended further evidence on the construct validity of the Spanish version of the PhoPhikat-45. We provided the first empirical evidence of the associations of gelotophobia, gelotophilia, and katagelasticism with the global traits of an alternative personality classifications such as the HEXACO *model* (i.e., honesty-humility, emotionality, extroversion, agreeableness, conscientiousness, and openness to experience: Ashton & Lee, 2004, 2007) and with the socially aversive traits of the Dark Triad (i.e., Machiavellianism, narcissism and psychopathy: Paulhus & Williams, 2002).

Further, the location of gelotophobia in the FFM and the HEXACO *model* also enabled us to introduce the research path on the degree of distinctiveness between gelotophobia and high-order personality traits such as introversion and neuroticism.

### *1.2. Further differentiation of gelotophobia from similar personality constructs*

There are multiple reasons for assuming that construct redundancy is a primary problem across disciplines because it hampers the systematization and accumulation of scientific research (Singh, 1991; Le, Schmidt, Harter, & Lauver, 2011). Consequently, the inclusion of a novel construct, such as gelotophobia, requires theoretical and empirical evidence proving that this disposition goes beyond and is sufficiently distinct

from preexisting constructs (Ruch et al., 2014a). As mentioned, earlier research has shown that gelotophobia cannot be fully accounted for basic personality classifications such as FFM and PEN model (Ďurka & Ruch, 2015; Edwards, Martin, & Dozois, 2010; Proyer & Ruch, 2010), or lower-order dispositions such as social anxiety and fear of negative evaluation, either singularly or in combination (Carretero-Dios et al., 2010b; Edwards, Martin, & Dozois, 2010). Further, a few studies have demonstrated that there are certain gelotophobia-based effects—such as its association with the history of being teased and the increased tendency to perceive as malicious certain features of laughter—which remained significant even after controlling for the influence of participants' scores on social anxiety (Edwards et al., 2010; Ruch et al., 2014b).

Nevertheless, these findings on the distinctiveness of gelotophobia are still rather limited and further evidence would be advisable to guarantee that gelotophobia merits singular study. Hence, the *second specific objective* of the present doctoral thesis was to further empirically differentiate gelotophobia from other similar personality constructs. More specifically, we applied two differencing approaches based on evidence of (1) nomological validity and (2) structural equation modelling (see, for instance, Sigh, 1991).

### *1.2.1. Incremental validity of gelotophobia beyond basic personality traits*

We first investigated whether gelotophobia would explain incremental variance in body image (BI) representations beyond the influence of FFM and HEXACO personality traits. Given that around the 40–50% of the variance in gelotophobia can be accounted for high-order personality traits such as introversion and neuroticism (e.g., Ďurka & Ruch, 2015), controlling for the influence of shared variance between gelotophobia and these global personality systems would allow us to ascertain

(possible) specific gelotophobia-based effects in the variation of BI-related manifestations.

The selection of BI as criteria variable also meets theoretical and empirical criteria. For instance, taking the model of putative causes and consequences of gelotophobia into account (Ruch et al., 2014a), the presence of disturbances in the own physical appearance might increase the likelihood of being ridiculed and, therefore, contribute to the development of an excessive fear of being laughed at. Empirical research has consistently shown that gelotophobes recall more frequently to have been teased about their own appearance during childhood and adolescence (Edwards et al., 2010; Kohlmann et al., 2018) and that the presence of recurrent teasing experiences about one's physical appearance may elicit future negative perceptions about the body across a lifespan (Cash, 1995; Kostanski, & Gullone, 2007). One might therefore anticipate that gelotophobia would be substantially associated with negative BI perceptions. These investigations are described in Chapters V and VI.

In *Chapter V*, we examined the associations of gelotophobia with a set of BI-related dimensions controlling for the influence FFM personality traits. Using hierarchical regression analyses, we explored the predictive capacity of gelotophobia in the explanation of the variance in body appreciation, body dissatisfaction, body surveillance, body shame, and appearance control beliefs over and above the FFM traits.

In *Chapter VI*, we sought a replication and extension of the relationships between gelotophobia and BI indicators controlling for the influence of a different personality system such as the HEXACO model. Using the same analytical approach, we first tried to replicate the association of gelotophobia with body surveillance, body shame and appearance control beliefs. Second, we provided an extension by testing the associations of gelotophobia with other BI indicators, namely appearance (positive) evaluation,

appearance orientation, body areas satisfaction, overweight preoccupation and self-classified weight. Moreover, considering that gelotophobia shows strong intercorrelations with social anxiety-related measures (e.g.,  $r_s = .57-.71$ ; Carretero-Dios et al., 2010b; Edwards et al., 2010), we also assessed social anxiety to test which of these narrow traits would have the strongest predictive values in the remaining variance of BI after the inclusion of the HEXACO traits. This enables us to study whether gelotophobia and social anxiety differ in terms of convergent-discriminant correlates with the HEXACO traits and BI dimensions.

*1.2.2. Multitrait-multimethod matrix: gelotophobia, social anxiety and paranoid ideation.*

We second examined the degree of distinctiveness between gelotophobia and similar lower-order dispositions as social anxiety and paranoid ideation using multitrait-multimethod data. Despite that certain studies have shown that gelotophobia and social anxiety are sufficiently distinct using self-report assessments (Carretero-Dios et al., 2010; Edwards et al., 2010; Weiss et al., 2012), we considered that these findings needed to be generalized to other sources of information such as peer-assessments. Moreover, there are other lower-order dispositions, like paranoid ideations, which also share some common manifestation with gelotophobia. For instance, gelotophobes show near-paranoid anticipations to be ridiculed (e.g., being suspicious when others laugh in their presence: Platt et al., 2012) and patients with either schizophrenia or paranoid personality disorders are likelier to report elevated scores on gelotophobia (Forabosco, Ruch, & Nucera, 2009; Weiss et al., 2012). Nevertheless, there are no studies supporting the differentiation of these construct in the subclinical range, and therefore,

an in-depth differentiation would be advisable. This investigation is described in the Chapter V.

In *Chapter VII*, we analyzed the latent structure and the convergent-discriminant validity of the three independent measures involving gelotophobia, social anxiety, and paranoid ideation using a multilevel multitrait-multimethod (MTMM) approach in which we established the scores on these personality dimensions as target traits, and self- and peer-assessments as methods. We first examined the latent structure of these personality constructs using a set of independent two-trait multilevel confirmatory factor analyses (ML-CFAs). Moreover, the convergent validity of the measures for each assessed construct was explored analyzing the associations between self- and peer-ratings considering both common (level-2) and unique (level-1) method-specificity factors of peer-assessment. Further, discriminant validity was investigated by testing the association between gelotophobia, social anxiety and paranoid ideation. Note that we provided the first empirical evidence of the associations between gelotophobia and a core manifestation of paranoia in the subclinical range.

Evidence on the distinctiveness between gelotophobia and social anxiety would be expanded through our following research path as we investigated putative modulation of gelotophobia over affective facial expressions and gaze processing controlling for the influence of the social anxiety scores of participants.

### *1.3. Gelotophobia and face-processing: affective facial expressions, gaze direction and inference from others' intentionality*

As indicated earlier, it has been stated that one of the main features of those high in gelotophobia is their difficulty in accessing the real meaning of positive affective expressions such as others' laughs and smiles (Platt et al., 2012; Ruch et al., 2014a). In



connection with this notion, research on gelotophobia must clarify the underlying mechanism that causes this misperception and/or misinterpretation of others' emotional states.

Regarding the association between gelotophobia and the perception of other's facial affective expressions, Papousek et al. (2009) found that those high in gelotophobia did not report, through self-report measures, global difficulties in perceiving correctly others' emotions. However, in another research, Hofmann et al. (2015) observed that highly gelotophobia individuals rated joy smiles as less joyful and more contemptuous than their lowly gelotophobia counterparts. Interestingly, the same authors found that these gelotophobia-based differences did not emerge in other facial expressions such as contempt or other types of smiles (e.g., phony ones). Despite these findings, the knowledge about gelotophobia and the processing of others' facial affective expressions is rather limited. For instance, no experimental studies have addressed whether gelotophobia would modulate both recognition and explicit affective evaluations (i.e., valence and intensity) using faces portraying positive (i.e., joy) and negative (i.e., anger, fear and sadness) affective states.

There are other socioaffective cues which are essential when individuals process the faces of others. For instance, gaze entails a relevant social source for inferring where others are focusing their attention, as well as their possible intentions and future behaviors (Argyle and Cook, 1976; Baron-Cohen, 1994). Similarly, the ability to detect gaze direction is linked to the capacity to make inferences about the mental states of others (Baron-Cohen, 1994, 1995). Moreover, prior investigations have shown that gaze direction may modulate the processing of facial affective expressions and vice-versa (Chen, Helminen, & Hietanen, 2017; Ganel, Goshen-Gottstein, & Goodale, 2005). As for the perception of smiles, a central emotional expression in research on gelotophobia,

it has been stressed that gaze direction may affect the access to the real meaning of smiles (Niedenthal et al., 2010). These authors proposed the Simulation of the Smile (SIMS) model which postulates that direct gaze or eye-contact would be one of the triggers of a neural and motor (i.e., facial mimicry) simulation process that facilitates understanding what other's smile means. This fits with empirical data on EMG showing an increased zygomatic major and corrugator responses to smiles when gaze is directed to the observer compared to averted gaze (Rychlowska, Zinner, Musca, & Niedenthal, 2012; Schrammel, Pannasch, Graupner, Mojzisch, & Velichkovsky, 2009).

Although no direct mention to SIMS model exists in prior studies on gelotophobia, there is evidence that highly gelotophobia individuals showed impaired facial mimicry of others' joyful faces (Hofmann et al., 2015). One might surmise that gelotophobia could be associated with a less efficient performance of the smile simulation processes as a putative explanation of their difficulties in decoding the affective motivation of this emotional cue. Moreover, as the discrimination of gaze direction influences smile simulation (Niedenthal et al., 2010), research on gelotophobia should incorporate the processing of affective facial expressions under different conditions of gaze direction.

Finally, closely linked to the above-mentioned information, the study of facial affective stimuli across different experimental procedures enables us to investigate whether the modulations of gelotophobia over the processing of smiles would be related to specific perceptual bias (bottom-up or stimulus driven) and/or disturbances in more elaborated processes (top-down or goal-driven). Regarding this latter point, albeit we know that individuals high in gelotophobia tend to attribute negative affective motivation to other good-natured laughs (Ruch et al., 2009), further evidence on the gelotophobes' expectations about other individuals displaying joy are needed. For instance, it seems important to explore whether the gelotophobia expressions would

modulate the processing of joyful faces in more socially relevant scenarios such as decision-making situations.

In sum, on the basis of these gaps in the literature on gelotophobia and emotion, the *third specific objective* of the present doctoral thesis was to investigate putative modulations of this laughter-regarding disposition over the processing of socioaffective signals (i.e., affective facial expressions and gaze direction) from others' faces. This objective was developed through Chapter VIII and IX.

In *Chapter VIII*, we investigated the modulation of gelotophobia over the processing of affective facial expression and gaze direction. Using a novel gaze discrimination task (Cañadas & Lupiáñez, 2012), we compared individuals high- vs. low in gelotophobia in terms of reactions times and accuracy rates in gaze direction discrimination (i.e., direct vs. averted gazes) of faces displaying either a positive (joy), negative (anger, fear or sadness) or neutral facial expression. Moreover, we also studied gelotophobia-based differences in identifying others' facial emotions with direct and averted gazes, as well as in attributing certain affective features such as valence, intensity and arousal. As mentioned, we included social anxiety as a covariate to determine whether the putative emerging effects could be interpreted as specific or more directly related to gelotophobia.

In *Chapter IX*, we investigated the modulation of gelotophobia over the processing of joyful faces in trust decision-making situations. Using a trust game (Berg, Dickhaut, & McCabe, 1995), we compared individuals scoring high vs. low in gelotophobia in terms of their trust interactions (i.e., reaction times and cooperation rates) with anonymous counterparts displaying joyful, angry and neutral faces either with straight, direct or averted gazes. This experimental task enables us to study the possible modulation of gelotophobia over (1) automatic biases toward joyful faces (bottom-up

processing) that may drives individuals to certain responses (trusting/distrusting) in accordance with the emotional valence; and (2) expectations of others' intentions on the basis of their prior knowledge about the affective facial expressions (top-down processing). Complementary, in this empirical chapter, we also sought a replication and extension of prior data from the preceding experimental series on gelotophobia-based differences in gaze discrimination and in the evaluations of affective dimensions of others' faces such as valence, intensity and trustworthiness. Again, we added social anxiety as covariate to elucidate the specificity of these potential effects.

# **Empirical Studies**

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*Estudios Empíricos*



## **Chapter III**

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*Assessing individual differences in the way  
people deal with ridicule and being laughed at:*

*The Spanish form of the PhoPhiKat-45*





**Assessing individual differences in the way people deal with ridicule  
and being laughed at: The Spanish form of the PhoPhiKat-45**

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### Abstract

The PhoPhiKat-45 assesses individual differences in the way people deal with ridicule and being laughed at. This instrument encompasses three intercorrelated—but independent—laughter-related traits: the fear of (gelotophobia) and the joy in (gelotophilia) being laughed at, and the joy in laughing at others (katagelasticism). This research tested the psychometric properties of the Spanish form of the PhoPhiKat-45. A total of 636 individuals whose ages ranged from 18 to 70 years participated in three different studies. Our data indicated good reliability coefficients and an adequate-to-good fit for the expected three-factor structure across all samples. As indicators of external validity, prior associations among these three laughter-related traits and diverse research variables were examined. Gelotophobia correlated with low self-enhancing humor; gelotophilia correlated with a high use of all humor styles, especially affiliative and self-defeating humor; and katagelasticism correlated with high aggressive and high self-defeating humor. Moreover, gelotophobia correlated with high subclinical autistic traits and high trait anxiety; gelotophilia correlated with low trait anxiety; and katagelasticism existed independently from both subclinical constructs. Finally, we replicated the location of the three dispositions in the Five-Factor Model (FFM) assessed by NEO-FFI. Additionally, curvilinear relationships among the traits of the FFM and gelotophobia, gelotophilia and katagelasticism were explored. Inverted U-shaped curvilinear relationships between agreeableness-gelotophobia and neuroticism-katagelasticism emerged. Our results suggest that the Spanish form of the PhoPhiKat-45 can be considered a promising instrument for the study of these dimensions in Spain.

*Keywords:* gelotophobia; gelotophilia; katagelasticism; PhoPhiKat-45; validation; Spain

## **Introduction**

Laughter and humor are potent communicative cues that can be used to show various—even opposite—emotional states. Laughter is a context-dependent expression that can signal affiliative/prosocial intentions or convey negative feelings, such as dominance or superiority over others (Szameitat et al., 2009; Wood, Martin, & Niedenthal, 2017). Similarly, the ambiguous nature of humor can be conveniently used to strengthen social bonds (Martin, 2007) or to express certain socially unacceptable ideas that could be otherwise rejected by others (Ziv & Gadish, 1990).

This duality was previously introduced by traditional theories on laughter and humor. According to the relief theory (Freud, 1960), the basis of laughter and humor is to serve as mechanisms to reduce tensions or overcome social inhibitions. Conversely, the superiority theory (Hobbes, 1840) maintained that laughter and humor are rooted in the assumption that individuals make fun at others' shortcomings and misfortunes as a way of denoting their superior status. Prior personality research has also described diverse constructs assessing individual differences in the “lighter” and “darker” sides of laughter and humor. Ruch and Köhler (1999) introduced the dimensions of cheerfulness, seriousness and bad mood, attending to individuals' tendencies toward hilarity and their thresholds for amusement and laughter (i.e., temperamental basis of the sense of humor). Martin et al. (2003) proposed the existence of adaptive (i.e., affiliative and self-enhancing) and maladaptive (i.e., aggressive and self-defeating) humor styles based on their effects on individuals' psychosocial well-being. More recently, Ruch et al. (2018) generated a more comprehensive distinction of how people display humor in their daily lives (i.e., the differentiation of eight comic styles: fun, humor, nonsense, wit, irony, satire, sarcasm and cynicism). Notably, this model also

encompasses individual differences in lighter comic styles as fun or benevolent humor and in darker styles as cynicism and sarcasm.

That said, it should be noted that some of the potentially dark expressions of humor and laughter, such as sarcasm, are often directed at humiliating or ridiculing others (Kreuz & Glucksberg 1989). Ridicule has a strong impact on individuals' social life. The fear of being ridiculed can operate as a social corrective mechanism aimed at controlling others' behaviors (Billing, 2005). An ashamed person can overascribe ideas or actions to avoid being ridiculed and, in so doing, to achieve integration into their normative group (Davies, 2009). However, not all laughter-related expressions are unswervingly negative. Good-natured teasing or benign mockeries can be seen as a way of interacting playfully with others (Proyer, 2017). Previous investigations have shown that people often perceive/respond differently to potentially negative expressions of humor and laughter. Indeed, the reactions to these types of expressions are not uniform and cannot be decontextualized. For instance, some individuals have difficulties in discriminating accurately between good-natured teasing and malicious forms of ridicule (Platt, 2008). By contrast, other individuals are not concerned with ridiculing themselves as a way of entertaining others and actively seek or even establish situations in which others can laugh at them (Ruch, 2009). This emerging evidence propitiated the description and study of three intercorrelated but distinct laughter-related dispositions in the subclinical range (for an overview, see Ruch et al., 2014); namely, gelotophobia (i.e., the fear of being laughed at), gelotophilia (i.e., the joy in being laughed at) and katagelasticism (i.e., the joy in laughing at others).

The development of a standard measure, the PhoPhiKat-45 (Ruch & Proyer, 2009), enables assessment of these three dispositions toward ridicule and being laughed at as individual difference variables (i.e., personality traits). This questionnaire has been

translated and validated in various languages, including German (Ruch & Proyer, 2009), English (Platt & Ruch, 2010), Chinese (Chen, Chan, Ruch, & Proyer, 2011), Russian (Ivanova et al., 2016) and Turkish (Dursun, Dalğar, Brauer, Yerlikaya, & Proyer, in press). These investigations have provided support for its good psychometric properties (i.e., satisfying discrimination indexes for items, reliability and temporal stability) and construct validity (i.e., robust three-factor structure and relations with other relevant criteria). Nevertheless, to the best of our knowledge, no comprehensive psychometric validation of the Spanish form of the PhoPhiKat-45 exists. This approach involves testing the internal consistency, dimensionality, and external validity across diverse samples of Spanish adults. In an effort to close this gap in the literature, we administered the Spanish version of the PhoPhiKat-45 to three independently collected samples. The recruitment of three samples enables us to examine the stability of our findings across various modes of administration (e.g., paper-pencil and online methods) and diverse socio-demographic contexts (e.g., undergraduates and general population).

*The PhoPhiKat-45: Assessing individual differences in laughter-related traits*

The PhoPhiKat-45 (Ruch & Proyer, 2009) is a self-report measure that focuses on how people differ in the way people deal with ridicule and being laughed at. After establishing a reliable standard questionnaire to assess gelotophobia (GELOPH<15>; Ruch & Proyer, 2008; Spanish version by Carretero-Dios, Proyer, Ruch, & Rubio, 2010a), the study of the roles involved in ridicule-related scenarios was extended by the description/inclusion of the joy in being laughed at and the joy in laughing at others (Ruch & Proyer, 2009). This allows a more thorough examination of humor, laughter and ridicule, unveiling relevant interindividual differences in the interpretation of social interactions in which these expressions can be present. Individuals scoring high in

gelotophobia might be described as having a negative bias toward humor and laughter that leads them to anticipate ridicule (near-paranoid sensitivity) and exhibit disproportionate reactions to it. They react similarly toward ridicule and benign forms of humor, having difficulties in discriminating the emotional state/intentions behind others' laughter. Their negative interpretation of laughter and humor relates to an increased sensitivity to social rejection. On the other hand, those individuals scoring high in gelotophilia enjoy making others laugh at them and do not experience shame or other negative emotions when being faced with laughter by others. Contrary to gelotophobes, they even exaggerate their embarrassing situations, mishaps or misfortunes for the sake of laughter. Prototypes may be class-clowns or comedians who make an audience laugh at them by sharing and elaborating on embarrassing incidents that have happened to them. Importantly, they do this for their own enjoyment derived from the joint laughter, not because they feel inferior to others. Finally, those scoring high in katagelasticism are characterized by cold-heartedness, and they do not feel bad when laughing at others. For them, this is part of life, and those that do not enjoy being laughed at should just fight back—if they do not or cannot, then it is “bad luck” for the person being laughed at. They are willing to break social norms and conventions and accept that they may hurt others by doing so.

Research on the psychometric properties of the PhoPhiKat-45 has shown that the original three-factor structure has been consistently replicated through exploratory and confirmatory analyses, and high internal consistencies have been obtained for all the dimensions ( $\alpha > .80$ ). Similarly, good temporal stability has been found for all the subscales of the original German-language version (test-retest  $\geq .73$ ; 6-month interval). Furthermore, the intercorrelations reported in the original article (Ruch & Proyer, 2009) have been robustly replicated; namely, gelotophilia correlates negatively with

gelotophobia (correlation coefficients [ $r_s$ ] around  $-.30$ ) and positively with katagelasticism ( $r_s$  around  $.30$ ), while a near-zero correlation between gelotophobia and katagelasticism exists ( $-.10 > r_s < .10$ ). Lastly, the administration of the PhoPhiKat-45 across a large number of studies has also narrowed its nomological net by isolating convergent-discriminant correlates of these laughter-related dispositions with other relevant criteria such as socio-demographics, psychosocial variables as humor-related behaviors, subclinical phenomena, and personality characteristics, among others.

In terms of socio-demographic variables, no systematic gender differences have been found for gelotophobia and gelotophilia, while the male gender typically relates to katagelasticism (Ruch & Proyer, 2009). Importantly, these associations have been widely replicated across multiple adaptations of the PhoPhiKat-45 (Dursun et al., in press; Platt & Ruch, 2010). Similarly, no robust age effects have been previously reported for gelotophobia and gelotophilia (Ruch & Proyer, 2009). Research has provided mixed evidence for the relation between age and katagelasticism. Whereas some authors have found that katagelasticism relates to younger age (Ruch & Proyer, 2009), others have reported negligible age effects on the joy in laughing at others (Platt & Ruch, 2010). Overall, effects of age and gender differences are typically small.

As for other humor-related dispositions, the associations among the three dispositions toward ridicule and being laughed at and humor styles have been also examined. Ruch et al. (2009) reported that gelotophobia was linked to a reduced use of affiliative and self-enhancing humor styles and that this disposition existed independently from aggressive and self-defeating humor styles. Later, Dursun and collaborators (in press) obtained similar data on gelotophobia and extended these findings by measuring gelotophilia and katagelasticism. Both dispositions correlated with all the humor styles. However, gelotophilia was (mainly) associated with self-

defeating and, to a lesser extent, affiliative humor styles and katagelasticism was more strongly associated with an increased use of aggressive humor.

The study of these three dispositions toward ridicule and being laughed at has been extended to subclinical phenomena, such as developmental disorders and anxiety related-variables. For instance, Wu et al. (2015) screened the prevalence rates of the three dispositions among adults with autism spectrum disorder. Adults with autistic traits exhibited greater scores on the fear of and lower ones on the joy in being laughed at than healthy controls, whereas no differences were observed for katagelasticism in either group. Importantly, a similar pattern of results has been found for Asperger's syndrome (Samson, Huber, & Ruch, 2011). Furthermore, it has been argued that gelotophobes are prone to anxious symptomatology (Ruch, 2009; Ruch, Hofmann, Platt, & Proyer, 2014). Indeed, this laughter-related trait has been positively associated with social anxiety and fear of negative evaluation (Carretero-Dios, Ruch, Agudelo, Platt, & Proyer, 2010b). This also converges well with available data on heightened expression of gelotofobia and reduced self-esteem (Hiranandani & Yue, 2014), higher levels of body shame (Moya-Garófano, Torres-Marín, & Carretero-Dios, 2019) and increased feelings of shame in daily life (Proyer, Platt, & Ruch, 2010). On the other hand, an issue that needs to be further investigated concerns the relations between gelotophilia and katagelasticism with anxiety-related constructs. Gelotophilia has been positively associated with personal and occupational satisfaction and katagelasticism with higher work stress (Hofmann, Ruch, Proyer, & Gander, 2017). Furthermore, gelotophilia was unrelated to psychological stress, but the latter demonstrated positive associations with katagelasticism (Dursun et al., in press).

The localization of the three dispositions toward ridicule and being laughed at in broad personality models, such as the Five-Factor Model (FMM) has been previously



tested. Firstly, Ruch, Harzer and Proyer (2013) administered the Bipolar Adjective Rating Scale (BARS179; Ostendorf, 1990) and found that gelotophobia was related to high neuroticism and low extraversion, openness to experience and conscientiousness. Gelotophilia was related to high extraversion and low openness to experience along with less robust associations with low neuroticism and conscientiousness. Finally, katagelasticism was related to low agreeableness and conscientiousness. More recently, Ďurka and Ruch (2015) used the NEO-Five Factor Inventory (NEO-FFI; Costa and McCrae, 1992) and found highly comparable data. First, gelotophobia was related to low extraversion and high neuroticism along with a lower inclination to openness to experience. Gelotophilia was related to high extraversion, low neuroticism and low conscientiousness. Katagelasticism was related to low agreeableness, high extraversion and low conscientiousness. Altogether, these studies demonstrated that these three laughter-related traits can be robustly located in the FFM but that they did not fully overlap with these higher-order personality traits.

### *The present research*

The main objective of the present research was to provide a comprehensive assessment of the PhoPhiKat-45 in independently collected cross-sectional samples from Spain.

Sample 1 was used to test the adequacy of the metric properties of the items and the three-factor structure using a principal component analysis (PCA). Reliability analyses, intercorrelations, relations with gender and age and tests of the internal structure are based on all three samples. We expected that both the principal component and confirmatory factor analyses would reveal the expected three latent factor solutions (i.e., gelotophobia, gelotophilia and katagelasticism). We also expected high internal

consistencies ( $\alpha \geq .80$ ) for the Spanish-language version and to replicate the intercorrelations among the three subscales: gelotophobia would be correlated negatively with gelotophilia and uncorrelated with katagelasticism, whereas gelotophilia and katagelasticism would be positively correlated. Furthermore, no systematic gender- or age-based differences were expected for gelotophobia or gelotophilia, and katagelasticism would be robustly associated with male gender.

Second, we provided further support for the external validity of the Spanish form of the PhoPhiKat-45 by examining the convergent-discriminant associations with different research variables; namely, humor styles, subclinical autistic traits and trait anxiety (Sample 2). As for humor styles, we expected that gelotophobia would correlate with lower scores on affiliative and self-enhancing humor styles and would be uncorrelated with aggressive and self-defeating humor. Gelotophilia and katagelasticism would correlate positively with all the humor styles. However, stronger associations between gelotophilia and self-defeating humor would be expected as well as between katagelasticism and aggressive humor. Regarding subclinical autistic traits, we expected that gelotophobia would be correlated with heightened expressions of autistic traits, gelotophilia would be correlated with lower expressions of autistic traits and katagelasticism would exist independently from this construct. Finally, concerning trait anxiety, as no direct association exists, prior research guided our expectations that gelotophobia would correlate with high trait anxiety, as there is broad support for the association between gelotophobia and anxious symptomatology. Considering that gelotophilia has provided mixed evidence for anxiety-related phenomena, we examined its relation with trait anxiety in an exploratory way. Katagelasticism would correlate with high trait anxiety, as it would converge well with higher levels of work stress and personal distress.

Third, to expand external validity evidence, we also tested linear and curvilinear relationships between the three dispositions and the FFM (Sample 3). We expected to replicate well-established associations of gelotophobia, gelotophilia and katagelasticism with these high-order dimensions of personality. Gelotophobia would be related to high neuroticism, low extraversion and, to a lesser extent, a low openness to experience; gelotophilia would be related to high extraversion, low neuroticism and low conscientiousness; and katagelasticism would be related to low agreeableness, high extraversion and low conscientiousness. Finally, potential curvilinear relationships among these FFM traits and gelotophobia, gelotophilia and katagelasticism were also tested in an exploratory fashion.

## **Method**

### *Participants*

Overall, three independent samples ( $N = 636$ ) were collected to test the psychometric properties of the Spanish form of the PhoPhiKat-45.

Sample 1 comprised 306 adults (167 females [54.6%], 138 males [45.1%]; one participant did not indicate gender [0.3%]). The participants' ages ranged from 18 to 70 years ( $M = 31.74$ ;  $SD = 14.36$ ). The participants were highly educated; 2.9% held a doctoral degree; 47.4% had a university degree; 35.9% had a diploma qualifying them to attend a university; 6.5% had completed vocational education and training; 3.9% and 2.9% indicated secondary and primary education, respectively; and 0.3% had no formal education.

Sample 2 comprised 128 undergraduate students (106 females [82.8%] and 22 males [17.2%]). The participants' ages ranged from 18 to 44 years ( $M = 19.49$ ;  $SD = 3.64$ ). In terms of education attainment, 1.6% had a university degree; 81.3% had a

diploma qualifying them to attend a university; 16.4% had completed vocational education and training; and 0.8% indicated secondary education.

Sample 3 comprised 202 adults (102 females [50.5%], 99 males [49.0%]; one participant did not indicate gender [0.5]). Their age ranged from 18 to 56 years ( $M = 22.00$ ;  $SD = 4.94$ ). The participants were also highly educated; 0.5% held a doctoral degree; 42.6% had a university degree; 53.5% had a diploma qualifying them to attend a university; 3% had completed vocational education and training; and 0.5% and 2.9% indicated secondary and primary education, respectively.

### *Procedure*

To verify the psychometric properties of the Spanish PhoPhiKat-45, a set of initial stages needed to be completed. Four bilingual specialists were involved in a back-translation process (see Hambleton & de Jong, 2003). The original items of the PhoPhiKat-45 were translated from English into Spanish by two bilingual specialists and subsequently back-translated by two independent bilingual specialists. None of them were familiar with the original version of this measure before starting the translation. Original and back-translated versions were compared to verify their correspondence (e.g., no large discrepancies between items) and cultural fit.

Afterwards, three psychologists with expertise in test construction and psychometrical analyses assessed the preliminary Spanish version of the PhoPhiKat-45. They rated the adequacy of these items with the objective of obtaining validity evidence-based test content (Delgado-Rico, Carretero-Dios, & Ruch, 2012). Brief descriptions of gelotophobia, gelotophilia and katagelasticism were provided to the experts. In a first step, and according to these conceptualizations, experts determined the target dimension of each item and rated the degree of representativeness thereof (i.e., to

quantify whether a specific item was sufficiently relevant to evaluate latent characteristics related to the assessed construct). All of the items showed adequate content validity indexes (CVIs) above .70; the interjudge agreement was  $\kappa \geq .60$ , which is regarded as good (Cicchetti & Sparrow, 1981). In a second step, formal criteria such as comprehension, ambiguity and clarity of the items (Angleitner, John, & Löhr, 1986) were also evaluated.

Then, samples 1 (*construction*), 2 (*external validity I*) and 3 (*external validity II*) were recruited through pamphlets (e.g., handed out at libraries and bus stations) and online advertisements. Paper-pencil (Samples 1 and 3) and Online (Sample 2) administrations were used in the present research. In both types of administration, participants were informed that they were participating in a study on humor and personality (they had to be  $\geq 18$  years of age). After this brief description, the estimated duration for filling out the questionnaire booklet was provided. This research was authorized by a local ethics committee and performed in accordance with the Ethical Standards of the 1964 Declaration of Helsinki. Therefore, in the introduction to the survey, we emphasized that their participation was voluntary and that their confidentiality was guaranteed. Their responses would be used for research purposes only. None of the participants received financial compensation or course credit for their participation.

### *Instruments*

The Spanish form of the *PhoPhiKat-45* was administered to all samples. As in the original version (Ruch & Proyer, 2009), this self-report questionnaire was developed to assess three dispositions toward ridicule and being laughed at in non-clinical samples: (a) gelotophobia (e.g., “When they laugh in my presence I get suspicious”); (b)

gelotophilia (e.g., “When I am with other people, I enjoy making jokes at my own expense to make others laugh”); and (c) katagelasticism (e.g., “I enjoy exposing others and I am happy when they get laughed at”). Each laughter-related trait is assessed with 15 items. Scores are given on a 4-point answer format ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Internal consistency values in this research ranged from  $\alpha = .83$  (gelotophobia) to  $\alpha = .88$  (gelotophilia). The Spanish version is available in Annexes.

The *Humor Styles Questionnaire* (HSQ; Martin, Puhlik-Doris, Larsen, Gray, & Weir, 2003; Spanish version by Torres-Marín, Navarro-Carrillo, & Carretero-Dios, 2018) was administered to Sample 2. This self-report questionnaire consists of 32 items that assess four humor styles: (a) affiliative humor (e.g., “I usually don’t laugh or joke around much with other people”); (b) self-enhancing humor (e.g., “If I am feeling depressed, I can usually cheer myself up with humor”); (c) aggressive humor (e.g., “If someone makes a mistake, I will often tease them about it”) and (d) self-defeating humor (e.g., “I let people laugh at me or make fun at my expense more than I should”). Each humor style is assessed through 8 items. Scores are given on a 7-point answer format ranging from 1 (*totally disagree*) to 7 (*totally agree*). Internal consistencies in this research ranged from  $\alpha = 0.76$  (aggressive humor) to  $\alpha = 0.83$  (affiliative humor).

The *Autism-Spectrum Quotient* (AQ; Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001; Spanish version by Baron-Cohen, 2005) was administered to Sample 2. This self-report measure enables the assessment of autistic traits in adults with normal intelligence (e.g., “I prefer to do things with others rather than on my own”). The scale has a total of 50 items in a 4-alternative forced-choice format. Responses are provided on a range from *definitely agree* to *definitely disagree*. Importantly, we used the total score of AQ in this research. Internal consistency was  $\alpha = 0.75$ .

The trait form of the *State-Trait Anxiety Inventory* (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983; Spanish version by Buela-Casal, Guillén-Riquelme, & Seisdedos, 2011) was administered to Sample 2. This self-report questionnaire is a widely used 20-item measure of trait anxiety (e.g., “I worry too much over something that really doesn’t matter”). All items are rated on a 4-point rating scale from 0 (*never*) to 3 (*always*). Internal consistency in this research was  $\alpha = 0.91$ .

The *NEO Five-Factor Inventory* (NEO-FFI; Costa & McCrae, 1992; Spanish version by Cordero, Pamos & Seisdedos, 2008) was administered to Sample 3. This self-report instrument consists of 60 items divided among five dimensions: (a) neuroticism (e.g., “I often feel inferior to others”); (b) extraversion (e.g., “I like to have a lot of people around me”); (c) openness to experience (e.g., “I have a lot of intellectual curiosity”); (d) agreeableness (e.g., “I try to be courteous to everyone I meet”); and (e) conscientiousness (e.g., “I keep my belongings clean and neat”). Each trait is composed of 12 items rated on a 5-point Likert scale (0 = *completely disagree*; 4 = *completely agree*). Internal consistencies in this sample ranged from  $\alpha = 0.70$  (agreeableness) to  $\alpha = 0.85$  (extraversion/conscientiousness).

### *Data analysis*

Descriptive statistics (i.e., mean, standard deviation, skewness, and kurtosis) and corrected item-total correlations (CITC) for each item of the PhoPhiKat-45 were computed in Sample 1. Further, the factor structure of the PhoPhiKat-45 was examined by submitting the items to PCA with direct oblimin rotation. This analysis was conducted using SPSS v.24. Given that the Kaiser criterion commonly leads to an overestimation of the number of facets to be retained (eigenvalues  $>1$ ), we also conducted a parallel analysis (Horn, 1965) to determine the number of factors to retain.

Descriptive statistics (i.e., mean and standard deviation), reliability (i.e., Cronbach's alphas =  $\alpha$ s) and intercorrelations for the three subscales of the PhoPhiKat-45 were computed in Samples 1, 2 and 3. Further, Pearson correlations of the three dispositions toward ridicule and being laughed at with gender and age were also calculated across all the samples.

Confirmatory factor analyses with the robust maximum likelihood (MLR) estimator and four related fit statistics [i.e., comparative fit index (CFI), Tucker-Lewis index (TLI), root mean error of approximation (RMSEA) with a 90% confidence interval (CI) and standardized root mean square residual (SRMR)] were conducted for the PhoPhiKat-45 across all samples using Mplus 7.11 (Muthén & Muthén, 2012). These analyses were carried out to confirm whether the three-factor internal structure that emerged from the construction sample was replicated across the different subsamples of this research. Given that this study was focused on assessing the nature of the three dispositions toward ridicule and being laughed at across independent samples and to examine their relationships with other relevant criteria, well-applied parcelling might minimize the specific variances of each item and allow us to obtain a measurement model more parsimonious and representative of these constructs (Little, Rhemtulla, Gibson, & Schoemann, 2013). Additionally, parcelling may represent a recommendable option when sample sizes (in these studies,  $N \leq 306$ ) are relatively small (e.g., Little, Cunningham, Shahar, & Widaman, 2002). Therefore, three indicators were created for each disposition toward ridicule and being laughed at (total = 9 indicators). These item parcels were created using the single-factor method (Landis, Beal, & Tesluk, 2000). Two models were tested (see Table 3): the original three-factor model (i.e., gelotophobia, gelotophilia and katagelasticism) proposed by Ruch and Proyer (2009)



and a two-factor model composed of non-humor production traits (i.e., gelotophobia) versus humor production traits (i.e., gelotophilia and katagelasticism).

Partial correlations controlling for age and gender between the three PhoPhiKat-45 dimensions and other relevant criteria were computed for Samples 2 and 3. In addition, in Sample 3, we conducted a set of hierarchical regression analyses with the aim of locating gelotophobia, gelotophilia and katagelasticism in the FFM. Prior to conducting these analyses, we mean-centered all the independent questionnaire variables and confirmed that collinearity statistics (i.e., variance inflation factors [VIF]) were all within adequate limits (i.e., values < 5.0: Akinwande, Dikko, & Samson, 2015). Then, hierarchical regression analyses were computed with gelotophobia, gelotophilia and katagelasticism as criterion variables and NEO-FFI personality traits as predictors. To control for potential influence, gender and age of participants were entered as predictors in Step 1 (method: enter). Then, personality dimensions were entered in Step 2 of the analysis (method: stepwise).

Curvilinear relationships among the NEO-FFI traits and the three dispositions toward ridicule and being laughed at were computed in Sample 3. To carry out these analyses, the quadratic product terms were calculated by squaring the participants' NEO-FFI scores (Cohen et al., 2003). Then, a set of multiple hierarchical regression analyses was computed. Each participant's NEO-FFI score for each dimension was introduced as a predictor in Step 1. Later, the quadratic product term of the correspondence facet was also used as a predictor in Step 2. Finally, each of the three laughter-related traits was independently added as a criteria variable.

## Results

### *Item analysis and principal component analysis*

The 45 items of the Spanish form of the PhoPhiKat-45 were assessed in Sample 1 (*construction sample*). Item analyses showed appropriate variabilities ( $SD \geq 0.78$ ) and the absence of potential floor effects for all items ( $M \geq 1.44$ ). Skewness and kurtosis for all items were also acceptable and indicated normal distribution; they did not exceed the recommended set values of 2 and 7, respectively (West, Finch, & Curran 1995). The discrimination indices were satisfying (i.e., superior to .29) in the various subscales of the Spanish PhoPhiKat-45 (gelotophobia: .35 to .61; gelotophilia: .29 to .63; and katagelasticism: .37 to .66).

With regard to the examination of the internal structure of the Spanish PhoPhiKat-45, the adequacy of the data for the PCA was supported by a KMO value of .85 (above the recommended Kaiser's value [1974]  $\geq .80$ ) and a significant Bartlett's test (Chi-square = 4500.12,  $df = 990$ ,  $p < .001$ ). Based on the results of the parallel analysis, the PCA resulted in a three-factor structure that explained 35.72% of the total variance (eigenvalues: 8.33, 5.18, 2.56, 1.81, 1.50 and 1.37). As can be seen in Table 1, the resulting internal structure reflected the three dispositions toward ridicule and being laughed at and were labelled accordingly: Factor I = gelotophilia (loading from .30 to .77), Factor II = gelotophobia (loading from .42 to .71) and Factor III = katagelasticism (loading from .33 to .70). All items had their highest loading on the targeted dimension with the exception of one item for katagelasticism (item 30). This item had its highest loading on gelotophilia (.42) instead of katagelasticism (.33).

**Table 1.** Loadings of the 45 items of the Spanish form of the PhoPhiKat on the three rotated factors.

Items	F1	F2	F3	$h^2$
<b>Gelotophobia</b>				
PHO 1	.03	.44	.02	.19
PHO 4	.00	.57	.11	.32
PHO 7	-.06	.46	-.18	.26
PHO 10	-.26	.44	-.17	.32
PHO 13	.22	.55	-.12	.35
PHO 16	.12	.55	.17	.30
PHO 19	-.14	.50	-.04	.29
PHO 22	-.19	.48	.04	.30
PHO 25	-.20	.55	.06	.39
PHO 28	.12	.45	-.22	.29
PHO 31	.19	.71	.12	.48
PHO 34	-.01	.71	-.04	.51
PHO 37	-.00	.57	-.01	.33
PHO 40	-.04	.42	-.19	.24
PHO 43	.02	.60	.13	.36
<b>Gelotophilia</b>				
PHI 2	.58	.17	-.02	.34
PHI 5	.55	-.02	.16	.28
PHI 8	.38	-.05	.10	.14
PHI 11	.39	.11	-.21	.25
PHI 14	.58	.22	-.05	.37
PHI 17	.46	.20	-.25	.36
PHI 20	.44	-.15	-.13	.28
PHI 23	.39	-.04	-.16	.22
PHI 26	.68	.02	-.15	.54
PHI 29	.77	.05	-.06	.62
PHI 32	.52	-.21	-.08	.38
PHI 35	.61	.06	-.17	.46
PHI 38	.74	-.04	.05	.54
PHI 41	.30	-.09	-.21	.18
PHI 44	.59	-.20	.24	.41
<b>Katagelasticism</b>				
KAT 3	-.12	.02	-.64	.38
KAT 6	-.02	.05	-.70	.49
KAT 9	.01	.07	-.44	.21
KAT 12	.10	-.09	-.51	.31
KAT 15	-.08	.16	-.64	.44
KAT 18	.19	-.08	-.65	.53
KAT 21	-.03	-.05	-.64	.39
KAT 24	-.28	-.12	-.51	.44
KAT 27	.22	-.01	-.53	.39
KAT 30	.42	-.05	-.33	.37
KAT 33	.23	-.26	-.40	.33
KAT 36	.31	-.05	-.37	.30
KAT 39	-.27	-.08	-.60	.36
KAT 42	.21	-.08	-.61	.50
KAT 45	.28	-.01	-.43	.34
	F1	F2	F3	
Eigenvalues	8.33	5.18	2.56	
% explained variance	18.52	11.51	5.69	

$N = 306$ . PHO = gelotophobia; PHI = gelotophilia; KAT = katagelasticism; F = rotated factors (oblumin);  $h^2$  = communality.

*Intercorrelations, Reliability, and Relations with Gender and Age*

Intercorrelations, Cronbach's alpha values, and correlations with age and gender were calculated across the different samples (see Table 2).

Table 2 shows that mean scores and standard deviations of the three dispositions toward ridicule and being laughed at were similar to previously reported values (e.g.,  $M/SD_{PHO} = 1.97/0.54$ ;  $M/SD_{PHI} = 2.43/0.55$ ;  $M/SD_{KAT} = 1.99/0.46$ ; Ruch and Proyer, 2009). In our samples, the number of participants who exceeded a cut-off score indicating at least a slight expression of gelotophobia ( $> 2.50$ ; Ruch & Proyer, 2008) were 12.4% in Sample 1, 26.6% in Sample 2 and 13.7% in Sample 3 (mean across all samples = 17.57%). These scores were higher than those reported in other studies with Spanish samples (e.g., 11.61%; Carretero-Dios et al., 2010a). All scales yielded good reliability coefficients across samples ( $\alpha \geq .83$ ) and these findings were comparable to those reported in earlier research (e.g.,  $\alpha \geq .84$ ; Ruch & Proyer, 2009). Intercorrelations among gelotophobia, gelotophilia and katagelasticism were also in the expected direction. Gelotophobia was negatively correlated with gelotophilia ( $r_s \leq -.15$ ) and uncorrelated with katagelasticism ( $r_s = .01-.08$ ). Furthermore, a greater inclination to gelotophilia was correlated with higher scores on katagelasticism ( $r_s \geq .36$ ). Regarding the relations to socio-demographic variables, no systematic gender effects on gelotophobia and gelotophilia emerged. However, katagelasticism was robustly associated with male gender across all samples ( $r_s \geq .29$ ). The variables existed widely independently from age; nevertheless, our data from Sample 1 suggested that younger people might be more prone than older ones to express gelotophilia and, to a lesser extent, katagelasticism. In summary (see Table 2), earlier findings on the intercorrelations of the scales, their reliability and their relations with demographics were widely replicated in this research.

**Table 2.** Descriptive statistics, reliabilities, intercorrelations and correlations with gender and age for the PhoPhiKat scales

	<i>M</i>	<i>SD</i>	$\alpha$	<i>Pho</i>	<i>Phi</i>	<i>Kat</i>	<i>Gen</i>	<i>Age</i>
Sample 1								
Gelotophobia	1.86	0.51	.83	-	-	-	-.06	.12
Gelotophilia	2.33	0.55	.85	-.15*	-	-	.10	-.29**
Katagelasticism	1.88	0.54	.86	.05	.53**	-	.32**	-.14
Sample 2								
Gelotophobia	2.13	0.55	.86	-	-	-	-.13	-.01
Gelotophilia	2.30	0.56	.88	-.28*	-	-	.25*	.08
Katagelasticism	1.83	0.49	.86	.08	.43**	-	.29*	.04
Sample 3								
Gelotophobia	1.89	0.50	.84	-	-	-	-.02	-.04
Gelotophilia	2.30	0.47	.84	-.39**	-	-	.03	-.01
Katagelasticism	1.92	0.49	.85	.01	.36**	-	.39**	-.04

*N* = 128 – 306. Pho = gelotophobia; Phi = gelotophilia; Kat = Katagelasticism; Gen = Gender. Gender (Spearman correlation); Age (Pearson correlation). Due to sample size the significance threshold was set at .01 with the exception of Sample 2. \* $p < .01$ ; \*\*  $p < .001$

### *Confirmatory factor analysis*

The outputs of the separately conducted CFAs are summarized in Table 3. Our results indicated that the Model 1 (three original factors: gelotophobia, gelotophilia and katagelasticism) compared to Model 2 (non-humor production traits vs. humor production traits) showed the best model fit across the assessed independent samples. In fact, Model 2 showed very poor fit. Taking Kaplan's criteria (2000) into account, the CFI and TLI values ( $> .95$ ) indicated a good model fit for the three samples. The RMSEA values were below .08, indicating an acceptable model fit across all samples. Also, SRMR values ( $< .08$ ) indicated a good model fit in all the samples. Considering the overall pattern of the fit statistics, the three-factor solution (Model 1) showed an acceptable-to-good model fit across all samples.

**Table 3.** Confirmatory factor analyses of the PhoPhiKat across independent samples.

	<i>n</i>	$\chi^2$	df	CFI	TLI	RMSEA [90% CI]	SRMR
Sample 1	306						
Model 1		47.580	24	.981	.971	.057 [.032, .080]	.045
Model 2		378.369	26	.714	.605	.210 [.192, .229]	.094
Sample 2	128						
Model 1		42.371	24	.973	.959	.077 [.036, .115]	.048
Model 2		190.826	26	.754	.659	.223 [.194, .253]	.136
Sample 3	202						
Model 1		43.891	24	.976	.964	.064 [.032, .094]	.044
Model 2		274.026	26	.698	.582	.217 [.194, .241]	.139

CFI = Comparative fit index; TLI = Tucker-Lewis index; RMSEA = root-mean-square error of approximation; CI = confidence interval; SRMR = standardized root mean square residual. Model 1 = original three-factor structure (gelotophobia, gelotophilia and katagelasticism); Model 2 = two-factor structure: non-humor production traits (i.e., gelotophobia) vs. humor production traits (i.e., gelotophilia and katagelasticism).

*External validity I: Relationships of the three dispositions and humor styles, subclinical autistic traits and trait anxiety*

Table 4 shows that the partial correlations controlling for age and gender between the three dispositions toward ridicule and being laughed at and humor styles, subclinical autistic and trait anxiety were in the expected direction.

Concerning humor styles, higher scores on gelotophobia were linked to low self-enhancing humor ( $r = -.28, p < .01$ ) and low affiliative humor (although this latter association did not reach statistical significance:  $r = -.17, p = .061$ ). Moreover, higher scores on gelotophilia correlated with greater inclinations to all humor styles, showing stronger positive correlations with affiliative ( $r = .51$ ) and self-defeating ( $r = .68, ps < .001$ ) humor styles. Finally, higher scores on katagelasticism correlated with heightened expressions of aggressive ( $r = .68, p < .001$ ) and self-defeating ( $r = .24, p < .01$ ) humor styles. We also observed a positive trend between the joy in laughing at others and self-

enhancing humor, but it was not statistically significant ( $r = .17, p = .051$ ). As for subclinical autistic traits and trait anxiety, heightened expressions of gelotophobia were related to elevated autistic symptoms ( $r = .55$ ) and greater inclinations to trait anxiety ( $r = .59, ps < .001$ ). By contrast, higher scores on gelotophilia were related to a lower propensity to trait anxiety ( $r = -.21, p < .05$ ). The expected negative correlation between gelotophilia and subclinical autistic traits did not reach statistical significance ( $r = -.17, p = .053$ ). Finally, katagelasticism was unrelated to trait anxiety and autistic symptoms ( $|rs| \leq .09$ ).

*External validity II: Relationships of the three dispositions with the Five-Factor Model*

Table 4 shows that the pattern of correlation among dispositions toward ridicule and being laughed at and broad personality domains was highly similar to findings from past research with the NEO-FFI (Ďurka & Ruch, 2015). Those individuals high in gelotophobia exhibited higher scores on neuroticism ( $r = .57, p < .001$ ) and lower inclinations to extraversion ( $r = -.50, p < .001$ ) and openness to experience ( $r = -.23, p < .01$ ); gelotophilia was negatively correlated with neuroticism ( $r = -.23, p < .01$ ) and positively correlated with extraversion ( $r = .43, p < .001$ ). Katagelasticism demonstrated associations with low agreeableness ( $r = -.50, p < .001$ ) and low conscientiousness ( $r = -.23, p < .01$ ).

A set of hierarchical regression analyses using the PhoPhiKat-45 scales as criteria and demographics (i.e., gender and age) and NEO-FFI traits as predictors (see Tables 5, 6 and 7) revealed 46.9% overlapping variance with gelotophobia. As in earlier studies, high neuroticism was the main predictor of gelotophobia ( $\Delta R^2 = .32, p < .001$ ;  $\Delta f^2 = 0.47$ ) followed by low extraversion ( $\Delta R^2 = .09, p < .001$ ;  $\Delta f^2 = 0.16$ ), low openness to experience ( $\Delta R^2 = .04, p < .001$ ;  $\Delta f^2 = 0.08$ ) and low conscientiousness

( $\Delta R^2 = .01$ ,  $p = .034$ ;  $\Delta f^2 = 0.02$ ). Also in line with earlier studies, predictors accounted for 20.7% of the variance in gelotophilia. In particular, high extraversion ( $\Delta R^2 = .19$ ,  $p < .001$ ;  $\Delta f^2 = 0.23$ ) and low conscientiousness ( $\Delta R^2 = .02$ ,  $p = .031$ ;  $\Delta f^2 = 0.03$ ) were the most predictive NEO-FFI-traits. Katagelasticism was predicted by male gender, low agreeableness ( $\Delta R^2 = .21$ ,  $p < .001$ ;  $\Delta f^2 = 0.33$ ), high extraversion ( $\Delta R^2 = .05$ ,  $p < .001$ ;  $\Delta f^2 = 0.08$ ) and low conscientiousness ( $\Delta R^2 = .03$ ,  $p = .001$ ;  $\Delta f^2 = 0.06$ ), which comprised 43.7% of the total variance in this laughter-related disposition.

**Table 4.** Descriptive statistics and reliabilities for questionnaire scores and partial correlations (controlling for age and gender) between PhoPhiKat scales and other relevant criteria.

	<i>M</i>	<i>SD</i>	$\alpha$	<i>Pho</i>	<i>Phi</i>	<i>Kat</i>
Sample 2 ( <i>N</i> = 128)						
Affiliative humor	5.75	0.94	.83	-.17	.51***	.15
Self-enhancing humor	4.54	1.19	.81	-.28**	.45***	.17
Aggressive humor	2.60	1.02	.76	-.01	.37***	.68***
Self-defeating humor	3.73	1.22	.79	.12	.68***	.24**
Autistic traits	17.57	5.30	.75	.55***	-.17	.09
Trait-anxiety	27.35	11.24	.91	.59***	-.20*	.03
Sample 3 ( <i>N</i> = 202)						
NEO-FFI						
Neuroticism	2.90	0.66	.82	.57***	-.23**	.09
Extraversion	3.69	0.61	.85	-.50***	.43***	.09
Agreeableness	3.54	0.50	.70	-.15	.01	-.50***
Openness	3.60	0.67	.83	-.23**	.17	-.09
Conscientiousness	3.48	0.62	.85	-.08	-.05	-.23**

*N* = 128 – 202. Pho = gelotophobia; Phi = gelotophilia; Kat = Katagelasticism; Openness = Openness to experience. Due to sample size the significance threshold was set at .01 with the exception of Sample 2. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$



**Table 5.** Hierarchical regression analysis predicting gelotophobia with demographics and NEO-FFI traits

Predictors	$\Delta R^2$	$\beta$
Step 1: Demographics		
Model 1	.002	
Age		-.043
Gender		-.016
Step 2: NEO-FFI dimensions		
Model 2	.319***	
Age		-.055
Gender		.051
Neuroticism		.569***
Model 3	.093***	
Age		-.056
Gender		-.007
Neuroticism		.443***
Extraversion		-.332***
Model 4	.043***	
Age		-.049
Gender		-.012
Neuroticism		.467***
Extraversion		-.294***
Openness to experience		-.211***
Model 5	.012*	
Age		-.046
Gender		.000
Neuroticism		.492***
Extraversion		-.308***
Openness to experience		-.217***
Conscientiousness		-.117*
Total $R^2$	.469***	

Note.  $N = 202$ . Gender: 0 = females; 1 = males. Step 1 (Method: enter); Step 2 (stepwise). All VIFs  $\leq 1.19$ . \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

**Table 6.** Hierarchical regression analysis predicting gelotophilia with demographics and NEO-FFI traits

Predictors	$\Delta R^2$	$\beta$
Step 1: Demographics		
Model 1	.000	
Age		-.004
Gender		.009
Step 2: NEO-FFI dimensions		
Model 2	.187***	
Age		.002
Gender		.066
Extraversion		.437***
Model 3	.019*	
Age		-.002
Gender		.056
Extraversion		.465***
Conscientiousness		-.142*
Total $R^2$	.207***	

Note.  $N = 202$ . Gender: 0 = females; 1 = males. Step 1 (Method: enter); Step 2 (stepwise). All

VIFs  $\leq 1.23$ . \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

**Table 7.** Hierarchical regression analysis predicting katagelasticism with demographics and NEO-FFI traits

Predictors	$\Delta R^2$	$\beta$
Step 1: Demographics		
Model 1	.145***	
Age		-.007
Gender		.380***
Step 2: NEO-FFI dimensions		
Model 2	.214***	
Age		-.013
Gender		.266***
Agreeableness		-.476***
Model 3	.047***	
Age		-.011
Gender		.280***
Agreeableness		-.542***
Extraversion		.229***
Model 4	.031**	
Age		-.016
Gender		.271***
Agreeableness		-.520***
Extraversion		.260***
Conscientiousness		-.183**
Total $R^2$	.437***	

Note.  $N = 202$ . Gender: 0 = females; 1 = males. Step 1 (Method: enter); Step 2 (stepwise). All

VIFs  $\leq 1.24$ . \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

The analyses of the curvilinear relationships revealed this type of association between agreeableness-gelotophobia and neuroticism-katagelasticism. Concerning the former relation, agreeableness was a predictor for gelotophobia (model 1:  $\beta = -.14$ ,  $t = -2.03$ ,  $p = .043$ ,  $\Delta R^2 = .02$ ), and the addition of the quadratic product term of agreeableness also yielded a change in the multiple correlation squared (model 2:  $\beta = -1.38$ ,  $t = -2.17$ ,  $p = .031$ ,  $\Delta R^2 = .02$ ). It suggests an inverted U-shaped relation, indicating that middle levels of agreeableness are linked to the highest gelotophobia scores (see Figure 1). Furthermore, neuroticism did not serve as a predictor for katagelasticism (model 1:  $\beta = -.03$ ,  $t = .45$ ,  $p = .653$ ,  $\Delta R^2 = .00$ ), but the addition of the quadratic product term of neuroticism yielded a change in the multiple correlation squared (model 2:  $\beta = -1.84$ ,  $t = -3.82$ ,  $p < .001$ ,  $\Delta R^2 = .07$ ). As in the previous case, the function of the neuroticism-katagelasticism relation followed an inverted U-shaped curve, suggesting that middle levels of neuroticism are most conducive to katagelasticism (see Figure 2).

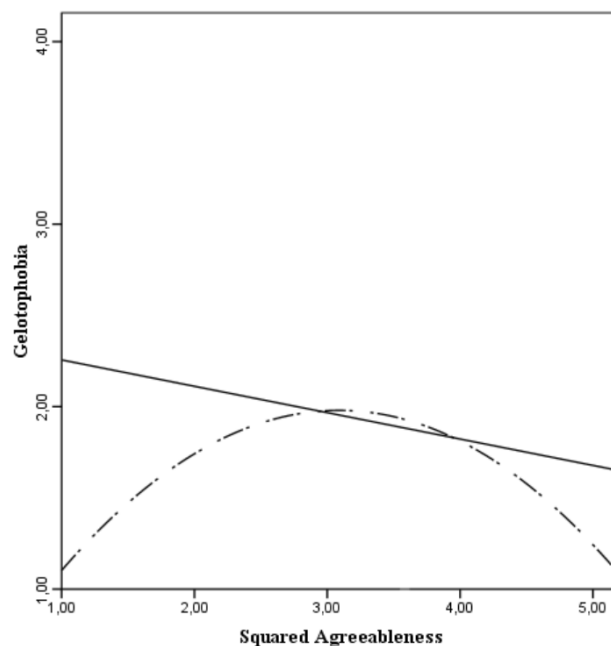


Figure 1. Curvilinear relationship between NEO-FFI agreeableness and gelotophobia.

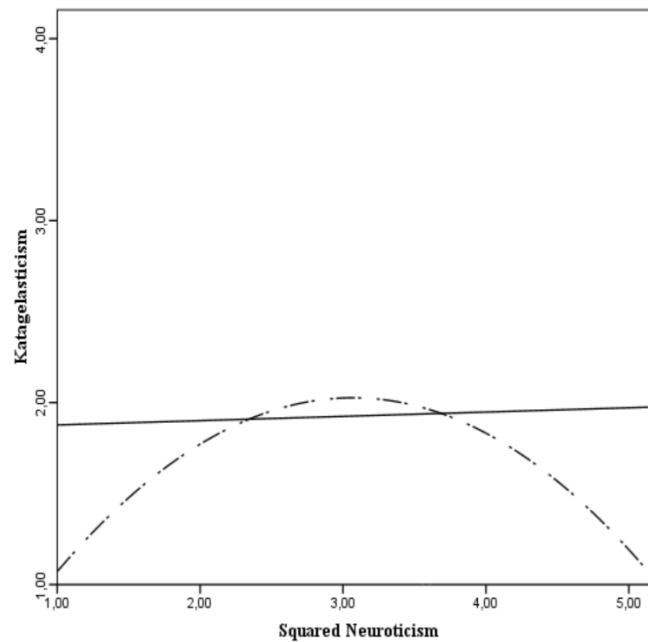


Figure 2. Curvilinear relationship between NEO-FFI neuroticism and katagelasticism.

## Discussion

Ridicule is an inherently social phenomenon that can be used to convey negative mental states as contempt or superiority and to exercise control over other individuals (Billing, 2005; Davies, 2009; Ruch, 2009). This manifestation, however, does not affect people in the same manner. The PhoPhiKat-45 is an instrument aiming at measuring three individual differences variables describing how people react to being exposed to laughter and ridicule (see Ruch & Proyer, 2009). Notably, the assessment of the fear of (gelotophobia) and joy in (gelotophilia) being laughed at, and the joy in laughing at others (katagelasticism) has been carried out across several countries over the last decade (Chen et al., 2011; Dursun et al., in press; Ivanova et al., 2016; Platt & Ruch, 2010; Ruch & Proyer, 2009). This psychometric work has contributed to an increasing number of empirical studies providing support for the associations of these laughter-related dispositions with multiple variables (Brauer & Proyer, 2018; Ďurka & Ruch, 2015; Samson et al., 2011; Wu et al., 2015). However, to date, this instrument has not

been translated and validated in a Spanish-speaking context. The present research had the aim to provide initial psychometric support for the Spanish form of the PhoPhiKat-45. For this purpose, after translating and obtaining validity evidence-based test content of the items, we investigated the internal structure, reliability, and external validity of our validation in three independently recruited samples of Spanish adults. The development of this Spanish version provides a promising instrument for studying the prevalence of these dispositions in Spain and offers an additional assessment tool for future research on cross-cultural differences in the way people deal with ridicule and being laughed at.

Overall, our results showed that the Spanish version of the PhoPhiKat-45 has high reliability ( $\alpha$ -coefficients from .83 to .88) and there is support for its dimensionality and construct validity. The reliability coefficients were highly similar to those reported in the original version (Ruch & Proyer, 2009) and adaptations to other languages (e.g., Dursun et al., in press). As for its internal structure, the PCA replicated the expected three-factor solution proposed by Ruch and Proyer (2009). Moreover, confirmatory factor analyses showed that the three-factor model (i.e., gelotophobia, gelotophilia and katagelasticism), in comparison to the two-factor model (i.e., non-humor production traits and humor production traits), had better fit values across all the samples. This structural equivalence seems to indicate that these laughter-related traits also exist as independent entities rather than dichotomous humorous/humorlessness tendencies among Spanish adults. As a final point, it is worth mentioning that the recruiting strategies and method of administration (paper-pencil vs. online methods) had no effect on the reliability or dimensionality of our measurement, resulting in comparable values through both modes of administration. Furthermore, our findings were widely comparable considering both groups—undergraduates (Sample 2) and general

population (Samples 1 and 3). Altogether, our results suggest that the Spanish form of the PhoPhiKat-45 taps three robust latent dimensions across diverse socio-demographic settings. Further, the negligible differences based on the administration procedures offer the possibility of contemplating potential in-person and virtual applications for our instrument.

Testing the associations with humor styles, subclinical autistic traits and trait anxiety provided additional support for the construct validity of our measure. First, the Spanish form of the PhoPhiKat-45 showed an adequate convergent and discriminant validity with respect to humor styles (Dursun et al., in press). As expected, the fear of being laughed at was associated with lower inclinations to positive types of humor, such as affiliative and self-enhancing humor, and was uncorrelated with aggressive and self-defeating humor styles. Ruch et al. (2014) already pointed out that gelotophobes exhibit a general biased perception toward positive/joyful signals that goes beyond laughter. Our data are consistent with this idea and support the notion that these individuals have difficulties interpreting humor, even its benign forms, as relaxing or enjoyable experiences (Ruch, 2009; Ruch et al., 2014). Also, the fact that gelotophobes do not engage in benign forms of humor such as affiliative and self-enhancing humor styles converges well with their greater self-perception of loneliness or negative life expectations (Führ, Platt, & Proyer, 2015).

The joy in being laughed at was associated with the use of all humor styles, but, as expected, correlation coefficients were numerically larger for self-defeating and affiliative humor styles than for the other humor styles. Martin (2007) stated that these humor styles are more representative of socially oriented forms of humor. Gelotophiles seem to lean toward humoristic behaviors aimed at improving their social relationships. They may interpret both prosocial and self-deprecating humoristic expressions as valid

options for amusing others. This fits well with the gelotophiles' extrovert characters (e.g., Ďurka & Ruch, 2015). At this point, it should be noted that although gelotophilia and a self-defeating humor style are manifested by similar behaviors (i.e., make others fun at one's own expense), gelotophiles, unlike those with higher scores in selfdefeating humor, do not use humor as a strategy to hide their shortcomings and thereby obtain others' approval but rather use it as an opportunity to entertain others and make them laugh (Ruch & Proyer, 2009).

Lastly, the joy in laughing at others correlated strongly with high aggressive humor and, to a lesser extent, with high self-defeating humor. These results are in line with the initial conceptualization of katagelasticism (Ruch & Proyer, 2009) and empirical evidence (Samson & Meyer, 2010), since those prone to this humor trait are more likely to (mainly) use and appreciate aggressive forms of humor more positively. Katagelasticism and aggressive humor seem to share common antisocial characteristics, such as the use of ridicule and sarcastic utterances to denigrate others (Martin, 2007; Ruch & Proyer, 2009) and reduce other-oriented feelings of compassion (Hampes, 2010; Proyer, Flisch, Tschupp, Platt, & Ruch, 2012; Torres-Marín, Proyer, López-Benítez, Brauer, & Carretero-Dios, 2019). Importantly, prior research has pointed out that these lower-order humor-related traits are not redundant dispositions (Dursun et al., in press; Ruch & Proyer, 2009). Lastly, as in the case of Dursun and collaborator's study (in press), katagelasticism was related to selfdefeating humor. Similarly, aggressive humor has also proven to be associated with this type of self-deprecating humor (Martin et al., 2003). This may indicate that those who are more likely to use hostile forms of humor engage in selfdefeating forms in some specific contexts. Putatively, these individuals could dip into self-defeating humor under specific circumstances; for example, when they feel low self-efficacy. They would make fun of



themselves before being ridiculed by others as a consequence of their potentially poor performance on some tasks.

We also replicated previously reported associations of the three laughter-related dispositions and subclinical manifestations of autism. Gelotophobia was correlated with heightened expressions of subclinical autistic traits. One might argue that some autistic-like deficits in social behavior may be linked to gelotophobes' perceptions of being ridiculous and/or their misperception of laughter and humor. Using humor and laughter appropriately requires decoding certain codes of interaction that can be affected among individuals with autistic traits. Similar, these findings on gelotophobia have proved to be extensible to similar developmental disorders as Asperger's syndrome (Samson et al., 2011). It has been suggested that the presence of common underlying mechanisms (e.g., difficulties in social communication) might contribute to explaining the prevalence of fear of being laughed at among individuals with autism and Asperger's syndrome (Samson et al., 2011; Wu et al., 2015).

Furthermore, in contrast to our expectations, the expected negative correlation between gelotophilia and the expression of subclinical autistic traits did not reach statistical significance in our sample (the association was small in size only). This might suggest that Spanish individuals with subclinical autistic traits do not dislike (at least at the same intensity) making fun of themselves in some situations. A possible explanation could be a culturally specific role of the act of laughing at oneself among Spanish adults. Indeed, in a Torres-Marín and colleagues' study (2018), making fun of oneself was associated with positive psychological functioning. Alternatively, this absence of relation may be due to other factors, such as sample-based effects; therefore, further data are needed to clarify this relation.

As expected, katagelasticism did not correlate with this subclinical construct. One possible explanation is that there could be a subgroup of individuals with autistic traits who engage in teasing or mockery as a defense strategy for protecting themselves from ridicule. This mechanism was already proposed among gelotophobes (Proyer & Ruch, 2010). In addition, it would be advisable to explore the potential role of anger management (and related traits) to clarify how subclinical autistic traits interact with the joy of laughing at others. Altogether, and taking previous findings into account, our results support the idea of a robust relationship between the expression of subclinical autistic traits and an individual's manner of dealing with ridicule and being laughed at.

For a further validation of the Spanish form of the PhoPhiKat-45, we tested the associations among the three dispositions toward ridicule and being laughed at and trait anxiety. As expected, gelotophobia correlated with higher levels of trait anxiety. This result is aligned with prior research indicating that anxiety plays an essential role on the fear of being laughed at (Ruch, 2009; Ruch et al., 2014). Further, this finding extends the previously reported relations of more specific dispositions, such as social phobia and fear of negative evaluation (Carretero-Dios et al., 2010a, 2010b; Weiss et al., 2012). Similarly, gelotophobes are likely to experience stable, general feelings of anxiety across their lifespan, reflecting a greater degree of emotional vulnerability.

Moreover, gelotophilia was correlated with low trait anxiety. On one hand, these results converge well with the notion that gelotophiles experience greater personal satisfaction (Hofmann et al., 2017); on the other hand, this did not fit with the near-zero relations of several indicators of psychological distress (Dursun et al., in press). The joy of being laughed at seems to be an indicator of a lower tendency toward trait anxiety among Spanish adults. Low anxiety has been associated with the ability to modulate negative self-impressions and reappraise threatening social cues (Kivity & Huppert,

2016). Presumably, gelotophiles would be able to experience being laughed at as a non-stressful situation implementing these types of strategies.

In contrast to our expectations, katagelasticism existed independently from trait anxiety. There is support for the idea that katagelasticists show higher levels of work stress (Hofmann et al., 2017) and personal distress (Dursun et al., in press), but no an increased tendency to some anxiety-related emotions, such as shame (Proyer, Platt, & Ruch, 2010). Our data suggest that katagelasticists do not necessarily have higher subjective perceptions of anxiety. Further research should explore objective measures (e.g., psychophysiological indicators, such as heart rate) to assess more directly the potential relationship between the joy in laughing at others and trait anxiety. In addition, to the best of our knowledge, this research provides the first empirical evidence of associations among the well-established measure of anxiety incorporated in this research (i.e., trait anxiety assessed by the STAI) and gelotophobia, gelotophilia and katagelasticism.

Our results on the relationships between broad personality dimensions and the three dispositions toward ridicule and being laughed at (Sample 3) provide additional support for the construct validity of the Spanish PhoPhiKat-45. In particular, the location of gelotophobia, gelotophilia and katagelasticism in the FFM in Spanish samples widely replicated earlier findings using the NEO-FFI (Ďurka & Ruch, 2015). As expected, gelotophobes could be described as neurotics and introverts with lower openness to experience. Gelotophiles can be described as extraverts with a low inclination to conscientiousness. There was a negative relationship between gelotophilia and neuroticism, however, according to hierarchical regression analysis; this trait did not predict joy in being laughed at among Spanish individuals. One possible explanation would be that there are at least two prototypes of Spanish gelotophiles; those who make

fun of themselves because they are less reactive to negative emotions, and a second smaller group who may use humor at their own expense to hide their fear, anger or frustration. Recent research conducted in Spain found a small positive relationship between neuroticism and self-defeating humor (Torres-Marín et al., 2018). Finally, in line with our expectations, katagelasticians exhibited low agreeableness, high extraversion and low conscientiousness. It should also be mentioned that the findings on the localization of the three dispositions in the FFM provide further support that there is an overlap, but no redundancy. Importantly, the amount of explained variance and nature of predictors of gelotophobia, gelotophilia and katagelasticism were comparable to previous German (Ruch et al., 2013) and Slovakian (Ďurka & Ruch, 2015) findings.

Additionally, our research explored the potential curvilinear relationships among the Big Five personality traits and gelotophobia, gelotophilia and katagelasticism. First, our results indicated an inverted U-shaped relation between agreeableness and gelotophobia. This means that the medium scores on agreeableness were more indicative of a greater inclination to gelotophobia than high and low scores on this trait. Since there was also a significant negative linear relationship between agreeableness and gelotophobia, this effect might be mainly due to individuals with higher scores on gelotophobia showing medium-to-low instead of low scores on agreeableness. This finding is consistent with previous literature suggesting that gelotophobes would not exhibit a general trend to be disagreeable but rather a context-dependent inclination that could be modulated by trust or safe feelings during interpersonal interactions (Ďurka & Ruch, 2015). Furthermore, there was also an inverted U-shaped relation between neuroticism and katagelasticism. This suggests that those individuals who excessively enjoy laughing at others seem to be characterized by moderate emotional stability. Therefore, their disparaging humor-related behaviors should not be understood as a way

of counteracting possible threatening or intimidating cues; they seem to be more associated with other personal tendencies, such as low empathy (Ruch & Proyer, 2009; Torres-Marín et al., 2019) or guilt-proneness (Proyer et al., 2010). However, given that the exploratory nature of these findings, they should be interpreted with caution. Comparative cross-cultural studies are needed to examine whether these curvilinear relationships are robust across various countries.

Our research has several limitations. All participants were recruited by a non-probabilistic sampling. This type of data collection could limit the generalization of our results. In this sense, we decided to incorporate multiple samples (these groups were diverse in terms of sociodemographic characteristics) to replicate the internal consistency and dimensionality of our measure. Future studies might also evaluate the cross-cultural validity of the PhoPhiKat-45. Since cultural and societal norms influence/shape the way individuals use humor (Martin, 2007), it would be interesting to analyze the measurement invariance of the PhoPhiKat-45 across different countries. All measures used are self-reports and, thus, potentially prone to answer distortions. Hence, future research may also consider the usage of peer-ratings and other assessment techniques (e.g., semi-projective techniques; Ruch, Platt, Bruntsch, & Ďurka, 2017).

In conclusion, our research shows that the Spanish form of the PhoPhiKat-45 has appropriate psychometric properties and can be considered a promising instrument for the study of gelotophobia, gelotophilia and katagelasticism in Spain. The reliability of our instrument was good and approximately the same across all the samples. Moreover, we provided construct validity evidence, confirming the widely accepted three-factor structure of the PhoPhiKat-45 and obtaining the expected relationships among these three dispositions and other relevant criteria such as humor styles, subclinical autistic traits, trait anxiety and FFM personality traits. Additionally, the inclusion of the

### CHAPTER III

previously untested curvilinear relations among the Big Five personality traits and gelotophobia, gelotophilia and katagelasticism implies an additional contribution to the research on humor and personality.

## **Chapter IV**

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*Beyond the Big Five as predictors of  
dispositions toward ridicule and being laughed  
at: The HEXACO model and the Dark Triad*





**Beyond the Big Five as predictors of dispositions toward ridicule and  
being laughed at: The HEXACO model and the Dark Triad**

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**Abstract**

We aimed to extend research on dispositions toward ridicule and being laughed at by testing the localization of the fear of (gelotophobia) and the joy in (gelotophilia) being laughed at, and the joy in laughing at others (katagelasticism) in the HEXACO model and the Dark Triad traits (both have not been examined so far). Study 1 (HEXACO model:  $N = 216$ ) showed that gelotophobia was related to low extraversion, high emotionality, and low honesty-humility; gelotophilia to high extraversion and high openness to experience; and katagelasticism to low agreeableness and low honesty-humility. These results were similar to prior findings based on the Five-Factor model, and supported the notion that the honesty-humility trait contributes to the prediction of individual differences in gelotophobia and katagelasticism. Study 2 (Dark Triad:  $N = 204$ ) showed that gelotophobia was related to high Machiavellianism and low narcissism; gelotophilia to high narcissism; and katagelasticism to high psychopathy and high Machiavellianism. These data helped to clarify our findings on the honesty-humility trait, showing that gelotophobes and katagelasticists differ in their socially aversive characteristics. Overall, this research provides empirical evidence that dark (but subclinical) traits can be seen as relevant personality predictors of how people deal with laughter and ridicule.

*Keywords:* Dark Triad; gelotophobia; gelotophilia; HEXACO; katagelasticism; laughter

## Introduction

Laughter plays an essential communicative role in human life. Although this emotion-related behavior is mainly associated with approach-oriented affective states, laughter may also be used to denote rejection or a sense of superiority over others (Wood, Martin, & Niedenthal, 2017). This potential ambiguity—laughing at me instead of laughing with me—may elicit a misinterpretation of the intention of laughter and lead to diametrically opposite psychological outcomes. Moreover, it has been demonstrated that there are interindividual differences in how people deal with ridicule and being laughed at. In particular, three distinct—but intercorrelated—dispositions at a subclinical level have been proposed (see Ruch, Hofmann, Platt, & Proyer, 2014; Ruch & Proyer, 2009a); namely, the fear of being laughed at (i.e., *gelotophobia*) and the joy in being laughed at (i.e., *gelotophilia*) and laughing at others (i.e., *katagelasticism*).

Earlier research on the relationship of the three dispositions with broad personality traits has shown that gelotophobia, gelotophilia, and katagelasticism can be well-located in different personality systems, such as Eysenck's PEN model or the Five-Factor Model (FFM). Nevertheless, no study has yet addressed the localization of these dispositions toward ridicule and being laughed at in the HEXACO model and the Dark Triad (DT). This research aims at narrowing this gap in the literature. From a theoretical perspective, the consideration of these traits may contribute to clarifying the nature of gelotophobia, gelotophilia, and katagelasticism, particularly by unveiling potentially relevant variance that may have been overlooked in prior studies.

### *Dispositions toward ridicule and being laughed at*

Individuals high in gelotophobia (*gelotophobes*; Greek: gelos = laughter) are characterized by exaggerated negative reactions to being laughed at and a near-paranoid

sensitivity to ridicule and being laughed at (Platt, Ruch, Hofmann, & Proyer, 2012). Individuals with an increased fear of being laughed at struggle to identify the emotional state behind others' laughter (Platt, 2008). This biased perception strongly impacts gelotophobes' social adjustment, leading them to perceive themselves as targets of derision and those with extreme expressions may even avoid social situations where laughter can be present (Platt & Ruch, 2010). Recent studies have also demonstrated that gelotophobes exhibit fewer positive facial expressions, such as joyful smiles, in response to laughter-eliciting emotions (Ruch, Hofmann, & Platt, 2015), exhibit a poorer neural protection against anger and aggression via social cues (Papousek, Schuler, Rominger, Fink, & Weiss, 2016), and have more difficulties to process perceptual cues as gaze direction (Torres-Marín, Carretero-Dios, Acosta, & Lupiáñez, 2017).

Individuals high in gelotophilia, or *gelotophiles*, tend to expose themselves to potentially embarrassing situations, in which they can make others laugh at their own expense (Ruch & Proyer, 2009a). Gelotophilia is negatively correlated with gelotophobia ( $r \sim 0.30$ ) but not redundant and, thus, should not be understood as the low pole of gelotophobia (Ruch & Proyer, 2009a). Indeed, despite a certain degree of common variance between these two dispositions, they can predict independent psychological outcomes (e.g., relationship satisfaction; Brauer & Proyer, 2018). Gelotophiles are likelier to use self-presentation styles aimed at gaining social approval (Renner & Heydasch, 2010), have a lowered capacity of self-control (Chiu, Hsu, Lin, Chen, & Liu, 2017), and report higher subjective levels of both personal and occupational satisfaction (e.g., Hofmann, Ruch, Proyer, Platt, & Gander, 2017).

Individuals high in katagelasticism (*katagelasticists*; Greek: katagelao = laughing at) actively seek and establish situations in which they can laugh at others (Ruch &

Proyer, 2009a). Katagelasticism is positively correlated with gelotophilia ( $r \sim 0.30$ ) and exists independently from gelotophobia. Consistent with this conceptual approach, katagelasticists are more prone to deploy aggressive humor (Dursun, Dalğar, Brauer, Yerlikaya, & Proyer, in press) and appreciate such humor (Samson & Meyer, 2010). Heightened expressions of katagelasticism have been linked with bullying-type behaviors (already in young children and in adolescents; Proyer, Neukom, Platt, & Ruch, 2012b) and with psychopathic personality traits (Proyer, Flisch, Tschupp, Platt, & Ruch, 2012a). Like gelotophiles, katagelasticists exhibit low self-control (Chiu et al., 2017), but higher levels of work stress (Hofmann et al., 2017).

*Gelotophobia, gelotophilia and katagelasticism across personality models*

There are diverse studies on the location of the three dispositions toward ridicule and being laughed at within models of personality. For instance, Ruch and Proyer (2009b) administered different measures of the PEN system (Eysenck, 1990), and found that gelotophobia was linked to low extraversion and high neuroticism, as well as higher expressions in the older, more clinically saturated variants of the psychoticism-scale. Moreover, multiple regression analysis indicated that these personality traits accounted for 37% of the variance in the fear of being laughed at. In another study using the PEN system, Proyer and Ruch (2010) managed to widely replicate the findings for gelotophobia (total  $R^2 = 0.41$ ). Further, gelotophilia and katagelasticism were associated with greater expressions of extraversion, while katagelasticism also correlated with higher scores on psychoticism. Importantly, the traits of the PEN system, along with demographics (i.e., gender and age), accounted for 17% of the variance in gelotophilia and katagelasticism.

Moreover, there have been several studies on the localization of these dispositions in the FFM. For instance, Ruch, Harzer and Proyer (2013) administered the Bipolar Adjective Rating Scale (BARS179; Ostendorf, 1990) and identified a link between gelotophobia and high neuroticism, as well as low extraversion, openness to experience, and conscientiousness. Gender, age, and these four broad personality dimensions were predictive of 52.7% of the variance in the fear of being laughed at. The authors also found that gelotophilia was associated with high extraversion and openness to experience, as well as low neuroticism and conscientiousness. Notably, the FFM traits and demographics accounted for 25.8% of the explained variance in the joy in being laughed at. Katagelasticism was associated with low agreeableness and conscientiousness. Overall, demographics and these personality traits were predictive of 24.7% of the variance in the joy in laughing at others. More recently, Ďurka and Ruch (2015) extended these findings by employing the NEO-Five Factor Inventory (NEO-FFI; Costa & McCrae, 1992) to discover that gelotophobes can be described as introverted neurotics with a lower inclination to openness to experience. Indeed, these FFM traits, in conjunction with demographics, explained 46.7% of the variance in the fear of being laughed at. Also, there were less robust associations with low agreeableness and low conscientiousness ( $\Delta R^2$  of both traits were statistically non-significant).

On the other hand, gelotophiles can be characterized as extraverts with low expressions in neuroticism and conscientiousness. Altogether, personality traits and demographics accounted for 21.3% of the variance in the joy in being laughed at. That said, the relationship between gelotophilia and high openness to experience was not as well-established ( $\Delta R^2$  of both traits were statistically non-significant). Lastly, katagelasticists can be described by low agreeableness and conscientiousness, as well as

high extraversion. In particular, demographics and FFM traits accounted for 37.3% of the variance in the joy in laughing at others.

The laughter-related dispositions have also been located in a model of character strengths (i.e., morally and positively valued traits; see Peterson & Seligman, 2004). Proyer, Wellenzohn and Ruch (2014) examined the associations between the dispositions and character strengths on basis of self- and peer-ratings. The inclusion of peer-ratings allowed to (1) add incremental information beyond self-descriptions that are prone to biases (e.g., Vazire & Carlson, 2011); (2) to examine the under- or overestimation of strengths in relation with the dispositions; and (3) controlling for common method bias (e.g., acquiescence; Campbell & Fiske, 1959). There was a robust association between gelotophobia and negative expressions of strengths: specifically, low ratings on humor, bravery, kindness, forgiveness, gratitude, and curiosity. However, this disposition was also linked to greater expressions of modesty and prudence. When comparing the findings with ratings by knowledgeable others, it was shown that gelotophobes seem to underestimate their virtuousness. For example, peer-ratings of high modesty had incremental validity beyond the self-reported strengths. Altogether, these predictors and demographics accounted for 39% of the variance in the fear of being laughed at. Furthermore, higher scores on humor, love, modesty, and appreciation of beauty were related to gelotophilia in self-reports, and high creativity and authenticity, but low modesty and bravery, in the peer-reports. Demographics and character strengths explained 39% of the variance in the joy in being laughed at. Katagelasticism had a less demonstrable overlap with character strengths than did gelotophobia and gelotophilia, as katagelasticists reported lower levels of modesty, kindness, fairness, and prudence. Peers perceived them as being low in love of learning. Demographics and character strengths accounted for 20% of the variance in the joy in

laughing at others. Overall, the findings converged well between self- and peer-ratings, with the exception that gelotophobes underestimated their virtuousness.

Based on these findings, one might conclude that gelotophobia, gelotophilia, and katagelasticism can be well-located in both traditional systems of personality and character strengths-based models. However, certain issues remain understudied. For instance, to the best of our knowledge, no studies have yet tested the localization of these dispositions in an alternative personality system such as the HEXACO model (Ashton & Lee, 2007). This model proposes the existence of six broad dimensions to describe personality (i.e., extraversion, emotionality, openness to experience, agreeableness, conscientiousness, and honesty-humility). Although the operationalization of extraversion, openness to experience, and conscientiousness are closely equivalent to their counterparts in the FFM, the HEXACO model also reorganizes some of the variance represented in the FFM (Ashton, Lee, & de Vries, 2014; Romero, Villar, & López-Romero, 2015). For instance, emotionality, relative to the FFM neuroticism trait, encompasses some sentimentality-related traits that were rather associated with FFM agreeableness trait. Similarly, the HEXACO agreeableness trait includes certain anger-related traits, traditionally associated with neuroticism in the FFM. Importantly, despite such modifications, empirical data supports convergent validity among emotionality-neuroticism, and both agreeableness traits ( $r_s \geq 0.52$ ; Ashton et al., 2014). Finally, the HEXACO model also allows for an assessment of the honesty-humility dimension, which encompasses such characteristics as sincerity, fairness, greed avoidance, and modesty. It has been suggested that these traits were underrepresented in the FFM (Ashton et al., 2014; Romero et al., 2015).



### Study 1

The purpose of this study was to examine the location of three dispositions toward ridicule and being laughed at in the HEXACO model. Given the similarities between the HEXACO model and the FFM (see Ashton et al., 2014), a replication of earlier findings was expected. Hence, gelotophobia would be associated with high emotionality and low extraversion; gelotophilia with high extraversion and low emotionality; and katagelasticism with low agreeableness and high extraversion.

The association between honesty-humility and the three dispositions has not yet been tested. Empirical research and conceptual similarities and differences between the honesty-humility dimension and the three laughter-related traits guided our expectations. Ashton et al. (2014) stated that greater expressions on honesty-humility are characterized by genuineness and modesty in interpersonal settings and the avoidance of unfair behaviors along with low avarice. In this respect, there is mixed evidence for a relation between gelotophobia and honesty-humility. For example, gelotophobes seem to mistrust others (paranoid/suspiciousness tendency) and to regulate their behavior to avoid being ridiculed (Ruch, 2009). One may assume that this notion is inconsistent with an inclination to be genuine in social interactions. Further, the fear of being laughed at has been linked to the manipulation of others (Proyer et al., 2012a) which is a type of unethical behavior. Simultaneously, those high in the fear of being laughed at present an underestimation of their abilities and greater expression of modesty (Proyer et al., 2014). We will therefore examine the relationship between this disposition and honesty-humility in an exploratory fashion. Second, we expected to find a positive association between high honesty-humility and a greater inclination to gelotophilia. Ruch and Proyer (2009a) surmised that individuals high in the joy in being laughed at are not concerned with appearing as ridiculous (even in embarrassing

situations) and experience joy from others' laughs (even if it is directed at them). This shows fit with the idea of that gelotophiles would be more prone to be genuine when interacts with others. Also, there is support for positive associations between gelotophilia and virtuousness' dimensions (Proyer et al., 2014). Finally, we expected that low honesty-humility would correlate with greater scores on katagelasticism. The conceptualization of the joy in laughing at others involves selfishness, cold-heartedness and indifference by others' feelings (Ruch & Proyer, 2009a). One may assume that katagelasticists would be more inclined to engage in cheating or unfair acts in order to achieve their purpose of ridiculing others. Consistent with this idea, katagelasticism has been also linked to psychoticism (Proyer & Ruch, 2010), lower expressions of guilt and shame (Proyer, Platt, & Ruch, 2010), manipulative life styles (Proyer et al., 2012a), and low virtuousness (Proyer et al., 2014).

Based on earlier findings on the associations of broad personality traits with gelotophobia, gelotophilia and katagelasticism, we expected that demographics (i.e., gender and age) and the traits of the HEXACO model would, in combination, predict the three dispositions toward ridicule and laughter, reflecting a medium-to-large effect size; we anticipated determination coefficients between 0.13 and 0.26 (Cohen, 1988).

## **Method**

### *Participants*

Our sample consisted of 216 adults (114 females [52.8%], 102 males [47.2%]). Their age ranged from 18 to 67 years ( $M = 30.60$ ;  $SD = 9.69$ ;  $Median = 28$ ). Of these participants, 51.9% were employees, 35.6% students, 9.7% unemployed people, 1.4% retired; and 1.4% did not indicate professional status. In terms of educational background, participants reported the following: 5.1% had completed a doctorate; 63.4

% held a university degree; 12.0% had a general certificate of education; 12.5% had completed a vocational education and training; and 4.6% and 2.3% indicated secondary and primary education, respectively.

### *Instruments*

The *PhoPhiKat-45* (Ruch & Proyer, 2009a; Spanish by Torres-Marín, Proyer, López-Benítez, & Carretero-Dios, 2019) was used to assess the three dispositions toward ridicule and being laughed at: (a) *gelotophobia* (sample item: “When they laugh in my presence, I get suspicious”); (b) *gelotophilia* (“When I am with other people, I enjoy making jokes at my own expense to make the others laugh”); and (c) *katagelasticism* (“I enjoy exposing others and I am happy when they get laughed at”). Each disposition was assessed through 15 items. Respondents provide answers on a 4-point format, ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Prior research (see, for example, Ruch & Proyer, 2009a) has provided evidence for its reliability (e.g.,  $\alpha \geq .80$ ; retest-reliability  $\geq .73$  [6-month-interval]) and validity (e.g., robust three-factor solution; construct validity evidences based on its relationships with external measures).

The *HEXACO-60* (Ashton & Lee, 2009; Spanish version by Romero et al., 2015) was administered to assess six broad personality traits using 60 items: namely, (a) *honesty-humility* (e.g., “I wouldn’t use flattery to get a raise or promotion at work, even if I thought it would succeed”); (b) *emotionality* (e.g., “I would feel afraid if I had to travel in bad weather conditions”); (c) *extraversion* (e.g., “I prefer jobs that involve active social interaction to those that involve working alone”); (d) *agreeableness* (e.g., “I rarely hold a grudge, even against people who have badly wronged me”); (e) *conscientiousness* (e.g., “I plan ahead and organize things, to avoid scrambling at the last minute”); and (f) *openness to experience* (e.g., “I would enjoy creating a work of

art, such as a novel, a song, or a painting”). Each factor was measured through 10 items and the response format was a 5-point Likert scale, ranging from 1 (*completely disagree*) to 5 (*completely agree*). There is support for the *HEXACO-60*’s good reliability (e.g.,  $\alpha \geq .72$ ; retest-reliability  $\geq .60$  [6-week-interval]) and factorial structure (i.e., the proposed six-factor internal structure has been widely reproduced). Moreover, the relation of the broad personality traits with other relevant criteria indicates adequate external validity (e.g., De Vries & Van Kampen, 2010).

### *Procedure*

The sample was recruited through online advertisements. Respondents were informed that they would participate in a study on humor and personality (they had to be  $\geq 18$  years of age). A brief description, including a general statement about our study (i.e., this study is aimed at assessing some personality characteristics among Spanish adults) and the estimated duration (~ 20 minutes) for the completion of the questionnaire booklet, were provided before respondents started the online assessments. In the introduction to the survey, we emphasized the voluntary nature of their participation was voluntary and guaranteed their anonymity and confidentiality. Their responses would be used for research purposes only. None of the participants received financial compensation or course credit for their participation. This research was authorized by a local ethical committee and carried out in accordance with the Ethical Standards of the 1964 Declaration of Helsinki.

### *Data analysis*

Mean scores, standard deviations, and reliabilities were computed. Pearson correlations were computed, to test the relationships of all the questionnaire variables

with gender and age. Partial correlations (controlling for age and gender) between the three PhoPhiKat dimensions and the HEXACO dimensions were computed. Also, we performed a series of hierarchical regression analyses to test the localization of the laughter-related dispositions in the HEXACO model. Prior to conducting these analyses, we mean-centered all the questionnaire variables and tested whether collinearity statistics (i.e., Variance Inflation Factors) were all within adequate limits (i.e., values  $< 5.0$ ; Akinwande, Dikko, & Samson, 2015). Then, hierarchical regression analyses were computed, with gelotophobia, gelotophilia, and katagelasticism as criteria and the HEXACO traits as predictors (Step 2; method: stepwise). To control for their potential influence, gender and age of the participants were entered as predictors in Step 1 (method: enter). To evaluate the effect size of the single steps, we computed Cohen's regression effect size  $f^2$  (Cohen, 1988), which allows for interpretation of the magnitude of effects ( $f^2 \geq 0.02/0.15/.035$  indicate small/medium/large effects; Cohen, 1988). The effect sizes were computed on the basis of the changes in  $R^2$  and inform about the contribution of a predictor variable.

## Results

### *Preliminary analyses*

The internal consistency was satisfying for the PhoPhiKat-45 ( $\alpha \geq .85$ ; median = .86) and the HEXACO-60 ( $\alpha \geq .72$ ; median = .76). Further, Table 1 gives the descriptive statistics for all measures. The scores' distribution, for the PhoPhiKat-45 and the HEXACO-60, was comparable to previous findings in Spanish samples (Romero et al., 2015; Torres-Marin et al., 2019). Correlations with gender and age were also tested. Gelotophobia ( $r = -.04$ ) and gelotophilia ( $r = .06$ ,  $ps > .01$ ) did not correlate significantly with gender. By contrast, katagelasticism correlated with male gender ( $r =$

.35,  $p < .001$ ). Moreover, female gender correlated with emotionality ( $r = -.45$ ,  $p < .001$ ) and conscientiousness ( $r = -.21$ ,  $p < .01$ ). Furthermore, younger age correlated with gelotophobia ( $r = .19$ ,  $p < .01$ ). Gelotophilia ( $r = -.17$ ) and katagelasticism ( $r = -.14$ ,  $ps > .01$ ) did not correlate with age. Finally, extraversion correlated with older age ( $r = .19$ ,  $p < .01$ ).

#### *Relationships with the HEXACO model*

Partial correlations (controlling for age and gender) among the HEXACO dimensions and the three dispositions toward ridicule and being laughed at are given in Table 1. Gelotophobia was related to high emotionality ( $r = .36$ ), low extraversion ( $r = -.58$ ), and low agreeableness ( $r = -.24$ ,  $ps < .001$ ). Additionally, gelotophobia was negatively related with honesty-humility ( $r = -.28$ ,  $p < .001$ ). Individuals high in gelotophilia were more extraverted ( $r = .39$ ), with a positive inclination to openness to experience ( $r = .29$ ,  $ps < .001$ ). Finally, higher katagelasticism scores were negatively correlated with agreeableness ( $r = -.38$ ) and honesty-humility ( $r = -.29$ ,  $ps < .001$ ).

#### *Hierarchical regression analyses with the HEXACO model*

Table 2 gives the findings from the hierarchical regression analysis predicting gelotophobia from demographics (i.e., gender and age) and using the HEXACO dimensions as predictors. Younger age, low extraversion ( $\Delta R^2 = .327$ ,  $p < .001$ ,  $\Delta f^2 = 0.52$ ), and high emotionality ( $\Delta R^2 = .071$ ,  $p < .001$ ;  $\Delta f^2 = 0.13$ ) also were predictors. Further, an additional part of the variance was explained by low honesty-humility ( $\Delta R^2 = .037$ ,  $p < .001$ ;  $\Delta f^2 = 0.07$ ). Altogether, demographics (explained variance for Step 1 = 3.8%) and the HEXACO facets accounted for 47.3% of the total variance of gelotophobia. For gelotophilia, younger age (explained variance for Step 1 = 3.1%),

high extraversion ( $\Delta R^2 = .147, p < .001; \Delta f^2 = 0.18$ ), and a higher inclination to openness to experience ( $\Delta R^2 = .066, p < .001; \Delta f^2 = 0.09$ ; see Table 2) accounted for 24.4% of the variance. Finally, demographics and the HEXACO traits accounted for 29.8% of the variance in katagelasticism. The joy in laughing at others was related to male gender (explained variance for Step 1 = 13.5%) and low agreeableness ( $\Delta R^2 = .123, p < .001; \Delta f^2 = 0.17$ ). Moreover, low honesty-humility also contributed to the prediction of this laughter-related disposition ( $\Delta R^2 = .041, p < .001; \Delta f^2 = 0.06$ ).

**Table 1.** Descriptive Statistics, Reliabilities, and Partial Correlations (Controlling for Age and Gender) between Dispositions Towards Laughter and Ridicule and HEXACO Traits

	<i>M</i>	<i>SD</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dispositions to laughter and											
ridicule											
(1) Gelotophobia	1.97	0.58	.88								
(2) Gelotophilia	2.27	0.54	-.41**	.86							
(3) Katagelasticism	1.88	0.49	.14	.29**	.85						
HEXACO-60											
(4) Extraversion	3.34	0.65	-.58**	.39**	-.05	.80					
(5) Emotionality	3.38	0.61	.36**	-.17	.05	-.16	.75				
(6) Agreeableness	3.18	0.60	-.24**	.12	-.38**	.19*	-.16	.72			
(7) Openness	3.68	0.65	-.12	.29**	-.02	.08	-.06	.08	.78		
(8) Conscientiousness	3.65	0.59	-.14	.04	-.06	.20*	.02	.04	.12	.77	
(9) Honesty-Humility	3.67	0.63	-.28**	.08	-.29**	.12	-.10	.22*	-.00	.19*	.72

*N* = 216. Cronbach's alpha in italics. \**p* < .01; \*\**p* < .001.



**Table 2.** Hierarchical Regression Analysis Predicting Dispositions toward Ridicule and Being Laughed at by Demographics and HEXACO

Gelotophobia			Gelotophilia			Katagelasticism		
Predictors	$\Delta R^2$	$\beta$	Predictors	$\Delta R^2$	$\beta$	Predictors	$\Delta R^2$	$\beta$
Step 1: Demographics								
<i>Model 1</i>	.038*			.031*			.135***	
Age		-.191**	Age		-.166*	Age		-.116
Gender		-.053	Gender		.046	Gender		.339***
Step 2: HEXACO								
<i>Model 2</i>	.327***			.147***			.123***	
Age		-.081	Age		-.240***	Age		-.111
Gender		-.087	Gender		.069	Gender		.348***
Extraversion		-.584***	Extraversion		.392***	Agreeableness		-.351***
<i>Model 3</i>	.071***			.066***			.041**	
Age		-.075	Age		-.209**	Age		-.115*
Gender		.053	Gender		.029	Gender		.315***
Extraversion		-.541***	Extraversion		.372***	Agreeableness		-.306***
Emotionality		.303***	Openness		.262***	H-H		-.209**
<i>Model 4</i>	.037***							
Age		-.082						
Gender		.015						
Extraversion		-.520***						
Emotionality		.286***						
H-H		-.197***						
Total $R^2$	.473***			.244***			.298***	

Note.  $N = 216$ . Gender: 0 = female; 1 = male. H-H = Honesty-Humility. Step 1 (Method: enter); Step 2 (stepwise). \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . All VIFs  $\leq 1.32$ .

**Discussion**

This is the first study to examine the associations among three dispositions toward ridicule and being laughed at and the HEXACO model of personality. Overall, our findings squared well with expectations and the data indicated that comparable findings could be obtained across the HEXACO and the FFM (see Ďurka & Ruch, 2015; Ruch et al., 2013).

As indicated by prior research on the FFM, gelotophobia can be characterized by low extraversion and high emotionality (i.e., the counterpart of neuroticism in the NEO-FFI), demonstrating medium-to-large effect sizes. Additionally, a lower tendency to honesty-humility was associated with gelotophobia. Gelotophobes arguably must use somewhat dishonest behaviors when they are in laughter-related situations that they do not fully appreciate (e.g., when laughing with others even if they don't get the joke or making up excuses to leave social settings upon feeling ridiculed by others). It would relate and could be seen as a consequence of their near-paranoid sensitivity to laughter by others (Ruch et al., 2014). Further, the association with low honesty-humility fits well with findings of the tendency of gelotophobes toward manipulative behaviors (Proyer et al., 2012a) and their suspicious perceptions of others (Ruch, 2009). At the same time, this negative association between gelotophobia and honesty-humility does not assert that gelotophobes are characterized by high modesty (Proyer et al., 2014). This may indicate that the honesty-humility dimension cannot adequately distinguish between dishonest and modest tendencies. Also, an alternative explanation of this association is that gelotophobes underestimate their honesty-humility due to their negative beliefs about themselves (Ruch, 2009). Gelotophobes have already been shown to underestimate their virtuousness, relative to ratings from knowledgeable others

(Proyer et al., 2014). Thus, analyzing peer-ratings for honesty-humility in future studies would help to clarify the localization of gelotophobia in this specific dimension.

Furthermore, high expressions in extraversion and openness to experience were robustly associated with gelotophilia, demonstrating small-to-medium-effect sizes, while emotionality negatively correlated, but did not uniquely contribute, in the regression analysis. This latter result was unexpected, as low neuroticism has been identified as a relevant predictor of the joy of being laughed at in the FFM (Ďurka & Ruch, 2015). Nevertheless, our data indicate that gelotophiles did not show a specific tendency toward emotional stability. This notion received support from the analyses of the joy in being laughed at and neuroticism in the PEN model (Proyer & Ruch, 2010). Contrary to our expectations, gelotophilia was not associated with honesty-humility. This seems to indicate that gelotophiles do not continually engage in virtuous, honest, or humble behaviors. Further studies should replicate and extend this finding, and incorporate additional measures to assess this relation more thoroughly.

Finally, katagelasticism can be described by low agreeableness and low honesty-humility, showing effects that are small-to-medium in size. Considering this latter association, one might argue that katagelasticists may engage in dishonest behavior, such as cheating, to create situations with a heightened opportunity to engage in harming others by laughing at or ridiculing them. This supports the notion of associations between katagelasticism and low virtuousness and tendencies to experience less shame or guilt, as well as high psychoticism and high inclinations to subclinical psychopathic traits (Proyer et al., 2012a, 2014; Proyer, Platt, & Ruch, 2010; Proyer & Ruch, 2010).

Altogether, this study reveals that the FFM and HEXACO model demonstrate a certain degree of overlap, when predicting gelotophobia, gelotophilia and

katagelasticism. More specifically, the amounts of explained variance in all these three ridicule-related dispositions were comparable across studies ( $.24 \leq R^2 \leq .53$ ; Ďurka & Ruch, 2015; Ruch et al., 2013). Moreover, our findings also show that broad personality dimensions contribute to explain how people deal with ridicule and being laughed, but without being redundant models. Accounting for the moderate correlations ( $-.58 \leq rs \leq .39$ ), as well as the variance explanation ( $\leq 47\%$ ) among the HEXACO traits and the three ridicule-related dispositions, we conclude that the narrow laughter-related traits can be localized in the HEXACO system but are not redundant with traits, either singularly or in combination. Using the HEXACO model extends our understanding of the laughter-related dispositions' relationship with positively valued behaviors and experiences (honesty-humility). Overall, low honesty-humility seems to be a relevant characteristic in describing gelotophobes' and katagelasticists' personalities. Hence, distinctive components (facets) of this broad trait could be especially relevant to predicting the fear of being laughed at and joy in laughing at others. It would therefore be advisable to test the predictive value of narrow traits, referring to a more limited range of internal experiences or behaviors that relate to dishonest or arrogant tendencies. Linking to this, a recent study of Hodson, Book, Visser, Volk, Ashton and Lee (2018) demonstrated that the opposite pole of honesty-humility overlaps with the common factor of the DT. Thus, examining the specific predictive value of narcissism, psychopathy, and Machiavellianism (traits of the *Dark Triad*; Paulhus & Williams, 2002) in gelotophobia and katagelasticism can contribute to ascertaining the significance of our findings.

## Study 2

The purpose of Study 2 was to examine the location of three dispositions toward ridicule and being laughed at in the Dark Triad (DT). Prior research has shown that gelotophobia, gelotophilia, and katagelasticism are differentially associated with psychoticism, psychopathic personality traits, and bullying-type behaviors (Proyer & Ruch, 2010; Proyer et al., 2012a, 2012b) —and with virtuousness (i.e., positive psychological functioning; Proyer et al., 2014). Nevertheless, to the best of our knowledge, there are no data available on the interrelations among three dispositions toward ridicule and being laughed at and the DT traits (Paulhus & Jones, 2014; Paulhus & Williams, 2002; Wai & Tiliopoulos, 2012). The DT covers three specific socially aversive traits in the subclinical range, namely: Machiavellianism, psychopathy, and narcissism. Machiavellianism can be defined as a tendency to use manipulative strategies and to show emotional coldness, alliance-building acts and a cynical worldview. Psychopathy is characterized by antisocial behaviors, high impulsivity (self-control deficit), and callous manipulation, along with a lower inclination to empathy. Narcissism refers to an individual's inclination toward grandiosity/ego-promoting behaviors, along with excessive admiration of one's own attributes. Although this “constellation” of traits share a common core (i.e., callous manipulation or lack of empathy), they are non-overlapping factors (Paulhus & Jones, 2014). This is supported by their different conceptual grounds as well as their moderate intercorrelations (e.g.,  $r$ s from 0.25 to 0.50: Paulhus & Williams, 2002). Additionally, these narrow traits of “dark” personality have been shown to predict diverse outcomes, such as sexual behaviors, striving for power, and materialistic tendencies, even controlling for broad personality traits represented in systems such as the FFM or HEXACO (Lee et al., 2012).

Given that gelotophobia has demonstrated positive associations with psychoticism (Proyer & Ruch, 2010) and manipulating others (Proyer et al., 2012a), we expected to find positive correlations with psychopathy and Machiavellianism. As gelotophobes exhibit low superficial charm/grandiosity (Proyer et al., 2012a), we anticipated a negative association with narcissism. Prior research has demonstrated that gelotophiles are more inclined to exhibit superficial charm or grandiosity (Proyer et al., 2014) and actively seek others' attention (Renner & Heydasch, 2010); therefore, we expected to find that narcissism predicts the joy in being laughed at. Finally, katagelasticism has been positively linked to psychoticism (Proyer & Ruch, 2010), as well as certain psychopathic traits that are highly related to the DT (i.e., superficial charm, manipulative lifestyle, and antisocial behaviors: Proyer et al., 2012a). This is also in line with the notion that katagelasticists exhibit low guilt-proneness when they laugh at others (Proyer, Platt & Ruch, 2010). These findings indicate that a greater propensity to take joy in laughing at others would be associated with reduced feelings of empathy toward others, which is argued to be the common core of the DT traits (e.g., Wai & Tiliopoulos, 2012). We, therefore, expected to find all three DT traits contributing to the prediction of katagelasticism.

As with Study 1, we expected that demographics (i.e., gender and age) and the DT traits would together predict the three dispositions toward ridicule and laughter with medium-to-large effect sizes (range total  $R^2$  from 0.13 to 0.26). Also, to address our objectives more thoroughly, we employ two measures for the DT; namely, the Short Dark Triad (SD3; Jones & Paulhus, 2014) and the Dirty Dozen (DD12; Jonason & Webster, 2010). As Maples, Lamkin and Miller (2014) have shown, the pair of scales seem to measure overlapping, but still distinct aspects of the DT traits (e.g., different

correlation patterns with external variables). Thus, to cover the full range of the DT, we incorporated both of the most frequently used measures in the literature.

## **Method**

### *Sample*

Our sample consisted of 204 adults (122 females [59.8%], 82 males [40.2%]). The participants' age ranged from 19 to 75 years ( $M = 35.74$ ;  $SD = 14.99$ ;  $Median = 28$ ). Of these participants, 46.6% were employees, 36.8% students, 11.8% unemployed people, 4.4% retired, and 0.5% did not indicate their professional status. In terms of educational background, respondents reported the following: 6.9% completed a doctorate; 62.3% held a university degree, 14.7% had a general certificate of education; 13.7% had completed a vocational education and training; and 2.5% indicated secondary education.

### *Instruments*

As in Study 1, we used the Spanish form of the *PhoPhiKat-45* (Torres-Marin et al., 2019) to assess the three laughter-related dispositions.

The *Short Dark Triad* (SD3; Jones & Paulhus, 2014; Spanish version by Nohales-Nieto & Ibáñez-Ribes, 2015) consists of 27 items that assess three dimensions (9 items each): (a) narcissism (e.g., "People see me as a natural leader"); (b) psychopathy (e.g., "I like to get revenge on authorities"); and (c) Machiavellianism (e.g., "It's not wise to tell your secrets"). Respondents answer, using a 5-point Likert scale (1 = *strongly disagree*; 5 = *strongly agree*). This measure has acceptable-to-good internal consistency (e.g.,  $\alpha \geq .68$ ; retest-reliability  $\geq .80$  [1-month-interval]) and there is broad evidence for its factorial and concurrent validity (Jones & Paulhus, 2014; Nohales-Nieto & Ibáñez-Ribes, 2015).

The *Dirty Dozen* (DD12; Jonason & Webster, 2010; Spanish version by Nohales-Nieto & Ibáñez-Ribes, 2015) consists of 12 items, divided among three dimensions (4 items each): (a) narcissism (e.g., “I tend to want others to admire me”); (b) psychopathy (e.g., “I tend to be unconcerned with the morality of my actions”); and (c) Machiavellianism (e.g., “I tend to manipulate others to get my way”). Respondents answer on a 5-point Likert scale (1 = *strongly disagree*; 5 = *strongly agree*). It demonstrates good reliability (e.g.,  $\alpha \geq .73$ ; retest-reliability  $\geq .71$  [3-week-interval]) and broad evidence of factorial validity (Jonason & Webster, 2010), but it has also been criticized for its weak correspondence with other DT measures (Jones & Paulhus, 2014; Maples et al., 2014)

#### *Procedure and data analysis*

The same procedure and analytical approach was applied in Study 1 and Study 2.

### **Results**

#### *Preliminary analyses*

Table 3 gives the descriptive statistics and internal consistency coefficients. The reliability was satisfying for the PhoPhiKat-45 ( $\alpha_s \geq .84$ ; median = .86) and the DT measures for research purposes (SD/DD12:  $\alpha_s \geq .60/.62$ ; median = .73/.77). The mean scores and standard deviations were, again, comparable with earlier findings on the three laughter-related dispositions (cf. Study 1; Torres-Marin et al., 2019) and prior reports on non-clinical samples for the DT (e.g., Nohales-Nieto & Ibáñez-Ribes, 2015). Correlations with gender and age were also calculated. Although gelotophobia ( $r = .03$ ) and gelotophilia ( $r = .14$ ) did not correlate with gender ( $p_s > .01$ ), katagelasticism correlated with male gender ( $r = .30$ ,  $p < .001$ ). Male gender also correlated with



psychopathy ( $|rs| \geq .25$ ) and Machiavellianism ( $|rs| \geq .21$ ) in both measures ( $ps < .01$ ). Further, younger age correlated with gelotophilia ( $r = -.25$ ) and katagelasticism ( $r = -.37$ ,  $ps < .001$ ), but demonstrated no association with gelotophobia ( $r = -.14$ ,  $p > .01$ ). Younger age also correlated with SD3 psychopathy ( $r = -.24$ ) and DD12 Machiavellianism ( $r = -.25$ ;  $ps < .01$ ). In line with Maples et al.'s findings (2014), the inspection of the intercorrelations of the DT measures has shown comparatively low convergence among the same facets ( $r = .38-.58$ ) whereas different facets (e.g., SD3 psychopathy and DD12 Machiavellianism) were robustly positively correlated.

#### *Relationships with the Dark Triad (SD3 and DD12)*

Table 3 shows the partial correlations (controlling for age and gender) among the DT traits and the three dispositions toward ridicule and being laughed at. Gelotophobia was positively correlated with Machiavellianism, but only the coefficient in the SD3 was statistically significant ( $r = .28$ ,  $p < .001$ ). As expected, we found a negative trend between gelotophobia and narcissism, assessed by SD3, of small magnitude ( $r = -.18$ ,  $p = .013$ ). Unexpectedly, there were no substantial associations identified between gelotophilia and the DT ( $|rs| \leq .15$ ). In line with expectations, however, katagelasticism yielded positive correlations with narcissism ( $|rs| \geq .26$ ), psychopathy ( $|rs| \geq .48$ ), and Machiavellianism ( $|rs| \geq .45$ ) across both measures ( $ps < .001$ )

#### *Hierarchical regression analyses with the Dark Triad (SD3 and DD12)*

Hierarchical regression analyses, predicting gelotophobia, gelotophilia, and katagelasticism, using demographics (i.e., gender and age) and the DT traits as predictors, are given in Tables 4 and 5. First, demographics (explained variance by Step 1 = 1.9%), high Machiavellianism ( $\Delta R^2 = .075$ ,  $p < .001$ ;  $\Delta f^2 = 0.08$ ), and low

narcissism ( $\Delta R^2 = .080$ ,  $p < .001$ ;  $\Delta f^2 = 0.10$ ) account for 17.4% of the variance of gelotophobia. When predicting gelotophilia, younger age (explained variance by Step 1 = 8.2%) and high narcissism ( $\Delta R^2 = .021$ ,  $p = .030$ ;  $\Delta f^2 = 0.02$ ) accounted for 10.3% of the variance. Importantly, gelotophobia and gelotophilia only revealed statistically significant outcomes when the DT was assessed via the SD3 (see Table 4). As in the correlational analysis, katagelasticism yielded significant effects using both measures. When using the SD3, demographics (young age and male gender; explained variance = 23.2%), high psychopathy ( $\Delta R^2 = .263$ ,  $p < .001$ ;  $\Delta f^2 = 0.52$ ), and high Machiavellianism ( $\Delta R^2 = .036$ ,  $p < .001$ ;  $\Delta f^2 = 0.08$ ; Table 4) explained 53.1% of the total variance in katagelasticism. Similarly, when utilizing the DD12 (see Table 5), demographics, high Machiavellianism ( $\Delta R^2 = .178$ ,  $p < .001$ ;  $\Delta f^2 = 0.30$ ), and high psychopathy ( $\Delta R^2 = .072$ ,  $p < .001$ ;  $\Delta f^2 = 0.14$ ) account for 48.2% of the variance in this disposition.

**Table 3.** Descriptive Statistics, Reliabilities and Partial Correlations (Controlling for Age and Gender) between Dispositions towards Laughter and Ridicule and Dark Triad's Traits.

	<i>M</i>	<i>SD</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dispositions to laughter and											
ridicule											
(1) Gelotophobia	1.96	0.54	<i>.86</i>								
(2) Gelotophilia	2.27	0.55	-.36**	<i>.86</i>							
(3) Katagelasticism	1.82	0.49	.08	<i>.28**</i>	<i>.84</i>						
Short Dark Triad											
(4) Narcissism	2.61	0.52	-.18	.15	<i>.26**</i>	<i>.60</i>					
(5) Psychopathy	1.90	0.57	.14	.14	<i>.59**</i>	<i>.33**</i>	<i>.73</i>				
(6) Machiavellianism	2.64	0.65	<i>.28**</i>	-.07	<i>.45**</i>	<i>.32**</i>	<i>.44**</i>	<i>.75</i>			
Dirty Dozen											
(7) Narcissism	2.82	0.85	.11	.08	<i>.30**</i>	<i>.38**</i>	<i>.28**</i>	<i>.43**</i>	<i>.77</i>		
(8) Psychopathy	1.70	0.67	.07	.10	<i>.48**</i>	<i>.25**</i>	<i>.40**</i>	<i>.35**</i>	.17	<i>.62</i>	
(9) Machiavellianism	2.20	0.88	.13	.02	<i>.48**</i>	<i>.34**</i>	<i>.54**</i>	<i>.58**</i>	<i>.46**</i>	<i>.41**</i>	<i>.79</i>

*N* = 204. Cronbach alphas in italics. \**p* < 0.01; \*\* *p* < 0.001.

**Table 4.** Hierarchical Regression Analysis Predicting Dispositions toward Ridicule and Being Laughed at by Demographics and Dark Triad (SD3)

Gelotophobia			Gelotophilia			Katagelasticism		
Predictors	$\Delta R^2$	$\beta$	Predictors	$\Delta R^2$	$\beta$	Predictors	$\Delta R^2$	$\beta$
Step 1: Demographics								
<i>Model 1</i>	.019		<i>Model 1</i>	.082***		<i>Model 1</i>	.232***	
Age		-.134	Age		-.253***	Age		-.380***
Gender		.016	Gender		.104	Gender		.251***
Step 2: Dark Triad Dimensions								
<i>Model 2</i>	.075***		<i>Model 2</i>	.021*		<i>Model 2</i>	.263***	
Age		-.099	Age		-.247***	Age		-.267***
Gender		-.060	Gender		.103	Gender		.130*
Machiavellianism		.287***	Narcissism		.146*	Psychopathy		.542***
<i>Model 3</i>	.080***					<i>Model 3</i>	.036***	
Age		-.100				Age		-.261***
Gender		-.085				Gender		.094
Machiavellianism		.389***				Psychopathy		.445***
Narcissism		-.299***				Machiavellianism		.221***
Total $R^2$	.174***			.103***			.531***	

Note.  $N = 204$ . Gender: 0 = female; 1 = male. Step 1 (Method: enter); Step 2 (stepwise). \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . All VIFs  $\leq 1.38$ .

**Table 5.** Hierarchical Regression Analysis Predicting Katagelasticism with Demographics and Dark Triad (DD12)

Predictors	$\Delta R^2$	$\beta$
Step 1: Demographics		
Model 1	.23***	
Age		-.380***
Gender		.251***
Step 2: DD12 dimensions		
Model 2	.178***	
Age		-.279***
Gender		.170**
Machiavellianism		.444***
Model 3	.072***	
Age		-.294***
Gender		.120*
Machiavellianism		.319***
Psychopathy		.303***
Total $R^2$	.482***	

Note.  $N = 204$ . Gender: 0 = female; 1 = male. Step 1 (Method: enter); Step 2 (stepwise).

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . All VIFs  $\leq 1.33$ .

## Discussion

This study extends our understanding of the role of socially aversive traits and the ways that people deal with ridicule and being laughed at by localizing gelotophobia, gelotophilia, and katagelasticism in a well-established model of dark personality traits—the Dark Triad (see Paulhus & Williams, 2002). As expected, gelotophobia was predicted by high Machiavellianism and low narcissism when using the SD3 measure of DT. The effects were of small size and are consistent with prior research on the association of gelotophobia with manipulative lifestyles and its negative relationship with superficial charm or grandiosity in terms of psychopathic personality traits (Proyer et al., 2012a). The joy in being laughed at was only predicted by high narcissism on the SD3 measure, which showed an effect of small size. Gelotophilic characteristics, such

as the usage of self-presentation styles aimed at gaining social approval (Renner & Heydasch, 2010) or greater expressions in extraversion (see Ďurka & Ruch, 2015) may be shared with narcissistic personality traits. Finally, katagelasticism demonstrated differential associations with Machiavellianism and psychopathy, depending on the DT instrument: When using the SD3, psychopathy was a potent predictor of katagelasticism, yielding a large effect size, while Machiavellianism contributed, but with a small effect. By contrast, utilization of the DD12 measure showed that Machiavellianism entered the regression first (large effect), while psychopathy contributed less than it did in the SD3 model. However, psychopathy accounted for a unique effect of medium size. This is broadly aligned with the traditional operationalization of the joy of laughing at others (see Ruch & Proyer, 2009a) and its correlates with psychoticism (Proyer & Ruch, 2010), psychopathological traits (Proyer et al., 2012a), and inclinations to greater frequencies of disagreement in romantic couples (Brauer & Proyer, 2018). Against expectations, narcissism did not contribute to the explanation of katagelasticism, independently of the utilized measure.

In sum, our findings supported the notion of discriminant validity for the three dispositions, as they demonstrated disparate associations (and with varying effect sizes) with the DT. It should here be noted that the findings for gelotophobia and gelotophilia were affected by the instrument utilized to assess the DT traits; namely, correlations existed for the SD3, but not the DD12. Moreover, we found that the intercorrelations between the SD3 and DD12 were partially lower among the same traits than they were across different traits, which might question the validity of the scales. Maples et al. (2014) have compared both measures regarding their overlap and relationship with external criteria. The findings reflect the superiority of the SD3, relative to the DD12; the psychometric features of the SD3 (internal consistency and mean inter-item

correlations) showed greater convergence with established measures that capture the DT, and met theoretical expectations, in terms of correlations with the FFM traits. Thus, while we aimed to cover the DT using two popular measures, we found that the relationships with the laughter-related dispositions did not converge well across different measures; thus, limiting the generalization of the findings. Since Maples et al.'s findings received further support (for an overview see Paulhus & Jones, 2014), we expect that our findings, based on the SD3, would replicate well with established and more comprehensive measures of the DT in future studies (cf. Maples et al., 2014).

### **General discussion**

This research provides the first data on the localization of gelotophobia, gelotophilia, and katagelasticism in the HEXACO and the DT models. Importantly, the findings from these two studies expand our understanding of the nature of these three dispositions toward ridicule and being laughed at. Concerning the HEXACO model, our results were similar to prior FFM findings, and supported the notion that the honesty-humility trait contributes to the prediction of individual differences in gelotophobia and katagelasticism. As this broad HEXACO trait represents distinct components, including dishonest and arrogant behaviors, Study 2 was aimed at clarifying the distinctive relationships with narrow traits such as narcissism, psychopathy, and Machiavellianism.

In line with our expectations, social aversive personality traits differentially predicted the three dispositions toward ridicule and being laughed at. For instance, gelotophobia was related to high Machiavellianism and low narcissism. These data help to clarify the previously obtained association between gelotophobia and low honesty-humility. Given the opposite associations with narcissism (negative) and Machiavellianism (positive), one might argue that gelotophobia is more strongly related

to low honesty characteristics (e.g., genuineness) than low humility (e.g., modesty). Such an expectation squares with prior research demonstrating that gelotophobes are more prone to low authenticity, fairness, forgiveness, and gratitude, but high modesty (Proyer et al., 2014).

Furthermore, gelotophilia was positively related to narcissism. Trait narcissism encompasses grandiose aspects that have previously been found to be associated with gelotophilia (Proyer et al., 2012a). Therefore, attending to the narcissism conceptualization (see Paulhus & Williams, 2002), individuals high in gelotophilia seem to demonstrate a greater inclination toward ego-promoting behaviors. Furthermore, these individuals may accept laughter from others as a way of gaining others' attention. Ruch and Proyer (2009a) already stated that gelotophiles may interpret laughter or jokes from others as a sign of recognition.

Finally, katagelasticism was related to high Machiavellianism and high psychopathy. It could be argued that katagelasticists are engaging in callous manipulation when they seek out situations in which they can laugh at others. This squares with this trait's core characteristics, such as cold-heartedness and the failure to feel bad in the context of laughing at others. On a related note, theoretically relevant features of Machiavellianism or psychopathy, such as being minimally empathetic or exhibiting impulsive behaviors, correspond clearly with the definition of this laughter-related disposition (Ruch & Proyer, 2009a). On the other hand, our results seem to suggest that narcissism may not be crucial to explain katagelasticists' behaviors. It makes sense to assume that these individuals are not especially focused on reputation-building acts (e.g., laughing at others for denoting to be wittier and exhibiting social dominance), but rather that they are just interested in using others for their own fun,



perhaps paying little attention to the impact of their behaviors. This also sheds some light on the relation between katagelasticism and low honesty-humility.

Altogether, our results suggest that aversive (but subclinical) personality traits incorporate relevant variance into the prediction of dispositions toward ridicule and being laughed at. Importantly, as a result of the extension of our findings concerning low honesty-humility, we observed that gelotophobes diverge from katagelasticists in terms of their “dark” personality characteristics. These data offer valuable information that expands our understanding of specific social-related impairments associated with these dispositions. Although there are some common deficits related to dark personality traits (e.g., decreased empathy: Wai & Tiliopoulos, 2012), they also showed independent social outcomes (see, for example, Rauthmann, 2012). Given the importance of humor and laughter in interpersonal situations involving humiliating feelings and feelings of superiority, humor and laughter can arguably be used as a sort of interpersonal strategy (e.g., Rees & Monrouxe, 2010; Renner & Heydasch, 2010). There is prior research indicating that humor and laughter may be conveniently used for conveying dominance or expressing inadmissible ideas under the semblance of seeking mere fun (Wood et al., 2017; Ziv & Gadish, 1990). Future research could examine the role of avoiding and initiating laughter toward oneself and others in normal and “dark” (e.g., antisocial) personality types. For instance, it would be advisable to test whether low vs. high-scorers in the Dark Triad traits would use more sarcastic jokes or dominance laughter as coercive tactics in interpersonal settings.

Moreover, *everyday sadism* has been identified as a fourth dark trait (i.e., Dark Tetrad; Buckels, Jones, & Paulhus, 2013) and may further extend our understanding regarding the association between the laughter-related dispositions and “dark” facets of personality. For example, that the reasonable expectation that katagelasticists’

inclinations to feeling low guilt and shame (Proyer et al., 2010) would extend to encompass everyday sadism and that the engagement in ridiculing others may be a facet of such non-pathological sadistic tendencies.

Several limitations need mentioning. First, all the respondents of this research were recruited through convenience sampling. Therefore, the generalizability of our findings is limited and should be further examined in non-Spanish samples. Crosscultural studies would be especially appropriate to explore putative sociocultural effects on the findings. Second, we found that the utilized DT measures allow for only limited generalizability concerning the relationships between the laughter-related dispositions and the DT, as they assess different aspects of what constitutes the DT (for an overview, see Maples et al., 2014). As mentioned above, it would be desirable to incorporate other standard measures of the DT, beyond the SD3, into future studies. Third, we only considered subjective self-ratings. An extension toward peer-ratings of the dispositions, as well as honesty-humility and DT, is desirable in future studies. Moreover, although socially aversive personality traits accounted for a part of the variance in these three laughter-related dispositions, we did not examine whether these effects can be replicated beyond the FFM and HEXACO traits. Finally, future research should also deepen the exploration of associations among gelotophobia and katagelasticism, respectively, and socially aversive (but subclinical) tendencies; for example, such an exploration would be to test whether these ridicule-related traits predict specific behaviors in naturalistic scenarios, such as decision-making based tasks or economic games (e.g., Ruch, Brunsch, & Wagner, 2017).

**Conclusions**

Our research reveals that the humility-honesty trait and the DT traits contribute to understanding interindividual differences in dealing with ridicule and being laughed at. More empirical work is needed to expand on these relations. For example, future studies should assess behavioral data, to validate the present findings. However, this research offers new and valuable insight into the field of laughter and personality.



## **Chapter V**

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*Beyond the Big Five: The fear of being laughed  
at as a predictor of body shame and appearance  
control beliefs*



**Beyond the Big Five: The fear of being laughed at as a predictor of body shame and appearance control beliefs**

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**Abstract**

Gelotophobia has been conceptualized as an individual difference variable concerned with the fear of being ridiculed by others' laughter. Individuals high in gelotophobia are more prone to anticipate and overreact to teasing interactions. It has been suggested that certain personal features susceptible to ridicule, such as physical appearance, could be differentially exhibited among gelotophobes. This study ( $N = 163$ ; 50.3% females) examined the associations between gelotophobia and body image-related measures controlling for Big Five personality traits. The results revealed that gelotophobia correlated to lower body appreciation and appearance control beliefs and higher body surveillance and body shame. Hierarchical regression analyses predicting these body image-related criteria showed that gelotophobia explained body shame and appearance control beliefs scores, even beyond the influence of gender, age, and Big Five personality traits. To our knowledge, this study contains the first empirical evidence of the relationship between the fear of being laughed at and body image. Further studies should be conducted to explore whether gelotophobia could be related to deficits in the perception of physical appearance.

*Keywords:* gelotophobia; Big Five; body shame; appearance control beliefs



## Introduction

The fear of being laughed at or gelotophobia (*gelos*=laughter in Greek) has been conceptualized as an individual difference variable that refers to the disposition/degree with which one person feels the fear of being ridiculed by others' laughter (Ruch & Proyer, 2008). Individuals with higher scores on trait gelotophobia tend to anticipate derision situations and overreact to them (Ruch, 2009). This misinterpretation of humoristic interactions may trigger a set of potentially harmful attributions, emotions, and behaviors among gelotophobes. For example, they have negative beliefs about themselves (e.g., internalizing that they are a valid option for being mocked; Ruch, Hofmann, Platt, & Proyer, 2014), are more prone to exhibit others-oriented expressions of anger (Weiss et al., 2012), and try to avoid potential situations in which they can be laughed at (Titze, 2009). Furthermore, gelotophobes tend to expect others' rejection (Ruch et al., 2014) and experience greater levels of shame in their daily lives (Platt & Ruch, 2009). In line with this, it might be assumed that gelotophobes also present more concerns related to personal features that could be a source of derision than those without the fear of being laughed at. Physical appearance could be one of these characteristics (Ruch et al., 2014), considering that some teasing-related expressions are focused on body shape or weight (Thompson, Fabian, Moulton, Dunn, & Altabe, 1991). Interestingly, it has also been proven that teasing experiences related to appearance—generally initiated during childhood and adolescence— may trigger negative psychological outcomes toward body image (Kostanski & Gullone, 2007). Therefore, because gelotophobes are more susceptible to misinterpreting teasing situations (Ruch et al., 2014), and considering that the experiences of ridicule associated with physical appearance might increase negative body image evaluations (Kostanski & Gullone,

2007; Thompson et al., 1991), it might be expected that gelotophobia can be somehow linked to body image disturbances.

*Body image, Big Five personality traits, and gelotophobia*

Body image refers to a multidimensional psychological construct that encompasses, among others, self-perceptions, feelings, and behaviors concerning one's body (Avalos, Tylka, & Wood-Barcalow, 2005). This construct has a profound effect on an adequate psychological functioning. It has been demonstrated that negative perceptions of body image might have harmful effects on self-esteem (Frost & McKelvie, 2004) and overall mood (Annesi & Gorjala, 2010). Moreover, body image-related disturbances have appeared to be related to depression and eating disorders (Wiederman & Pryor, 2000). As a consequence of the broad nature of body image, the study of this subject has involved the development of many individual dimensions to assess both the positive and negative aspects related to this construct. For example, past research has studied certain dimensions related to people's opinions about their bodies, such as body appreciation (Tylka & Wood-Barcalow, 2015) and body dissatisfaction (Mutale, Dunn, Stiller, & Larkin, 2016). Additionally, how the adoption of an outsider's perspective of the body can lead people to monitor their bodies (i.e., body surveillance), feel ashamed about them (i.e., body shame), or affect their control expectations of their physical appearance (i.e., appearance control beliefs) has also been explored (McKinley & Hyde, 1996).

Research on personality has stressed that broad personality traits, such as neuroticism (mainly) or extraversion, can explain inter-individual differences in body image dimensions. In particular, increasing neuroticism has been associated with lower body appreciation and higher body dissatisfaction (MacNeill, Best, & Davis, 2017; Swami et al., 2012). Neuroticism has also been correlated to higher body surveillance,

lower appearance control beliefs (Tylka, 2004), and higher body shame (Miner-Rubino, Twenge, & Fredrickson, 2002). Furthermore, extraversion has been associated with a higher appreciation of one's own body and lower body dissatisfaction (Swami et al., 2012). Concerning agreeableness, openness to experience, and conscientiousness, Swami et al. (2012) reported that body appreciation has been positively correlated to agreeableness and conscientiousness. This latter basic trait also correlated negatively to body dissatisfaction (MacNeill et al., 2017). Miner-Rubino et al. (2002) also found that body shame was negatively related to agreeableness. Nevertheless, in general, the results of these three broad personality traits concerning body image's dimensions are less consistent than those obtained for neuroticism (Swami et al., 2012). Finally, it needs to be said that, with the exception of MacNeill et al. (2017), all of the studies previously mentioned were carried out exclusively using a female population.

In addition, further narrow traits might enhance our understanding about which factors could predict the individual differences in appearance-related criteria. In this sense, and taking into account the theoretical assumptions described above, we consider that the fear of being laughed at could be added as a potential predictor. However, in agreement with Ďurka and Ruch (2015), around the 40% of the variance in gelotophobia can be explained by high neuroticism, low extraversion, and low openness to experience. Given this amount of shared variance, controlling for the influence of the Big Five personality traits would allow us to ascertain specific effects of gelotophobia in body image-related dimensions.

The aim of this study was twofold. First, we explored the understudied relationships between gelotophobia and body image-related dimensions. Second, we tested whether the predictive capacity of gelotophobia in body image-related dimensions goes beyond the Big Five personality traits. To evaluate body image, we included five different

dimensions that have been widely used in specialized literature: (a) body appreciation, (b) body dissatisfaction, (c) body surveillance, (d) body shame, and (e) appearance control beliefs. Taking into account that teasing experiences have been associated with more negative body evaluations (Kostanski & Gullone, 2007) and that gelotophobes exhibit greater sensitivity to derision situations (Ruch, 2009; Titze, 2009), it was hypothesized that gelotophobia would predict negative outcomes concerning body image; that is, higher scores on body surveillance, body shame, and body dissatisfaction, and lower scores on appearance control beliefs and body appreciation. Finally, we expected that gelotophobia accounted for an incremental variance in body image-related measures beyond the influence of the Big Five personality traits.

## **Method**

### *Sample*

One hundred and sixty-three undergraduates (82 females [50.3%], 81 males [49.7%]) from a large public university in the south of Spain took part in this research. The participants' ages ranged from 18 to 50 years ( $M = 21.36$ ;  $SD = 5.03$ ). The 68.7% of the participants were studying psychology; 14.1% social work; 4.3% labor relations; 5.5% other; and 7.4% did not indicate their university degree. To estimate the adequate sample size with which to carry out our analysis approach, we conducted an a priori power analysis using G\*Power 3.1 (Faul, Erdfelde, Buchner, & Lang, 2009). It indicated that 160 participants would be needed to detect a medium effect ( $f^2 = 0.15$ ) using a linear multiple regression with eight predictors. The following input parameters were introduced: (a) power set at 0.95 and (b) desired significance level at 0.05.

### *Instruments*

#### *Big Five personality traits*

The NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992; Spanish version by Cordero, Pamos, & Seisdedos, 2008) consists of 60 items for the assessment of several Big Five personality traits: neuroticism (e.g., item “I often feel inferior to others”), extraversion (e.g., item “I like to have a lot of people around me”), agreeableness (e.g., item “I try to be courteous to everyone I meet”), openness to experience (e.g., item “I have a lot of intellectual curiosity”), and conscientiousness (e.g., item “I keep my belongings clean and neat”). Each personality trait of the scale is evaluated using 12 items. The response format, which used a 4-point Likert scale, ranged from 0 (*completely disagree*) to 4 (*completely agree*). Prior research has supported good cross-cultural validity of this measure in Spain (e.g., Aluja, García, Rossier, & García, 2005). Internal consistencies in this sample ranged from  $\alpha = .68$  (openness to experience) to  $\alpha = .87$  (extraversion).

#### *Humor-related trait*

The Geloph <15> (Ruch & Proyer, 2008; Spanish version by Carretero-Dios, Proyer, Ruch, & Rubio, 2010) is a self-report instrument for the assessment of individual differences in gelotophobia (e.g., item “When others laugh in my presence, I get suspicious”). It comprises 15 positively keyed items and employs a 4-point answer format ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Internal consistency in this study was  $\alpha = .87$ .

*Body image-related measures:*

The Body Appreciation Scale-2 (BAS-2; Tylka & Wood-Barcalow, 2015; Spanish version by Swami, García, & Barron, 2017) is a self-report measure aimed at evaluating people's favorable opinions about their bodies, such as respect and acceptance (e.g., item "I take a positive attitude towards my body"). Individuals complete 10 items on a 5-point format with answers ranging from 1 (*never*) to 5 (*always*). Internal consistency in this study was  $\alpha = .93$ .

The Body Dissatisfaction Scale (Mutale et al., 2016) is an assessment tool used to measure people's discrepancies between their actual weight and their ideal body weight. It presents a set of 9 human figures that differ in body weight from underweight to overweight. There are two versions of these computer-generated stimuli, one for males and another for females. Participants are asked to choose their ideal body shape and, later, their actual body shape. The dissatisfaction score is obtained by calculating the discrepancy between these two measures.

The Objectified Body Consciousness Scale (OBCS; McKinley & Hyde, 1996; Spanish version by Moya-Garófano, Megías, Rodríguez-Bailón, & Moya, 2017) is a questionnaire for the assessment of body surveillance (e.g., item "I often worry about whether the clothes I am wearing make me look good"), body shame (e.g., item "I feel like I must be a bad person when I don't look as good as I could"), and appearance control beliefs (e.g., "I really don't think I have much control over how my body looks"). Each of the three subscales comprises 8 items on a 7-point Likert-type, ranging scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Although the OBCS was specifically created for a female population, other studies have pointed out that this measure is a valid option for assessing these dispositions in a male population as well

(Daniel & Bridges, 2010). Internal consistencies in this sample ranged from  $\alpha = .73$  (appearance control beliefs) to  $\alpha = .79$  (body shame).

It is worth mentioning that reliability indexes of all dimensions assessed in this study are shown in Table 1.

### *Procedure*

The total sample was recruited through the same procedure. Two trained researchers requested volunteers to participate in personality research. Following this, a brief description with a general statement of our research (i.e., this study is aimed at evaluating personality in university students) and the estimated duration of this study was provided. No information about our research hypothesis was provided to the participants. Individuals who decided to collaborate were tested in small groups in different university centers. The questionnaire booklet included the personality traits and the body image measures mentioned above.

This study was authorized by a local ethical committee and conducted in accordance with the Ethical Standards of the 1964 Declaration of Helsinki. Information concerning the anonymity and confidentiality of their responses was highlighted at the beginning of this research. Participation was voluntary, and all of the participants obtained course credit in exchange for their cooperation.

### *Data analyses*

Pearson correlations among the Big Five personality traits, gelotophobia, and body image-related measures were conducted. Additionally, we conducted a series of hierarchical multiple regressions. Prior to conducting these analyses, the independent questionnaire variables were centered and the collinearity statistics were tested.

Importantly, the Variance Inflation Factor (VIF) never exceeded the accepted limits (Akinwande, Dikko, & Samson, 2015). Then, gender and age were introduced as predictors in Step 1 (method: enter), the Big Five personality traits were considered in Step 2 (method: stepwise), and trait-gelotophobia in Step 3 (method: enter).

## Results

The pattern of correlations among the Big Five personality traits, gelotophobia, and body image-related dimensions is given in Table 1.

As can be seen, neuroticism was negatively correlated with body appreciation ( $r = -.39, p < .001$ ) and appearance control beliefs ( $r = -.27, p < .01$ ). It was also correlated to higher body surveillance ( $r = .32, p < .001$ ) and higher body shame ( $r = .31, p < .001$ ). Furthermore, neuroticism was uncorrelated to body dissatisfaction ( $r = .09, p = .25$ ). Extraversion was correlated to a higher body appreciation ( $r = .33, p < .001$ ), and it was uncorrelated to the other dimensions of body image assessed ( $p > .05$ ). With regard to the other Big Five personality traits, agreeableness was only negatively correlated to with body surveillance ( $r = -.21, p < .01$ ), openness to experience was only positively correlated to body appreciation ( $r = .21, p < .01$ ), and conscientiousness was correlated to higher body appreciation ( $r = .23, p < .01$ ) and higher appearance control beliefs ( $r = .18, p < .05$ ). Additionally, the pattern of results between the Big Five personality traits and gelotophobia showed the expected relationships between neuroticism and high gelotophobia ( $r = .60, p < .001$ ) and extraversion and low gelotophobia ( $r = -.42, p < .001$ ). The fear of being laughed at also correlated to low conscientiousness ( $r = -.17, p < .05$ ). Concerning gelotophobia and body image-related variables, our data were in line with our expectations. Gelotophobia showed a pattern of results quite similar to neuroticism's findings. A greater inclination of this humor-related disposition was



correlated to lower body appreciation ( $r = -.39, p < .001$ ), lower appearance control beliefs ( $r = -.29, p < .001$ ), higher body surveillance ( $r = .24, p < .01$ ), and higher body shame ( $r = .35, p < .001$ ). Finally, it was uncorrelated to body dissatisfaction ( $r = .12, p > .01$ ).

**Table 1.** Descriptive statistics for all scales and Pearson correlations among the Big Five personality traits, gelotophobia and body image-related measures

	<i>M</i>	<i>SD</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
NEO-FFI dimensions													
(1) Neuroticism	2.78	0.71	<i>.86</i>										
(2) Extraversion	3.60	0.65	-.42***	<i>.87</i>									
(3) Agreeableness	3.46	0.47	-.21**	.24**	<i>.77</i>								
(4) Openness	3.72	0.57	.14	.06	.08	<i>.68</i>							
(5) Conscientiousness	3.60	0.60	-.40***	.13	.08	-.05	<i>.84</i>						
Humor-related trait													
(6) Gelotophobia	1.92	0.52	.60***	-.46***	-.03	-.10	-.17*	<i>.87</i>					
Body image													
(7) Body Appreciation	3.73	0.76	-.39***	.33***	.09	.21**	.23**	-.39***	<i>.93</i>				
(8) Body Dissati.	0.46	1.31	.09	-.00	.03	-.10	-.03	.12	-.36***	-			
(9) Body Surveillance	4.11	1.03	.32***	-.02	-.21**	-.02	-.05	.24**	-.33***	.31***	<i>.75</i>		
(10) Body Shame	3.10	1.11	.31***	-.14	-.00	-.07	-.06	.35***	-.53***	.43***	.45***	<i>.79</i>	
(11) App. Control Bel.	5.04	0.92	-.27**	.11	-.04	.08	.18*	-.29***	.24**	.11	.05	-.12	<i>.73</i>

Note. *N* = 143-163. Cronbach's alphas in italics. Openness = Openness to experience; App. Control Bel. = Appearance Control Beliefs; Body Dissati = Body Dissatisfaction.

\**p* < .05; \*\**p* < .01; \*\*\**p* < .001.

Hierarchical regression analyses were conducted to predict the different body image-related criteria. Concerning *body appreciation* (see Table 2), being male ( $\beta = .18$ ,  $p < .05$ ) was the only significant predictor among socio-demographics ( $\Delta R^2$  for the Step 1 = .060). Then, neuroticism ( $\beta = -.35$ ,  $p < .001$ ;  $\Delta R^2 = .114$ ), openness to experience ( $\beta = .28$ ,  $p < .001$ ;  $\Delta R^2 = .074$ ), extraversion ( $\beta = .20$ ,  $p < .05$ ;  $\Delta R^2 = .031$ ), and conscientiousness ( $\beta = .16$ ,  $p < .05$ ;  $\Delta R^2 = .019$ ) also contributed to the prediction of this body image dimension. In this case, gelotophobia had no influence beyond gender and the abovementioned broad personality traits ( $\beta = -.10$ ,  $p = .28$ ;  $\Delta R^2 = .005$ ).

**Table 2.** Hierarchical regression analysis predicting body appreciation

Predictors	$\Delta R^2$	$\beta$
Step 1: Demographics		
Model 1	.060**	
Gender		.18*
Age		.12
Step 2: NEO-FFI dimensions		
Model 2	.114***	
Neuroticism		-.35***
Model 3	.074***	
Openness to experience		.28***
Model 4	.031*	
Extraversion		.20*
Model 5	.019*	
Conscientiousness		.16*
Step 3: Humor-related trait		
Model 6	.005	
Gelotophobia		-.10
Total $R^2$	.304***	

Note.  $N = 163$ . Gender: 0 = female, 1 = male. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Regarding *body dissatisfaction* (see Table 3), being female was predictive ( $\beta = -.39$ ,  $p < .001$ ;  $\Delta R^2$  for the Step 1 = .162). Contrary to expectations, none of the Big Five personality traits yielded an incremental variance in participants' actual-ideal discrepancy (all  $ps > .05$ ). Gelotophobia did not account for a significant amount of explained variance in this dimension ( $\beta = .03$ ,  $p = .67$ ;  $\Delta R^2 = .001$ ).

**Table 3.** Hierarchical regression analysis predicting body dissatisfaction

Predictors	$\Delta R^2$	$\beta$
Step 1: Demographics		
Model 1	.162***	
Gender		-.39***
Age		-.03
Step 3: Humor-related trait		
Model 2	.001	
Gelotophobia		.03
Total $R^2$	.163***	

Note.  $N = 162$ . Gender: 0 = female, 1 = male. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

In regard to *body surveillance* (see Table 4), being female ( $\beta = -.33$ ,  $p < .001$ ) and young ( $\beta = -.21$ ,  $p < .01$ ) were predictors of this variable ( $\Delta R^2$  for the Step 1 = .194). Then, agreeableness ( $\beta = -.23$ ,  $p < .01$ ;  $\Delta R^2 = .053$ ) and neuroticism ( $\beta = .18$ ,  $p < .05$ ;  $\Delta R^2 = .028$ ) were predictive among the Big Five personality traits. Again, gelotophobia did not predict an additional part of the variance in body surveillance ( $\beta = .03$ ,  $p = .73$ ;  $\Delta R^2 = .001$ ).

**Table 4.** Hierarchical regression analysis predicting body surveillance

Predictors	$\Delta R^2$	$\beta$
Step 1: Demographics		
Model 1	.194***	
Gender		-.33***
Age		-.21**
Step 2: NEO-FFI dimensions		
Model 2	.053**	
Agreeableness		-.23**
Model 3	.028*	
Neuroticism		.18*
Step 3: Humor-related trait		
Model 4	.001	
Gelotophobia		.03
Total $R^2$	.276***	

Note.  $N = 161$ . Gender: 0 = female, 1 = male. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Concerning *body shame* (see Table 5), being female ( $\beta = -.24, p < .01$ ) was the only significant predictor among socio-demographics ( $\Delta R^2$  for the Step 1 = .072). Among the Big Five personality traits, neuroticism ( $\beta = .29, p < .01; \Delta R^2 = .077$ ) significantly contributed to the prediction of this dimension. Interestingly, gelotophobia ( $\beta = .25, p < .05; \Delta R^2 = .039$ ) accounted for an additional part of the variance in body shame.

**Table 5.** Hierarchical regression analysis predicting body shame

Predictors	$\Delta R^2$	$\beta$
Step 1: Demographics		
Model 1	.072**	
Gender		-.24**
Age		-.07
Step 2: NEO-FFI dimensions		
Model 2	.077**	
Neuroticism		.29**
Step 3: Humor-related trait		
Model 3	.039*	
Gelotophobia		.25*
Total $R^2$	.188***	

Note.  $N = 144$ . Gender: 0 = female, 1 = male. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Finally, *appearance control beliefs* (see Table 6) were not explained by gender and age ( $\Delta R^2$  for the Step 1 = .002). On the other hand, neuroticism ( $\beta = -.28, p < .01; \Delta R^2 = .072$ ) contributed to predicting this body image dimension. As in the case of body shame, it was found that gelotophobia ( $\beta = -.22, p < .05; \Delta R^2 = .031$ ) accounted for an additional part of the variance in this dimension.

**Table 6.** Hierarchical regression analysis predicting appearance control beliefs

Predictors	$\Delta R^2$	$\beta$
Step 1: Demographics		
Model 1	.002	
Gender		.02
Age		.03
Step 2: NEO-FFI dimensions		
Model 2	.072**	
Neuroticism		-.28**
Step 3: Humor-related trait		
Model 3	.031*	
Gelotophobia		-.22*
Total $R^2$	.104**	

Note. N = 159. Gender: 0 = female, 1 = male. . \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

## Discussion

This study explored the relationship between gelotophobia and certain body image-related dimensions. To extend the scope of our data, we also tested whether these potential relationships went beyond the influence of the Big Five personality traits. We considered that this humor-related trait could be relevant to the study of body image, given that teasing experiences focusing on physical appearance have a profound negative impact on body perception (Kostanski & Gullone, 2007). In addition, it has been suggested that certain personal features susceptible to being ridiculed, such as physical appearance, could be differentially exhibited among gelotophobes (Ruch et al., 2014). Our results are consistent with this idea, revealing evidence for the connection between gelotophobia and negative body image-related outcomes.

Gelotophobia was associated with a lower body appreciation, which might imply that gelotophobes do not display favorable opinions and respectful attitudes about their bodies. This supports other studies, which have demonstrated that gelotophobes show low self-esteem and greater feelings of inferiority (Ruch, 2009; Ruch et al., 2014). Furthermore, gelotophobia was also associated with higher body surveillance. To avoid

possible teasing situations, gelotophobes could observe their physical appearance with a greater intensity, with the purpose of adjusting how they look to the normative group. This heightened inclination to self-monitor could be understood as a way of coping with derision by controlling the situation, a strategy that has been found to be a typical behavior of gelotophobes (Ruch et al., 2014). Nevertheless, it should be noted that when we tested the predictive power of gelotophobia in body appreciation and body surveillance while controlling for gender, age, and the Big Five personality traits, this humor-related trait did not yield an incremental variance in these dimensions.

By contrast, gelotophobia predicted an additional part of the variance in body shame and appearance control beliefs. More specifically, gelotophobia was positively associated with body shame. Perhaps, because gelotophobes usually display biased negative perceptions about themselves (Titze, 2009), they could consider their physical appearance not to fulfill peer and group standards. This negative comparison may lead them to feel ashamed of their bodies. This result connects to previous literature, which has pointed out that shame plays an essential role in gelotophobes' daily lives (Platt & Ruch, 2009). Last, gelotophobia was related to lower appearance control beliefs. Past research has indicated that gelotophobes internalize being a valid object of others' laughter as another strategy to cope with derision (Ruch et al., 2014). It means that they accept that something is wrong with them and that they deserve to be mocked (Ruch, 2009; Titze, 2009). In line with this notion, individuals high in gelotophobia could assume a lack of control of their physical appearance. Thus, when gelotophobes' physical appearance does not conform to group standards, they accept that this characteristic is intrinsically linked to them and that there is nothing they can do about it. The fact that these effects emerge, regardless of the influence of socio-demographics and the Big Five personality traits, could imply that specific components of

gelotophobia account for some inter-individual differences in these body image-related dimensions. Therefore, our findings constitute additional support for the existence of differential features of gelotophobia.

Additionally, this study provides further evidence of the relationship between the Big Five personality traits and body image-related measures using a sample of males and females. Regarding gender effects, being a male was predictive of body appreciation, whereas being a female was predictive of body dissatisfaction, body surveillance and body shame. Concerning the Big Five personality traits, neuroticism was the more consistent predictor of negative body image-related outcomes, increasing the prediction of a lower body appreciation, higher body surveillance, higher body shame, and lower appearance control beliefs. These findings concerning neuroticism are similar to other studies conducted only with females (Miner-Rubino et al., 2002; Swami et al., 2012; Tylka, 2004). Furthermore, openness to experience, extraversion, and, to a lesser extent, conscientiousness accounted for a higher body appreciation, while agreeableness predicted low body surveillance. Altogether, it reveals the predictive capacity of the certain Big Five traits goes beyond the influence of gender. Finally, not all the results were in line with our expectations, since neither broad personality dimensions nor gelotophobia predicted body dissatisfaction.

#### *Limitations and further studies*

Certain limitations of this study should be considered. In the first place, we recruited the sample using a non-probabilistic convenience method, and only undergraduates composed it. Future studies should replicate these findings using general population samples. Second, the inclusion of body image-related measures was not exhaustive and could be extended in additional research. Third, the influence of



gelotophobia on body image could be also tested by controlling for additional variables not included in this research. After demonstrating that the effect of the fear of being laughed at on some body image-related dimensions goes beyond the Big Five personality traits (e.g., neuroticism), it would be necessary to determine whether these results are robust even incorporating similar low-order traits such as the fear of negative evaluation. In a previous study, Carretero-Dios, Ruch, Agudelo, Platt, and Proyer (2010) proved that gelotophobia presents some particularities which make it distinct from this partially overlapped construct. They suggested that gelotophobes are especially sensitive to those negative evaluations that are expressed through ridicule and laughter. Since physical appearance is proved to be a possible target of teasing/mockery (Ruch et al., 2014; Thompson et al., 1991), one might argue that gelotophobia would remain as a significant predictor of body image outcomes over and above even the influence of similar constructs such as the fear of negative evaluation. Future studies should clarify these relationships. Finally, given that correlations and regression analyses cannot be used to infer a causal association between gelotophobia and the previously mentioned dispositions concerning body image (e.g., higher body shame), new empirical studies aimed at clarifying this relationship should be addressed. Our current design does not allow us to confirm whether, for example, the fear of being laughed at produces a greater sensitivity to body shame experiences or less appearance control beliefs. In contrast to this potential explanation, these dimensions regarding one's body may be part of a set of vulnerability factors that lead to gelotophobia development. In this sense, longitudinal studies would be useful to clarify the pattern of relationships.

## **Conclusions**

As far as we know, this research entails the first empirical evidence about the relationship between gelotophobia and the negative psychological outcomes concerning body image. In addition, our data revealed that gelotophobia accounted for the incremental inter-individual variance in body shame and appearance control beliefs beyond sociodemographics and the Big Five personality traits. Our data are consistent with the idea that teasing affects body image evaluation (Kostanski & Gullone, 2007; Thompson et al., 1991). In this sense, this contribution adds new research variables of interest to the literature concerning the excessive fear of being laughed at.

## **Chapter VI**

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*Beyond the HEXACO model: The fear of being  
laughed at as a predictor of body image*



**Beyond the HEXACO model: The fear of being laughed at as a  
predictor of body image**

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as a predictor of body image.

**Abstract**

This research examines the associations between the excessive fear of being laughed at (i.e., gelotophobia) and several body image dimensions in a sample of 240 young adults from Spain (126 women and 114 men). Moreover, using regression analyses, we investigate the robustness of these associations, controlling for the influence of the HEXACO traits and adding an alternative predictor—strongly associated with gelotophobia—such as social anxiety to the predicting model. Gelotophobia correlates with greater scores on body surveillance, body shame, appearance orientation, and overweight preoccupation ( $r_s \geq .26$ ). This laughter-related disposition also correlates with lower scores on appearance control beliefs, appearance evaluation, and body areas satisfaction ( $r_s \leq -.30$ ). Self-classified weight existed independently from gelotophobia. Hierarchical regression analyses reveal gelotophobia adds incremental variance (3–13%) in the prediction of these appearance-regarding dimensions beyond the HEXACO traits (3–20%; predominantly emotionality, extraversion, and honesty-humility traits). Furthermore, our results show that gelotophobia yielded stronger incremental values than social anxiety in the prediction of body image indicators after the inclusion of broad personality traits. Implications of these findings are discussed in relation to the earlier literature on gelotophobia, teasing-ridicule, and body image disturbances.

*Keywords:* body image; gelotophobia; HEXACO model; personality traits; physical appearance; social anxiety

## Introduction

Having negative perceptions of your own physical appearance may trigger a great diversity of injurious consequences; among others, it decreases self-esteem (Frost & McKelvie, 2004) and might promote the appearance of certain pathologies, such as eating disorders (Brechan & Kvalem, 2015). Earlier research on body image (BI) and the Five-Factor Model (FFM) has shown that those who display increasing neuroticism and decreasing extraversion expressions are more likely to display BI disturbances (see Allen & Walter, 2016). Similarly, although comparatively much less studied, research on the HEXACO model has demonstrated comparable findings with high emotionality and low extraversion being indicative of negative body self-perceptions (Lodewyk & Sullivan, 2017; Visser & Pozzebon, 2013).

There still remains much to be done with regard to the study of personality characteristics among those suffering from negative BI representations. For instance, considering that the associations between BI constructs and broad personality dimensions, such as FFM and HEXACO traits, are typically found with small-to-moderate coefficients (Allen & Walter, 2016; Lodewyk & Sullivan, 2017; Swami, Hadji-Michael, & Furnham, 2008; Swami et al., 2013; Visser & Pozzebon, 2013), the incorporation of theoretically relevant narrow traits, such as the fear of being laughed at or gelotophobia (*gelos* in Greek means laughter), might offer substantial incremental validity to the prediction of individual differences in negative BI dimensions. Previous investigations have already shown gelotophobia accounts for high body shame and low appearance control beliefs even beyond the influence of FFM traits (Moya-Garófano, Torres-Marín, & Carretero-Dios, 2019). However, no studies have yet tested whether this laughter-related disposition would relate to alternative BI disturbances (e.g., low appearance evaluations or high overweight preoccupation) and whether these possible

gelotophobia associations would go over and above the influence of an alternative personality system, such as the HEXACO model (see Ashton & Lee, 2007). This research aims at reducing this gap in the literature. Moreover, gelotophobia shows a strong intercorrelation with social anxiety-related measures (e.g.,  $r_s = .57-.71$ ; Carretero-Dios, Ruch, Agudelo, Platt, & Proyer, 2010b; Edwards, Martin, & Dozois, 2010); therefore, we also assessed social anxiety to test which of these narrow traits would have the strongest predictive values in the remaining variance after the inclusion of HEXACO traits. To the best of our knowledge, no studies have yet addressed a direct differentiation between gelotophobia and social anxiety in terms of their correlates with BI indicators.

#### *Body image in the Five-Factor Model*

One of the most well-established models of personality in BI literature is the FFM. This personality system is comprised of a five-dimensional structure, namely neuroticism, extraversion, agreeableness, openness to experience, and conscientiousness (see Costa & McCrae, 1992). Regarding its relations with BI dimensions, it has been proven that neuroticism correlates with lower ratings of psychical attractiveness (e.g., Davis, Dionne, & Lazarus, 1996) and greater actual-ideal weight discrepancy (e.g., Swami et al., 2013). Other studies have shown that this trait correlates negatively with body appreciation (e.g., Swami et al., 2008) and positively with body dissatisfaction (e.g., MacNeill, Best, & Davis, 2017). Further, high neuroticism scorers seem to be more likely to have negative appearance evaluations and also tend to be more appearance-oriented (e.g., Kvaem, von Soest, Roald, & Skolleborg, 2006). Elevated neuroticism is also linked to greater expressions of body surveillance and body shame along with lower scores on appearance control beliefs (Moya-Garófano et al., 2019;



Miner-Rubino, Twenge, & Fredrickson, 2002). Continuing with the FFM, extraversion correlates negatively with actual-ideal weight discrepancy (e.g., Swami et al., 2013). Consistent with these findings, high extraversion scorers are more likely to have favorable opinions about their own bodies and global appearance (Kvalem et al., 2006; Swami et al., 2013). There is also small evidence for the associations of reduced levels of extraversion with increasing body shame and increasing appearance control beliefs (Moya-Garófano et al., 2019), but these correlates seem to be inconsistent across studies (see Carrotte & Anderson, 2018). Finally, findings of agreeableness, openness to experience, and conscientiousness seem to be less stable as well (Allen & Walter, 2016; Carrotte & Anderson, 2018; Swami et al., 2013). While some studies have found that these traits are linked to greater satisfaction with physical appearance, body appreciation, and appearance evaluations (Kvalem et al., 2006; Swami et al., 2013), other investigations did not offer support for the links between these domains and having a favorable opinion about the own body (Allen & Walter, 2016; Swami et al., 2008). Moreover, it has been stressed that these FFM traits exist independently from other BI dimensions, such as body shame, body surveillance, appearance control beliefs, and appearance orientation (see Carrotte & Anderson, 2018).

#### *Body image in the HEXACO Model*

The HEXACO model is an alternative model of personality that encompasses six broad domains, namely emotionality, extraversion, agreeableness, openness to experience, conscientiousness, and honesty-humility (Ashton & Lee, 2007). This system proposes an alternative interpretation of personality variation (by reorganizing certain variance of the FFM) and incorporates meaningful aspects that could be absent or weakly represented within the FFM (Ashton, Lee, & de Vries, 2014). While

extraversion, openness to experience, and conscientiousness contain highly comparable characteristics to their FFM counterparts, the HEXACO emotionality—unlike its FFM counterpart, neuroticism—involves sentimentality-related traits that are associated rather with FFM agreeableness. Moreover, the HEXACO agreeableness incorporates anger-related characteristics (its low pole) that were associated with FFM neuroticism. Consistent with these modifications, empirical research not only offers an acceptable correspondence among emotionality-neuroticism and both agreeableness traits ( $r_s \geq 0.52$ ; Ashton et al., 2014) but also shows that these traits can differentially account for external criterion (e.g., phobic tendencies; Ashton, Lee, Visser, & Pozzebon, 2008). The HEXACO model also encompasses the honesty-humility trait, which slightly overlaps with FFM agreeableness and captures additional aspects that could not be well-represented within the FFM (e.g., sincerity, fairness, greed avoidance, and modesty; see Ashton & Lee, 2007).

Unlike the FFM, there is little research on the associations between the HEXACO model and BI constructs. Research carried out by Visser and Pozzebon (2013) found that body shame correlates with high emotionality and low scores in extraversion, agreeableness, openness to experience, and honesty-humility dimensions. They also found that attractiveness was negatively associated with agreeableness, conscientiousness, openness to experience, and honesty-humility. Later, Lodewyk and Sullivan (2017) found that greater scores on emotionality and lower scores on extraversion, agreeableness, and honesty-humility were linked to greater actual-ideal body size discrepancy. Moreover, extraversion correlated positively with upper fitness levels. Altogether, these findings seem to be comparable to prior findings on the FFM. Nevertheless, further evidence for supporting the role of the HEXACO model in BI is still needed, for instance, to test its associations with alternative BI dimensions.

Furthermore, attending to the effect sizes regarding the associations of BI within FFM and HEXACO traits, broad traits seem to be insufficient to account for the overall variability in this construct. Hence, one might surmise that the inclusion of narrow traits—referring to a more restricted range of internal experiences or behaviors—would help elucidate the link between personality and BI.

#### *Gelotophobia as an additional predictor of body image dimensions*

Gelotophobia is an emerging individual differences variable describing how people differ in their fear of being laughed at (Ruch & Proyer, 2008). High scorers in this laughter-related disposition exhibit excessive negative reactions to being laughed at and near-paranoid beliefs about being ridiculed by others (Ruch, Hofmann, Platt, & Proyer, 2014). This leads these individuals to perceive others' laughter to be mean-spirited and directed at them regardless the real context and target (Ruch & Proyer, 2008). In addition, empirical findings have pointed out that highly gelotophobia individuals are more inclined to exhibit similar (negative) reactions to ridicule and more benevolent forms of humor (Platt, 2008) and to attribute negative affective states to good-natured others' laughs (Ruch, Altfreder, & Proyer, 2009).

One main concern in the research on gelotophobia has been to corroborate that (1) this disposition goes beyond broad traits, such as neuroticism and extraversion, and (2) that its nature is sufficiently different from other well-studied (and conceptually similar) low-order traits, such as social anxiety (see Ruch et al., 2014). In connection with the former point, there are numerous contributions on the location of gelotophobia within traditional models of personality. When comparing its overlapping variance with the higher-order traits of the FFM, it has been proven that approximately 44% of the variance in the fear of being laughed at can be accounted for heightened expressions on

neuroticism and lower inclinations to extraversion and openness to experience (Ďurka & Ruch, 2015). Furthermore, in recent research, the combination of three HEXACO traits, this is, low extraversion, high emotionality, and low honesty-humility, predicted approximately 44% of the variation in gelotophobia (Torres-Marín, Proyer, López-Benítez, Brauer, & Carretero-Dios, 2019). Furthermore, gelotophobia shows conceptual and empirical similarities with other fear-based dispositions. Indeed, this laughter-related disposition strongly correlates with both social anxiety and fear of negative evaluations; however, these socially anxious tendencies cannot account for (singularly or in combination) the overall variance in gelotophobia (Carretero-Dios et al., 2010b). In accordance, further research has found gelotophobia-based effects even controlling for participants' social anxiety scores (e.g., Edwards et al., 2010).

Thus far, little is known about the associations between gelotophobia and BI. There is broad evidence that physical appearance (i.e., weight, shape and general looks) represents one the most common focuses of mockeries (Kostanski & Gullone, 2007). Ruch et al. (2014) postulated in their model of putative causes and consequences of gelotophobia that the presence of disturbances in one's appearance may increase the likelihood of being ridiculed (risk factor) and, therefore, contribute to the development of this excessive fear of being laughed. Empirical research has endorsed this notion because gelotophobia correlates with more memories of being teased about appearance (Edwards et al., 2010). Further, using online interviews, high gelotophobia scorers acknowledged that callous weight-related experiences of teasing (during childhood and adolescence) could be assumed as one of the potential initial triggers for their excessive fears of being ridiculed (Kohlmann et al., 2018).

Furthermore, research on BI has demonstrated that the presence of recurrent teasing experiences about one's physical appearance may elicit future negative perceptions

about the body across a lifespan (Cash, 1995; Kostanski, & Gullone, 2007). More specifically, receiving mocking comments focused on weight, shape, and global appearance was associated with greater body dissatisfaction and more probabilities of suffering from eating disorders (Menzel et al., 2010). Similarly, being teased by peers can unleash negative BI outcomes as body shame, body surveillance, and appearance anxiety in childhood and adolescence (Slater & Tiggemann, 2011).

Gelotophobia involves an excessive sensitivity to teasing and links to have experienced more appearance-regarding teasing (Platt, 2008; Edwards et al., 2010; Kohlmann et al., 2018); therefore, one might argue that this disposition would be solidly related to negative perceptions about the own body. Direct tests on this issue have offered supports for this assumption. First, high gelotophobia scorers were more likely to describe themselves as rather less attractive (Führ, Platt, & Proyer, 2015). Moreover, these highly gelotophobia individuals had greater scores on body shame and lower on appearance control beliefs—these effects went beyond FFM traits (Moya-Garófano et al., 2019). Nevertheless, additional research is needed to test whether these findings are stable across samples and generalizable to additional BI dimensions even controlling for other personality systems. Moreover, there are other narrow personality traits, such as social anxiety, which may overlap gelotophobia's effects on negative BI. Similar to individuals scoring high in gelotophobia, those high in social anxiety are more inclined to have negative BI manifestations (e.g., Aderka et al., 2014). Therefore, it would be advisable to examine whether gelotophobia and social anxiety share common versus specific effects in the prediction of BI and, if this is the case, which of these narrow traits would have greater incremental predictive values of this multidimensional construct.

*Aims and hypotheses of the present research*

The objective of this research was threefold: (a) to examine whether gelotophobia shows substantial correlations with several BI indicators; (b) to test whether these associations would go beyond the influence of the HEXACO traits; and, simultaneously, (c) to analyze whether gelotophobia would have stronger incremental predicate values than social anxiety in predicting the variation of these BI outcomes.

We first expected a replication of the associations of gelotophobia with greater expressions of body surveillance and body shame and lower appearance control beliefs (Hypothesis 1; see Moya-Garófano et al., 2019). Second, we expected to generalize these findings to additional negative BI expressions; in particular, highly gelotophobia individuals would show higher scores on appearance orientation, overweight preoccupation, and self-classified weight, along with lower scores on appearance evaluation and body areas satisfaction (Hypothesis 2). We then would test whether these associations between gelotophobia and BI dimensions would go over and above the influence of the HEXACO traits. Considering that this system of personality accounted for approximately 44% variance in gelotophobia (Torres-Marín et al., 2019) and yielded small-to-moderate associations with BI dimensions (e.g., Visser & Pozzebon, 2013), we thus anticipated incremental values of gelotophobia beyond the HEXACO traits in the prediction of the BI (Hypothesis 3). This expectation converges well with prior conceptual and empirical findings on the role of appearance-regarding teasing in the development of gelotophobia and BI disturbances (Cash, 1995; Edwards et al., 2010; Kohlmann et al., 2018; Kostanski & Gullone, 2007; Ruch et al., 2014). Furthermore, we also investigated possible differences between gelotophobia and social anxiety in predicting BI disturbances. Attending to the similar natures (Carretero-Dios et al., 2010b) and comparable findings with BI disturbances (Aderka et al., 2014; Führ et al.,

2015; Moya-Garófano et al., 2019), we expected a similar pattern of correlations among these constructs (Hypothesis 4). However, because of the aforementioned connection between gelotophobia and appearance-regarding teasing in BI disturbances, we would expect that this laughter-related disposition would be more strongly correlated with BI variation (Hypothesis 5).

On the basis of these previous findings regarding personality traits and BI (e.g., Moya-Garófano et al., 2019), we expected that demographics, HEXACO traits, social anxiety and gelotophobia would, in combination, predict BI dimensions reflecting a medium-to-large effect size (i.e., determination coefficients between 0.13 and 0.26; Cohen, 1988).

## **Method**

### *Participants*

Our sample consisted of 240 young adults (126 women [52.5%] and 114 men [47.5%]). Their ages ranged from 18 to 33 years ( $M = 21.12$ ;  $SD = 2.73$ ;  $Median = 21$ ). Of these participants, 20% were employees; 78.3% were students; 1.3% were unemployed people; and 0.4% did not indicate a professional status. In terms of educational background, respondents reported the following: 12.5% held a university degree; 60.8% had a general certificate of education; 22.1% had completed a vocation education and training; 3.8% had secondary education; and 0.8% did not indicate educational status. Power analyses revealed that our sample size enables us to detect small-to-large correlation coefficients ( $\rho \geq .18$ ; two-tailed) and to detect a moderate or larger multivariate effect ( $f^2 \geq .08$ ) using a linear regression with ten predictors (i.e., age, gender, HEXACO traits, gelotophobia, and social anxiety) with power greater than .80 at  $\alpha = .05$ . These effect sizes are similar to those obtained in earlier research on

gelotophobia and personality traits predicting BI dimensions (Moya-Garófano et al., 2019).

### *Instruments*

The GELOPH-15 (Ruch & Proyer, 2008; Spanish version by Carretero, Proyer, Ruch, & Rubio, 2010a) consists of 15 positively keyed items that measure gelotophobia (e.g., “When they laugh in my presence, I get suspicious”). Respondents provide answers on a four-point Likert-scale format (1 = *strongly disagree*; 4 = *strongly agree*). Previous investigations have offered strong support for the good reliability ( $\alpha \geq .80$ ; retest-reliability = .80 [six-month interval]) and construct validity (i.e., robust one-factor solution and consistent associations with other personality traits) of this measure (Carretero-Dios et al., 2010a; Ruch & Proyer, 2008).

The HEXACO-60 (Ashton & Lee, 2009; Spanish version by Romero, Villar, & López-Romero, 2015) consists of 60 items that measure six broad personality traits, namely (1) *extraversion* (e.g., “I prefer jobs that involve active social interaction to those that involve working alone”); (2) *emotionality* (e.g., “I would feel afraid if I had to travel in bad weather conditions”); (3) *openness to experience* (e.g., “I would enjoy creating a work of art, such as a novel, a song, or a painting”); (4) *agreeableness* (e.g., “I rarely hold a grudge, even against people who have badly wronged me”); (5) *conscientiousness* (e.g., “I plan ahead and organize things to avoid scrambling at the last minute”); and (6) *honesty-humility* (e.g., “I wouldn’t use flattery to get a raise or promotion at work, even if I thought it would succeed”). Each dimension was assessed through 10 items and respondents provide answers on a five-point Likert scale (1 = *completely disagree*; 5 = *completely agree*). This instrument has satisfying values of internal consistency and temporal reliability (e.g.,  $\alpha \geq 0.72$ ; retest-reliability  $\geq 0.60$



[six-week interval]), and there is strong support for its proposed six-factor structure and adequate convergent and discriminant validity on the basis of its associations with other personality measures (Ashton & Lee, 2009; Romero et al., 2015).

The Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998; Spanish version by Olivares, García-López, & Hidalgo, 2001) consists of 20 items that measure social anxiety (e.g., “I get nervous if I have to speak with someone in authority [teacher, boss, etc.]”). Responses are given on a five-point Likert scale ranging from 0 (*not at all*) to 4 (*totally*). This measure has demonstrated elevated levels of internal consistency ( $\alpha \geq .88$ ), and there is broad evidence for its one-factor structure and high correspondence with other social anxiety measures (Mattick & Clarke, 1998; Olivares et al., 2001).

The Objectified Body Consciousness Scale (OBCS; McKinley & Hyde, 1996; Spanish version by Moya-Garófano, Megías, Rodríguez-Bailón, & Moya, 2017) consists of 24 items that measure body surveillance (e.g., “I often worry about whether the clothes I am wearing make me look good”), body shame (“I feel like I must be a bad person when I don’t look as good as I could”), and appearance control beliefs (e.g., “I really don’t think I have much control over how my body looks”). Each dimension comprises eight items and responses are given on a seven-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). This measure shows acceptable reliabilities coefficients ( $\alpha \geq .68$ ; retest-reliability = .73 [two-week interval]) and external validity based on its intercorrelations with other BI indicators (Moya-Garófano et al., 2017; McKinley & Hyde, 1996).

The Multidimensional Body-Self Relations Questionnaire-Appearance Scales (MBSRQ-AS; Cash, 2000; Spanish version by Roncero, Perpiñá, Marco, & Sánchez-Reales, 2015) is a reduced version of the MBSRQ. This measure consists of 34 items that assess five dimensions, namely appearance evaluation (seven-items: e.g., “I like my

looks just the way they are”), appearance orientation (12-items: e.g., “I am always trying to improve my appearance”), body areas satisfaction (nine-items: “dissatisfaction-satisfaction with discrete aspects of one’s appearance, such as, among others, face, muscle tone or weight”), overweight preoccupation (four-items: e.g., “I constantly worry about becoming fat”) and self-classified weight (two-items: “how one perceives one’s weight status”). The five subscales demonstrated satisfying reliability ( $\alpha \geq .70$ ; retest-reliability = .71 [one-month interval]) and have an adequate correspondence with other BI measures (Cash, 2000; Roncero et al., 2015).

### *Procedure*

The sample was obtained through in-person recruitment. Three trained recruiters (1 man and 2 women) approached potentially eligible participants in various public locations and through personal contacts (i.e., convenience sampling procedure). They requested volunteers for participating in an investigation on personality and physical appearance. The inclusion criterion was to be older than 18 and younger than 35-years-old. Recruiters were instructed to provide only a general description of this research and the estimated duration (30–35 min) for its completion. They also emphasized the voluntary nature of their participation and guaranteed the anonymity and confidentiality of their responses. Participants provided written informed consents at the beginning of the questionnaire booklets. It is worth mentioning that none of them received either economical compensation or course credit for their participation. Debriefing and individualized feedback on their scores was available upon request. This research was authorized by a local ethics committee and carried out in accordance with the Ethical Standards of the 1964 Declaration of Helsinki. The data and syntax are available at the Open Science Framework under <https://osf.io/v58tq/>

*Data analyses*

Descriptive statistics (i.e., means and standard deviations), reliabilities, and bivariate correlations for examining age and gender differences on all the questionnaire variables were computed. Furthermore, we tested the associations among the HEXACO traits, gelotophobia, social anxiety, and BI dimensions through bivariate correlations. Based on Cohen's benchmarks, the magnitude of the correlation was set at .10/.30/.50 for small/medium/large coefficients (Cohen, 1988).

We further examined the associations among these variables by performing a set of hierarchical regressions analyses. Crucial for our hypotheses, we also investigated the incremental validity of gelotophobia and social anxiety on BI dimensions over the influence of the six broad personality traits of the HEXACO model. First, age, and gender were entered as predictors in Step 1 (method: enter). Concerning personality traits, the six traits of the HEXACO model (higher-order factors) were entered in Step 2 (method: stepwise) and gelotophobia and social anxiety (lower-order factors) in Step 3 (method: stepwise). BI dimensions were independently considered as criteria variables. Prior to conducting all these regression analyses, we mean-centered the predictor questionnaire variables and corroborated whether collinearity statistics (e.g., Variance Inflation Factor [VIF]) were all within satisfying limits (i.e., VIFs < 5.0). We also calculated the standardized regression effect sizes ( $f^2$ ) that offer information on the magnitude of each predictor/single step ( $\geq 0.02/0.15/0.35$  indicate small/medium/large effects; Cohen, 1988) on the basis of the changes in  $R^2$ .

## Results

### *Preliminary analyses*

The descriptive statistics (i.e., means and standard deviations) were comparable to previous findings on these personality and body image measures (e.g., Moya-Garófano et al., 2019). The amount of respondents who exceeded the cut-off score indicating at least a slight expression of gelotophobia ( $\geq 2.50$ ; Ruch & Proyer, 2008) were 18.8% in our sample, which was slightly higher than previous values reported in other investigations with similar samples (e.g., 11.61%; Carretero-Dios et al., 2010a). Table 1 shows that all instruments yielded satisfying internal consistency coefficients for research purposes, namely GELOPH-15 ( $\alpha = .90$ ), SIAS ( $\alpha = .90$ ), HEXACO-60 ( $\alpha s \geq .68$ ; median = .75), OBCS ( $\alpha s \geq .71$ ; median = .73), and MBRSQ-AS ( $\alpha s \geq .69$ ; median = .83).

As for age effects, younger ages correlated with greater scores on social anxiety ( $r = -.18, p < .01$ ). Gender differences on the personality measures revealed that female gender correlated with lower expressions on emotionality ( $r = -.43, p < .001$ ) and honesty-humility ( $r = -.36, p < .001$ ). The inspection of gender effects on BI dimensions showed that female gender correlated with greater scores on body surveillance ( $r = -.18, p < .01$ ), body shame ( $r = -.19, p < .01$ ), appearance orientation ( $r = -.24, p < .001$ ), and overweight preoccupation ( $r = -.21, p < .01$ ). Male gender correlated with greater scores on appearance control beliefs ( $r = .19, p < .01$ ).

Intercorrelations between BI measures (i.e., OBCS and MBRSQ-AS) are given in Table 1. Our results highlighted a strong empirical correspondence among similar BI indicators as body surveillance correlated with low appearance evaluation ( $r = -.38$ ), high appearance orientation ( $r = .69$ ), low body areas satisfaction ( $r = -.35$ ), and high overweight preoccupation ( $r = .30, ps < .001$ ); body shame correlated with low

appearance evaluation ( $r = -.64$ ), high appearance orientation ( $r = .51$ ), low body areas satisfaction ( $r = -.61$ ), high overweight preoccupation ( $r = .62$ ), and high self-classified weight ( $r = .30$ ,  $ps < .001$ ); appearance control beliefs correlated with high appearance evaluation ( $r = .34$ ) and high body areas satisfactions ( $r = .31$ ,  $ps < .001$ ).

Table 1 also gives the intercorrelations among personality measures (i.e., GELOPH-15, SIAS, and HEXACO-60). We first observed a strong and positive association between gelotophobia and social anxiety ( $r = .74$ ,  $p < .001$ ). Second, gelotophobia had substantial association with the HEXACO model. This disposition correlated with low extraversion ( $r = -.63$ ,  $p < .001$ ), high emotionality ( $r = .34$ ,  $p < .001$ ), and low agreeableness ( $r = -.17$ ,  $p < .01$ ). Furthermore, higher social anxiety scores were positively correlated with emotionality ( $r = .37$ ,  $p < .001$ ) and negatively with extraversion ( $r = -.64$ ,  $p < .001$ ).

Hierarchical regressions using demographics and the HEXACO traits as predictors showed that female gender (explained variance for Step 1 = 2.8%), low extraversion ( $\Delta R^2 = .385$ ,  $p < .001$ ;  $\Delta f^2 = 0.66$ ), high emotionality ( $\Delta R^2 = .028$ ,  $p < .01$ ;  $\Delta f^2 = 0.05$ ), and low honesty-humility ( $\Delta R^2 = .011$ ,  $p = .034$ ;  $\Delta f^2 = 0.02$ ) accounted for 45.2% of the overall variance in gelotophobia. Similarly, younger age (Step 1 = 3.8%), low extraversion ( $\Delta R^2 = .395$ ,  $p < .001$ ;  $\Delta f^2 = 0.70$ ), and high emotionality ( $\Delta R^2 = .045$ ,  $p < .001$ ;  $\Delta f^2 = 0.09$ ) revealed 47.8% overlapping variance with social anxiety.

#### *Relationships of HEXACO traits with body image dimensions*

The pattern of correlations among the HEXACO traits and body image dimensions is also displayed in Table 1. First, higher scores on extraversion were linked to low body shame ( $r = -.32$ ), high appearance control beliefs ( $r = .23$ ), high appearance evaluation ( $r = .45$ ), and high body areas satisfaction ( $r = .35$ ,  $ps < .001$ ). Second,

emotionality was positively correlated with body surveillance ( $r = .36, p < .001$ ), body shame ( $r = .30, p < .001$ ), appearance orientation ( $r = .38, p < .001$ ), and overweight preoccupation ( $r = .19, p < .01$ ), and negatively correlated with appearance evaluation ( $r = -.24, p < .001$ ) and body areas satisfaction ( $r = -.28, p < .001$ ). Moreover, agreeableness correlated with lower scores on body surveillance ( $r = -.25, p < .001$ ), body shame ( $r = -.18, p < .01$ ), and appearance orientation ( $r = -.23, p < .001$ ). Openness to experience was unrelated to BI dimensions, and conscientiousness correlated with greater inclinations to appearance control beliefs ( $r = .17, p < .01$ ) and appearance orientation ( $r = .22, p < .01$ ). Finally, honesty-humility was unrelated to BI.

#### *Relationships of Gelotophobia and Social Anxiety with Body Image Dimensions*

Bivariate correlations of gelotophobia and social anxiety with BI dimensions are also given in Table 1. As expected, gelotophobia was associated with greater scores on body surveillance ( $r = .36$ ), body shame ( $r = .53$ ), appearance orientation ( $r = .42$ ), and overweight preoccupation ( $r = .26, ps < .001$ ). This laughter-related disposition was also associated with lower scores on appearance control beliefs ( $r = -.30$ ), appearance evaluation ( $r = -.55$ ), and body areas satisfaction ( $r = -.43, ps < .001$ ). Furthermore, heightened expressions of social anxiety were associated with higher scores on body surveillance ( $r = .25$ ), body shame ( $r = .37$ ), and appearance orientation ( $r = .29, ps < .001$ ). Moreover, social anxiety correlates negatively with appearance control beliefs ( $r = -.25$ ), appearance evaluation ( $r = -.42$ ), and body areas satisfaction ( $r = -.34, ps = .001$ ).

**Table 1.** Bivariate correlations among gelotophobia, social anxiety, HEXACO traits, OBCS and MBRSQ-AS dimensions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
GELOPH-15																
(1) GEL	<i>.90</i>															
SIAS																
(2) SOA	<i>.74**</i>	<i>.90</i>														
HEXACO-60																
(3) EXT	<i>-.63**</i>	<i>-.64**</i>	<i>.76</i>													
(4) EMO	<i>.34**</i>	<i>.37**</i>	<i>-.21*</i>	<i>.76</i>												
(5) AGR	<i>-.17*</i>	<i>-.08</i>	<i>.07</i>	<i>-.25**</i>	<i>.68</i>											
(6) OPN	<i>-.16</i>	<i>-.14</i>	<i>.08</i>	<i>-.18*</i>	<i>.13</i>	<i>.77</i>										
(7) CON	<i>.01</i>	<i>-.05</i>	<i>.07</i>	<i>.05</i>	<i>-.04</i>	<i>.06</i>	<i>.74</i>									
(8) H-H	<i>-.10</i>	<i>-.04</i>	<i>.08</i>	<i>.12</i>	<i>.21*</i>	<i>.10</i>	<i>.07</i>	<i>.70</i>								
OBCS																
(9) SUR	<i>.36**</i>	<i>.25**</i>	<i>-.14</i>	<i>.36**</i>	<i>-.25**</i>	<i>-.08</i>	<i>.06</i>	<i>-.10</i>	<i>.71</i>							
(10) SHA	<i>.53**</i>	<i>.37**</i>	<i>-.32**</i>	<i>.30**</i>	<i>-.18*</i>	<i>-.12</i>	<i>.03</i>	<i>-.10</i>	<i>.47**</i>	<i>.85</i>						
(11) ACB	<i>-.30**</i>	<i>-.25**</i>	<i>.23**</i>	<i>-.15</i>	<i>.01</i>	<i>-.01</i>	<i>.17*</i>	<i>-.01</i>	<i>-.09</i>	<i>-.23**</i>	<i>.73</i>					
MBRSQ-AS																
(12) AEV	<i>-.55**</i>	<i>-.42**</i>	<i>.45**</i>	<i>-.24**</i>	<i>.10</i>	<i>.07</i>	<i>.12</i>	<i>-.02</i>	<i>-.38**</i>	<i>-.64**</i>	<i>.34**</i>	<i>.89</i>				
(13) AOR	<i>.42**</i>	<i>.29**</i>	<i>-.17</i>	<i>.38**</i>	<i>-.23**</i>	<i>-.08</i>	<i>.22*</i>	<i>-.17</i>	<i>.69**</i>	<i>.51**</i>	<i>-.10</i>	<i>-.28**</i>	<i>.83</i>			
(14) BAS	<i>-.43**</i>	<i>-.34**</i>	<i>.35**</i>	<i>-.28**</i>	<i>.15</i>	<i>.05</i>	<i>.12</i>	<i>.04</i>	<i>-.35**</i>	<i>-.61**</i>	<i>.31**</i>	<i>.76**</i>	<i>-.31**</i>	<i>.76</i>		
(15) OWP	<i>.26**</i>	<i>.10</i>	<i>-.05</i>	<i>.19*</i>	<i>-.13</i>	<i>-.13</i>	<i>.05</i>	<i>-.10</i>	<i>.30**</i>	<i>.62**</i>	<i>-.04</i>	<i>-.38**</i>	<i>.41**</i>	<i>-.40**</i>	<i>.69</i>	
(16) SCW	<i>.08</i>	<i>.01</i>	<i>-.05</i>	<i>.08</i>	<i>-.08</i>	<i>-.08</i>	<i>-.04</i>	<i>.07</i>	<i>.03</i>	<i>.30**</i>	<i>-.01</i>	<i>-.24**</i>	<i>-.01</i>	<i>-.13</i>	<i>.43**</i>	<i>.83</i>

*N* = 240; Cronbach alphas in italics. GEL = Gelotophobia; SOA = Social Anxiety; EXT = Extraversion; EMO = Emotionality; AGR = Agreeableness; OPN = Openness to experience; CON = Conscientiousness; H-H = Honesty-Humility; SUR = Body Surveillance; SHA = Body Shame; ACB = Appearance Control Beliefs; AEV = Appearance Evaluation; AOR = Appearance Orientation; BAS = Body Areas Satisfaction; OWP = Overweight Preoccupation; SCW = Self-classified Weight; \**p* < .01; \*\**p* < .001; (two-tailed).

*Incremental validity of gelotophobia and social anxiety on body image dimensions over the HEXACO traits*

Hierarchical regression analyses, predicting BI dimensions, using demographics (i.e., gender and age), the HEXACO traits, gelotophobia, and social anxiety as predictors, are displayed in Tables 2 and 3.

Concerning the OBCS dimensions, we first observed that younger age and female gender were predictive of body surveillance (explained variance for Step 1 = 5.1%). High emotionality ( $\Delta R^2 = .092, p < .001; \Delta f^2 = 0.11$ ), low honesty-humility ( $\Delta R^2 = .027, p < .01; \Delta f^2 = 0.03$ ), and low agreeableness ( $\Delta R^2 = .015; p < .05; \Delta f^2 = 0.02$ ) revealed 13.4% overlapping variance with this BI dimension. Moreover, heightened expressions of gelotophobia ( $\Delta R^2 = .049, p < .001; \Delta f^2 = 0.06$ ) yielded a significant effect on the prediction of body surveillance over demographics and HEXACO traits. Altogether, these predictors explained 23.4% of the variance in body surveillance (see Table 2). Second, body shame was predicted by female gender (Step 1 = 3.5%). Low extraversion ( $\Delta R^2 = .103, p < .001; \Delta f^2 = 0.12$ ), high emotionality ( $\Delta R^2 = .031, p < .01; \Delta f^2 = 0.04$ ), and low honesty-humility ( $\Delta R^2 = .021, p < .05; \Delta f^2 = 0.03$ ) accounted for the 15.5% of the total variance of body shame. Greater scores on gelotophobia ( $\Delta R^2 = .127, p < .001; \Delta f^2 = 0.19$ ) had unique contribution to the overall variance in this BI dimension beyond demographics and HEXACO traits. In total, the 31.7% of the variance in body shame was explained by these variables (see Table 2). Finally, male gender was predictive of appearance control beliefs (Step 1 = 4.6%), and elevated scores on extraversion ( $\Delta R^2 = .047, p < .01; \Delta f^2 = 0.05$ ) and conscientiousness ( $\Delta R^2 = .028, p < .01; \Delta f^2 = 0.03$ ) showed 7.5% overlapping variance with this BI dimension. Moreover, lower scores on gelotophobia ( $\Delta R^2 = .033, p < .01; \Delta f^2 = 0.04$ ) led to a significant increase in the variance explained in appearance control beliefs, apart from demographics and



HEXACO traits. The explained proportion of the overall variance in appearance control beliefs was 15.4% (see Table 2).

As for MBSRQ-AS, age and gender were not significant predictors of appearance evaluation (Step 1 = 1.4%). Using the HEXACO traits as predictors, elevated expressions of extraversion ( $\Delta R^2 = .195, p < .001; \Delta f^2 = 0.25$ ) and lower levels of emotionality ( $\Delta R^2 = .015, p < .05; \Delta f^2 = 0.02$ ) accounted for the 21% variance in this BI criterion. Moreover, decreased inclinations to gelotophobia ( $\Delta R^2 = .102, p < .001; \Delta f^2 = 0.15$ ) had an incremental value over these basic personality traits of the HEXACO model. In total, demographics and personality predictors explained the 32.6% variance in appearance evaluation (see Table 3). Furthermore, female gender predicted appearance orientation (Step 1 = 5.7%). As for the HEXACO model, high emotionality ( $\Delta R^2 = .094, p < .001; \Delta f^2 = 0.11$ ), low honesty-humility ( $\Delta R^2 = .065, p < .001; \Delta f^2 = 0.08$ ), and high conscientiousness ( $\Delta R^2 = .043, p < .001; \Delta f^2 = 0.06$ ) were the most predictive traits of this BI criterion, explaining the 20.2% variance in appearance orientation. An additional part of variance of this BI dimension was explained by heightened expressions of gelotophobia ( $\Delta R^2 = .075, p < .001; \Delta f^2 = 0.11$ ). Altogether, demographics, the HEXACO model, and gelotophobia accounted for 33.4% variation of appearance orientation (see Table 3). In regard to body areas satisfaction, demographic variables did not explain this dimension (Step 1 = 2.1%). By contrast, the HEXACO model yielded substantial effects on this BI criterion with greater scores on extraversion ( $\Delta R^2 = .117, p < .001; \Delta f^2 = 0.14$ ), and lower scores on emotionality ( $\Delta R^2 = .030, p < .01; \Delta f^2 = 0.04$ ) accounted for the 14.7% variance. Reduced expressions of gelotophobia ( $\Delta R^2 = .046, p < .001; \Delta f^2 = 0.06$ ) emerged as a significant predictor of appearance orientation, even controlling for the influence of demographics and HEXACO traits, for a total proportion of 21.4% of the overall variance in body areas satisfaction (Table 3).

**Table 2.** Regression Analysis Predicting Body Surveillance, Body Shame and Appearance Control Beliefs by Demographics and Personality Measures

Body Surveillance			Body Shame			Appearance Control Beliefs		
Predictors	$\Delta R^2$	$\beta$	Predictors	$\Delta R^2$	$\beta$	Predictors	$\Delta R^2$	$\beta$
Step 1: DEMO								
<i>Model 1</i>	.051**		<i>Model 1</i>	.035*		<i>Model 1</i>	.046**	
AGE		-.14*	AGE		.01	AGE		.10
GEN		-.16*	GEN		-.19**	GEN		.18**
Step 2: HEXACO								
<i>Model 2</i>	.092***		<i>Model 2</i>	.103***		<i>Model 2</i>	.047**	
AGE		-.11	AGE		.05	AGE		.07
GEN		-.01	GEN		-.19**	GEN		.18**
EMO		.34***	EXT		-.32***	EXT		.22**
<i>Model 3</i>	.027**		<i>Model 3</i>	.031**		<i>Model 3</i>	.028**	
AGE		-.12*	AGE		.06	AGE		.07
GEN		-.07	GEN		-.10	GEN		.18**
EMO		.33***	EXT		-.28***	EXT		.21**
H-H		-.18**	EMO		.20**	CON		.17**
<i>Model 4</i>	.015*		<i>Model 4</i>	.021*		<i>Model 4</i>	.033**	
AGE		-.12*	AGE		.05	AGE		.07
GEN		-.06	GEN		-.16*	GEN		.15*
EMO		.30***	EXT		-.27***	EXT		.06
H-H		-.14*	EMO		.20**	CON		.18**
AGR		-.13*	H-H		-.16*	GEL		-.24**
<i>Model 5</i>	.049***		<i>Model 5</i>	.127***				
AGE		-.11	AGE		.05			
GEN		-.05	GEN		-.11			
EMO		.23**	EXT		.01			
H-H		-.11	EMO		.11			
AGR		-.12	H-H		-.10			
GEL		.24***	GEL		.48***			
Total $R^2$	.234***			.317***			.154***	

$N = 240$ . Gender: 0 = female; 1 = male. DEMO = Demographics; GEN = Gender; EXT = Extraversion; EMO = Emotionality; AGR = Agreeableness; CON = Conscientiousness; H-H = Honesty-Humility; GEL = Gelotophobia; Step 1 (Method: enter); Step 2 (stepwise). \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . All VIFs  $\leq 1.82$

**Table 3.** Regression Analysis Predicting Appearance Evaluation, Appearance Orientation, Body Areas Satisfaction and Overweight Preoccupation by Demographics and Personality Measures

Appearance Evaluation			Appearance Orientation			Body Areas Satisfaction			Overweight Preoccupation		
Predictors	$\Delta R^2$	$\beta$	Predictors	$\Delta R^2$	$\beta$	Predictors	$\Delta R^2$	$\beta$	Predictors	$\Delta R^2$	$\beta$
Step 1: DEMO											
<i>Model 1</i>	.014		<i>Model 1</i>	.057**		<i>Model 1</i>	.021		<i>Model 1</i>	.048**	
AGE		.06	AGE		-.04	AGE		.08	AGE		.05
GEN		.09	GEN		-.23***	GEN		.11	GEN		-.22**
Step 2: HEXACO											
<i>Model 2</i>	.195***		<i>Model 2</i>	.094***		<i>Model 2</i>	.117***		<i>Model 2</i>	.033**	
AGE		.02	AGE		-.01	AGE		.05	AGE		.04
GEN		.09	GEN		-.09	GEN		.11	GEN		-.29***
EXT		.44***	EMO		.34***	EXT		.34***	H-H		-.20**
<i>Model 3</i>	.015*		<i>Model 3</i>	.065***		<i>Model 3</i>	.030**		<i>Model 3</i>	.042**	
AGE		.01	AGE		-.02	AGE		.04	AGE		.06
GEN		.04	GEN		-.19**	GEN		.03	GEN		-.25***
EXT		.42***	EMO		.33***	EXT		.31***	H-H		-.16*
EMO		-.14*	H-H		-.27***	EMO		-.20**	GEL		.21**
<i>Model 4</i>	.102***		<i>Model 4</i>	.043***		<i>Model 4</i>	.046***		<i>Model 4</i>	.015*	
AGE		.01	AGE		-.02	AGE		.03	AGE		.04
GEN		.01	GEN		-.19**	GEN		.01	GEN		-.24***
EXT		.17*	EMO		.32***	EXT		.14	H-H		-.15*
EMO		-.06	H-H		-.29***	EMO		-.14*	GEL		.35***
GEL		-.43***	CON		.21***	GEL		-.29***	SOA		-.19*
			<i>Model 5</i>	.075***							
			AGE		-.01						
			GEN		-.17**						
			EMO		.22***						
			H-H		-.24***						
			CON		.21***						
			GEL		.30***						
Total $R^2$	.326***			.334***			.214***			.138***	

$N = 240$ . Gender: 0 = female; 1 = male. DEMO = Demographics; GEN = Gender; EXT = Extraversion; EMO = Emotionality; AGR = Agreeableness; CON = Conscientiousness; H-H = Honesty-Humility; GEL = Gelotophobia; SOA = Social Anxiety; Step 1 (Method: enter); Step 2 (stepwise). \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . All VIFs  $\leq 2.29$

Considering those MBRSQ-AS dimensions that focused explicitly on weight-regarding perceptions, female gender explained overweight preoccupation (Step 1 = 4.8%) and lower scores on honesty-humility ( $\Delta R^2 = .033, p < .01; \Delta f^2 = 0.04$ ). Adding elevated scores on gelotophobia ( $\Delta R^2 = .042, p < .01; \Delta f^2 = 0.05$ ) into the regression equation had an incremental predictive value on this BI criterion over the influence of these variables. Moreover, low social anxiety ( $\Delta R^2 = .015, p < .05; \Delta f^2 = 0.02$ ) emerged as a significant predictor of the remaining variance in overweight preoccupation. Altogether, these predictors accounted for the 13.8% variance in overweight preoccupation (see Table 3). Finally, neither demographics (Step 1 = 1.2%) nor diverse personality measures were predictive of the variance in self-classified weight.

## Discussion

The present research contributes to narrowing a gap in the literature on the associations between BI and personality traits such as the fear of being laughed at. Three major findings emerged: (1) gelotophobia showed substantial correlations with diverse BI dimensions; (2) had unique contribution in the prediction of these dimensions beyond the HEXACO traits; and (3) had stronger incremental predictive values than social anxiety in the remaining variance in BI indicators after the inclusion of the six traits of the HEXACO model.

Regarding our preliminary analysis, descriptive statistics, age- and gender-based effects were consistent with prior studies (Ashton & Lee, 2009; Cash, 2000; Mattick & Clarke, 1998; McKinley & Hyde, 1996; Ruch & Proyer, 2008). Further, intercorrelations between the OBCS and MBSRQ-AS showed a good correspondence. Regarding the associations among personality measures, gelotophobia, and social anxiety were strongly correlated and both constructs showed similar associations with

the HEXACO model (i.e., correlates with high emotionality and low extraversion), which squares well with their partially overlapping nature (e.g., Carretero et al., 2010b). However, it should be noted that honesty-humility demonstrates an incremental value (with a small effect size) explaining individual differences in gelotophobia, whereas this basic trait did not account for social anxiety variation. This converges with earlier research showing that honesty-humility is related to gelotophobia (Torres-Marín et al., 2019) but unrelated to social fears (e.g., Ashton et al., 2008).

Regarding the associations of gelotophobia and BI, we first replicated the association of gelotophobia with high body surveillance, high body shame, and low appearance control beliefs (Moya-Garófano et al., 2019: Hypothesis 1). Our finding on gelotophobia and high body surveillance suggests that highly gelotophobia individuals are more inclined to self-monitor and compare (with others) their own physical appearance. One possible explanation is that these individuals may check how they look regularly with the purpose of avoiding sources of jokes or mockeries (e.g., to inspect what kind of clothes they are wearing, as well as their general aspect or hairstyle). Moreover, these individuals could compare themselves with similar peers to adjust their appearance, thus avoiding the risk of being the target of teasing.

Furthermore, the positive association of gelotophobia with body shame seems to indicate that those high in this disposition seem to be more likely to have negative impressions of their own bodies (in comparison with their social peers) and experience more intense shame feelings for not fulfilling social appearance criteria (see McKinley & Hyde, 1996). One might argue that these tendencies would be related to the firm convictions among highly gelotophobia individuals of appearing ridiculous to others and their inclinations to underestimate themselves (Ruch et al., 2014; Proyer, Wellenzohn, & Ruch, 2014). This finding is aligned with the predominant role of shame

in the daily lives of those high in gelotophobia (Platt & Ruch, 2009) and their inclinations to describe themselves as rather less attractive (Führ et al., 2015).

The negative association between gelotophobia and appearance control beliefs suggests that high scorers in gelotophobia arguably must think they have a reduced control over some elements of their physical appearance such as weight or shape, because these body-related aspects are mostly determined by external factors (e.g., genetic inheritance; McKinley & Hyde, 1996). Hence, those with an excessive fear of being laughed at would be more likely to believe that certain body characteristics susceptible to ridicule (e.g., deviations from normative peers in terms of weight or body's discrete aspects) cannot be modified regardless of their efforts. This fits well with earlier research postulating that to accept being a valid target of others' mockeries is a core feature of gelotophobia (e.g., Ruch et al., 2014). This also converges with gelotophobes' underestimation of their own abilities (Proyer et al., 2014).

Converging with our Hypothesis 2, we extended the association between gelotophobia and BI, showing that this laughter-related disposition was related to lower scores on appearance evaluation and body areas satisfaction, and greater ones on appearance orientation and overweight preoccupation. However, we did not meet all our expectations because gelotophobia was unrelated to self-classified weight.

Regarding appearance evaluation and body areas satisfaction and attending to their conceptualizations (see Cash, 2000), our results suggest that individuals having greater scores on gelotophobia might exhibit more negative assessments of both global appearance and its discrete elements, such as face, hair, muscular tone, or height, among others, than those scoring low in this laughter-related disposition. These findings converge well with other investigations showing that gelotophobia correlates with lower

self-perceptions of being attractive and reduced self-esteem (Führ, 2015; Ruch et al., 2014).

Similar to findings on body surveillance, gelotophobia was also positively related to appearance orientation, which suggests that highly gelotophobia individuals confer a considerable importance to how they look and present a greater investment in their appearance (see Cash, 2000). One might expect that individuals with an excessive fear of being laughed at would engage more often in behaviors such as clothes selection or personal grooming because an unkempt or disheveled appearance may be eye-catching for others and trigger others' laughs. Gelotophobia also correlates with low appearance control beliefs. Hence, one might expect that although those high in gelotophobia would get more involved in appearance-regarding behaviors, they are also more likely to believe that their efforts did not result in the desirable outcomes. An alternative explanation could be that those high scorers in gelotophobia would perceive certain quick-impact behaviors (e.g., clothing style) as useful, but they would have negative beliefs about the feasibility of those changes that require greater efforts (e.g., dieting). Future research should test these assumptions using behavioral data.

In addition, gelotophobia was positively related to overweight preoccupation. This means that heightened expression on gelotophobia may often be accompanied by greater feelings of fat anxiety and weight vigilance (Cash, 2000). As weight and shape disturbances are one the most common focus of mockeries and teasing (especially among children and adolescents; Kostanski & Gullone, 2007), it is reasonable to assume that high scorers in gelotophobia would have concerns about their weight and the possibility of being teased for that reason. This association also asserts that injurious experiences of weight-related teasing can be seen as a potential cause of gelotophobia (Kohlmann et al., 2018). Nevertheless, it should be noted gelotophobia was unrelated to

self-classified weight, suggesting that heightened expressions of this laughter-related disposition are not restricted to those suffering specific weight problems (i.e., overweight or underweight) but may rather be to those having cognitive disturbances of their own physical appearance (at least in young adults). An alternative implication would be that gelotophobia correlates with negative body perceptions, irrespective of current body proportions. Further research should explore this issue.

Further strengthening these findings, we found that these associations of gelotophobia with BI dimensions remained significant even after controlling for the influence of demographics and the six traits of the HEXACO model (Hypothesis 3). As indicated by earlier research on the HEXACO model and BI (Lodewyk & Sullivan, 2017; Visser & Pozzebon, 2013), emotionality and extraversion seems to be the more consistent predictor. In particular, emotionality was related to high body surveillance, high body shame, high appearance orientation, low appearance evaluation, and low body areas satisfaction. Moreover, extraversion was negatively related to body shame and positively to appearance control beliefs, appearance evaluation, and body areas satisfaction. These results are also highly comparable to prior FFM's findings (e.g., Allen & Walter, 2016). Furthermore, honesty-humility shows negative associations with body surveillance, body shame, appearance orientation, and overweight preoccupation in our sample. Importantly, the introduction of gelotophobia to the model significantly increased the amount of the BI variance explained (ranging from 3% [appearance control beliefs] to 13% [body shame]) after the inclusion of these traits. This suggests that the fear of being laughed at shows incremental validity on the prediction of the variation of these BI dimensions over and above the HEXACO model. One might argue gelotophobia captures some particularities underrepresented in the HEXACO model. Moreover, its incremental validity in BI variation squares well with prior research



highlighting the associations between gelotophobia and appearance-related teasing (Edward et al., 2010; Kohlmann et al., 2018; Ruch et al., 2014) and the role of this type of teasing in the elicitation of BI disturbances (Cash, 1995; Kostanski & Gullone, 2007; Menzel et al., 2010). Moreover, it is worth mentioning that while the associations of gelotophobia with high body shame and low appearance control beliefs seem to be stable across studies and personality models, the relation of this laughter-related disposition with body surveillance should be interpreted with caution, as other research showed that gelotophobia had no incremental validity on this BI facet after controlling the influence of FFM (Moya-Garófano et al., 2019). Future replications are needed to extend generalizability.

Finally, our research also incorporates social anxiety as an additional narrow trait, for which the effects on BI could go beyond the HEXACO model. As expected, social anxiety and gelotophobia showed closely equivalent associations with all the BI indicators (Hypothesis 4), with the exception of the absent correlation between social anxiety and overweight preoccupation. Furthermore, when gelotophobia and social anxiety were available for predicting BI variation beyond the HEXACO traits (hierarchical regression analyses), the laughter-related disposition showed the strongest incremental predictive values in the variance for the BI indicators (Hypothesis 5). A possible explanation would be that gelotophobia would have some additional particularities, not captured in social anxiety, which can be relevant for the development of BI disturbances. This proposition converges well with the idea that weight and shape and appearance-related teasing may be one of the influential factors in the presence of BI disturbances (Cash, 1995; Kostanski & Gullone, 2007). This also fits with the findings of Kohlmann et al. (2018), which suggest that appearance-regarding teasing can be seen as one of the causes of the development of an excessive fear of being

laughed at. This may be addressed by specific BI-based interventions. For instance, the use of programs aimed at minimizing the importance of weight or general appearance in self-evaluations.

Several limitations need mentioning. First, we used a non-probabilistic sampling that may limit the generalizability of our results. Hence future replications are needed in large samples. Cross-cultural research would be advisable for corroborating the plausible cultural modulations over the connections between gelotophobia and BI disturbances. Second, the selection of BI dimensions was not exhaustive and should be expanded in further investigations. Third, we only examined self-ratings. An extension toward peer-rating may contribute to avoid possible biases associated with self-descriptions and to test potential over- or underestimation of BI perceptions in relation to gelotophobia (see Proyer et al., 2014). Finally, longitudinal studies would help to clarify the causal sense between this disposition and BI disturbances.

Overall, this research reveals that an excessive fear of being laughed at correlates substantially with several BI indicators and that these associations go beyond the overlapping variance with HEXACO traits, such as emotionality, extraversion, and honesty-humility. This strengthens the differentiation of gelotophobia from broad personality traits, suggesting the presence of non-overlapping characteristics in this laughter-related construct. Moreover, we offered further supports for the distinction between gelotophobia and social anxiety, as this laughter-related disposition has the strongest values in predicting BI dimensions, which fits well with the role of appearance-regarding teasing in the elicitation of BI disturbances.

## **Chapter VII**

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*The fear of being laughed at, social anxiety and  
paranoid ideation: A multilevel confirmatory  
factor analysis of multitrait-multimethod data*



**The fear of being laughed at, social anxiety and paranoid ideation: A multilevel confirmatory factor analysis of multitrait-multimethod data**

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**Abstract**

The GELOPH-15 is a self-report measure that focuses on how people differ in their fear of being laughed at. This research examined the convergent-discriminant validity of this gelotophobia scale using a multitrait-multimethod (MTMM) approach in which we examined targets' scores on gelotophobia, social anxiety and paranoid ideation through self- and peer assessments. Data from 217 targets/self-raters and 651 peer raters (i.e., three close acquaintances per target) were gathered. First, multilevel confirmatory factor analyses (ML-CFA) showed that these personality constructs are empirically homogeneous and sufficiently independent of each other, considering both self- and peer reports. Moreover, the overlapping between self- and peer ratings for each assessed construct supported the convergent validity of the GELOPH-15. Discriminant validity analyses yielded gelotophobia's expected relationship patterns with social anxiety and paranoid ideation (i.e., strong associations but without being redundant). This research shows that ML-CFA-MTMM models might be a useful tool for analyzing the associations between partially overlapping constructs.

**Keywords:** confirmatory factor analysis; gelotophobia; GELOPH-15; social anxiety; paranoid ideation; multilevel analysis.

## Introduction

The fear of being laughed at or gelotophobia (*gelos* in Greek means *laughter*) is a young and still relatively understudied individual differences variable. This laughter-related disposition involves exaggerated negative responses to being laughed at along with misguided anticipations of being ridiculed by others (Ruch, 2009). Although first descriptions of this negative-biased perception of the laughter of others emerged from clinical observations (Titze, 2009), empirical investigations have ascertained that gelotophobia also shows meaningful variations in the subclinical range (Ruch & Proyer, 2008).

Substantial debate exists about the putative overlap between gelotophobia and social anxiety as both constructs share conceptual characteristics and similarly impair social functioning (Ruch, Hofmann, Platt, & Proyer, 2014a; Weiss et al., 2012). Previous investigations have demonstrated that gelotophobia strongly correlates with different social anxiety measurements in the subclinical range, but, importantly, this laughter-related disposition could not be fully accounted for by them, either singularly or in combination (Carretero-Dios, Ruch, Agudelo, Platt, & Proyer, 2010b; Edwards, Martin, & Dozois, 2010). Furthermore, it has been also argued that gelotophobia and paranoia may capture some common features of the same high-order latent dimension. In connection with this notion, laughter-related paranoid ideations are distinctive of the experiential world of those high in fear of being laughed at (Ruch & Proyer, 2009b), and individuals with either schizophrenia or paranoid personality disorders have a high prevalence of greater gelotophobia scores (Forabosco, Ruch, & Nucera, 2009; Weiss et al., 2012).

Although the abovementioned findings on gelotophobia and social anxiety have offered preliminary support for the distinction of these constructs, in-depth studies

incorporating further sources of information (e.g., peer ratings) and alternative analytical approaches are still needed. Moreover, no study has yet empirically tested the degree of overlap/independence between gelotophobia and paranoid ideation. Therefore, we aim at narrowing these gaps in the literature by analyzing the convergent and discriminant validity of a well-established gelotophobia measure (i.e., the GELOPH-15; Ruch & Proyer, 2008) using a multitrait-multimethod (MTMM) approach (Campbell & Fiske, 1959) in which we also studied social anxiety and paranoid ideation as target traits and self- and peer assessments as methods.

*Gelotophobia: Conceptualization, assessment, correlates and experimental data*

Gelotophobia is a personality trait describing how individuals differ in their fear of other people's laughter (Ruch et al., 2014a). Those high in this disposition are prone to experience others' smiles and laughs as mean-spirited cues regardless of the real meaning of these expressions (Hofmann, Platt, Ruch, & Proyer, 2015; Platt, 2008; Ruch, 2009; Ruch, Altfreder, & Proyer, 2009). The GELOPH-15 is a 15-item self-report assessment tool constructed to measure gelotophobia's core characteristics (Ruch & Proyer, 2008) that offers empirically derived cut-offs for the identification of no (1.00–2.49), slight (2.50–2.99), marked (3.00–3.49) and extreme (3.50–4.00) expressions of this disposition. The instrument involves statements about (a) attributing the laughter of others to oneself, (b) anticipations of ridicule by others, (c) negative responses to being laughed at, and (d) coping strategies for dealing with derision (e.g., controlling one's behaviors that could appear ridiculous). The results of psychometric analyses favor a one-factor solution on the basis of examining factor loadings and corrected item-total correlations showing a high internal consistency ( $\alpha = .93$ ) for the original version of this scale (Ruch & Proyer, 2008). Cross-cultural research involving data of non-clinical



adults from 73 countries (93 samples/22,610 adults) replicated these findings (mean  $\alpha = .85$ ) and revealed that at least slight expressions on this disposition exist across diverse cultural backgrounds (Proyer et al., 2009). Importantly, the GELOPH<15> has been translated and validated into multiple languages and shown a robust single dimension and highly comparable internal consistency ( $\alpha \geq .80$ ) scores (e.g., Arabic version by Kazarian, Ruch, & Proyer, 2009; Chinese by Chen, Liao, Proyer, & Ruch, 2010; English by Platt, Proyer, & Ruch, 2009; French by Samson, Thibault, Proyer y Ruch, 2010; German by Ruch & Proyer, 2008; Spanish by Carretero-Dios, Proyer, Ruch, & Rubio, 2010a).

Previous research has also highlighted an adequate construct validity of the gelotophobia trait based on its relationships with other relevant personality criteria. For instance, the fear of being laughed at has shown positive correlations with neuroticism and negative correlations with extraversion and openness to experience using the Five-Factor Model (Ďurka & Ruch, 2015; Ruch, Harzer, & Proyer, 2013). Similarly, gelotophobia also correlates positively with the older, more clinically saturated variants of the PEN model's psychoticism scale (Ruch & Proyer, 2009b) and negatively with honesty-humility using the HEXACO model (Torres-Marín, Proyer, López-Benítez, Brauer, & Carretero-Dios, 2019). Furthermore, gelotophobia has also shown theoretically consistent correlates with narrower personality traits and more specific behaviors/internal experiences. For instance, heightened gelotophobia levels were associated with low cheerfulness and high bad mood (Ruch, Beermann, & Proyer, 2009), greater anger-proneness (Weiss et al., 2012), negative expressions of virtuousness (Proyer, Wellenzohn, & Ruch, 2014), high Machiavellianism and low narcissism (Torres-Marín et al., 2019), disturbances in body image (Kohlmann et al., 2018; Moya-Garófano, Torres-Marín, Carretero-Dios, 2019), and lower relationship

satisfaction levels (Brauer & Proyer, 2018). Altogether, these findings comfortably fit the prior assumptions about gelotophobia and suggest that this laughter-related disposition is a non-overlapping trait because of its relations with higher- and lower-order personality traits.

The incorporation of experimental designs has also extended the construct validity of the gelotophobia measure. Prior investigations demonstrated that individuals scoring high in gelotophobia (hereafter *gelotophobes*) were more likely to perceive the smiles and laughter of others as malicious or ill-willed (Ruch et al., 2009). This was consistent with these individuals' difficulties in discriminating between positively and negatively motivated laughter, because they respond similarly to mean-spirited ridicule and good-natured forms of teasing (Platt, 2008). Importantly, it has also been proven that gelotophobes exhibited less joyful smiles and more contemptuous expressions in response to joyful stimuli, especially to laughter-eliciting emotions (Platt, Hofmann, Ruch, & Proyer, 2013; Hoffman, Platt, Ruch, and Proyer, 2015; Ruch, Hofmann, & Platt, 2015). Moreover, they perceived as more potentially malicious those characteristics of others' laughter that may denote down regulation or voluntary modulation (e.g., restricted facial expression and disproportioned body movements; Ruch et al., 2014b). Furthermore, including central and peripheral measures (e.g., EEG and heart rate) in the study of gelotophobia revealed that gelotophobes have poor neuronal protection in the processing of angry and aggressive social cues (Papousek, Schulter, Rominger, Fink, and Weiss, 2016). Gelotophobes also experience heart rate decelerations or "freezing-like" responses to others' laughter, suggesting that this stimulus might be seen as a fear elicitor among these individuals (Papousek et al., 2014).

*The association between gelotophobia and social anxiety*

An evident overlap exists between gelotophobia and social anxiety that results from their common introverted neurotic nature (Ďurka & Ruch, 2015; Kotov, Watson, Robles, Schmidt, 2007; Ruch et al., 2014). Both constructs share certain underlying characteristics such as an excessive fear of negative evaluation, shyness, somatic signs of anxiety, increased attention to social threats and social withdrawal (Ďurka & Ruch, 2015; Kotov et al., 2007; Ruch, 2009; Ruch et al., 2014a; Weiss et al., 2012). This notion also converges well with overlapping correlates, such as, among others, increased anger-proneness (Kashdan & McKnight, 2010; Papousek et al., 2016; Weiss et al., 2012), victim or bullying-type behaviors (already in young children and in adolescents; Navarro, Yubero, Larrañaga, & Martínez, 2011; Proyer, Neukom, Platt & Ruch, 2012b) or inefficient/poor emotional regulation (Goldin, Jazaieri, & Gross, 2014; Papousek et al., 2009).

Carretero-Dios et al. (2010b) provided the first empirically robust support for the non-redundancy of gelotophobia and social anxiety. Using a psychometric approach, the authors conducted a set confirmatory factor analyses involving items of gelotophobia, fear of a negative evaluation and social anxiety measurements. Although these dimensions were highly correlated ( $.47 \leq r_s \leq .64$ ), the authors observed that the model with three factors, which could clearly be labeled as the abovementioned target dispositions, had the best fit compared with either one- or two-factor models (in any type of combination). Therefore, it seems that the three constructs do not perfectly overlap. Shortly after, Edwards et al. (2010) replicated the strong associations of gelotophobia with fear of a negative evaluation ( $r = .70$ ) and social anxiety ( $r = .67$ ) dispositions. Moreover, they also indicated that the connection between gelotophobia and a history of being teased went over and above the influence of social anxiety.

Accordingly, Platt, Ruch, Hofmann, & Proyer (2012), in a study that aimed to define gelotophobia's core components, argued that the heightened expression of this disposition can be differentiated from other anxiety-related constructs. This differentiation could exist on the basis that overreactions to being laughed at and groundless/near-paranoid anticipations of ridicule can be seen as specific/more directly related features of the fear of being laughed at.

Other studies have also reported certain gelotophobia-based effects that emerged beyond the influence of social anxiety; for example, the increased tendency to perceive certain features of laughter as malicious (Ruch et al., 2014b) and difficulties in discriminating gaze direction in recreated one-on-one interactions (Torres-Marín, Carretero-Dios, Acosta, & Lupiáñez, 2017). In another study, Ritter, Brück, Jacob, Wildgruber, and Kreifelts (2015) reported that the negative laughter interpretation and attention bias away from joyful laughter present in highly socially anxious individuals were fully mediated by their gelotophobia scores. Recently, a study of the prevalence of greater gelotophobia scores in a clinical sample with social anxiety suggested that the fear of being laughed at could be seen as additional criterion for the diagnosis of this disorder (Havranek et al., 2017).

#### *The association between gelotophobia and paranoia*

Unlike the gelotophobia–social anxiety association, little is known about the degree of distinctiveness between gelotophobia and paranoia in either clinical or subclinical settings. These constructs share substantial manifestations as cognitive distortions that involve fear and mistrust of other individuals' intentions (Ruch et al., 2014a; Fenigstein & Vanable, 1992). Heightened expressions of gelotophobia are linked to laughter-related paranoid ideations such as being suspicious when another person laughs

(referring to oneself) and attributing negative affective states to the laugher and good-natured mockeries of others (Platt, 2008; Ruch et al., 2009; Ruch & Proyer, 2009). This near-paranoid sensitivity to offense through ridicule represents a main component of gelotophobia and may be differentiated from general paranoia because it would be confined (or more specifically related) to laughter-related scenarios (Platt et al., 2012). Research on gelotophobia among psychiatric patients reveals greater scores on this disposition in personality disorders that may involve paranoid beliefs, such as schizophrenia, and those belonging to the Cluster A personality disorders ( $\approx$  50-60%; Forabosco et al., 2009; Weiss et al., 2012).

Other findings also seem to suggest a partial overlap without being redundant between gelotophobia and paranoia. On one hand, the comorbidity fits well with data on convergent correlates between these two constructs. They have in common associations with high neuroticism (Đurka & Ruch, 2015; Freeman, Evans, & Lister, 2012), low self-esteem (Hiranandani & Yue, 2014; Kesting, Bredenpohl, Klenke, Westermann, & Lincoln, 2013) and heightened expressions of hostility and psychoticism (Rawlings & Freeman, 1996; Ruch & Proyer, 2009; Weiss et al., 2012), among others. It also worth mentioning that paranoia is highly interrelated with social anxiety; therefore, most of the abovementioned features shared between gelotophobia and social anxiety are also applicable to paranoia (Lysaker et al., 2010; Piccirillo & Heimberg, 2016; Rietdijk et al., 2009). On the other hand, divergent correlations exist between gelotophobia and paranoia that support their non-redundancy. For instance, it has been proven that paranoia correlates positively with some facets of narcissism (Cicero & Kerns, 2011), whereas gelotophobia correlates with negative expression of this Dark Triad trait (Torres-Marín et al., 2019). In the clinical setting, paranoia manifestations have been linked to guilt feelings (Lake, 2008). On the contrary, the fear of being laughed at

existed independently from guilt-proneness in the subclinical range (Proyer, Platt, & Ruch, 2010). Finally, biased perceptions of faces displaying positive emotions have been associated with gelotophobia and not paranoia (Combs, Michael, & Penn, 2006; Hoffman, Platt, Ruch, & Proyer, 2015).

Based on these findings, one might conclude that gelotophobia seems to be a strongly correlated but also sufficiently different construct from social anxiety and paranoia. Nevertheless, no comprehensive multimethod studies have analyzed the convergent-discriminant validity of the GELOPH-15, including measures of social anxiety and paranoid ideation. The present research aimed at contributing to the ongoing debate concerning the distinctiveness of gelotophobia–social anxiety and gelotophobia–paranoid ideation. Complementary to this aim, this research also provides additional support for the association between social anxiety and paranoid ideation. Beyond that, we aimed at showing how multilevel confirmatory factor analysis (ML-CFA) of MTMM data (Eid et al., 2008) can be used to examine the reliability and convergent and discriminant validity of scales.

#### *The multitrait-multimethod approach*

The MTMM approach involves the assessment of more than one construct using more than one assessment method for each construct and results in a matrix of correlations among these measures (Campbell & Fiske, 1959). To obtain evidence of convergent and discriminant validity, Campbell and Fiske (1959) suggested analyzing the correlation matrix defined by different traits and methods. High heteromethod-monotrait correlations and low monomethod-heterotrait correlations would support good convergent validity. Further, a reasonably low correlation between different constructs, whether they are measured with the same or a different method, would be

evidence of good discriminant validity. In short, convergent validity requires a high overlap between alternative instruments assessing the same construct, and discriminant validity entails that a construct should not correlate highly with another independent construct that uses the same measurement method. Moreover, convergent validity implies small method effects (Maas, Lensvelt-Mulders, & Hox, 2009).

In the study of overlap between gelotophobia, social anxiety and paranoid ideation, multimethod approaches supplementing traditional self-reports with other non-self-report measures are still missing. No studies in this research area have examined convergent and discriminant validity of these constructs simultaneously assessed using self-reports in conjunction with other assessment methods. Moreover, it is worth mentioning that Campbell-Fiske's (1959) suggestion to analyze the convergent and discriminant validity of the constructs is based on the observation of zero-order correlations. However, contemporary analysis has moved beyond this analytic approach to more complex strategies based on latent variable modeling that allow for a more rigorous evaluation of the influences of trait and method factors on supposedly observed measures of a given construct (Eid, 2006). In this sense, CFA models or structural equation modeling have become the most often applied methodological strategies beyond the classical approach based on the inspection of a correlation matrix (Eid et al., 2008). Indeed, in recent years various structural equation models of MTMM data have been proposed (for an overview see, e.g., Eid, Lischetzke, & Nussbeck, 2006). Linking to this, Eid et al. (2008) have shown that ML-CFA models are appropriate in cases of the most commonly used assessment methods (self-ratings vs. peer ratings). Due to the advantages of multilevel analysis, it has been suggested that the most appropriate CFA strategy for this type of data would be ML-CFA (Hox, 2002; Muthén, 1994).

*Aims of the present research*

The main aim of the present research was to analyze the convergent and discriminant validity of a well-established gelotophobia scale (i.e., the GELOPH-15; Ruch & Proyer, 2008) using an MTMM approach (Campbell & Fiske, 1959). For that purpose, we assessed targets' gelotophobia, social anxiety and paranoid ideation through self- and peer ratings. We then examined the latent structure of the associations among these personality constructs using a set of two-trait ML-CFAs. We expected that gelotophobia, social anxiety and paranoid ideation would partially overlap but without being redundant (H1). The convergent validity of the GELOPH-15 was further explored analyzing its associations using two different types of informants or methods (i.e., self- and peer ratings). In this sense, the correlations between self- and peer reports are typically in the range of  $r = .25$  and  $r = .58$  to be able to conclude convergent validity (see Watson, Hubbard, & Wiese, 2000). It was hypothesized that this gelotophobia scale would show an appropriate convergent validity (H2). To analyze discriminant validity, we assessed social anxiety and paranoid ideation constructs, in addition to gelotophobia. First, we expected a strong positive correlation between gelotophobia and social anxiety based on earlier research (e.g., Carretero-Dios et al., 2010b; H3). Furthermore, although gelotophobia and social phobia have a variety of shared characteristics (e.g., preoccupation with fear of negative evaluation; Weiss et al., 2012), the overlap between gelotophobia and paranoid ideation may be circumscribed to the paranoid sensitivity towards others, although perhaps only when laughter, smiling or a funny context are involved. Therefore, we expect weaker positive correlations between gelotophobia and paranoid ideation than between this laughter-related disposition and social anxiety (H4). Complementary to this notion, concerning the association between paranoid ideation and social anxiety, previous investigations have shown that paranoid thinking and social



anxiety are highly comorbid in clinical settings (e.g., Gilbert, Boxall, Cheung, & Irons, 2005) and non-clinical populations (e.g., Matos, Pinto-Gouveia, & Gilbert, 2012); therefore, we also expected a strong positive correlation between these constructs (H5).

The convergent-discriminant validity was analyzed with ML-CFA of MTMM data (Eid et al., 2008). As will be discussed in the method section, this analytical strategy allows the separation of measurement error from true method-specific effects while it considers that the chosen methods are both structurally different (self-reports vs. peer reports) as well as interchangeable (multiple peer reports).

## **Method**

### *Participants and procedure*

In the first phase, 217 Spanish undergraduate students (169 women, 48 men) completed self-reported measures of gelotophobia, social anxiety and paranoid ideation, using paper-and-pencil format in a single session in their classrooms. The participants' ages ranged from 18 to 51 years ( $M = 20.76$ ,  $SD = 5.12$  years). Second, the 217 participants were asked to choose three close acquaintances to rate them on the peer evaluation version of the measures (resulting in  $n = 651$  paper-and-pencil peer reports). It is worth mentioning that participants were instructed to select three friends or relatives who know them well enough to provide a valid evaluation.

This research protocol was approved by the local ethics committee and performed in accordance with the Ethical Standards of the 1964 Declaration of Helsinki. Before beginning the study, we provided a general description of our aim (i.e., this study has the aim to assess certain personality characteristics among undergraduates) and emphasized the voluntariness and confidentiality of their responses. Participants obtained course credits in exchange for their participation.

*Measures*

The *GELOPH-15* (Ruch & Proyer, 2008; Spanish version by Carretero et al., 2010a) consists of 15 positively keyed items that assess the gelotophobia trait (e.g., “When they laugh in my presence, I get suspicious”). Respondents answer on a 4-point scale (1 = *strongly disagree*; 4 = *strongly agree*). It demonstrates good reliability ( $\alpha \geq .80$ ; retest reliability = .80 [6-month interval]), broad evidence of factorial validity (i.e., robust one-factor solution) and convergent and discriminant validity based on its correlates with other personality and social criteria.

The *Social Interaction Anxiety Scale* (SIAS; Mattick and Clarke, 1998; Spanish version by Olivares et al., 2001) consists of 20 items that assess social anxiety (“I get nervous if I have to speak with someone in authority (teacher, boss, etc.).” Respondents answer using a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*totally*). This measure has demonstrated good reliability ( $\alpha \geq .88$ ), in conjunction with satisfying support for its one-factor structure and adequate correspondence to other social anxiety measures.

The *Paranoia Scale* (PS; Fenigstein & Venable, 1992; Spanish version by García-Montes, Cangas, Pérez-Álvarez, Hidalgo, & Gutiérrez, 2005) consists of 20 items that assess paranoid thoughts (e.g., “I believe that I have often been punished without cause”). Respondents answer using a 5-point scale ranging from 1 (*not at all applicable*) to 5 (*extremely applicable*). This measure has good internal consistency (e.g.,  $\alpha \geq .81$ ; retest reliability = .70 [6-month interval]) and strong support for its one-factorial solution and external validity based on its correlates with other criteria.

*Structural equation modeling of MTMM data*

We analyzed the MTMM data with CFA. There are excellent revisions where the most important MTMM models are exposed (e.g., Eid et al., 2006). When deciding which model to use to analyze the data, one of the most important criteria is the types of methods applied (Eid et al., 2008). In this sense, it is important to define whether the methods are interchangeable or structurally different. Methods are interchangeable if they are randomly selected from the same set of methods. If raters are considered methods (see Kenny, 1995), then interchangeable raters are raters that are randomly selected from the same class of raters. Hence, the three different peer raters in this study are considered interchangeable raters. Unlike interchangeable methods, the structurally different methods are not selected from the same set of methods. For instance, self-ratings can be considered structurally different methods, in contrast to peer ratings.

When both interchangeable and structurally different methods are used in the same study, a set of ML-CFA models can be applied (see Eid et al., 2008). In this research, the methods have a nested (multilevel) structure: interchangeable raters (friends) are Level-1 units who are nested within targets (Level-2 units). The sampling procedure for interchangeable raters is conceptualized as a two-step procedure. First, we selected a sample of targets (participants who answered the self-report scales). Second, each target chose a sample of raters (i.e., three close acquaintances or friends) from a group of possible raters. For this type of data, the ML-CFA approach is the most appropriate CFA approach (Hox, 2002; Muthén, 1994). In addition, we applied this ML-CFA plan along with the correlated trait-correlated method minus one [CT-C( $M-1$ )] strategy (Eid, Lischetzke, Nussbeck, & Trierweiler, 2003; Gaudron & Vautier, 2007; Mitte, & Kämpfe, 2008). In sum, we used a ML-CT-C( $M-1$ ) approach to analyze our data.

In CT-C( $M-1$ ) (Eid et al., 2006), one method is selected as the reference method (i.e., GELOPH-15; self-ratings of gelotophobia in this study). For this method, no latent method factor is defined, whereas method factors are considered for all non-reference methods (peer ratings, in our case). To apply the CT-C( $M-1$ ) approach, a reference method must be chosen with the aim of being compared with the rest of the methods. The choice of the GELOPH<15> as reference method was determined by the main aim of the present study (i.e., to analyze the convergent and discriminant validity of this instrument). Moreover, we have, as central methods, the self-report of the trait scales.

The absence of method factors for the reference method means that the common trait factors in the CT-C( $M-1$ ) model reflect the traits measured by the reference method. Consequently, a score on a method factor (peer rating, in our case) represents the deviation of an error-free value (true value) of a non-reference method from its expected value, given the reference method; that is, the GELOPH<15> self-report in this study (Eid et al., 2008). A method factor reflects the overestimation or underestimation of a target by a specific method, with respect to the prediction based on the reference method (Geiser, Eid, & Nussbeck, 2008). Hence, the method factors are uncorrelated with all trait factors (gelotophobia, social anxiety and paranoid ideation) of the same dimension. In the CT-C( $M-1$ ) approach, convergent validity is defined as the amount of variance of the non-reference methods (peer report) that is determined by the self-report. In addition, the generalizability of method effects across traits can be studied, observing the correlations of the method factors belonging to the same method but different traits.

Another important point to consider relates to the variance components provided by the multilevel CT-C( $M-1$ ) model for interchangeable and structurally different methods. Specifically, the present research must take four variance components into account: (1)

the convergent validity of self and peer ratings (consistency coefficient), (2) the consistency of peer ratings (common method-specificity coefficient), (3) the unique method influence (unique method specificity coefficient), and (4) the reliability (the ratio of explained to observed variance). In more detail, *consistency coefficient* is the proportion of true variance of an indicator of a non-reference method that is explained by the reference method. The *common method-specificity coefficient* reflects the proportion of true variance of an interchangeable non-reference method (peer rating) shared with the other interchangeable methods (other peer ratings), but not shared with the reference method (self-report). The *unique method-specificity coefficient* is the proportion of true variance of an interchangeable non-reference method that is due to the variability of the single non-reference method (single peer rater), and neither shared with the reference method (self-report) nor with the other non-reference methods (other peers). The *reliability* is the proportion of variance of an observed variable that can be explained by the latent variable and is not due to measurement error.

Finally, critical information about the discriminant validity and the generalizability of method effects can be obtained by analyzing the correlations between the latent variables. The degree of discriminant validity is provided for the correlations between trait factors (gelotophobia, social anxiety and paranoid ideation), and the generalizability of common and specific method effects is provided by the correlations between different method factors.

*Definition of a ML-CT-C(M-1) model for gelotophobia, social anxiety and paranoid ideation.*

In this study, we collected target self-reports (Method 1: reference method), and peer reports (Method 2) of gelotophobia (GELO: Trait 1), social anxiety (SOAN: Trait

2), and paranoid ideation (PAID: Trait 3). To competently distinguish between measurement error and true differences, we created item parcels. Indeed, we constructed three indicators (i.e., item parcels) per factor. We had a total of 18 observed variables for three traits (6 indicators for gelotophobia, social anxiety, and paranoid ideation, respectively). This model is depicted in Figure 1. In the results section, we provide a detailed explanation of this figure and the meaning of the parameters. We used MLR estimator, which accounts for the non-independence of observations, as well as the possible non-normality of the data. It should be noted that we conducted all analyses using Mplus 8.1 (Muthén & Muthén, 2018).

Prior to applying ML-CFAs, it is important to determine how large the sample size must be. Although the number of level-1 units (within clusters) is less important, including a sufficient number of level-2 units is essential. Taking into account previous simulation studies (Hox & Maas, 2001), attaining valid results from multilevel factor analysis requires at least 100 Level-2 units, and this is the case in the present research. Further, it is crucial that the number of clusters be larger than the number of parameters requiring estimation to avoid biased estimates of standard errors. Due to the complexity of our model, the number of parameters requiring estimation is larger than the number of clusters. As a result, we have reduced the complexity of the model, limiting the analysis to only two traits. That is, we computed the model to analyze the associations of gelotophobia-social anxiety (GELO-SOAN model), gelotophobia-paranoid ideation (GELO-PAID model), and social anxiety-paranoid ideation (SOAN-PAID model), respectively. At this form, we reduce the number of models for analysis by omitting one of the traits depicted in Figure 1. This strategy allows us to obtain all the information needed to achieve the research aims of the present study. In the appendix, we provide an

example of an input for this model for the computer program Mplus (Muthén & Muthén, 2018).

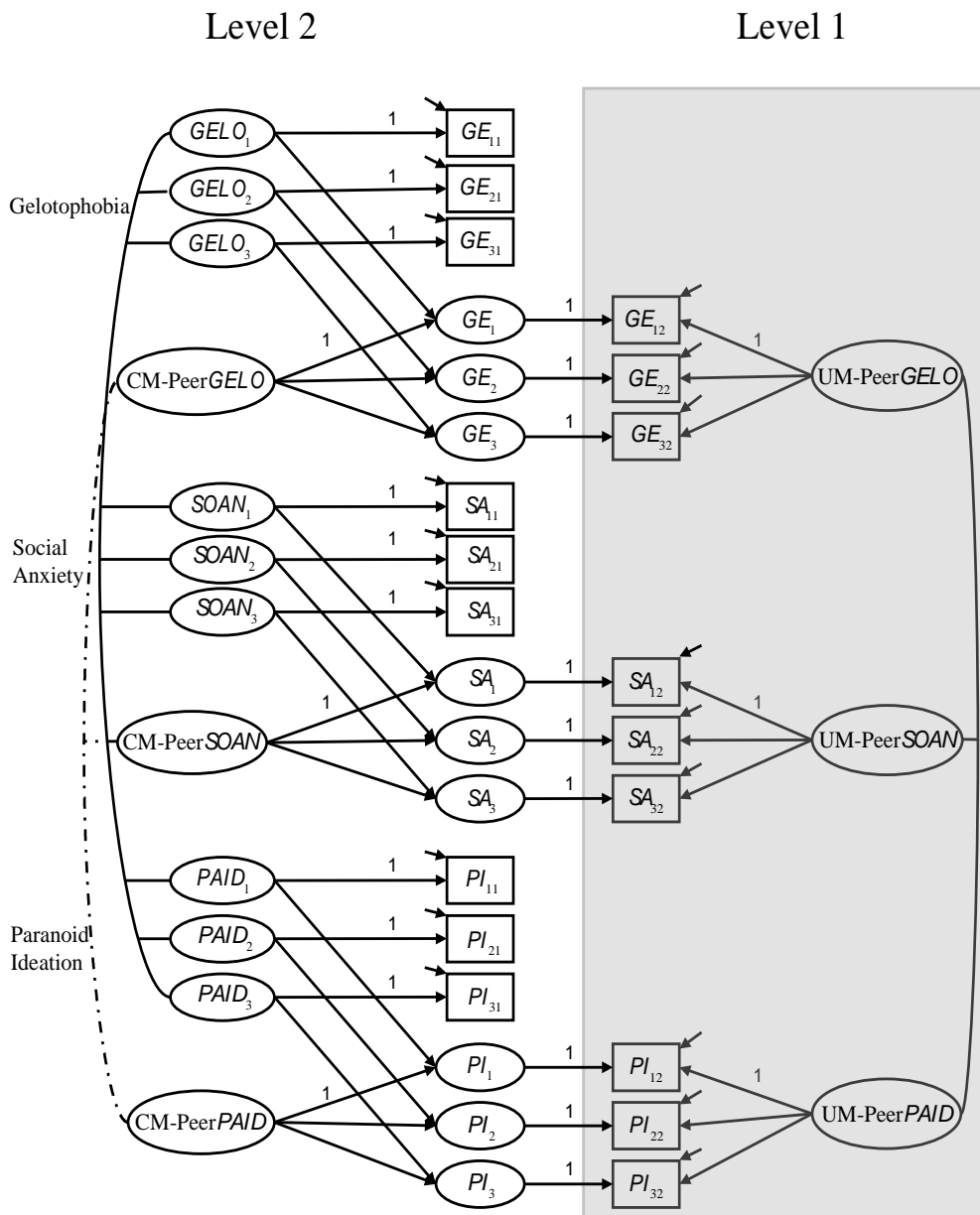


Figure 1. Multilevel confirmatory factor analysis-multitrait-multimethod (ML-CFA-MTMM) model of Gelotophobia, Social Anxiety and Paranoid Ideation for structurally different and interchangeable methods with indicator-specific trait variables. *GELO* = gelotophobia self-report factor; *SOAN* = social anxiety self-report factor; *PAID* = paranoid ideation self-report factor. *CM-PeerGELO* = common method factor of the peer ratings of gelotophobia; *CM-PeerSOAN* = common method factor of the peer ratings of social anxiety; *CM-PeerPAID* = common method factor of the peer ratings of bad paranoid ideation. *UM-PeerGELO* = unique method factor of the peer ratings of gelotophobia; *UM-PeerSOAN* = unique method factor of the peer ratings of social anxiety; *UM-PeerPAID* = unique method factor of the peer ratings of bad paranoid ideation.  $GE_{ik}$  = observed indicators for gelotophobia;  $SA_{ik}$  = observed indicators for social anxiety;  $PI_{ik}$  = observed indicators for paranoid ideation;  $i$  = indicator;  $k$  = method;  $GE_i$  = level-2 variable for the peer reports of gelotophobia;  $SA_i$  = level-2 variable for the peer reports of social anxiety;  $PI_i$  = level-2 variable for the peer reports of paranoid ideation.



**Results**

Table 1 shows that the three two-trait models fit the data well. We compared this basic model (ML-CFA-MTMM model) with a more restricted model, in which the loadings of the indicators belonging to the same peer-factor (Level-1 and Level-2) were fixed as one. Moreover, the loadings of self-report indicators and loadings of peer report indicators were fixed to be equal across trait factors (ML-CFA-MTMM Model with Homogeneous Loading Structure). Importantly, these more restrictive models also fit the data well (Table 1). The MLR chi-square difference tests did not show any statistically significant difference between the less and more restrictive models, GELO-SOAN model: Scaled  $\chi^2$  difference = 17.69,  $df = 12$ ,  $p = .12$ ; GELO-PAID model: Scaled  $\chi^2$  difference = 8.98,  $df = 12$ ,  $p = .70$ ; SOAN-PAID model: Scaled  $\chi^2$  difference = 19.32,  $df = 12$ ,  $p = .07$ . Consequently, we decided to report only the results of the more restrictive model.

**Table 1.** Fit of the ML-CFA-MTMM Models

	$\chi^2 (N = 651)$	CFI	RMSEA	SRMR <sub>Level-1</sub>	SRMR <sub>Level-2</sub>
<i>ML-CFA-MTMM Model</i>					
GELO-SOAN model	41.80	.99	.01	.03	.05
GELO-PAID model	49.19	.99	.02	.03	.14
SOAN-PAID model	48.81	.99	.02	.02	.06
<i>ML-CFA-MTMM restrictive model</i>					
GELO-SOAN model	58.59	.99	.01	.03	.06
GELO-PAID model	57.97	.99	.01	.02	.07
SOAN-PAID model	64.38	.99	.02	.02	.06

*Note.* GELO-SOAN model = model in which gelotophobia and social anxiety dimensions were considered. GELO-PAID model = model in which gelotophobia and paranoid ideation dimensions were considered. SOAN-PAID model = model in which social anxiety and paranoid ideation dimensions were considered. CFI = comparative fix index. RMSEA = root-mean-square error of approximation. SRMR<sub>Level-1</sub> = standardized root mean square residual on Level-1. SRMR<sub>Level-2</sub> = standardized root mean square residual on Level-2. Level-1  $df = 40$ . Level-2  $df = 81$ .

The estimated means, unstandardized loading parameters, and error variances are shown in Table 2. The standardized loading parameters and coefficients of reliability, consistency, method specificity, common method specificity, and unique method specificity can be observed in Table 3.

Next, we explain the results with regard to Trait 1 (gelotophobia) to exemplify the meaning of the model. The first three observed variables those measuring the factor *gelotophobia* by self-report (i.e.,  $GE_{11}$ ,  $GE_{21}$ ,  $GE_{31}$ ). The standardized loading parameters for these self-reported indicators were high (between .78 and .94; see Table 3 and Figure 2). Moreover, their reliability coefficients were between .61 and .88, showing that the trait gelotophobia is measured with high reliability. These coefficients are equal to the squared standardized loading parameters. It is important to underline that no method factor exists for the observed self-report [CT-C( $M-1$ ) model].

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**Table 2.** Means, Factor Loadings, and Error Variances for the ML-CT-C(M-1) Model for Structurally Different and Interchangeable Raters

Indicator	Means	Trait factor loading	Common Method factor loading (peer ratings)	Unique method factor loading	Error variance
<i>Gelotophobia</i>					
Self-report					
<i>GE</i> <sub>11</sub>	1.84	1.00			0.07
<i>GE</i> <sub>21</sub>	1.79	1.00			0.12
<i>GE</i> <sub>31</sub>	2.08	1.00			0.04
Peer-report					
<i>GE</i> <sub>12</sub>	1.73	.27	1.00	1.00	0.14
<i>GE</i> <sub>22</sub>	1.73	.27	1.00	1.00	0.19
<i>GE</i> <sub>32</sub>	1.79	.27	1.00	1.00	0.17
<i>Social Anxiety</i>					
Self-report					
<i>SA</i> <sub>11</sub>	1.17	1.00			0.05
<i>SA</i> <sub>21</sub>	1.26	1.00			0.12
<i>SA</i> <sub>31</sub>	0.95	1.00			0.10
Peer-report					
<i>SA</i> <sub>12</sub>	1.01	.41	1.00	1.00	0.10
<i>SA</i> <sub>22</sub>	1.05	.41	1.00	1.00	0.13
<i>SA</i> <sub>32</sub>	0.78	.41	1.00	1.00	0.12
<i>Paranoid Ideation</i>					
Self-report					
<i>PI</i> <sub>11</sub>	2.04	1.00			0.05
<i>PI</i> <sub>21</sub>	2.39	1.00			0.10
<i>PI</i> <sub>31</sub>	1.81	1.00			0.10
Peer-report					
<i>PI</i> <sub>12</sub>	1.99	.35	1.00	1.00	0.08
<i>PI</i> <sub>22</sub>	2.09	.35	1.00	1.00	0.13
<i>PI</i> <sub>32</sub>	1.90	.35	1.00	1.00	0.12

*Note.* ML-CT-C(M-1) = multilevel correlated trait-correlated (method-1) model; GE = gelotophobia; SA = social anxiety; PI = paranoid ideation. The estimates refer to the models in which gelotophobia was always included. The results differ only marginally in the other models.

**Table 3.** Standardized Factor Loadings, and Coefficients of Consistency, Unique Method Specificity, and Reliability Estimated for the ML-CT-C(M-1) Model for Structurally Different and Interchangeable Raters

Indicator	Trait factor loading	Common Method factor loading (peer ratings)	Unique Method factor loading	Consistency	Common method specificity (peer ratings)	Unique method specificity	Reliability
<i>Gelotophobia</i>							
Self-report							
<i>GE</i> <sub>11</sub>	.85						.72
<i>GE</i> <sub>21</sub>	.78						.61
<i>GE</i> <sub>31</sub>	.94						.88
Peer-report							
<i>GE</i> <sub>12</sub>	.61	.79	.83	.08	.14	.79	.57
<i>GE</i> <sub>22</sub>	.61	.79	.65	.08	.14	.79	.50
<i>GE</i> <sub>32</sub>	.68	.74	.67	.11	.13	.76	.52
<i>Social Anxiety</i>							
Self-report							
<i>SA</i> <sub>11</sub>	.93						.86
<i>SA</i> <sub>21</sub>	.85						.72
<i>SA</i> <sub>31</sub>	.89						.79
Peer-report							
<i>SA</i> <sub>12</sub>	.65	.76	.83	.15	.22	.63	.78
<i>SA</i> <sub>22</sub>	.64	.77	.80	.15	.22	.64	.73
<i>SA</i> <sub>32</sub>	.67	.74	.81	.17	.21	.62	.75
<i>Paranoid Ideation</i>							
Self-report							
<i>PI</i> <sub>11</sub>	.93						.86
<i>PI</i> <sub>21</sub>	.88						.77
<i>PI</i> <sub>31</sub>	.87						.76
Peer-report							
<i>PI</i> <sub>12</sub>	.63	.78	.90	.09	.14	.77	.84
<i>PI</i> <sub>22</sub>	.63	.78	.85	.09	.14	.77	.77
<i>PI</i> <sub>32</sub>	.62	.78	.86	.09	.14	.77	.77

*Note.* ML-CT-C(M-1) = multilevel correlated trait-correlated (method-1) model; GE = gelotophobia; SA = social anxiety; PI = paranoid ideation. The estimates refer to the models in which gelotophobia was always included. The results differ only marginally in the other models.

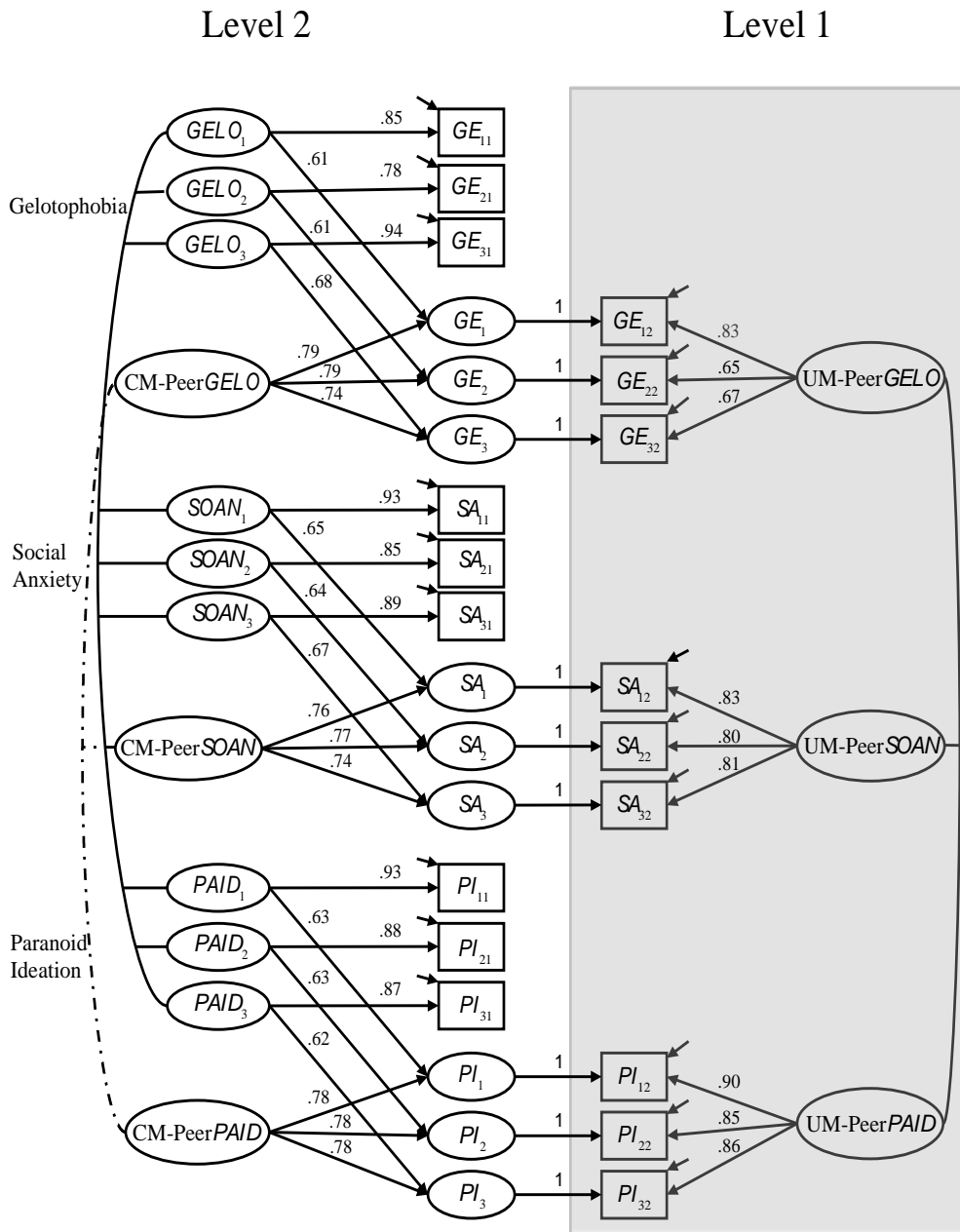


Figure 2. Multilevel confirmatory factor analysis-multitrait-multimethod (ML-CFA-MTMM) model of Gelotophobia, Social Anxiety and Paranoid Ideation for structurally different and interchangeable methods with indicator-specific trait variables. *GELO* = gelotophobia self-report factor; *SOAN* = social anxiety self-report factor; *PAID* = paranoid ideation self-report factor. *CM-PeerGELO* = common method factor of the peer ratings of gelotophobia; *CM-PeerSOAN* = common method factor of the peer ratings of social anxiety; *CM-PeerPAID* = common method factor of the peer ratings of paranoid ideation. *UM-PeerGELO* = unique method factor of the peer ratings of gelotophobia; *UM-PeerSOAN* = unique method factor of the peer ratings of social anxiety; *UM-PeerPAID* = unique method factor of the peer ratings of bad paranoid ideation.  $GE_{ik}$  = observed indicators for gelotophobia;  $SA_{ik}$  = observed indicators for social anxiety;  $PI_{ik}$  = observed indicators for paranoid ideation;  $i$  = indicator;  $k$  = method;  $GE_i$  = level-2 variable for the peer reports of gelotophobia;  $SA_i$  = level-2 variable for the peer reports of social anxiety;  $PI_i$  = level-2 variable for the peer reports of paranoid ideation.

The observed peer ratings of gelotophobia are values of the following observed variables:  $GE_{12}$ ,  $GE_{22}$  and  $GE_{32}$ . Because there are 651 peer raters (i.e., close acquaintances) each observed peer-rated variable has 651 values. Moreover, an observed peer rating variable is decomposed into a variable  $GE_1$ ,  $GE_2$  or  $GE_3$ , the unique method factor *UM-PeerGELO* weighted by a method factor loading, and a measurement error variable. The values of the variable  $GE_1$  are the expected gelotophobia ratings of the targets across the different peer ratings, with respect to  $GE_{12}$ . In other words, they are the true scores of the targets across peer raters. Whereas there are 651 values of the variable  $GE_{12}$  in our application, there are only 217 values of the variable  $GE_1$  – one for each target. A value of the variable  $GE_1$  describes the average gelotophobia peer-ratings of a single target. Therefore,  $GE_1$  is a level-2 variable. This explication can be extrapolated to  $GE_2$  and  $GE_3$ .

The variables  $GE_1$ ,  $GE_2$ , and  $GE_3$  (the targets' true scores across peer raters) are regressed on the trait indicator factors  $GELO_1$  to  $GELO_3$  (the targets' self-report true scores). The part of the expected (“average”) peer ratings that cannot be predicted by the self-ratings are represented by the factor *CM-PeerGELO*. This factor has 217 values – one for each target. A positive value indicates that the target's gelotophobia is overestimated by her or his peers, compared to other targets with the same true self-rating. A negative value shows that the target's gelotophobia is underestimated by the peers. A value of 0 indicates that the true (average) peer rating is exactly equal to the expected peer rating for the target, given the true self-rating. The factor *CM-PeerGELO* is called the common method factor of gelotophobia. As mentioned, it represents the method effect common to all peer ratings of the same target. The factor *CM-PeerGELO* is a level-2 method factor in the model.

The standardized regression coefficients for the regression of the variables  $GE_1$ ,  $GE_2$ , and  $GE_3$  on the self-report factors were .61 ( $GE_1$  and  $GE_2$ ) and .68 ( $GE_3$ ) (see Table 3 and Figure 2). These are also latent level-2 correlations and indicate the degree of convergent validity on level 2. Overall, the correlations between the true self-ratings and the true expected (“average”) peer ratings are high, indicating high convergent validity. The squared standardized regression coefficient indicates the degree of variance of the common peer-ratings, which is explained by the self-ratings. The values of  $(.61)^2 = .37$  and  $(.68)^2 = .46$  show that 37% ( $GE_1$  and  $GE_2$ ) and 46% ( $GE_3$ ) of the variance of the true expected (“average”) peer ratings is explained by the true self-ratings. The standardized loadings of the common method factor are .79 ( $GE_1$  and  $GE_2$ ) and .74 ( $GE_3$ ). The squared values of these standardized loadings show that 62% ( $GE_1$  and  $GE_2$ ) and 55% ( $GE_3$ ) of the variance of the expected (“average”) peer ratings is not shared with the self-report and are specific to the common peer ratings.

In contrast to the common method factor, the unique method factor *UM-PeerGELO* is a level-1 method factor. There are 651 values of the *UM-PeerGELO* factor because there are 651 peer raters, that is, three peer raters for each of the 217 targets. A value of the unique method factor is the deviation of the true score of a single peer rater from the expected (“average”) value of all peer raters belonging to the same target. A positive value indicates that this single peer overestimates the target’s gelotophobia compared to the expected value of all peer raters belonging to the same target. A negative value shows that this single peer underestimates the gelotophobia of the target compared to the expected value of all peers. A value of 0 shows that this person neither over- nor underestimates the gelotophobia of the target compared to all peers of this target. The standardized loadings of the unique method factor represent the correlations between the method factor and the observed ratings. Their squared values can be interpreted as a

level-1 reliability coefficient. This reliability coefficient differs from the general reliability coefficient of the observed peer-ratings that also takes the true level-2 differences into account.

In this model, the variance of an observed peer-rated variable,  $GE_{12}$ ,  $GE_{22}$ , and  $GE_{32}$ , can be decomposed into four components: (1) the variance determined by the self-report factor, (2) the variance due to common method effects, (3) the variance due to unique method effects, and (4) measurement error. On the basis of this decomposition, the coefficients of consistency, method specificity, common method specificity, unique method specificity, and reliability of the peer-ratings can be calculated (see the formulas reported by Eid et al., 2008). A detailed illustration of the calculation of these coefficients can be found in Carretero-Dios, Eid, and Ruch (2011).

The consistency coefficient is the degree of true variance that is due to the self-report factor. In our application, the consistency coefficients for gelotophobia were .08 ( $GE_{12}$  and  $GE_{22}$ ) and .11 ( $GE_{32}$ ). The common method specificity coefficient is the degree of true variance that is due to the common method factor. In our case, the values were .14 ( $GE_{12}$  and  $GE_{22}$ ) and .13 ( $GE_{32}$ ). The unique method specificity coefficient is the degree of true variance that is determined by the unique method factor. The unique method specificity coefficients were .79 ( $GE_{12}$  and  $GE_{22}$ ) and .76 ( $GE_{32}$ ).

These results showed that the variance of the individual peer raters reflects, to the largest degree, the individual view of a peer (79% and 76%, respectively), then the common view of the different peers (14% and 13% respectively), and finally, the variance shared with the target (8% and 11% respectively). An explained variance of 8%, due to the self-report factor, corresponds to a correlation coefficient of  $(.08)^{1/2} = .28$ , which is in the lower part of the range of values, indicating a satisfying convergent validity, given the self- and peer-ratings (Watson et al., 2000). In this study, these



values ranged between .28 ( $GE_{12}$  and  $GE_{22}$ ) and .33 ( $GE_{32}$ ). The convergent validity was even higher on level-2, at which ignores the individual peer views, in favor of considering only the common peer view. The convergent validity on level 2 ranged from .61 to .68.

In peer ratings, the reliability coefficient is calculated as 1 minus the error variance, divided by the total variance (see application in Carretero-Dios et al., 2011). The reliability coefficients for gelotophobia's peer-ratings ranged between .50 and .57.

The results for the other two constructs, social anxiety and paranoid ideation, had an analogous meaning. The standardized loadings of the common peer-ratings on the traits factor ranged from .62 (paranoid ideation) to .67 (social anxiety). These standardized loading parameters are correlations between true self-reports and the true common peer reports and can be interpreted as level-2 convergent validity coefficients. These values of  $r_s \geq .62$  indicate high convergent validities. Moreover, the consistency coefficients of the peer-ratings of social anxiety (.15-.17) and paranoid ideation (.09) were comparable to those obtained for gelotophobia. However, these values show that it was easier for peer raters to assess the target's social anxiety than his or her paranoid or gelotophobic tendencies (consistency coefficients ranging from .08 to .11). The square root of the consistency coefficients are the correlations between the true self-reports of the trait scales and the true single peer ratings. These correlations of social anxiety ( $.39 \leq r_s \leq .41$ ) and paranoid ideation ( $r_s = .30$ ) revealed values within the expected range for a moderate convergent validity.

The common method-specificity coefficients for the peer-ratings were also substantial. In particular, they ranged between .21 and .22 for social anxiety and were equal to .14 for paranoid ideation. This indicates that the three peer-raters shared a common view of the target that is not shared by the target her- or himself. The unique

method-specificity coefficients were high for social anxiety (ranging from .62 to .64) and for paranoia (.77). This means that the major source of variance for the peer-ratings was the unique view of each peer-rater. Dividing the consistency coefficient in Table 3 by the sum of the consistency coefficient and the common method-specificity coefficient yields a Level-2 consistency coefficient that indicates the convergent validity, with respect to the self-reported trait ratings and the common factor of the peer ratings belonging to the same peer. Again, these values were adequate for social anxiety (.41 - .45) and paranoid ideation (.39) and similar to those obtained for gelotophobia (.36 - .46).

The correlations between the latent variables are presented in Table 4. As expected, the trait factors of gelotophobia (i.e.,  $GELO_1$ ,  $GELO_2$  and  $GELO_3$ ) and social anxiety (i.e.,  $SOAN_1$ ,  $SOAN_2$  and  $SOAN_3$ ) were highly positively correlated with each other ( $.73 \leq r_s \leq .80$ ). The correlations of gelotophobia and social anxiety trait factors with the paranoid ideation trait factors (i.e.,  $PAID_1$ ,  $PAID_2$  and  $PAID_3$ ) reflected moderate sizes and were in the expected direction, namely:  $GELO$  factors with  $PAID$  factors,  $.49 \leq r_s \leq .61$ ; and  $SOAN$  factors with  $PAID$  factors,  $.39 \leq r_s \leq .57$ .

**Table 4.** Variances, Covariances, and Correlations (Below Diagonal) of the Trait and Method Factors in the ML-CT-C(M-1) Model

Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. <i>GELO</i> <sub>1</sub>	<u>.19</u>	.18	.21	.19	.20	.20	.14	.15	.15	.00	-.01	.01	----	----	----
2. <i>GELO</i> <sub>2</sub>	.94	<u>.19</u>	.20	.20	.20	.21	.12	.14	.13	.00	-.01	-.01	----	----	----
3. <i>GELO</i> <sub>3</sub>	.93	.89	<u>.27</u>	.23	.24	.23	.16	.17	.14	.00	-.01	.01	----	----	----
4. <i>SOAN</i> <sub>1</sub>	.78	.83	.76	<u>.32</u>	.29	.32	.12	.16	.13	.02	.00	.01	----	----	----
5. <i>SOAN</i> <sub>2</sub>	.83	.80	.82	.93	<u>.30</u>	.29	.15	.18	.14	.03	.00	.04	----	----	----
6. <i>SOAN</i> <sub>3</sub>	.77	.80	.73	.94	.89	<u>.36</u>	.12	.15	.11	.01	.00	.01	----	----	----
7. <i>PAID</i> <sub>1</sub>	.54	.49	.54	.39	.48	.36	<u>.32</u>	.30	.29	-.01	-.02	.00	----	----	----
8. <i>PAID</i> <sub>2</sub>	.60	.55	.60	.51	.57	.46	.92	<u>.33</u>	.27	-.01	-.02	.00	----	----	----
9. <i>PAID</i> <sub>3</sub>	.61	.53	.49	.40	.47	.34	.91	.84	<u>.31</u>	-.01	.00	.00	----	----	----
10. <i>CM-PeerGELO</i>	----	----	----	.20	.31	.08	-.15	-.13	-.03	<u>.02</u>	.03	.03	----	----	----
11. <i>CM-PeerSOAN</i>	-.03	-.10	-.03	----	----	----	-.13	-.13	.01	<b>.74</b>	<u>.08</u>	.03	----	----	----
12. <i>CM-PeerPAID</i>	.05	-.06	.11	.02	.32	.07	----	----	----	<b>.94</b>	<b>.47</b>	<u>.06</u>	----	----	----
13. <i>UM-PeerGELO</i>	----	----	----	----	----	----	----	----	----	----	----	----	<u>.14</u>	.11	.10
14. <i>UM-PeerSOAN</i>	----	----	----	----	----	----	----	----	----	----	----	----	<b>.62</b>	<u>.22</u>	.17
15. <i>UM-PeerPAID</i>	----	----	----	----	----	----	----	----	----	----	----	----	<b>.45</b>	<b>.63</b>	<u>.34</u>

*Note.* ML-CT-C(M-1) = multilevel correlated trait-correlated (method-1) model; ---- = non-admissible correlations/covariances. Values italicized are the correlations between the trait factors. Values in boldface type indicate correlations between the method factors belonging to the same type of method factors. Variances are in main diagonal. GELO = gelotophobia; SOAN = social anxiety; PAID = paranoia ideation; *CM* = common method factor; *UM* = unique method factor. The estimates refer to the models in which gelotophobia was always included. The results differ only marginally in the other models.

The correlations of the method factors belonging to the same method showed a similar pattern, although in this case, the link between gelotophobia and paranoid ideation was very high. The correlations of the common method factors belonging to peer ratings showed that peer groups who overestimate the targets, with respect to gelotophobia, tended to overestimate their social anxiety and paranoid ideation (i.e., associations of *CM-Peer-GELO* with *CM-Peer-SOAN*:  $r = .74$  and with *CM-Peer-PAID*:  $r = .94$ ). A similar bias structure holds for the unique method effects. Single peer-raters overestimating the gelotophobia had the tendency to overestimate their target's social anxiety (*UM-Peer-GELO* with *UM-Peer-SOAN*:  $r = .62$ ), as well as their target's paranoid ideation (*UM-Peer-GELO* with *UM-Peer-PAID*:  $r = .45$ ).

The correlations between the trait factors (*GELO*<sub>1-3</sub>, *SOAN*<sub>1-3</sub>, *PAID*<sub>1-3</sub>) and the common method factors of the peer-ratings belonging to different traits (*CM-PeerGELO*, *CM-PeerSOAN*, *CM-PeerPAID*) ranged from low- to medium-sized ( $-.15 \leq rs < .32$ ). More specifically, this pattern of results showed that peer-raters were likelier to overestimate the scores on gelotophobia ( $.08 \leq rs \leq .31$ ) and, to a lesser extent, paranoid ideation ( $.02 \leq rs \leq .32$ ) of those individuals describing themselves as high in social anxiety. By contrast, the association of gelotophobia and paranoid ideations factors with common method factors of the peer-ratings belonging to different traits were small ( $|rs| \leq .15$ ).

## Discussion

The primary aim of this research was to estimate the degree of the independence-redundancy among gelotophobia, social anxiety and paranoid ideation using MTMM data. There is a long-standing debate regarding whether gelotophobia differs sufficiently from social anxiety to merit consideration as an independent construct (Carretero-Dios

et al., 2010b; Ruch et al. 2014a). Similarly, although comparatively much less studied, there also exists a strong conceptual overlap between gelotophobia and paranoid ideation, as this laughter-related disposition subsumes paranoid sensitivity to the laughter of others as core characteristics (e.g., being suspicious and inferring others' laughter as being directed at them, irrespective of its true target: Platt et al., 2012).

Our results first indicated adequate fit indexes for all of the two-trait models (i.e. GELO-SOAN, GELO-PAID, and SOAN-PAID), using less and more restrictive versions of the ML-CFA-MTMM approach. These findings suggest that the three constructs, gelotophobia, social anxiety and paranoid ideation, are empirically homogeneous and, simultaneously, sufficiently independent of each other, considering both self-reports and peer reports (H1). Despite these personality constructs shared conceptual and empirical characteristics (Carretero-Dios et al. 2010b; Ruch et al. 2014a), our data are consistent with the notion that they also capture some unique particularities. These data replicated prior psychometric investigations demonstrating that gelotophobia is distinct from social anxiety and the fear of negative evaluation, using exploratory and confirmatory (joint) factor analyses with self-ratings (e.g., no supports for a general factor: Carretero-Dios et al. 2010b). Moreover, this research gives additional insights, as this differentiation of the fear of being laughed at seems to be generalizable to alternative partially overlapped constructs, such as paranoid ideation and to other assessment methods (i.e., being perceived by peer-raters as close acquaintances).

The application of the model also allows further investigation of the adequate convergent validity of the gelotophobia scale (H2). In particular, our results showed that the latent correlations of the self-reported gelotophobia trait with the common peer ratings (level-2) yielded adequate values. Taking the data on the level of the single peer

raters (level-1) into account, the latent correlations were lower than on level-2 but also within range for satisfying coefficients, thereby establishing their convergent validity. These values fit well with Watson and colleagues' (2000) findings, which state that the correlations between self-assessment and peer assessment typically range from .25 to .58, with the lower threshold of this range usually applying to those associations involving affective traits. Further, the exploration of these coefficients for social anxiety and paranoid ideation offered similar values to those obtained for gelotophobia, considering peer-ratings from level-1, as well as level-2. Nevertheless, attending to the magnitude of the correlations (amount of shared variance), one may consider peer raters to make more accurate judgments of targets in terms of their ("true") scores on social anxiety than their ("true") scores on gelotophobia and paranoid ideation. One possible explanation is that the main features of these latter traits involve less visible elements (e.g., being suspicious or referring others' behavior to oneself) than social anxiety, which yields worse self-other agreement (Funder & Colvin, 1988, 1997; Watson et al. 2000). Therefore, alternative assessment instruments of gelotophobia may strengthen the presence of indicators subsuming core (frequent) behavioral manifestations, such as displaying less facial joy and avoidance tendencies in laughter-related situations (Hofmann et al., 2015; Ruch & Proyer, 2008; Ruch et al., 2014).

Regarding the evidence of discriminant validity between gelotophobia, social anxiety and paranoid ideation, our findings were in line with earlier research and with our predictions. These findings first revealed that the three self-rated indicators of the trait gelotophobia had the expected strong positive correlations with those for social anxiety (H3), which is broadly aligned with the degree of overlapping variance obtained for these constructs (Carretero-Dios et al., 2010b; Edward et al., 2010). Similarly, these indicators of the trait gelotophobia had numerically lower but also substantially positive

correlations with those describing participants' scores on paranoid ideation (H4). To the best of our knowledge, this research contains the first empirical evidence on the association between gelotophobia and this paranoid manifestation. This association fits well with the notion that laughter-related paranoid ideations are a core characteristic of the experiential world of gelotophobes and with empirical data showing that there is heightened expression of gelotophobia among schizophrenics and paranoids (Forabosco, Ruch, & Nucera, 2009; Ruch et al., 2014a; Ruch & Proyer, 2009b; Weiss et al., 2012). Nevertheless, our data seem to suggest that the degree of overlapping variance between gelotophobia and social anxiety may be higher, compared to gelotophobia-paranoid ideations. Future research should clarify these results and investigate possible situations in which the presence of paranoid ideation may be relevant for gelotophobes (e.g., social situations where the motive and focus of others' laughter are ambiguous or elusive). Finally, and according to prior research (Gilbert et al. 2005; Matos et al., 2012), our data also provide further support for the positive associations between social anxiety and paranoia in the subclinical range (H5).

Further, the correlations of the common and unique method factors belonging to peer-ratings showed that both peer group and single peers who tend to overestimate the target scores on gelotophobia are more inclined to overestimate the target's scores on social anxiety and paranoid ideation. This pattern of results is clearly consistent with the great amount of shared variance among these constructs. Moreover, the correlation between self-rated trait indicators and the common method factors of the peer-rating belonging to different traits showed that peer raters tend to overestimate the gelotophobic and, to a lesser extent, paranoid tendencies of those individuals who consider themselves as high in social anxiety. These findings may be an additional consequence of the increased peer-raters' difficulties in identifying targets' ("true")

scores on both gelotophobia and paranoid ideation scales, compared to scores on social anxiety. One may argue that peer-raters would perceive that the presence of evident socially anxious behaviors should go along with heightened suspicions or mistrust of others' intentions (either in general or more specific situations like those involving teasing or ridicule). Nonetheless, it must be noted that this effect was unexpected and small-to-moderate, warranting caution against over-interpretation. Finally, there were only zero-to-small correlations between common method factors belonging to different traits and self-rated indicators of gelotophobia and paranoid ideation ( $-.15 \leq r_s \leq .11$ ).

Altogether, these findings lend further support to the satisfying construct validity of the GELOPH-15 (see Ruch and Proyer, 2008). This gelotophobia assessment tool showed an adequate convergent validity through self- and peer-ratings (see Watson et al. 2000), and the expected strong, but non-redundant, associations with social anxiety and paranoid ideation, in terms of discriminant validity. Linking to this latter point, our research expanded the empirical supports for the differentiation of gelotophobia from these similar personality constructs. Despite their associations evinced strong empirical connections, the independent latent structure and non-redundant correlations support that gelotophobia, social anxiety, and paranoid ideation can be seen as separated constructs. Considering that construct proliferation and redundancy hamper the systematization of empirical knowledge (Singh, 1991; Le, Schmidt, Harter, & Lauver, 2010), personality psychologists should integrate ML-CFA-MTMM models into analyses of the associations between partially overlapping constructs.

#### *Limitations and future directions*

This research has several limitations that must be mentioned. For instance, our sample consisted of undergraduate students, which may limit the generalizability of our



findings. Hence future studies should incorporate more representative samples to test the robustness of these findings. In the same vein, it is advisable to conduct studies using samples from diverse cultural backgrounds to corroborate the cross-cultural validity of the previously described connections among gelotophobia, social anxiety, and paranoid ideation. Linking to this, earlier investigations have shown that cultural differences can modulate the expression of the fear of being laughed at and may vary its associations (Proyer et al. 2009). However, given that the gelotophobia-social anxiety relation has proven to be rather stable across Spanish, Colombian and Canadian samples (Carretero-Dios et al., 2010b; Edward et al., 2010), one may surmise our findings to be generalizable across diverse countries.

Further, these findings may be extended by incorporating alternative traits (e.g., fear of negative evaluation) and methods (e.g., comparing family members *versus* close acquaintances). Considering that these groups have different kinds of access to a target's information, one may expect them to differ in their judgements (e.g., accuracy) on the personality inclinations of the target, especially those focusing on less visible or undesirable personal characteristics. Importantly, it should be noted that the incorporation of new structurally different methods based on, for example, the social distance between peer and target would require the use of an alternative MTMM model (see Eid et al. 2008).

## **Conclusions**

Our results suggest that gelotophobia does not constitute an epiphenomenon of either social anxiety or paranoid ideation in the subclinical range, but rather an intercorrelated and sufficiently distinct laughter-related disposition that merits singular or, at least, combined research. Note that our findings do not imply that these constructs

are entirely distinct, as certain overlap does exist, but rather suggest that gelotophobia, social anxiety and paranoid ideation capture singular or specific variance, on the basis of their core conceptual characteristics. Likewise, our research shows that ML-CFA-MTMM models can be a useful and valid analytical strategy to investigate the independency *versus* redundancy among partially overlapping constructs.

## **Chapter VIII**

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*Eye contact and fear of being laughed at in a  
gaze discrimination task*



## Eye contact and fear of being laughed at in a gaze discrimination task

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**Abstract**

Current approaches conceptualize gelotophobia as a personality trait characterized by a disproportionate fear of being laughed at by others. Consistently with this perspective, gelotophobes are also described as neurotic and introverted and as having a paranoid tendency to anticipate derision and mockery situations. Although research on gelotophobia has significantly progressed over the past two decades, no evidence exists concerning the potential effects of gelotophobia in reaction to eye contact. Previous research has pointed to difficulties in discriminating gaze direction as the basis of possible misinterpretations of others' intentions or mental states. The aim of the present research was to examine whether gelotophobia predisposition modulates the effects of eye contact (i.e., gaze discrimination) when processing faces portraying several emotional expressions. In two different experiments, participants performed an experimental gaze discrimination task in which they responded, as quickly and accurately as possible, to the eyes' directions on faces displaying either a happy, angry, fear, neutral, or sad emotional expression. In particular, we expected gelotophobia to modulate the eye contact effect, showing specific group differences in the happiness condition. The results of Study 1 ( $N = 40$ ) indicated that gelotophobes made more errors than non-gelotophobes did in the gaze discrimination task. In contrast to our initial hypothesis, the happiness expression did not have any special role in the observed differences between individuals with high vs. low trait-gelotophobia. In Study 2 ( $N = 40$ ), we replicated the pattern of data concerning gaze discrimination ability, even after controlling for individuals' scores on social anxiety. Furthermore, in our second experiment, we found that gelotophobes did not exhibit any problem with identifying others' emotions, or a general incorrect attribution of affective features, such as valence, intensity, or arousal. Therefore, this bias in processing gaze might be related to the

global processes of social cognition. Further research is needed to explore how eye contact relates to the fear of being laughed at.

*Keywords:* gelotophobia; gaze discrimination; eye contact; emotional expression; emotional categorization

**Introduction**

The term gelotophobia (gelos in Greek means laughter) refers to a personality trait characterized by a disproportionate fear of being laughed at by others (Ruch, 2009). Although this phenomenon was originally conceptualized as a psychopathological disorder (Titze, 2009), recent approaches have operationalized gelotophobia as an individual differences variable that also shows considerable variation in non-clinical samples (e.g., Ruch & Proyer, 2008). In this sense, those individuals scoring high in trait-gelotophobia—or gelotophobes—are described as neurotic and introverted and as having a paranoid tendency to anticipate derision and mockery situations (Ruch & Proyer, 2009). This misinterpretation of humor related-situations undermines their social interactions, as they are constantly expecting contempt and rejection from others individuals (Ruch et al., 2014a). Research on gelotophobia has gradually progressed over the past two decades (Ruch et al., 2008; Titze, 2009; Platt et al., 2012, 2013; Wu et al., 2016), leading to a theoretical framework of reference that includes major findings concerning both potential triggering causes and moderating factors (e.g., bullying, parental influences or sociocultural factors), as well as consequences (e.g., humourlessness or social withdrawal) linked to gelotophobia predisposition (Ruch, 2009; Ruch et al., 2014a). Nevertheless, it is important to note that still, the nature of the predisposing factors of gelotophobia remains unclear. Contrary to traditional assumptions about the appearance/origin of gelotophobia (Titze, 2009), the presence of the traumatic experiences of teasing during childhood and adolescence does not seem to be a differentiating or invariant aspect of the development of this humor-related trait (Ruch et al., 2010). Therefore, additional research areas such as, for example, perceptual biases toward relevant affective or social cues (e.g., gaze or eye contact) need to be



explored. Indeed, it has been stressed that gelotophobia research needs to move toward a more comprehensive and accurate theoretical model (Ruch et al., 2014a).

Recent experimental research on the fear of being laughed at has advanced our knowledge about this phenomenon. For instance, Papousek et al. (2009) designed an experimental task in which participants were exposed to several emotionally contagious films displaying a positive (e.g., cheerfulness), negative (e.g., anxiety or sadness), or neutral mood, with the purpose of comparing gelotophobes' and non-gelotophobes' responses to the emotional states of other individuals. The results revealed that individuals with gelotophobia did not show a reduced emotional induction to positive emotions compared with non-gelotophobes; interestingly, however, they showed a higher degree of affective induction to negative emotions, that is, high scores of subjective anxiety or sadness after watching anxiety- or sadness-causing films, respectively. In line with the analysis of gelotophobes' reactions concerning the affective states of others, Ruch et al. (2015) used the Facial Action Coding System to analyze the potential differences between gelotophobes and non-gelotophobes in joy and contempt responses to videos of laughter-eliciting emotions (e.g., amusement or relief). In particular, they found that gelotophobes exhibited reduced facial expressions of joy (i.e., joyful smiles) and more expressions of contempt when they were exposed to laughter-eliciting emotions.

In a different study, Ruch et al. (2014b), by using interactions with virtual agents (i.e., human-like figures or avatars) investigated which features of avatar laughter were considered to be not genuine, threatening, or malicious among individuals who score high on gelotophobia. Their results indicated that, among other factors, a low or mid-level intensity of laughter, an inhibited facial expression, and exaggerated body movements that accompany the laughter may be perceived as more malicious among

gelotophobes. In a further investigation, Papousek et al. (2014) developed a realistic and socially relevant context in which participants were interrupted while performing an arithmetic task. The nature of the interruption was manipulated in three experimental conditions: anger provocation together with laughter, anger provocation together with white noise, and no interruption. The cardiac responses of the participants were recorded during the experiment, with a specific reaction of individuals with gelotophobia emerging, that is, a heart rate deceleration in response to others' laughter. According to these authors, this psychophysiological response would be associated with a higher inclination in gelotophobes to interpret laughter as a cue of social rejection. To sum up, gelotophobes, compared with non-gelotophobes, seem to exhibit differentiated emotional manifestations. They are more sensitive to the contagion of negative emotions, show fewer facial expressions related to positive affective states as joyful smiles, and exhibit specific physiological reactions to potential threatening laughter. However, despite the undeniable progress made in the understanding of gelotophobia, further experimental research and new research topics are necessary for deepening the role of the fear of being laughed at in gelotophobes' processing of emotional information.

#### *Smiles, eye contact, and gelotophobia*

Numerous authors have discussed the variability of meanings ascribed to a smile as well as the implication of its degree of genuineness or authenticity (Ekman et al., 1990; Ekman, 2003; Johnston et al., 2010). Although a smile is generally labelled as an indicator of a positive affective state, this emotional expression may hide other motivations as to denote, for example, social hierarchy or to mask negative feelings (Niedenthal et al., 2010). Evidence exists that a smile perceived as false or as a non-

enjoyment smile is evaluated more negatively and can even lead the perceiver to show less cooperation or trust in comparison with a genuine or enjoyment smile (Johnston et al., 2010). One of the main features related to the fear of being laughed at is the tendency to interpret benevolent or neutral humor-related situations as threatening or malicious (Titze, 2009). Consistent with these findings, gelotophobes also tend to perceive others' smiles as less joyful and more scornful than non-gelotophobes do (Hofmann et al., 2015). This smile misattribution may disturb the adequate social integration of these individuals, thus constituting to the persistence of gelotophobia (Ruch et al., 2014a). Exploring all different cues that may support the recognition of smiles and that may facilitate correct access to the meaning of smiles, especially among individuals with a higher inclination to gelotophobia, is therefore important.

Previous research has indicated that gaze and eye contact play relevant roles in the processes of recognition and inference making with regard to the meanings of others' smiles (Niedenthal et al., 2010). Indeed, gaze entails an essential information source for enhancing our understanding of other people's intentions, facilitating adaptation to our environment and being particularly relevant during social interactions (Argyle & Cook, 1976; Baron-Cohen, 1994; Cañadas & Lupiáñez, 2012). In particular, according to the simulation of smiles (SIMS) model, eye contact could act as a trigger of an embodied simulation process by which an individual obtains information to identify and interpret smiles (Niedenthal et al., 2010). Another theoretical approach that has highlighted the importance of the gaze direction when individuals have to interpret the intentions or anticipate the actions of others is theory of mind (ToM). According to Baron-Cohen (1994, 1995), the capacity to make inferences about others' states of mind, or the "mind reading" system, would consist of a set of modular components, among which would be an eye direction detector (EDD). This module would be involved in the identification of

a gaze direction (e.g., direct or averted) and therefore in the subjective perception of being looked at (Cañadas & Lupiáñez, 2012).

It has already been proposed —as a tentative explanation— that an atypically developed ToM could be related to the underlying wrong attribution present in gelotophobes, which would lead them to interpret that people are not laughing with them but rather laughing at them during social interactions (Ruch et al., 2008). Given that gaze discrimination is associated with both access to adequate meanings of smiles and expectations about how someone is going to behave, providing useful information for interpreting their objectives or intentions (Hudson et al., 2009; Niedenthal et al., 2010; Hudson & Jellema, 2011), we decided to explore whether higher trait-gelotophobia could be associated with potential bias processing gaze discrimination or eye contact, especially when the looking face portrays a smile. In this sense, a fundamental difficulty in gaze discrimination might underlie interpretation biases, leading gelotophobes to wrongly interpret others' smiles as malicious or false.

To test this point, we used a novel gaze discrimination task that Cañadas and Lupiáñez (2012) developed, with the objective of exploring the importance of social stimuli (i.e., eye contact) in spatial Stroop paradigms. These authors discovered that the identification of a gaze direction is quicker when a face is located to the left but looking to the right, or vice versa (incongruent condition), in comparison with when the face location and eyes' direction match (congruent condition). This reverse congruency effect —classical results with non-social stimuli, such as arrows, show faster responses for congruency trials— was interpreted in terms of eye contact (e.g., responses are faster when a face located to the left looks to the right, i.e., at us). Moreover, further investigation revealed that the emotional charge of the facial expression modulated this eye contact effect (Jones, 2015). More specifically, Jones's results indicated that the

effect was stronger for happy and angry faces (approach-oriented emotions) than for neutral faces, and it was non-existent for fearful faces (avoidance-oriented emotions). According to Adams and Kleck (2003), approach-oriented emotions (i.e., happiness and anger) are those that are identified more quickly when the faces displaying these emotions feature direct gazes rather than averted gazes. On the contrary, avoidance-oriented emotions (i.e., fear and sadness) are those that are recognized more quickly when the faces feature averted gazes vs. direct gazes. In this sense, Jones (2015) pointed out that the differences in the observed eye contact effect could be due to the differential facilitation of the processing of each emotion depending on the eye contact condition (e.g., a direct gaze would facilitate the processing of anger or happiness, and an averted gaze would facilitate the processing of fear or sadness).

### **Experiment 1**

The purpose of the first experiment was to explore the performance of individuals scoring high vs. low in trait-gelotophobia in a gaze direction discrimination task, which has been previously shown to index an eye contact effect. The emotional expression of the face whose gaze direction had to be discriminated was also manipulated to investigate whether emotion affected the observed eye contact effect as a function of the gelotophobia levels of the participants. We expected gelotophobia to modulate the eye contact effect data, showing specific group differences in the happiness condition. It may be possible for gelotophobes to respond to happy faces in the same way they would respond to fear faces, that is, as an avoidance-oriented emotion. Additionally, to corroborate the adequacy of the “approach or avoidance oriented emotions” interpretation for the reverse congruency (i.e., eye contact) effect that Jones (2015) proposed, and to extend our understanding of the role of emotional expression in the

modulation of gaze discrimination, we decided to incorporate faces portraying sadness into our experiment. In accordance with Jones (2015), we expected to replicate the previous results in happiness, anger, neutral, and fear stimuli; regarding sadness, we expected to find a pattern similar to fearful faces and different from angry or happy faces.

## **Material and methods**

### *Participants*

From a total sample of 202 undergraduate students, 40 (32 females, 8 males; age ranging from 17 to 34;  $M = 19.80$ ,  $SD = 2.94$ ) were selected on the basis of their extreme scores in trait-gelotophobia, and they were assigned to one of two comparison groups (gelotophobes vs. non-gelotophobes). All participants took part in the experiment voluntarily and received course credits in exchange for their collaboration. They reported normal or corrected-to-normal vision and hearing.

In particular, the selection criterion was the participant's score on the Spanish version of Geloph <15> (Carretero, Proyer, Ruch, & Rubio, 2010; Ruch & Proyer, 2008). The gelotophobes group consisted of the 20 participants who had the highest trait-gelotophobia scores (18 females; 17–25 years;  $M_{Geloph} = 2.76$ ;  $SD_{Geloph} = .35$ ;  $Min_{Geloph} = 2.20$ ;  $Max_{Geloph} = 3.27$ ). According to a transcultural investigation (Proyer et al., 2009), gelotophobia scores can be set in the following categories: 1.0–2.0: no gelotophobia; 2.0–2.5: borderline fearful; 2.5–3.0: slight expression of gelotophobia; 3.0–3.5: marked expression of gelotophobia; and 3.5–4.0: extremely fearful of being laughed at. Therefore, of the 20 participants, five were classified as borderline fearful, seven as slight expression of gelotophobia, and eight as marked expression of gelotophobia. Meanwhile, the non-gelotophobes group was also made up of 20

participants but, in this case, with the lowest trait-gelotophobia scores. (14 females; 18–34 years;  $M_{Geloph} = 1.38$ ;  $SD_{Geloph} = .25$ ;  $Min_{Geloph} = 1.00$ ;  $Max_{Geloph} = 1.80$ ). These 20 participants were classified as having no gelotophobia. It should be noted that, in order to improve the comparability of the results, we ensured that both comparison groups had the same number of participants ( $n=20$ ).

The two reported experiments were conducted in accordance with the ethical standards of the 1964 Declaration of Helsinki, following an ethical protocol approved by the University of Granada. All participants participated voluntarily in the studies and provided signed written consent before participating in the experiment.

### *Instruments*

The Spanish version of the Geloph <15> (Carretero-Dios et al., 2010; Ruch & Proyer, 2008) consists of a self-report questionnaire that assesses trait-gelotophobia. A sample item is “when others laugh in my presence I get suspicious”. It includes 15 positively keyed items in a 4-point answer format ranging from 1 (*Strongly disagree*) to 4 (*Strongly agree*). Test reliability (Cronbach’s alpha) was  $\alpha = .94$  in the present sample.

### *Apparatus and stimuli*

In this experiment, stimuli presentation, timing, and data collection were controlled by using E-Prime 2.0 run on a standard personal computer (PC). Stimuli were presented on a 1700 screen running at a 1024 pixel x 768 pixel resolution. The stimulus material consisted of 40 different full-color photographs (dimensions = 152 pixels x 186 pixels or 5.5 cm x 6.0 cm) of four males and four females portraying either a happy, angry, fearful, neutral, or sad emotional expression. All faces were selected from the

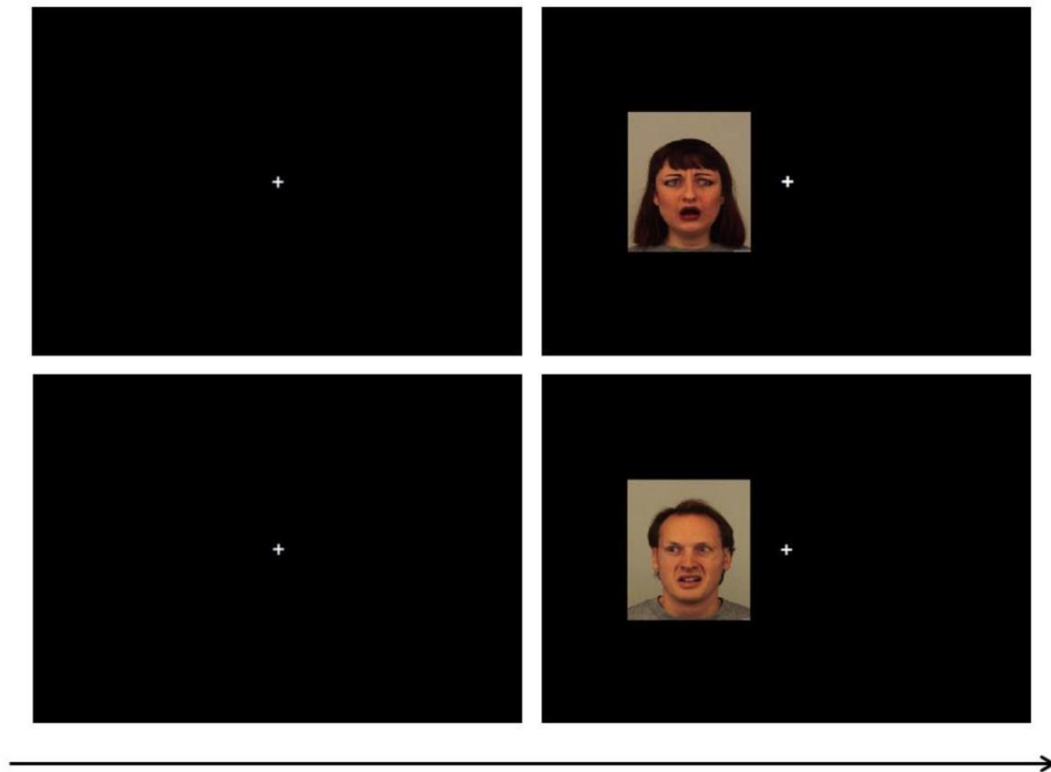
Karolinska Directed Emotional Faces (KDEF; Lundqvist et al., 1998). As the original photos featured faces that looked straight ahead, they were manipulated via Adobe Photoshop CS6 for the purpose of changing the gaze directions to the left and right sides. The main selection criteria for the faces were as follows: (a) the gaze was clearly visible while displaying each facial expression (Jones, 2015), and (b) the global hit rate accuracy scores of each individual displaying an emotional expression was higher than 0.49 ( $M = 0.66$ ;  $SD = 0.10$ ; Goeleven et al., 2008).

### *Procedure*

We used a paradigm similar to that used in previous research (Cañadas & Lupiáñez, 2012; Jones, 2015). Participants performed an experimental task in which they had to discriminate the gaze directions (left or right) of faces that were presented to the left or to the right of fixation, by pressing, as quickly and accurately as possible, the corresponding key on the keyboard. Participants sat approximately 60 cm away from the monitor in a dimly illuminated testing room. Each trial began with the onset of a fixation point (a white cross:  $0.5^\circ \times 0.5^\circ$ ) located in the center of a black computer screen for 500 ms. Then, a face portraying different emotional expressions was presented either to the left or to the right of the fixation point (approximately at  $3.02^\circ$  away from fixation to the inner edge of the face) and gazing either to the left or to the right (see Figure 1). Thus, considering that participants were in the middle, and following the interpretation by Cañadas and Lupiáñez (2012), the gaze direction could be either direct (e.g., a left-looking face presented to the right of fixation, i.e., potentially producing eye contact) or averted (e.g., a left-looking face presented to the left of fixation). Participants had to identify the face's gaze direction by pressing, respectively, the "Z" or "M" key of the computer keyboard when the correct answer was



left or right. Feedback on no-response or incorrect response trials was provided via a 220-Hz tone for 700 ms and a short text message. All possible combinations of stimuli, 8 (face identity) x 5 (emotional expression) x 2 (presentation side) x 2 (gaze direction), formed a total of 160 trials. Two blocks of trials with all combinations were presented for a total of 320 trials. Participants completed a practice block of 16 randomly selected trials to familiarize themselves with the task, followed by eight experimental sub-blocks of 40 randomly selected trials each, with a rest period between blocks. Participants could determine the duration of each rest period.



*Figure 1.* Procedure used in Experiments 1 and 2. The pictures located above illustrate a direct gaze trial (incongruent condition: a left-looking face located to the right), whereas the bottom pictures illustrate an averted gaze trial (congruent condition: a left-looking face located to the left).

After performing the experimental task, participants had to fill out, again, the Geloph <15> (Carretero-Dios et al., 2010a) to ensure that they had been assigned to the appropriate groups and hence to enhance the validity of the obtained results.

### *Design*

A 2 (gelotophobia: participants scoring high vs. low on Geloph<15>) x 5 (emotional expression: happiness, anger, fear, neutral, or sadness) x 2 (gaze direction: direct or averted) mixed design was used to analyze the data, with 32 observations per experimental condition. Response times (RTs) and error rates were used as dependent variables. The gelotophobia level was treated as a between-participant variable, and emotional expression and gaze direction as within-participant factors. A two-tailed significance level of  $p < 0.05$  was used for all analyses.

## **Results**

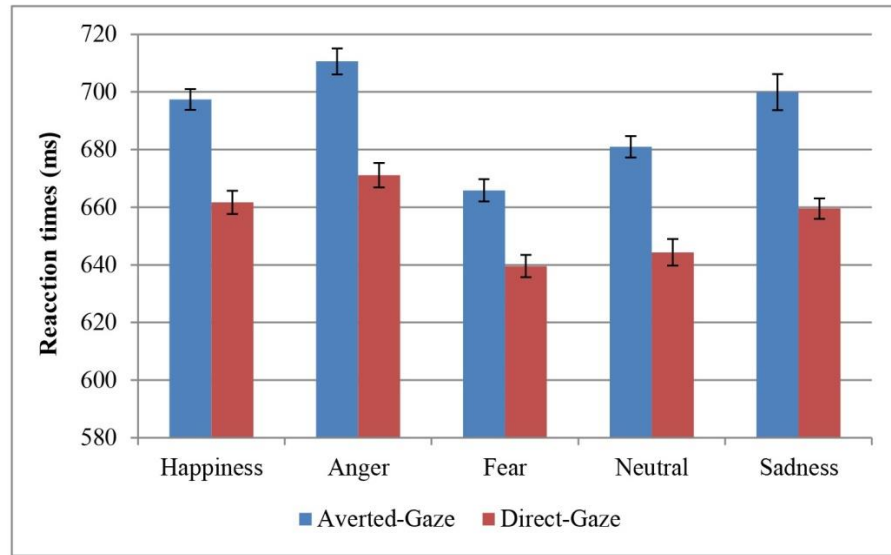
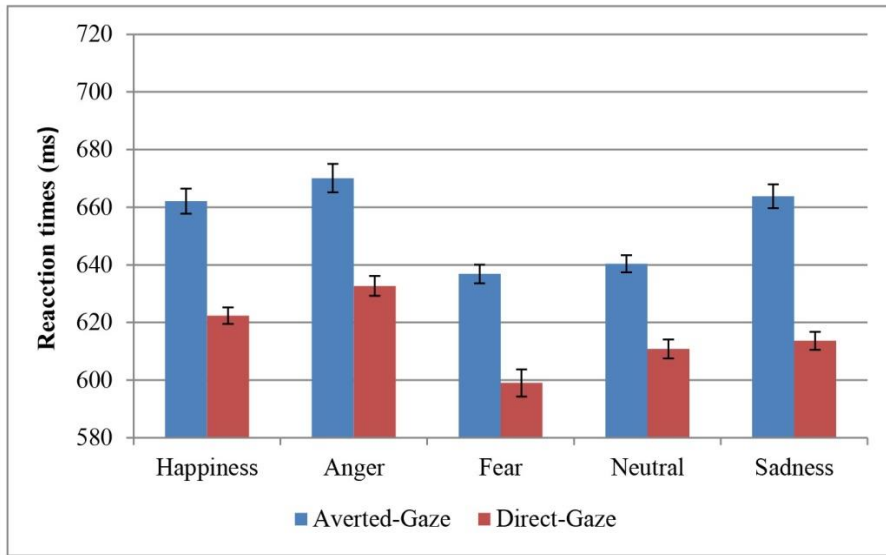
### *Response time*

Taking into account the procedure followed in the original study by Cañadas and Lupiáñez (2012), those trials with RTs shorter than 200 ms or slower than 1300 ms were eliminated from the RT analyses. Mean corrected RTs were submitted to a 2 (gelotophobia) x 5 (emotional expression) x 2 (gaze direction) mixed ANOVA. All response times (RTs) are measured and reported in ms. The results showed a main effect of emotional expression,  $F(4, 152) = 29.75, p < .001, \eta_p^2 = .44$ , with the lowest reaction times being for fearful faces ( $M = 618; SD = 55.86$ ) and the highest for angry faces ( $M = 651; SD = 60.72$ ). Replicating Cañadas and Lupiáñez (2012), a main effect of gaze direction was also found,  $F(1, 38) = 68.02, p < .001, \eta_p^2 = .64$ , with shorter RTs for direct gaze stimuli ( $M = 616; SD = 53.87$ ) than for averted gaze stimuli ( $M = 655;$

$SD = 65.40$ ). Furthermore, as Jones (2015) showed, the interaction between emotional expression and gaze direction was significant,  $F(4, 152) = 2.67, p = .035, \eta_p^2 = .07$ . However, in contrast to Jones's (2015) conclusions regarding the interaction, paired  $t$ -tests showed that RTs were lower in the direct gaze than in the averted gaze condition for all emotional expressions ( $8.11 > t(39) > 5.54$ ; all  $ps < .001, d = 0.47-0.79$ ) (see Figure 2). Regarding trait-gelotophobia, no main effect of group was observed,  $F(1, 38) = 0.15, p = .697, \eta_p^2 = .004$ . Furthermore, and importantly for our hypotheses, gelotophobia did not modulate any effect, especially the emotional expression  $\times$  gaze direction interaction,  $F(4, 152) = 0.40, p = .807, \eta_p^2 = .01$ .

#### *Error rates of responses*

In a similar pattern to the RT data, the obtained results showed a significant main effect of emotional expression,  $F(4, 152) = 4.21, p = .003, \eta_p^2 = .10$ , with a higher error rate for responses to angry ( $M = .07; SD = .09$ ) compared with fearful faces ( $M = .04; SD = .06$ ). A main effect of gaze direction,  $F(1, 38) = 10.17, p = .003, \eta_p^2 = .21$ , was also found, with lower error rates for direct gaze ( $M = .04; SD = .05$ ) than for averted gaze stimuli ( $M = .07; SD = .10$ ). Finally, as in the RT analysis, the interaction between emotional expression and gaze direction was significant,  $F(4, 152) = 3.14, p = .016, \eta_p^2 = .08$ . To explore this interaction (see Figure 3), paired-samples  $t$ -tests were employed, and a greater error rate for averted gaze stimuli emerged for happiness,  $t(39) = 3.22, p = .003, d = 0.54$ ; anger,  $t(39) = 3.17, p = .003, d = 0.29$ ; and sadness,  $t(39) = 2.76, p = .011, d = 0.41$ . Furthermore, in spite of the results just bordered on a statistically significant value,  $t(39) = 1.98, p = .054, d = 0.29$ , a low effect size was observed for fearful faces in accordance with Cohen (1988) criteria. Lastly, no differences were found for neutral faces,  $t(39) = .84, p = .404, d = 0.12$ .



*Figure 2.* Responses time for gaze discrimination by emotional expression and gaze condition. The results obtained in the Experiment 1 are on the left and Experiment 2 on the right. Error bars represent standard error of the mean computed following Cousineau (2005) method

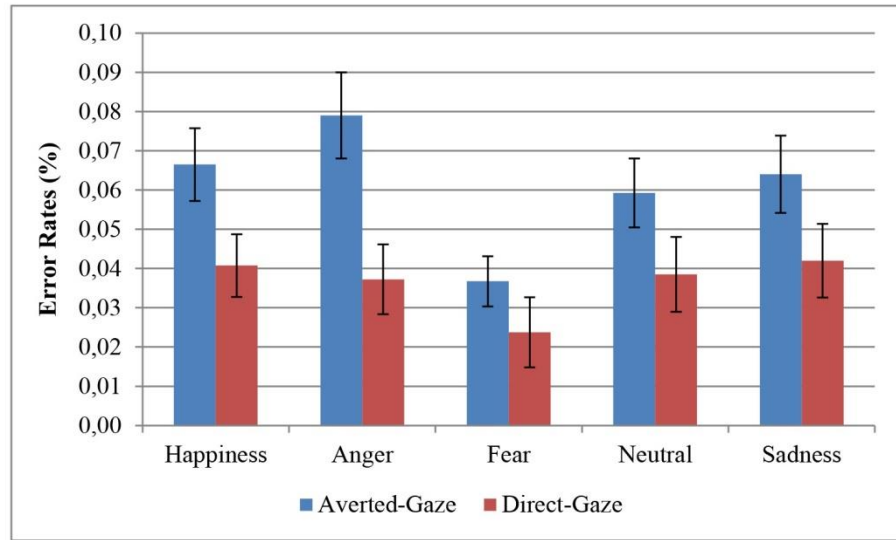
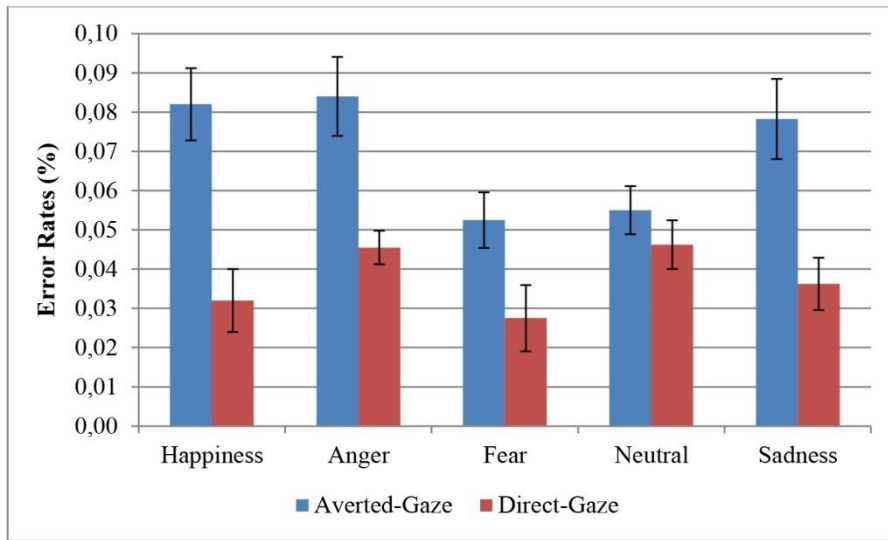


Figure 3. Error rates for gaze discrimination by emotional expression and gaze condition. The results obtained in the Experiment 1 are on the left and Experiment 2 on the right. Error bars represent standard error of the mean computed following Cousineau (2005) method.

Concerning gelotophobia effects, our data revealed that this predisposition did not modulate the gaze discrimination error rate,  $F(1, 38) = 2.32$ ,  $p = .136$ ,  $\eta_p^2 = .06$ , but an interaction close to statistical significance between gelotophobia and gaze direction appeared,  $F(1, 38) = 3.56$ ,  $p = .067$ ,  $\eta_p^2 = .09$ . To explore this interaction, an independent analysis was performed on each gaze direction condition (direct vs. averted). Although our results failed to attain statistical significance at conventional levels, the Cohen values suggested that gelotophobes had higher error rates than non-gelotophobes, specially for averted gaze,  $F(1,38) = 2.91$ ,  $p = .096$ ,  $d = 0.50$ , compared to direct gaze,  $F(1,38) = 0.92$ ,  $p = .343$ ,  $d = 0.40$ .

Given that Ruch and Proyer (2008) derived empirical cut-off points for gelotophobia ( $\geq 2.50$ ), and with the aim of avoiding potential limitations of our participant selection, we decided to repeat the above analyses but remove those participants classified as borderline fearful ( $n = 5$ ) in the gelotofobia group. In addition, to balance the two comparison groups, we also removed the five participants of the no-gelotophobia group with the highest scores on the Geloph <15>. Thirty individuals composed our new test sample. Again, two comparison groups were created: 15 gelotophobes (14 females; 17–21 years;  $M_{Geloph} = 2.91$ ;  $SD_{Geloph} = .24$ ;  $Min_{Geloph} = 2.53$ ;  $Max_{Geloph} = 3.27$ ) and 15 non-gelotophobes (nine females; 18–34 years;  $M_{Geloph} = 1.26$ ;  $SD_{Geloph} = .16$ ;  $Min_{Geloph} = 1.00$ ;  $Max_{Geloph} = 1.53$ ). The RT analysis on the data from the more extremely selected sample did not change from the results with the whole sample. However, with regard to error rates, the new analysis indicated that gelotophobes had significantly higher error rates ( $M = .05$ ;  $SD = .05$ ) compared with non-gelotophobes ( $M = .02$ ;  $SD = .01$ ),  $F(1, 28) = 8.59$ ,  $p = .007$ ,  $\eta_p^2 = .24$ . Additionally, the interaction between gelotophobia and gaze direction was also significant,  $F(1, 28) = 4.99$ ,  $p = .034$ ,  $\eta_p^2 = .15$ . Again, an independent analysis was performed on each gaze direction

condition (direct vs. averted). A between-participant effect emerged for the averted gaze condition,  $F(1, 28) = 7.65, p = .010, d = 1.03$ , showing that gelotophobes had higher error rates ( $M = .08; SD = .08$ ) compared with non-gelotophobes ( $M = .02; SD = .02$ ). Along the same lines, a trend that approached significance and a low effect size,  $F(1, 38) = 3.71, p = .064, d = 0.39$ , emerged for direct gaze stimuli, with higher error rates for gelotophobes ( $M = .03; SD = .03$ ) than for non-gelotophobes ( $M = .02; SD = .02$ ). Finally, and importantly for our hypotheses, the third-order interaction among gelotophobia, emotional expression, and gaze direction (see Table 1) did not reach statistical significance,  $F(4, 112) = 1.33, p = .263, \eta_p^2 = .05$ .

**Table 1.** Means of reaction times (in ms) and error rates for gaze discrimination in Experiments 1 and 2 for each condition and gelotophobia group.

			High Gelotophobia		Low Gelotophobia	
			RT	% Errors	RT	% Errors
Experiment 1	Happiness	Averted	669	.10	655	.07
		Direct	623	.04	622	.03
	Anger	Averted	673	.11	668	.06
		Direct	635	.06	630	.04
	Fear	Averted	644	.08	630	.02
		Direct	600	.03	598	.02
	Neutral	Averted	647	.08	634	.03
		Direct	616	.06	606	.04
	Sadness	Averted	666	.12	662	.04
		Direct	616	.04	612	.03
Experiment 2	Happiness	Averted	675	.10	721	.04
		Direct	641	.06	682	.03
	Anger	Averted	693	.12	729	.04
		Direct	643	.05	699	.02
	Fear	Averted	646	.06	685	.01
		Direct	613	.04	666	.01
	Neutral	Averted	655	.09	707	.03
		Direct	621	.06	668	.02
	Sadness	Averted	679	.09	721	.04
		Direct	640	.06	679	.02

**Discussion**

As we expected, the results of the present experiment confirmed that gaze direction and emotion modulate reaction time in gaze discrimination. In line with Cañadas and Lupiáñez (2012), participants were faster and more accurate at identifying a gaze direction when the face was presented to the left but looking to the right (direct gaze) than the same face location but looking to the left (averted gaze). These data reinforce the eye contact interpretation of this reversed congruency effect and entail new evidence regarding its robustness. Importantly, our results indicated a similar pattern for RT and accuracy data in contrast to other authors who have reported that gaze direction does not modulate accuracy in a gaze-cueing paradigm (Prinzmetal et al., 2008). Furthermore, we found that emotional expression influenced our eye contact effect, but in a way that is inconsistent with the “approach and avoidance oriented emotions” interpretation by Jones (2015). In fact, the expression of sadness, which has been considered an avoidance-oriented emotion (Adams & Kleck, 2003), showed a pattern similar to that of approach-oriented emotions (e.g., happiness and anger).

Similarly, emotional expression modulated the gaze direction effect in error rates as well. Participants showed lower error rates in identifying gaze directions with fearful faces compared with angry faces. In addition, more interestingly, direct gaze facilitated performance leading to higher accuracy, i.e., lower error rates for all emotional expressions with the exception of neutral faces. Therefore, although the “approach and avoidance oriented emotions” interpretation by Jones (2015) was not supported, the pattern of results supported the social nature of the reverse congruency effect observed, and therefore its interpretation in terms of eye contact (Cañadas & Lupiáñez, 2012). Eye contact is important in human communications (Doherty-Sneddon & Phelps, 2005),



particularly in those interactions where emotional expression is present (Milders et al., 2011).

With respect to gelotophobia, and in relation to RT, we found no evidence for any modulation of gelotophobia in gaze discrimination. However, and interestingly, individuals with high trait-gelotophobia tend to make more errors when they have to discriminate gaze direction. The ability to detect correctly gaze direction is associated with the appropriate interpretation of others' intentions (Baron-Cohen, 1994; Hudson & Jellema, 2011). Given that wrong attributions on the motivations and goals of other individuals could be considered one of the main components of gelotophobia (Ruch et al., 2008; Titze, 2009), this potential bias related to gaze identification could be a relevant finding to better understand the fear of being laughed at. Furthermore, the interaction between gelotophobia and gaze direction was significant, showing that the higher error rates observed in gelotophobes was larger in averted gaze trials than in direct gaze trials. Nevertheless, the independent analyses of the direct gaze condition also showed a low effect size for gelotophobia, so it seems necessary to explore this interaction further.

Finally, and in contrast to our hypothesis, happiness did not seem to have any special role in the observed differences between individuals with high and low trait-gelotophobia. Previous research has shown that gelotophobia may influence reactions to others' affective states but not just those related to happiness (Papousek et al., 2009). However, inasmuch as we had to reduce our testing sample to adjust it to the reported cut-off points for gelotophobia ( $\geq 2.50$ ) (Ruch & Proyer, 2008), we carried out an additional experiment to confirm the observed pattern of data, thus avoiding this potential limitation of the research. In addition, and importantly, to test whether our

findings are specific to gelotophobia, in the next experiment, we controlled for social phobia as an alternative explanation of the observed effect of gelotophobia.

### **Experiment 2**

In Experiment 2, we tried to replicate the results observed in the preceding experiment, but controlling for the potential limitations highlighted above. The newly recruited participants for the high- and low-gelotophobia groups showed greater differences in their trait-gelotophobia scores. Then, we tested again whether individuals scoring high in trait-gelotophobia indeed have higher error rates in detecting gaze direction compared with individuals with lower trait-gelotophobia scores. Moreover, we explored the interaction between gelotophobia and gaze direction with the aim of confirming our previous finding that a larger gelotophobia predisposition could be associated with poorer performance, especially with averted gaze in comparison with direct gaze conditions. Finally, we were interested in analyzing the third-order interaction among gelotophobia, emotional expression, and gaze direction once again to corroborate that the happiness condition does not play any specific role in the eye contact effect that gelotophobes show.

Another main objective in gelotophobia research is to determine its differential features in relation to other disorders with similar symptomatology (e.g., social phobia) (Carretero-Dios et al., 2010b). Actually, previous research studies have reported that a high percentage of gelotophobes are also assessed as individuals with social phobia and/or Cluster A (i.e., schizoid, paranoid, or schizotypal) personality disorder (Weiss et al., 2012). Consequently, we included social phobia as a control variable to investigate whether the effects of gelotophobia could be explained on the basis of differences in social phobia.

In addition, we added a new experimental phase related to the identification of others' emotional expressions. Although previous research indicated that gelotophobes did not have a general deficit in interpersonal emotion-related skills so as to categorize the emotions of others (Papousek et al., 2009), the goal of this second phase was to test whether eye contact conditions (direct vs. averted) modulate gelotophobes' capacity to identify others' emotional expressions. The manipulation of gaze direction in our preceding experiment seemed to be relevant, so we were interested in knowing whether gelotophobes would show a different pattern of emotion categorization depending on gaze conditions. Furthermore, all participants evaluated the intensity of the expressed emotion together with the valence and arousal of each face.

## **Materials and methods**

### *Participants*

Undergraduate students ( $N = 241$ ) were screened using the Geloph <15>. The Sample included a total of 40 participants (32 females, 8 males; mean age of 21.18,  $SD = 6.34$ ; range from 18 to 49) who were selected on the basis of their extreme scores in trait-gelotophobia and assigned to one of the two comparison groups (gelotophobes and non-gelotophobes). As in Experiment 1, all participants reported normal or corrected-to-normal vision and hearing, and participants' collaboration was in exchange for course credit. None of the participants had participated in Experiment 1.

The gelotophobes group was made up of 20 participants who had the highest trait-gelotophobia scores (16 females; 17–27 years;  $M=20.00$ ;  $SD=3.06$ ;  $M_{\text{Geloph}} = 2.93$ ;  $SD_{\text{Geloph}} = .39$ ;  $\text{Min}_{\text{Geloph}} = 2.53$ ;  $\text{Max}_{\text{Geloph}} = 3.60$ ). Thus, in contrast to Experiment 1, all participants in this study exceeded the cut-off point for gelotophobia ( $> 2.50$ ; see Ruch & Proyer, 2008). Thus, of these 20 participants with high trait-gelotophobia scores,

none was classified as borderline fearful, 11 were classified as slight expression of gelotophobia, seven were classified as marked expression of gelotophobia, and two were classified as extremely fearful of being laughed at. Likewise, the non-gelotophobes group was made up of 20 participants whose scores were the lowest in the GELOPH<15> (16 females; 18–49 years;  $M=22.35$ ;  $SD=8.39$ ;  $M_{Geloph} = 1.24$ ;  $SD_{Geloph} = .17$ ;  $Min_{Geloph} = 1.00$ ;  $Max_{Geloph} = 1.53$ ). As in the experiment 1, these individuals were classified as having no gelotophobia.

### *Instruments*

The Spanish version of the Geloph <15> was also used in this experiment with test reliability (Cronbach's alpha)  $\alpha = .96$ .

The Spanish version of the Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998; Olivares, García-López & Hidalgo, 2001) consists of 20 items rated on a Likert-type scale ranging from 0 (*Not at all*) to 4 (*Totally*). A sample item is “I get nervous if I have to speak with someone in authority (teacher, boss, etc.)”. In this study, the SIAS showed adequate good internal consistency ( $\alpha = .94$ ).

### *Apparatus, stimuli, and procedure*

The same procedure as in Experiment 1 was used in the first phase of this experiment. Additionally, a second experimental task was added in which participants had to identify the emotional expressions of faces with direct vs. averted gaze. For this new task, 160 photographs of 16 individuals, eight males and eight females, portraying either a happy, angry, fearful, neutral, or sad emotional expression, were also selected from the KDEF (Lundqvist et al., 1998). Stimuli were different from those used in the gaze discrimination task. Photographs did not have to be modified to recreate eye

contact conditions. Each target face was presented for an unlimited time at the center of the monitor either with a direct gaze (i.e., the eyes looking straight ahead) or an averted gaze (i.e., the eyes looking left or right). Participants had to categorize the emotional expression by pressing the corresponding key on the keyboard (“1 = happiness,” “2 = anger,” “3 = fear,” “4 = neutral,” or “5 = sadness”). After each categorization, and while the picture remained visible, participants indicated their estimation of different affective dimensions —valence, intensity, and arousal— for that facial expression based on the Self-Assessment Manikin (SAM: Lang, 1980). Only one experimental block composed of 160 trials, 16 (faces) x 5 (emotion) x 2 (gaze direction), was created. Hence, we obtained 16 observations per gaze direction condition displaying each emotional expression. Trials were presented randomly for each participant. Finally, participants responded to gelotophobia and social phobia questionnaires, in that order.

### *Design*

For the gaze discrimination task, the same design was used as in Experiment 1. For the analysis of the ratings in the emotional expression task, a similar design was used, 2 (gelotophobia: high trait-gelotophobia vs. low trait-gelotophobia) x 5 (emotional expression: happiness, anger, fear, neutral, or sadness) x 2 (gaze direction: direct or averted), with the following dependent variables (DVs): (a) *reaction time*; (b) *accuracy of responses* in the emotional categorization task; (c) *intensity* or magnitude of the emotion expressed (high vs. low); (d) *valence* or pleasantness of the faces displaying either emotional expression (positive vs. negative); and (e) the *arousal* or activation of these faces (active vs. calm). Again, gelotophobia predisposition was manipulated between participants, whereas the other variables were manipulated within participants. Furthermore, in all analyses, social phobia scores were introduced as a covariate to

determine whether the specific effects are related to gelotophobia independently of social phobia. A two-tailed significance level of  $p < 0.05$  was used for all analyses.

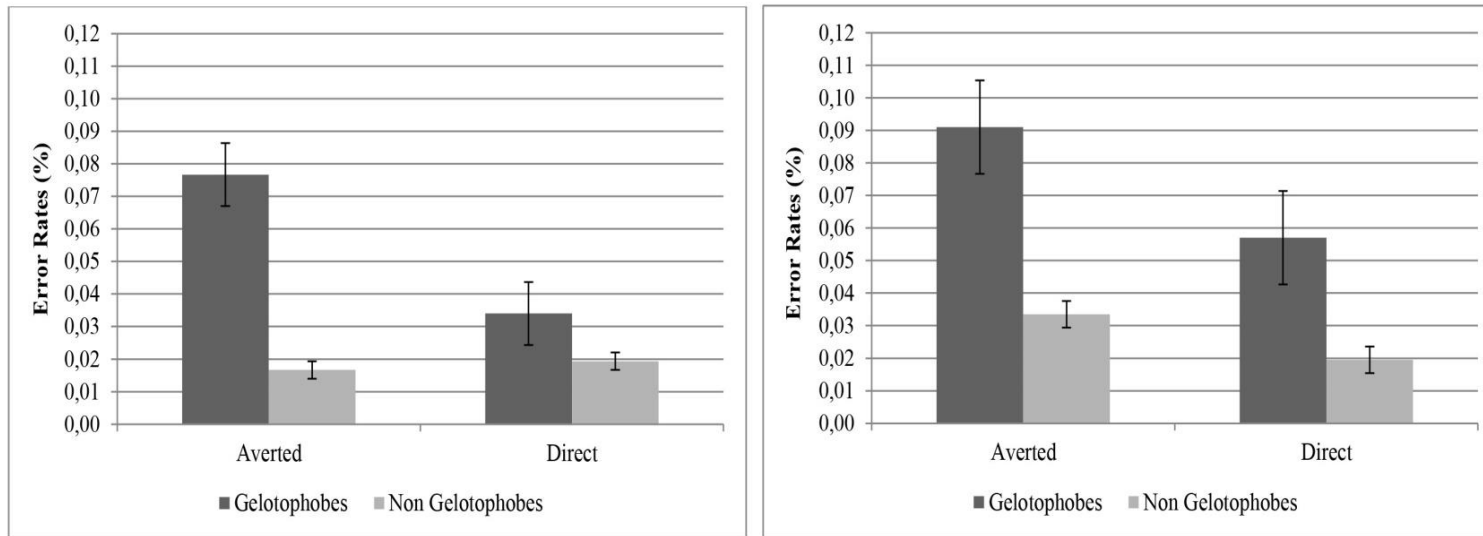
## Results

### *Gaze direction discrimination task*

*Response time data* showed, again, a main effect of emotional expression,  $F(4, 152) = 30.16, p < .001, \eta_p^2 = .44$ , with the lowest reaction times for fearful faces ( $M = 653; SD = 64.71$ ) and the highest for angry faces ( $M = 691; SD = 67.24$ ). As in the previous experiment, a main effect of gaze direction was also found,  $F(1, 38) = 41.18, p < .001, \eta_p^2 = .52$ , with participants having shorter RTs for direct gaze ( $M = 655; SD = 62.42$ ) than averted gaze faces ( $M = 691; SD = 69.61$ ). However, the interaction between emotional expression and gaze direction was not significant in this case,  $F(4, 152) = 1.33, p = 0.26, \eta_p^2 = .03$ . Furthermore, there was a main effect of group,  $F(1, 38) = 5.58, p = .023, \eta_p^2 = .13$ , with gelotophobes ( $M = 651; SD = 70.90$ ) being faster compared with non-gelotophobes ( $M = 696; SD = 48.83$ ). Nevertheless, this effect disappeared after controlling for social phobia scores,  $F(1, 37) = 1.96, p = .170, \eta_p^2 = .05$ . As in the experiment 1, the interaction between emotional expression and gaze direction was not modulated by gelotophobia,  $F(4, 152) = 1.48, p = .210, \eta_p^2 = .04$ .

As in our previous experiment, the analysis of *error rate data* also showed a main effect of emotional expression,  $F(4, 152) = 7.60, p < .001, \eta_p^2 = .17$ . Again, participants had the lowest error rate for fearful ( $M=.03; SD =.05$ ) and the highest for angry faces ( $M=.06; SD =.07$ ). However, the difference between direct gaze and averted gaze did not reach significance this time,  $F(1, 38) = 2.70, p = .109, \eta_p^2 = .07$ , and neither was an interaction found between emotional expression and gaze direction,  $F(4, 152) = 1.60, p = .179, \eta_p^2 = .04$ . Concerning gelotophobia, our results replicated the significant main

effect of group,  $F(1, 38) = 6.68, p = .014, \eta_p^2 = .15$ , with gelotophobes having higher error rates ( $M = .07; SD = .08$ ) compared with non-gelotophobes ( $M = .03; SD = .03$ ). Interestingly, this effect remained significant after controlling for individual social phobia scores,  $F(1, 37) = 5.54, p = .024, \eta_p^2 = .13$ . Additionally, and in contrast to Experiment 1, the interaction between gelotophobia and gaze (see Figure 4) was not statistically significant,  $F(1, 38) = 0.14, p = .708, \eta_p^2 = .004$ . Notwithstanding, a trend close to being significant and a medium effect size according to Cohen's criteria (1988), were found for the averted gaze condition,  $F(1, 38) = 3.54, p = .067, d = 0.62$ , with gelotophobes having higher error rates ( $M = .09; SD = .13$ ) compared with non-gelotophobes ( $M = .03; SD = .04$ ), and it was significant for the direct gaze condition,  $F(1, 38) = 8.65, p = .006, d = 0.79$ , with gelotophobia predispositions being associated, again, with higher error rates ( $M = .05; SD = .05$ ) in comparison with lower gelotophobia ( $M = .02; SD = .02$ ). Both effects remained after controlling for social phobia,  $F(1, 37) = 3.59, p = .066$ , and  $F(1, 37) = 4.80, p = .036$ , respectively.



*Figure 4.* Error rates for gaze discrimination as a function of gaze condition and gelotophobia group. The results from Experiment 1 are plotted on the left and those for Experiment 2 on the right. Error bars represent standard error of the mean computed following Cousineau (2005) method.



*Emotional expression categorization task*

The *analysis of RTs* showed a main effect of emotional expression,  $F(4, 152) = 32.35, p < .001, \eta_p^2 = .46$ , with happiness faces identified significantly more quickly ( $M = 2137; SD = 614.52$ ) than all other emotions were. Gaze direction and the interaction between emotional expression and gaze direction did not modulate any effect. It should be noted that RT was not limited in this phase. Furthermore, individuals with gelotophobia showed a tendency to respond more quickly when they identified others' emotional expressions,  $F(1, 38) = 5.87, p = .020; d = 0.77, \eta_p^2 = .13$ . Nevertheless, this effect disappeared after the inclusion of social phobia as a covariate,  $F(1, 37) = 0.99, p = .327; \eta_p^2 = .03$ . On the other hand, the interaction between gelotophobia and emotional expression,  $F(4, 152) = 2.02, p = .095, \eta_p^2 = .05$ , did not reach statistical significance. Finally, and interestingly with regard to our hypothesis, individuals with higher gelotophobia scores did not differ in their RTs due to gaze direction conditions,  $F(1, 38) = 0.29, p = .865; \eta_p^2 = .001$ .

On the other hand, the *analysis of accuracy* data indicated a main effect of emotional expression,  $F(4, 152) = 8.47, p < .001, \eta_p^2 = .18$ . The highest accuracy was observed for faces displaying happiness ( $M = .97; SD = .05$ ) and the lowest for neutral faces ( $M = .86; SD = .15$ ). On the contrary, no main effect of gaze direction,  $F(1, 38) = 0.34, p = .566; \eta_p^2 = .01$ , was found, and the interaction between emotional expression and gaze direction did not reach statistical significance,  $F(4, 152) = 1.47, p = .213, \eta_p^2 = .04$ . Importantly, the results showed that gelotophobia predisposition did not have any effect,  $F(1, 38) = 0.40, p = .531; \eta_p^2 = .01$ , and did not modulate the effects of emotional expression,  $F(4, 152) = 1.17, p = .328, \eta_p^2 = .18$ , or gaze,  $F(1, 38) = 0.62, p = .805; \eta_p^2 = .002$ .

*Emotional expression rating task: intensity, valence, and arousal*

Emotional expression,  $F(4, 152) = 15.80, p < .001, \eta_p^2 = .29$ , modulated the reported *intensity*. Particularly, the neutral expression had the lowest reported levels ( $M = 5.42$ ;  $SD = 1.62$ ) and the happiness expression the highest ones ( $M = 6.75$ ;  $SD = 1.14$ ). Gaze direction also modulated intensity,  $F(4, 38) = 12.84, p < .001, \eta_p^2 = .25$ , with greater intensity levels reported for direct gaze ( $M = 6.20$ ;  $SD = 1.03$ ) than for averted gaze ( $M = 6.08$ ;  $SD = 1.11$ ). Furthermore, the interaction between emotional expression and gaze direction was also significant,  $F(4, 152) = 3.95, p = .004, \eta_p^2 = .09$ . Paired t-tests showed that happy faces,  $t(39) = 5.30, p < .001, d = 0.34$ , with direct gazes ( $M = 6.94$ ;  $SD = 1.09$ ) were assessed with a greater level of intensity in comparison with happy faces with averted gazes ( $M = 6.54$ ;  $SD = 1.23$ ). A similar pattern was found for angry faces  $t(39) = 1.98, p = .055, d = 0.14$ , with larger intensity reports for direct gaze ( $M = 6.41$ ;  $SD = 1.19$ ) than for averted gaze ( $M = 6.23$ ;  $SD = 1.36$ ). No differences were found for the other emotional expressions. The main effect of the gelotophobia group did not reach statistical significance,  $F(1, 38) = 0.24, p = .628, \eta_p^2 = .01$ , although an interaction close to statistical significance between emotional expression and gelotophobia was observed,  $F(4, 152) = 2.28, p = .063, \eta_p^2 = .06$ . Nevertheless, it completely disappeared after controlling for social phobia,  $F(4, 148) = 0.93, p = .446, \eta_p^2 = .03$ .

Concerning valence and arousal, as expected, the *valence* ratings were modulated by emotional expression,  $F(4, 152) = 172.83, p < .001, \eta_p^2 = .82$ . No evidence was found, however, that gaze direction modulated the valence ratings,  $F(1, 38) = 0.21, p = .653, \eta_p^2 = .01$ . Interestingly, a significant interaction between emotional expression and gaze direction was also observed,  $F(4, 152) = 3.37, p = .011, \eta_p^2 = .08$ . Paired t-tests,  $t(39) = 2.85, p = .007, d = 0.21$ , showed that happy faces with direct gazes ( $M = 7.27$ ;

$SD = 0.98$ ) were evaluated as more positive than happy faces with averted gazes ( $M = 7.06$ ;  $SD = 1.02$ ). In contrast, angry faces with direct gazes were evaluated as less positive ( $M = 3.05$ ;  $SD = 1.02$ ) than angry faces with averted gazes ( $M = 3.20$ ;  $SD = 0.94$ ),  $t(39) = -2.09$ ,  $p = .044$ ,  $d = 0.15$ . No differences for the other emotional expressions were found. On other hand, neither the main effect of gelotophobia,  $F(1, 38) = 1.34$ ,  $p = .255$ ,  $\eta_p^2 = .03$ , nor its modulation over emotional expression,  $F(4, 152) = 0.07$ ,  $p = .992$ ,  $\eta_p^2 = .002$ , or gaze direction,  $F(1, 38) = 0.58$ ,  $p = .451$ ,  $\eta_p^2 = .02$ , reached statistical significance.

Finally, emotional expression also influenced the participants' perceptions of *arousal*,  $F(4, 152) = 48.64$ ,  $p < .001$ ,  $\eta_p^2 = .56$ , whereas gaze direction did not,  $F(1, 38) = 0.31$ ,  $p = .583$ ,  $\eta_p^2 = .01$ . Nevertheless, the interaction between emotion and gaze was also significant,  $F(4, 152) = 2.67$ ,  $p = .034$ ,  $\eta_p^2 = .07$ , and paired t-tests were used to explore this interaction. Differences in arousal were found for angry faces,  $t(39) = 2.53$ ,  $p = .016$ ,  $d = 0.20$ , with a greater arousal associated with direct gaze ( $M = 6.52$ ;  $SD = .97$ ) versus averted gaze ( $M = 6.33$ ;  $SD = 1.07$ ). Finally, no main effect of group,  $F(1, 38) = 0.42$ ,  $p = .522$ ,  $\eta_p^2 = .01$ , or interaction involving gelotophobia and emotional expression,  $F(4, 152) = 0.10$ ,  $p = .984$ ,  $\eta_p^2 = .003$ , or gaze,  $F(1, 38) = 0.48$ ,  $p = .491$ ,  $\eta_p^2 = .01$ , reached statistical significance for the arousal ratings. Those results concerning the abovementioned third interaction can be seen in Table 2.

**Table 2.** Means RTs and percentages of correct responses, and affective dimensions evaluations, for each condition and gelotophobia group, in the emotional categorization task of Experiment 2.

Emotional Expression	Eye Contact	High Gelotophobia					Low Gelotophobia				
		RT	% Correct	Intensity	Valence	Arousal	RT	% Correct	Intensity	Valence	Arousal
Happiness	Averted	2108	.97	6.57	7.15	5.30	2236	.97	6.52	6.97	5.64
	Direct	2113	.96	7.05	7.37	5.43	2091	.99	6.84	7.17	5.73
Anger	Averted	2975	.88	6.17	3.28	6.36	3672	.91	6.29	3.13	6.31
	Direct	2823	.91	6.40	3.15	6.43	3590	.93	6.43	2.94	6.63
Fear	Averted	3416	.86	6.12	3.60	6.13	3876	.88	6.20	3.32	6.18
	Direct	3369	.84	6.12	3.48	5.90	3828	.90	6.30	3.30	6.21
Neutral	Averted	2799	.89	5.93	4.83	3.75	3575	.84	4.99	4.81	3.93
	Direct	3042	.87	5.70	5.02	3.76	3614	.83	5.04	4.75	3.82
Sadness	Averted	3113	.89	5.97	3.30	4.83	3638	.93	6.04	3.24	5.01
	Direct	2905	.87	6.16	3.31	4.82	3812	.90	5.97	3.26	4.96

## General discussion

In this study, we explored the modulation that a higher trait-gelotophobia produced in a task in which individuals were asked to discriminate the directions of the gazes of faces portraying different emotions. In particular, we were interested in examining the RTs and the error rates of gelotophobes to discriminate adequately the left-right direction of others' eyes, as a function of whether they conformed direct vs. averted gaze conditions. To our knowledge, this is the first empirical study investigating the potential effects of gelotophobia in reaction to eye contact. In contrast to our initial hypothesis, and compared with non-gelotophobes, gelotophobes did not show a differential eye contact effect for happy faces. However, our results revealed a potential tendency among individuals with a greater degree of gelotophobia to make more error rates when identifying gaze direction. Interestingly, this potential bias in gaze discrimination is rather general, as it does not seem to be associated with a specific emotion or, according to our second experiment, the eye contact condition (direct or averted gaze). In fact, gelotophobes constantly exceeded—in terms of error rates—non-gelotophobes when they had to detect correctly the eyes' directions of the different faces.

Detecting correctly gaze direction or eye contact is widely considered as a crucial factor in the communication of social intentions or desires (e.g., Argyle & Cook, 1976), to modulate social cognition processes as person categorization (e.g., Macrae et al., 2002) and also to obtain key elements concerning the mental states of others (e.g., Baron-Cohen, 1995). Traditional conceptualizations of gelotophobia have included a poorly developed social competence among its features (Titze, 2009). These limited social skills are characterized, for example, by a widespread fear of acting in a socially inadequate way (“maybe funny”), a feeling of insecurity, hypervigilance toward all

possible contempt manifestations of social partners, and a general belief in the negative intentions of others (Platt et al., 2012; Ruch et al., 2014a).

In accordance with Baron-Cohen (1994), difficulties with discriminating others' gaze direction could lead to wrong interpretations of others' intentions or mental states. This is because individuals use the information provided by gaze in order to clarify ambiguous situations and, thus, to judge correctly intentions or acts of others (Phillips et al., 1992). Accordingly, a greater difficulty in knowing where other people are exactly looking at could be connected with the misattributions of others' intentions that gelotophobes make during social interactions, as well as the incorrect access to the real meanings of some more complex emotional expressions. In this sense, given that gelotophobes seem to be less able to identify accurately the direction of other's eyes (i.e., and therefore whether the attention is focused at a particular point or not), may contribute to perceive social interactions as ambiguous or, even, threatening. Furthermore, these results are in line with previous studies, which reported that gelotophobes show difficulties in adequately interpreting facially expressed communication (Ruch et al., 2014b).

In addition, it has been demonstrated that ambiguous eye contact conditions influence the subjective feeling of being observed (Senju & Hasegawa, 2006). Theoretical considerations and empirical data have supported the importance of studying eye contact and, more specifically, the feeling of being observed in relation to several disorders, such as social anxiety. For this reason, the goal of previous research was to determine the contextual cues that exacerbate the feeling of being looked at (Gamer et al., 2011). These authors found that a higher social phobia inclination would be associated only with a greater tendency to judge a "mutual gaze" in situations with a light social pressure (i.e., a second observer is present during the interaction), but not in

one-to-one conditions. Given that our experimental setting recreated a one-to-one interaction, this may help with explaining why social anxiety cannot explain the bias revealed for gaze discrimination, i.e., why this bias rather seems to be specific to gelotophobia. Additionally, in our second experiment, we found that a higher gelotophobia predisposition could be related to faster responses regardless of eye contact conditions—direct or averted—in the gaze discrimination task. However, this effect disappeared after controlling for social phobia scores. These results could be due to the tendency of individuals with high social anxiety to be hypervigilant toward threatening social cues (Eysenck, 1992; Boll et al., 2016), such as eye contact, which is an indicator of the beginning of a social interaction.

Consistent with previous research (Cañadas & Lupiáñez, 2012; Jones, 2015), we replicated a reversed congruency effect. Furthermore, in general, the emotional expressions of faces modulate this effect: Although the interaction was not significant in Experiment 2, the same tendency was observed, and the combined analysis of the two experiments showed a significant interaction for both RT,  $F(4, 316) = 2.48, p = .044, \eta_p^2 = .03$ , and error rates,  $F(4, 316) = 3.30, p = .011, \eta_p^2 = .04$ . This is important, as it favors the interpretation of the reversed congruency effect in terms of eye contact. Nevertheless, it should be noted that in contrast to the pattern of results that Jones (2015) reported, the effect was also observed for the fearful expression; furthermore, sadness (theoretically, an avoidance-oriented emotion) showed a pattern similar to those of happiness and anger (approach-oriented emotion) in both experiments. For this reason, we cannot corroborate the “approach and avoidance oriented emotions” interpretation that Jones (2015) suggested. Thus, additional studies of our eye contact effect should look into other different frameworks used to explain the interaction between facial expression and gaze direction, as the appraisal theory (Sander et al.,

2007). This theory focuses on the importance of the observer's goals or intentions when interpreting or evaluating (appraisal process) the meaning of all of the external social clues (Sander et al., 2007; Milders et al., 2011). Perhaps, sadness could trigger avoidance motivation in others but also feelings of compassion or approach behavior to offer occasional help to the observer. Nevertheless, it is important to note the need for developing further research to elucidate the relationship between sadness and the reverse congruency effect data and, more generally, the role of emotional expression in this unusual effect. Furthermore, in this research, we incorporated the data of error rates in the gaze discrimination task. We observed a main effect of emotional expression, which was replicated in both experiments, with the highest error rates in faces expressing anger and the lowest in faces expressing fear. Importantly, the joint analysis of the error data in these two experiments revealed that this eye contact effect was stronger in faces displaying emotional expressions—with the exception of fearful faces—compared with neutral faces.

Concerning the emotional expression categorization task, we found that gelotophobes were faster when they had to categorize others' emotional expressions, but as in the previous gaze discrimination task, this effect disappeared after controlling for social phobia scores. No accuracy differences between gelotophobes and non-gelotophobes in identifying others' emotional expressions were found, with our results being consistent with the notion that gelotophobes do not present difficulties in the use of interpersonal emotion-related skills (Papousek et al., 2009). Interestingly, neither did we find any interaction among gelotophobia, emotional expression, and gaze direction for intensity, valence, or arousal. In sum, our results seem to indicate that eye contact conditions do not modulate the gelotophobes' ratings of these affective dimensions.



Aside from gelotophobia effects, however, it should be noted that in this categorization task emotional expression modulated both RT and accuracy. More specifically, we found that happiness trials produced the fastest RTs and highest accuracy rates. Furthermore, the lowest accuracy rates were found in neutral faces. This data could be in line with previous studies reporting that emotional expressions, in comparison with neutral faces, facilitated processes such as face detectability (de Jong & Martens, 2007; Calvo & Nummenmaa, 2008; Milders et al., 2011). Along the same lines, we know that neutral faces contain affective keys more ambiguously than others' emotional expressions. Indeed, authors as Zebrowitz et al. (2010) pointed out that neutral faces are often wrongly labeled as faces displaying anger in males or faces portraying surprise in females. In addition, a fewer number of neutral trials exist compared with emotional faces, which can lead to interpreting neutral faces as an emotional expression.

With respect to the affective dimensions measured, our results showed an interaction between emotion and gaze direction for intensity, valence, and arousal rates. More specifically, we found that faces displaying anger or happiness with direct gazes were evaluated as more intense than those with averted gazes. These results are consistent with other studies that have proposed that gaze direction modulates the recognition accuracy and perceived intensity of several emotions (Adams & Kleck, 2005). Consistent with intensity data, we obtained for valence an opposite pattern between anger and happiness. Whereas happy faces with direct gazes were rated as more positive than happy faces with averted gazes, angry faces with direct gazes were evaluated as more unpleasant than angry faces with averted gazes. Finally, differences in arousal were found for angry faces with a greater arousal associated with direct gaze than with averted gaze. The observed interaction between emotional expression and

gaze direction fits with other empirical data suggesting that the processing of emotional expression and the processing of gaze pattern are interdependent (Ganel et al., 2005).

### **Conclusion**

The current results provide the first preliminary empirical evidence that gelotophobia is related to a potential bias in gaze discrimination. The effects of gelotophobia on error rates in discriminating gaze direction were replicated in two experiments. Furthermore, in the second experiment, the effect remained when controlling for social anxiety scores. Taking into account that gelotophobes, on the other hand, did not show any difference with non-gelotophobes in discriminating emotional expression, or intensity, arousal, or valence, our results could suggest that the gaze discrimination difficulties observed in high gelotophobes are not associated with problems with identifying others' emotions or an incorrect attribution of affective features. These higher error rates in gaze direction accuracy might not be due to any limitation in processing affective information but rather might be related to global processes of social cognition. However, future research should clarify and continue exploring social cognition biases in gelotophobia to analyze the potential consequences of feeling being observed.

Several limitations of this research must be nevertheless pointed out. Firstly, due to the low prevalence of gelotophobes in non-clinical population, the sample sizes were relatively small. However, both the number of participants selected and the strategy adopted for recruiting them (i.e., construction of extreme groups) were in the line with previous research concerning gelotophobia (Papousek et al., 2014; Ruch et al., 2015). Lastly, it is important to indicate that some particular laughter (or humor)-related aspects were not included in these studies. Indeed, the use of pictures does not allow for

the incorporation of key emotional components, such as sounds or movements. Therefore, it is possible that these stimuli may be insufficient to trigger some gelotophobes' specific reactions and can help with explaining the absence of a specific effect on eye contact in the happiness condition. For this reason, future research should add other materials (e.g., films, virtual reality, etc.) with the aim of creating more realistic scenarios of emotional interactions where laughter is present, which will surely be a significant step forward for the main purpose of this research.



## **Chapter IX**

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*Trust game reveals reduced cooperation rates  
with faces displaying joy in individuals scoring  
high in gelotophobia*



**Trust game reveals reduced cooperation rates with faces displaying joy  
in individuals scoring high in gelotophobia**

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**Abstract**

Gelotophobia is a personality trait describing an individual's fear of being laughed at. The research reported in this paper aimed at examining whether this laughter-related disposition may modulate the way individuals process joyful stimuli in trust decision-making situations. Using an experimental Trust Game, we compared participants scoring high vs. low in gelotophobia in their interactions with anonymous counterparts displaying joyful, angry or neutral faces either with straight, direct or averted gaze. Our results showed that joyful face did not drive automatic faster non-cooperation responses of high-gelotophobia individuals. However, these individuals did exhibit lower cooperation rates than the low-gelotophobia group in trust-decisions when interacting with faces displaying joy, which suggests that they were less likely to anticipate positive intentions from a trustee conveying a joyful state. No gelotophobia-based differences emerged for cooperation rates with either anger or neutral expressions. Complementary, in a second experimental phase, our findings lent further supports for the gelotophobes' difficulties in discriminating others' gaze direction. Moreover, no robust evidence emerged for gelotophobia modulating the attribution of affective facial features such as valence, intensity, or trustworthiness of others' faces. All these effects were investigated controlling for individuals' scores on social anxiety. Implications of these findings are discussed in relation to earlier research on gelotophobia, joyful faces, and the attributions of others' intentions.

*Keywords:* emotional expressions; gaze discrimination; gelotophobia; trust game



## **Introduction**

Gelotophobia (*gelos* in Greek means laughter) is a laughter-related personality trait describing how people differ in their fear of being laughed at (Ruch & Proyer, 2008). Earlier research has shown that heightened levels of gelotophobia may negatively bias perceptions and reactions to positive affective stimuli such as others' laughs and smiles (e.g., impaired facial mimicry of others' smiles; Hofmann, Platt, Ruch, & Proyer, 2015). However, to the best of our knowledge, no study has yet tested whether gelotophobia may influence the way individuals process joyful stimuli in trust decision-making situations. This research aims at closing this gap in the literature by comparing participants with high- vs. low-gelotophobia in their decisions in a Trust Game with anonymous counterparts displaying joyful, angry and neutral faces either with straight, direct or averted gazes.

### *Trust game and facial cues*

Social interactions often require the ability of encoding appropriately the motives and intentions of other individuals (McKinnon & Moscovitch, 2007; Mitchell, 2006). This sociocognitive capacity, also known as mentalizing, may be especially relevant in those interpersonal interactions engaging decisions with potentially beneficial or adverse consequences for oneself, such as trust-related behaviors (Sripada et al., 2009; Rotenberg, Petrocchi, Lecciso, & Marchetti, 2014). Trust is a psychological state comprising good expectations on others' intentions along with the acceptance of being hesitant and vulnerable to their actions (e.g., McKnight & Chervany, 2001). Accordingly, trusting someone can be affected by diverse factor such as external circumstances (e.g., economic crisis; Navarro-Carrillo, Valor-Segura, Lozano, & Moya, 2018) and distinctive characteristics of the trustor (e.g., narcissistic tendencies;

Kwiatkowska, Jułkowski, Rogoza, Żemojtel-Piotrowska, & Fatfouta, 2018) and the trustee (e.g., facial appearance Winston, Strange, O'Doherty, & Dolan, 2002).

The Trust Game (TG) is an experimental procedure designed to assess trusting behaviors in social interactions (Berg, Dickhaut, & McCabe, 1995; Brülhart & Usunier, 2012; Johnson and Mislin, 2011). The basic version of this task sets an economic situation where participants, playing the role of trustors, must make the trust-decision of sharing/sending a determined amount of money to their partners, or trustees, on the basis of their expectations of reciprocation. If participants cooperate, their partner enhances their personal gains (usually duplicating/tripling their earnings). Then the participants are informed of the decision of their partner to either reciprocate (i.e., acting trustworthily and sharing the gains), or not (i.e., violating the participant's trust), in which case participants would receive nothing. Hence, to maximize benefits, the TG demands to make correct inferences of others' intentions, discriminating personal and contextual cues that may evince the trustworthiness and reliability of the partners (Javor, Riedl, Kirchmayr, Reichenberger, & Ransmayr, 2015; Sripada et al., 2009). The TG has been robustly validated over the past 20 years, and there are several adaptations involving the manipulation of the role of the player (i.e., trustor vs. trustee), social distance between the players, or partners' reciprocation rates, among others (see Johnson & Mislin, 2011, for a meta-analytic review).

The progressive integration of investigations using the TG has permitted to unveil distinctive factors that may alter trust decision-making interactions. Regarding personal factors, for instance, Unoka, Seres, Áspán, Bódi and Kéri (2009) found that patients with borderline personality disorder exhibited decreased expectations of partner's reciprocation during the economic game, evidenced by sharing smaller amount of money compared to either patients with depression or healthy controls. Further, in a

recent study, Anderl et al. (2018) observed that there was a decreased pattern of reciprocation of those with elevated subclinical levels of social anxiety when they played in the TG as trustees (i.e., reciprocal giving), but not as trustor (i.e., trustful giving).

There are other investigations focusing on the role of salient characteristics and social signals of the partners in the TG. These studies revealed that social distance (e.g., Etang, Fielding, & Knowles, 2010), gender (e.g., Telga, de Lemus, Cañadas, Rodríguez-Bailón, & Lupiáñez, 2018), race (e.g., Tortosa, Lupiáñez, & Ruz, 2013a), and facial affective expressions (e.g., Tortosa, Strizhko, Capizzi, & Ruz, 2013b), amongst others features, may guide individuals' expectations in the TG. Regarding the latter variable, and importantly to our goals, it has been shown that joyful faces promote trusting (cooperation) responses while angry faces rather promote non-trusting (non-cooperation) ones, even with these facial cues are not predictive of the real partners' reciprocation (e.g., Tortosa et al. 2013b). Furthermore, although participants can learn individual reciprocating rates and cooperate accordingly (Telga et al., 2018), or cooperate according to other cues, they are still faster in cooperation responses for joyful faces, and in non-cooperation responses for angry ones (e.g., Alguacil, Madrid, Espín, & Ruz, 2016). Altogether, these findings suggest that facial emotional expressions may shape, automatically and perhaps implicitly, individuals' expectations/attribution of others intentions (top-down processing: e.g., Telga, 2019).

Although these findings support the existence of robust effects of facial emotional expression in the TG, not much research has investigated the possible effects of alternative salient dynamic (i.e., changeable) facial cues as gaze direction. Previous findings have shown that the manipulation of gaze direction (i.e., looking or not directly at the perceiver) affects the assessment of the partners' trustworthiness (Kaisler &

Leder, 2016) and alters trust-related responses in economic transitions (e.g., reliable partners' gaze cues can enhance altruism tendencies: Roger et al. 2014). Moreover, gaze modulates emotion recognition and the subjective assessment of affective dimensions such as valence and intensity, which suggests that these facial cues are processed in an integrative manner (Adam & Kleck, 2003, 2005; Ganel, Goshen-Gottstein, & Goodale, 2005; Jones, 2015; Torres-Marín, Carretero-Dios, Acosta, & Lupiáñez, 2017). Consequently, one might surmise that gaze direction would be able to modulate emotion effects on the TG and that, therefore, this social signal should be considered to examine its interaction on trust-decision making.

Furthermore importantly for our research, the affective facial expression and gaze processing in trust-decisions may be influenced by people's inclination to certain personality traits. In particular, individual differences regarding variables involving disturbances in the processing of joyful stimuli, i.e., gelotophobia, might bias the way these facial cues guide our expectation in trust settings.

#### *Gelotophobia as a personality factor modulating trust-decision making*

Gelotophobia is a laughter-related trait involving a negative biased processing of joyful stimuli (see, for an overview, Ruch, Hofmann, Platt, & Proyer, 2014a). Those high in gelotophobia (or *gelotophobes*) are more likely to experience exaggerated, negative reactions to being laughed at along with a near-paranoid sensitivity to be ridiculed (Ruch, 2009; Ruch & Proyer, 2009). Despite gelotophobia first emerged from clinical settings, this laughter-related disposition is also observed in a spectrum of varying intensities in the subclinical range (see Ruch & Proyer, 2008). Gelotophobes can be described as neurotics and introverted, with slight, negative inclinations to honesty-humility, and greater ones to the older, more clinically saturated variants of the

psychoticism-scale (Ďurka & Ruch, 2015; Ruch & Proyer, 2009; Torres-Marín, Proyer, López-Benítez, Brauer, & Carretero-Dios, 2019). Moreover, the nature of gelotophobia seems to be sufficiently distinct from similar preexisting phenomena like social anxiety and fear of negative evaluation, as evidenced by the presence of unique particularities through factorial and regression analyses, as well as their associations with external criteria (Carretero-Dios, Ruch, Agudelo, Platt, & Proyer, 2010; Edwards, Martin, & Dozois, 2010; Ruch et al. 2014a, 2014b).

Research on emotional processing have robustly supported an impaired ability to differentiate between positively and negatively motivated humor and laughter among those high in gelotophobia (Platt, 2008, 2019; Ruch, 2009; Ruch, Altfreder, & Proyer, 2009). They also exhibit reduced facial joy and more contempt markers to laughter-eliciting stimuli (Hofmann et al., 2015; Ruch et al., 2015), together with a “freezing-like” physiological response, that is, decreased heart rate, when they are exposed to others’ laughs in ambiguous interpersonal situations (Papousek et al., 2014). Despite these findings, no study has empirically tested the role of gelotophobia in trust settings where interact with faces portraying joy. Previous findings have revealed automatic- and goal-driven biases toward joyful faces in the TG (Alguacil et al., 2016; Tortosa et al., 2013b). Given that gelotophobes are likelier to attribute negative affective states to others’ smiles (e.g., “joyful faces hiding evil minds”; Hofmann et al., 2015); one might surmise that these individuals would not show the usual facilitation effects, in terms of reaction times (RTs) and cooperation rates (CRs), when interacting with joyful faces. Alternatively, and considering that gelotophobes are also more likely to score high in socially aversive interpersonal traits (e.g., reduced virtuousness/honesty-humility) and tend to expect social rejection from others (Proyer, Wellenzohn, & Ruch et al., 2014; Ruch et al., 2014; Torres-Marín et al., 2019b) they could exhibit an overall, non-specific

inclination to non-cooperation responses with faces displaying either emotional expression.

*Aims and hypothesis of the present research*

The main aim of this research was to analyze whether gelotophobia may modulate the processing of joyful stimuli in a multi-round TG with anonymous counterparts. We firstly expected that those high in gelotophobia would show slower RTs when cooperating with individuals displaying joy, whereas the opposite pattern would emerge for non-cooperation responses (H1). We secondly expected that gelotophobes would have lower CRs than their low gelotophobia counterparts, especially with faces displaying happiness (H2). Complementary, in the current experiment we tested whether emotional expressions' effects and our expectations on gelotophobia on trust-decision could be modulated by partners' gaze direction in an explorative manner.

Furthermore, our second objective was to further investigate the way in which high- and low-gelotophobia groups discriminate gaze direction, and subjectively rate trustworthiness, intensity and valence, for which we asked participants to judge the same faces employed in the TG on these dimensions. Taking prior findings into account, we expected gelotophobes would have more error rates in the gaze-discrimination task (H3; Torres-Marín et al., 2017) and would perceive joyful faces as less trustworthy, less positive and more intense (H4; Hofmann et al, 2015). These hypotheses together with the plan of analyses were pre-registered at [osf.io/b823r](https://osf.io/b823r)

## Method

### *Participants*

A total of 513 undergraduates completed several online screening questionnaires for their potential inclusion in an experimental task. They received a course credit for their participation on this phase. The selection criterion was the participant's score on gelotophobia-scale assessed through the PhoPhiKat-45 (see Ruch & Proyer, 2009). Individuals who exceeded at least a slight expression of gelotophobia ( $\geq 2.5$ ) and those with the lowest scores on trait-gelotophobia ( $\leq 1.99$ ) were invited to participate in this study. This cut-off scores have been empirically derived (see Proyer et al., 2009), namely, “no” [1.0-1.99], “borderline fearful” [2.00-2.49], “slight” [2.50-2.99], “marked” [3.00-3.49] and “extreme” [3.50-4.00] expression of gelotophobia. A total of 47 undergraduates, selected for being high- or low-scorers in gelotophobia, agreed to participate in our study. However, six of them did not fulfill the criteria for being assigned to the high-gelotophobia condition in a second assessment at the laboratory setting (see procedure) and one participant decided to abort the experiment before completion. These individuals were excluded from the final sample ( $n = 40$ ), which was determined on the basis of earlier investigations on gelotophobia obtaining significant behavioral (moderate-to-large) effects (e.g., Hofmann et al., 2015).

Thus, 40 undergraduates (38 females [95%], 2 males [5%]) were finally recruited for this experiment. All participants had normal or corrected-to-normal vision. Two groups of comparison, matched by gender and highly comparable in terms of age, were established, namely: high- and low-gelotophobia groups. The high-gelotophobia group ( $n = 20$ ) was made up of individuals having the greatest scores on gelotophobia (19 females; 18-22 years;  $M/SD_{PHO} = 2.87/0.36$ ;  $Min_{PHO} = 2.53$ ;  $Max_{PHO} = 3.80$ ). Among this subgroup there were 14 individuals with slight (70%), 5 with marked (25%) and 1 with

extreme (5%) expression of this trait. By contrast, the low-gelotophobia group ( $n = 20$ ) consisted of individuals with the lowest scores on gelotophobia (19 females; 18-23 years;  $M/SD_{PHO} = 1.38/0.17$ ;  $Min_{PHO} = 1.07$ ;  $Max_{PHO} = 1.60$ ).

### *Instruments*

The PhoPhiKat-45 (Ruch & Proyer, 2009; Spanish version by Torres-Marín et al., 2019) was used to assess gelotophobia (“When they laugh in my presence, I get suspicious”). This measure also provides the assessment of two complementary laughter-related traits, namely: gelophilia (i.e., the joy in being laughed at: “When I am with other people, I enjoy making jokes at my own expense to make the others laugh”); and (c) katagelasticism (i.e., the joy in laughing at others: “I enjoy exposing others and I am happy when they get laughed at”). Each dimension was assessed through 15 positively keyed items in a 4-point format, ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Prior studies have provided satisfying support for this scale’s reliability (e.g.,  $\alpha \geq .80$ ) and construct validity (i.e., well-replicated three-factor structure and external validity evidences based on its associations with other personality traits). The gelotophobia-scale had an excellent reliability in our final sample ( $\alpha = .95$ ).

The Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998; Spanish version by Olivares, García-López, & Hidalgo, 2001) was administered to assess trait-social anxiety (“I get nervous if I have to speak with someone in authority (teacher, boss, etc.)”). This scale includes 20 items and the response format was a 5-point Likert scale, ranging from 0 (*Not at all*) to 4 (*Totally*). This measure has demonstrated good reliability (e.g.,  $\alpha \geq .88$ ) and adequate support for its factorial structure and convergent-discriminant validity. This measure also demonstrated an excellent internal consistency in our final sample ( $\alpha = .95$ ).



*Apparatus and stimuli*

The experiment was run on a standard Pentium 4 PC using E-Prime 2.0 software package (Schneider, Eschman, & Zuccolotto, 2002). This program enables control for stimulus presentation, timing, and data collection. Stimuli were displayed on a 17-in. screen running (1024 x 768 pixel resolution), with a refresh rate of 100 Hz. Responses were made via a keyboard.

Stimulus material for the trust game task comprised 24 frontal full-color photographs of eight people (four females and four males) portraying joyful, angry or neutral faces with straight gaze on a gray background. Each picture measured 746 (high) x 562 (wide) pixels and was selected from the Karolinska Directed Emotional Faces (KDEF; Lundqvist, Flykt, & Ohman, 1998; [www.emotionlab.se/kdef/](http://www.emotionlab.se/kdef/)). The main criteria in selecting the set of faces<sup>1</sup> were: (a) eyes were visible in a clear manner; (b) satisfying support for the appropriate identification of each emotional expression (global hit rate accuracy  $\geq .49$  [mean = .66]: see Goeleven, De Raedt, Leyman, & Verschuere, 2008); and (c) smiles were displaying visible teeth in the case of joyful faces. At a later stage, eyes direction of these 24 photographs was modified using Adobe Photoshop CS for creating two further gaze direction conditions (i.e., faces looking to the left or to the right). Altogether, a total of 72 photographs displaying the aforementioned emotional expressions and the three types of eyes direction (i.e., straight, left and right) were used, which can be seen in [osf.io/k4hjs](https://osf.io/k4hjs). This manipulation of the eyes direction has been previously validated in experimental research on gaze discrimination (e.g., Cañadas & Lupiáñez, 2012).

The same faces were used for the gaze discrimination and emotional expression rating task. Additionally, a computer-generated sound signal (220-Hz tone) was

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<sup>1</sup> The KDEF codes of the faces were BF02, BF10, BF20 and BF22 for females, and BM08, BM10, BM11 and BM16 for males

presented through headphones to provide auditory feedback in no-response trials in the gaze discrimination task.

### *Procedure*

All participants gave their written, informed consent before starting the experiment. Participants were tested individually in a sound-attenuated and dimly illuminated room. They sat comfortably on a height-adjustable chair at approximately 60 cm from the monitor. Three distinct phases were implemented across the experiment, namely: (a) trust game task; (b) gaze discrimination and emotional expressions rating task; (c) assessment of the scores on gelotophobia and social anxiety. The research protocol used in this study was authorized by the ethics committee of the University of Granada, and carried out according to the Ethical Standards of the 1964 Declaration of Helsinki.

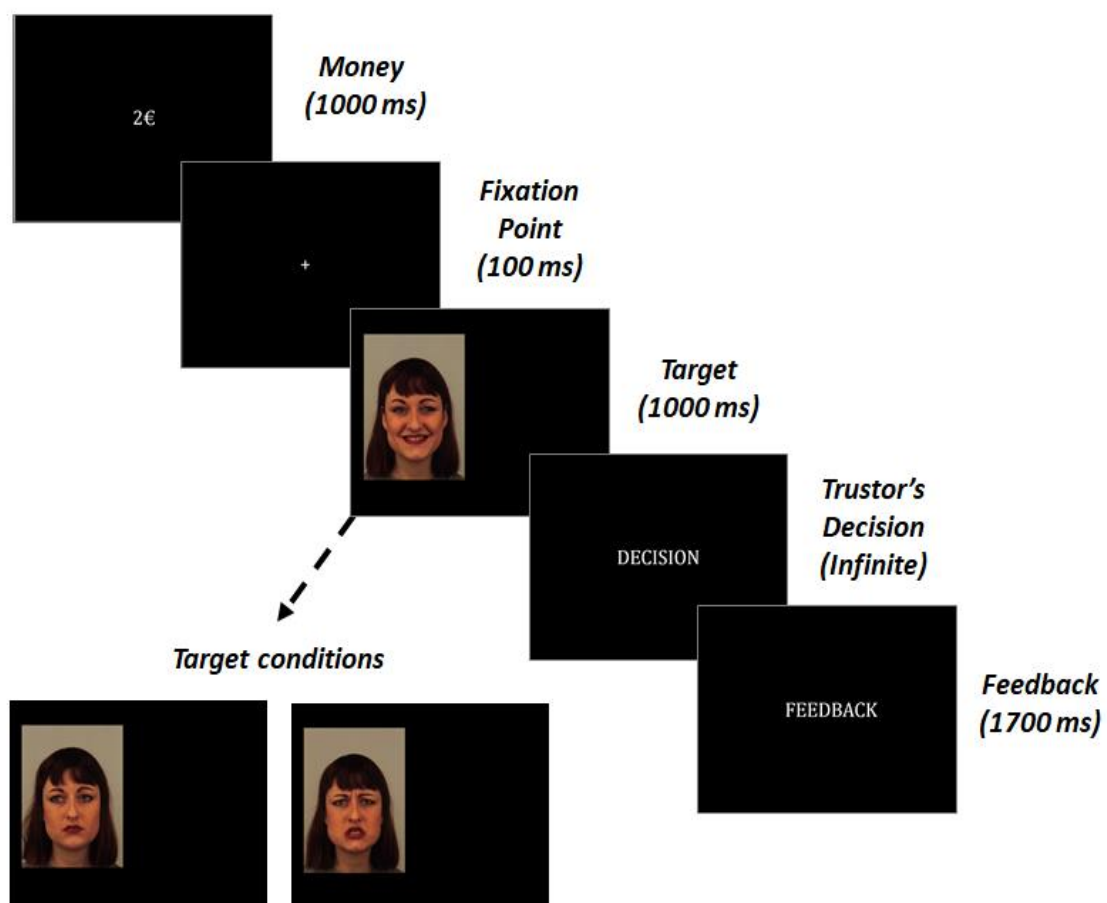
Participants firstly carried out a trust game task with a multi-round design in which they had the role of trustors. Their virtual partners, or trustees, were represented by each of the 72 photographs that served as material stimuli. At the beginning of each trial, a symbol of 2€ (0.5° x 0.8°) appeared on the center of a black screen (1000 ms) indicating the amount of money that participants initially received. It was followed by a fixation point (a white cross: 0.5° x 0.5°) located at the same place and lasting 100 ms. Then, one of the faces (15.5° x 20°), symbolizing the trustee with whom to cooperate or not in this trial, was displayed either to the left or the right of the point of fixation (eccentricity  $\approx$  3°) for 1000 ms. Faces could portray either a joyful, angry or neutral emotional expression. Further, the combination of the spatial location of each face (i.e., left or right of the fixation) and the manipulated eyes direction (i.e., straight, left and right) yielded three gaze direction trials: (a) straight gaze (i.e, a straight ahead-looking face presented either to the left or to the right of the point of fixation); (b) direct or inward

gaze (i.e., a left[right]-looking face presented to the right[left] of fixation); and (c) averted or outward gaze (i.e., a left[right]-looking face presented to the left[right] of fixation).

After being exposed to a specific face/trustee, participants were asked to decide between two options: (a) to keep the 2€ (i.e., non-cooperation response), which would yield no earnings for the trustee on that trial; or (b) to share it with their partner (i.e., cooperation response), which would quintuple its value to 10€. There was no-time-restriction for this decision. In the case of participants decided to share the money, their decision was followed by the feedback of the trustee's decision. The trustee could reciprocate, in which case both players would receive 5€, or not to reciprocate, and keep the 10€, in which case the participant would receive 0€. The cooperation/non-cooperation responses of the participants were indicated by pressing “Z” and “M” on the keyboard, being these responses counterbalanced across participants. Visual feedback was provided through a brief text message including information about the decision of the trustee and the raised money in the corresponding trial. The duration of the feedback was 1700 ms. Then, participants returned to the starting to begin the next trial [inter-trial-interval (ITI) = 750 ms]. This procedure is summarized in Figure 1.

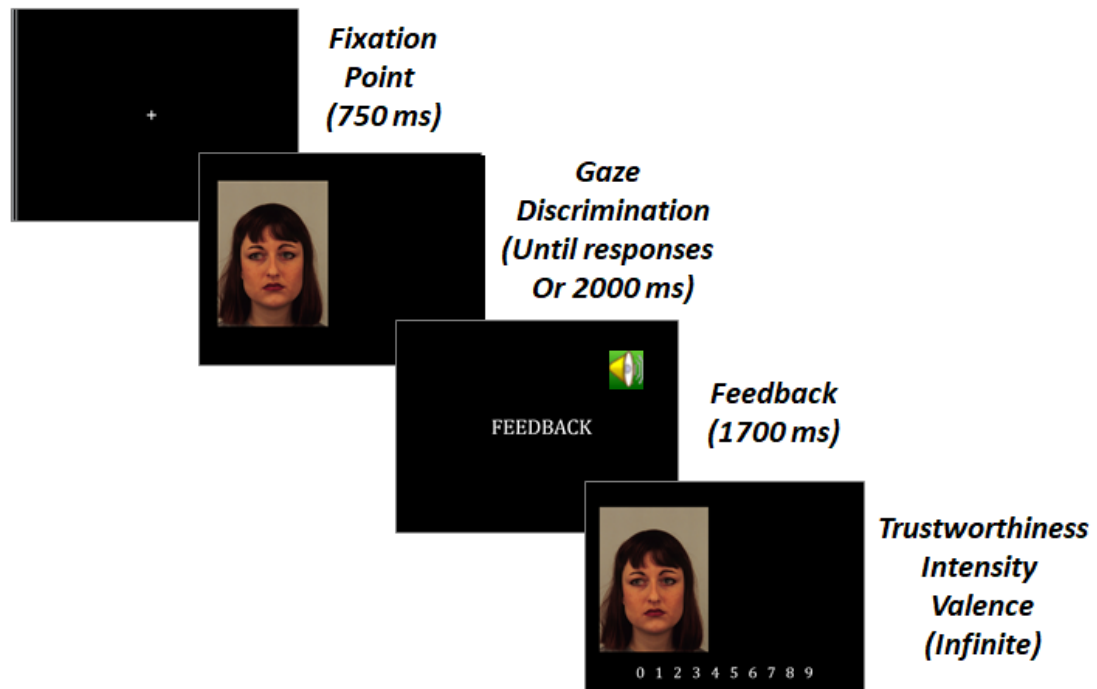
The experiment was composed of a short practice phase (36 randomly selected trials) and five main experimental blocks. There were rest-periods (pauses) between the blocks whose duration were determined by the participants. Each experimental block involved 72 trials with equal probability of faces displaying either emotional expression (joy, anger and neutral), with each gaze direction (straight, direct and averted). Altogether, there were a total of 360 trials per participant (40 observations per experimental condition; 3-emotional expression- x 3-gaze direction). Based on prior research (e.g., Tortosa et al., 2013b), the probability of reciprocation of the trustees was

set at the constant rate of 50% regardless of face identity, emotional expression or gaze direction. Participants were informed that they could achieve a maximum of 10€ for the trust game task. To maximize their earnings, they had to cooperate with the trustees that they thought would reciprocate with them and not to cooperate with those that would not do so. Therefore, the corresponding financial reward was proportional to their performance in the task (4.91€ on average).



*Figure 1.* Procedure used in the Trust Game. The pictures located above illustrate a face displaying joy with direct gaze trial (a right-looking face located to the left), whereas the bottom pictures illustrate other examples as a neutral face with averted gaze trial (a left-looking face located to the left) and anger face with straight gaze trial.

After the TG task, participants performed the gaze discrimination and emotional expressions rating tasks (see Figure 2). A central fixation point (a white cross:  $0.5^\circ \times 0.5^\circ$ ) lasting 750 ms was displayed at the onset of each trial. Later, one of the same faces that were used in the trust game task was presented either to the left or right of the fixation point (same eccentricity). Participants were instructed to discriminate as quickly as possible (while trying to avoid errors) whether the face was gazing straight ahead, to the left, to the right by respectively pressing the “space bar”, “Z” or “M” key on the keyboard. Auditory feedback (700 ms) was presented through headphones at approximately 70 dB on error trials. Further, visual feedback (1500 ms) along with the previously described tone was provided for those trials in which no response was executed (within 2000 ms). Once the participant responded to the gaze direction, each target face was again displayed at the same location. Participants then had to assess, without time restriction, three affective-related dimensions: (a) trustworthiness (i.e., how trustworthy each face looked [untrustworthy vs. trustworthy]), (b) intensity (i.e., magnitude of the emotion expressed [low vs. high]) and (c) valence (i.e., pleasantness of the emotional expression displayed [negative vs. positive]). This Likert-type scale regarding each affective dimension (from 1 = not at all to 9 = very much) was presented for each judgement on the bottom of the screen. Each face remained visible until the three judgements were made. After evaluating these affective dimensions, participants read a short message stressing the need to place their hands in an adequate position before starting the upcoming gaze discrimination trial (each trial started by pressing the space bar). Therefore, the ITI was determined by each individual. This phase of the experiment was made up of only one experimental block of 144 trials (16 observations per emotional expressions with each gaze direction). Trials were also presented randomly.



*Figure 2.* Procedure used in the Gaze Discrimination task and the Emotional Ratings Task. The picture illustrates a face displaying a neutral emotional expression with averted gaze trial (a left-looking face located to the left).

Finally, respondents were asked to complete a questionnaire booklet including the PhoPhiKat-45 (i.e., gelotophobia [second assessment: post-screening]; Ruch & Proyer, 2009) and the SIAS (i.e., social anxiety: Mattick and Clarke, 1998; Olivares et al., 2001). Participants received a course credit (0.1) for their participation.

### *Data analysis*

Prior to conducting the main analyses, we applied a set of filters on the basis of previous research. Regarding the TG task, we removed trials with RTs faster than 200ms and verified that participants had adequate pattern of CRs ( $.20 \leq x \leq .80$ ; Telga et al. 2018; Tortosa et al. 2013b). As for the gaze discrimination task, trials with RTs faster than 200ms or slower than 1300ms were removed and verified all participants had

an adequate accuracy rate ( $\geq .50$ ; Torres-Marín et al. 2017). Finally, note that no specific filters were applied to the emotional rating tasks.

A repeated measure ANOVA with trust-decision (cooperation and non-cooperation), emotional expression (joyful, angry and neutral faces) and gaze direction (straight, averted and direct gazes) was conducted for the reaction times (RTs) of the trust game. Similarly, we computed five further repeated measure ANOVAs with emotional expression (joy, angry and neutral faces) and gaze direction (straight, averted and direct gazes) for (a) CRs in the trust game, (b) accuracy in the gaze discrimination task, and (c) trustworthiness, (d) intensity, and (e) valence of the emotional expression rating task. For these ANOVAs, estimates of effect size were calculated using partial eta-squared ( $\eta^2 \geq 0.01/0.06/0.13$  indicate small/medium/large effects; Cohen, 1988). Finally, partial ANOVAs and *t test* for examining significant interactions were carried out. We also included a measure of effect size (Cohen's  $d \geq 0.2/0.5/0.8$  indicate small/medium/large effects; Cohen 1988) for both analyses.

To analyse the hypothesized gelotophobia-based differences, we repeated these analysis introducing gelotophobia (i.e., high- vs. low-gelotophobia groups) as a between-participants variable. Moreover, mean scores on social anxiety were included as a covariate (i.e., mixed-measures ANCOVAs). Significant interactions involving gelotophobia were independently examined using single factor ANCOVAs and Cohen's  $d$  values. Finally, linear relationships between gelotophobia (mean-scores) and research variables were performed using regression analysis with gelotophobia and social anxiety as predictors, and research variables as criteria.

Due to space restrictions, we focus on the analysis of our main hypotheses in the results section (see Hypotheses). For transparency, the entire pattern of results is provided in Supplementary Material. All the analyses were conducted using JASP

version 0.8.6.0 statistical software (this program is openly available at: <https://jasp-stats.org/>).

## Results

### *Reaction times in the trust game*

The type of trust-decision did not affect RTs,  $F < 1$ , but the emotional expression elicited the expected modulation in RTs,  $F(2, 78) = 5.773$ ,  $p = 0.005$ ,  $\eta^2 = 0.129$ , with joyful faces yielding faster RTs than angry and neutral faces. The expected interaction between trust-decision and emotional expression only approached significance,  $F(2, 78) = 2.544$ ,  $p = 0.085$ ,  $\eta^2 = 0.061$ , and RTs were not influenced by gaze direction,  $F < 1$ . However, the interaction between the trust-decision and gaze direction reached significance,  $F(2, 78) = 3.851$ ,  $p = 0.025$ ,  $\eta^2 = 0.090$ . In particular, faster RTs for cooperation, compared with non-cooperation trials, were obtained for straight gaze but not for averted or direct gazes. By contrast, neither the interaction between emotional expressions and gaze direction, nor the three-way interaction between trust-decision, emotional expression, and gaze direction reached statistical significance,  $F_s < 1$ .

Regarding gelotophobia-based differences, the main effect of group and the group x emotional expressions interaction were significant,  $F(1, 37) = 4.160$ ,  $p = 0.049$ ,  $\eta^2 = 0.101$ , and  $F(2, 74) = 3.190$ ,  $p = 0.047$ ,  $\eta^2 = 0.079$ , respectively, indicating that the high-gelotophobia group had in general faster trust-decisions than their low-gelotophobia counterparts, and specially with angry and neutral faces, but not with joyful ones. However, as can be seen in Figure 3, and in contrast to our expectations, there was no evidence for any modulation of gelotophobia on the effect of joyful faces in either cooperation or non-cooperation trials,  $F(1, 37) = 1.397$ ,  $p = 0.254$ ,  $\eta^2 = 0.036$ . On the other hand, the interaction between gelotophobia and gaze direction only



approach significance,  $F(1, 37) = 3.032$ ,  $p = 0.054$ ,  $\eta p^2 = 0.076$ , and the interaction between gelotophobia, trust-decision and gaze direction did not emerge,  $F(1, 37) = 1.397$ ,  $p = 0.254$ ,  $\eta p^2 = 0.036$ . Finally, the four-way interaction between gelotophobia, trust-decision, emotional expression and gaze direction was significant,  $F(4, 148) = 4.465$ ,  $p = 0.002$ ,  $\eta p^2 = 0.108$ , but the pattern of results was difficult to interpret (see Supplemental Material).

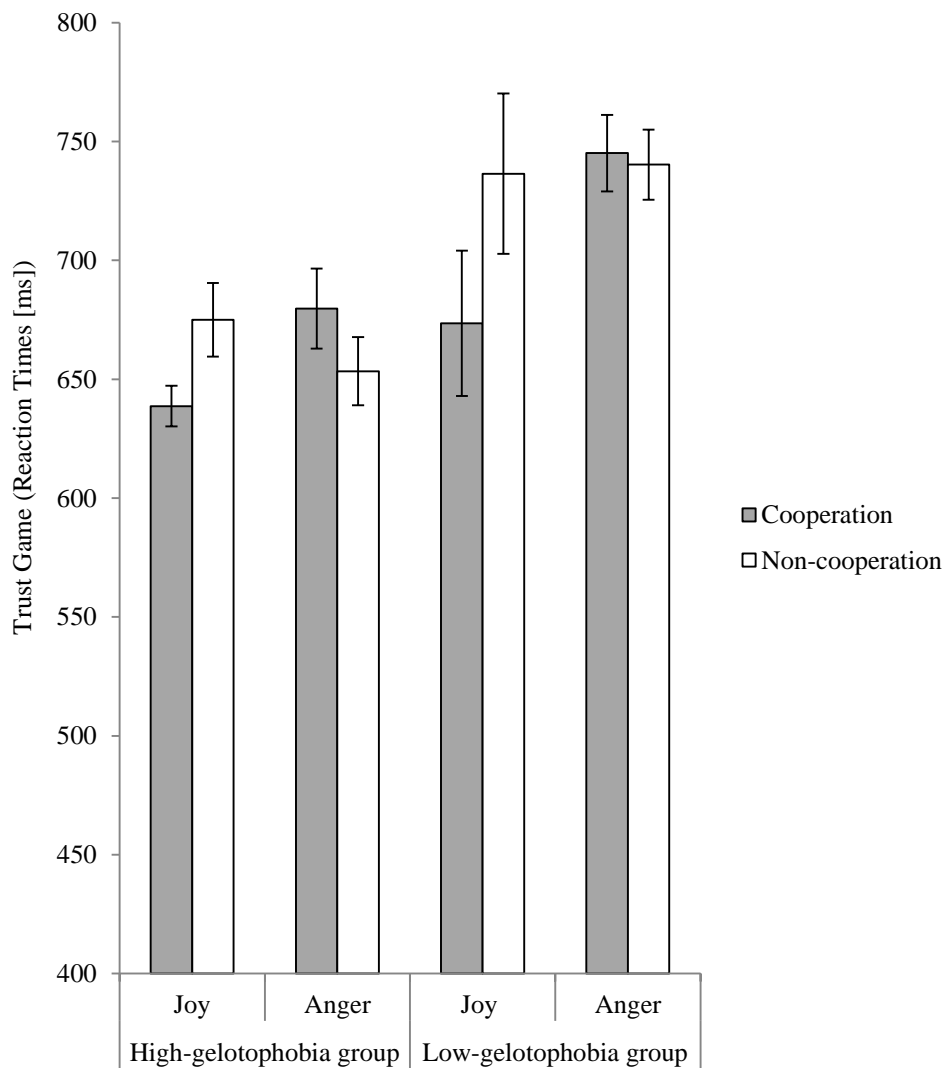


Figure 3. Responses time for the trust game by emotional expression (joy and anger), trust-decision and gelotophobia. Error bars represent standard error of the mean computed following Cousineau (2005) method.

*Cooperation rates in the trust game*

In line with prior findings, emotion modulated CRs,  $F(2, 78) = 25.954, p < .001, \eta p^2 = 0.400$ , such that joyful faces yielded higher CRs than neutral faces, and these higher CRs than angry faces. In contrast to our preliminary expectations, although CRs were in general larger for straight (.56%) than for averted (.53%) and direct (.54%) gaze (see Table 2 in Spp. Material), the main effect of gaze direction on CRs did not reach significance,  $F(2, 78) = 2.133, p = 0.125, \eta p^2 = 0.052$ , and the two-way interaction between emotional expression and gaze direction was not significant either,  $F < 1$ .

The main effect of gelotophobia group on CRs only approached significance,  $F(1, 37) = 3.848, p = 0.057, \eta p^2 = 0.094$ . Moreover, and crucially for our hypothesis, the interaction between emotional expression and gelotophobia was significant,  $F(2, 74) = 3.874, p = 0.025, \eta p^2 = 0.095$ . As shown in Figure 4, those scoring high in gelotophobia showed reduced CRs with joyful faces compared to their low gelotophobia counterparts, whereas the two comparison groups did not differ in their CRs with neither neutral nor angry faces. In other words, whereas the low gelotophobia group showed higher CRs for joyful than neutral faces, the high gelotophobia group showed similar CRs for both (the two groups showed lower CRs for angry than neutral faces). Moreover, the interaction between gelotophobia and gaze direction was not significant,  $F < 1$ , and the three-way interaction between gelotophobia, emotional expression and gaze direction was not significant either,  $F < 1$ ; see Supplemental Material).

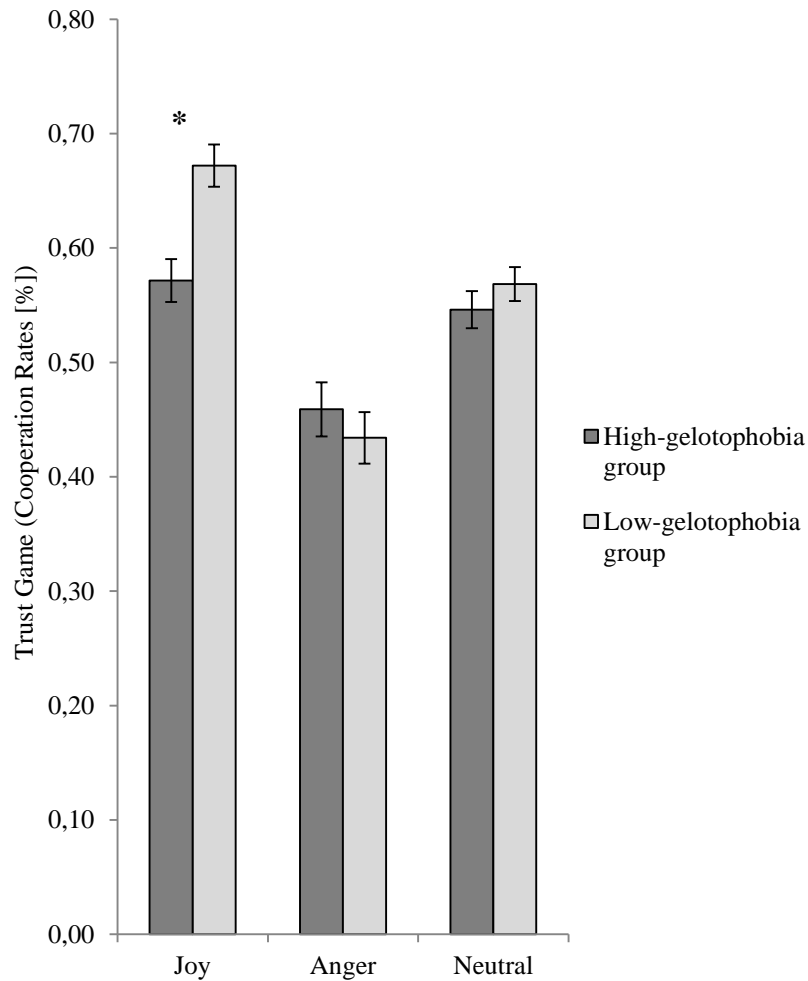


Figure 4. Cooperation rates for the trust game by emotional expression and gelotophobia. Error bars represent standard error of the mean computed following Cousineau (2005) method.

#### *Accuracy of gaze discrimination*

Emotional expressions influenced gaze discrimination,  $F(2, 78) = 12.721$ ,  $p < .001$ ,  $\eta^2 = 0.246$ , with faces displaying anger leading to larger error rates than the joyful and the neutral ones. Gaze direction also altered the accuracy in the gaze discrimination task,  $F(2, 78) = 3.132$ ,  $p = 0.049$ ,  $\eta^2 = 0.074$ , with straight gaze yielding lower error rates than averted and direct gaze. The interaction between emotional expression and gaze also reached significance,  $F(4, 156) = 3.633$ ,  $p = 0.007$ ,  $\eta^2 = 0.085$ , showing that the direction of gaze only modulated error rates in joyful faces,  $F(2, 78) = 7.727$ ,  $p <$

.001,  $\eta p^2 = 0.165$ . Indeed, faces portraying joy with straight gaze had lower error rates than these faces with averted or direct gazes.

Furthermore, although the high-gelotophobia group showed a numerically large percentage of errors (5.42%) than the low-gelotophobia group (2.66%), the main effect of gelotophobia on the accuracy of gaze discrimination did not yield significant results,  $F(1, 37) = 1.257, p = 0.269, \eta p^2 = 0.033$ . Moreover, this group-variable did not interact either with emotional expression or gaze direction,  $F_s < 1$ . Finally, the interaction gelotophobia x emotional expression x gaze direction did not reach significance either,  $F < 1$ . Data for from this three-way interaction are reported in Table 1.

**Table 1.** Means and standard deviations of error rates, for each condition and gelotophobia group, in the gaze discrimination task

Emotion	Gaze	Error Rates		
		High in gelotophobia	Low in gelotophobia	<i>d</i>
Joy	Straight	0.018 (0.046)	0.009 (0.023)	0.247
	Averted	0.078 (0.142)	0.039 (0.044)	0.370
	Direct	0.064 (0.127)	0.016 (0.029)	0.515
Anger	Straight	0.034 (0.048)	0.038 (0.077)	-0.062
	Averted	0.097 (0.197)	0.051 (0.077)	0.304
	Direct	0.096 (0.127)	0.049 (0.071)	0.456
Neutral	Straight	0.031 (0.069)	0.018 (0.039)	0.232
	Averted	0.029 (0.083)	0.006 (0.020)	0.371
	Direct	0.041 (0.079)	0.013 (0.033)	0.468

Note: Means are on the left and standard deviations are given in parentheses.

*d* = Standardized effect size

*Emotional expressions rating task*

The rates of trustworthiness, intensity and valence were largely influenced by the emotional expression,  $F_s \geq 71.714$ ,  $p_s < .001$ ,  $\eta p^2 \geq 0.648$ , with joyful faces being evaluated as more trustworthy and positive than angry and neutral faces. Both joyful and angry faces were judged as more intense than neutral faces and joyful faces as less intense than angry ones. Furthermore, the trustworthiness and valence were modulated by the direction of gaze,  $F_s \geq 6.236$ ,  $p_s \leq 0.003$ ,  $\eta p^2 \geq 0.138$ , with straight gaze being evaluated as more trustworthy and more positive than averted or direct gazes. Moreover, although there was not main effect of gaze direction on intensity,  $F(2, 78) = 1.199$ ,  $p = 0.307$ ,  $\eta p^2 = 0.030$ , gaze modulated the effects of emotional expression,  $F(4, 156) = 4.728$ ,  $p < .001$ ,  $\eta p^2 = 0.108$ , with a larger increase in intensity in joyful and angry faces, compared to neutral faces, with straight gaze than with averted or direct gazes.

The exploration of the possible group-effects of gelotophobia, and its interactions with emotional expressions and gaze direction, did not reveal any significant effect on trustworthiness ( $F_s \leq 1.69$ ,  $p_s \geq 0.155$ ), intensity or valence ( $F_s < 1$ ). The entire pattern of results is reported in Table 2.

**Table 2.** Means and standard deviations of affective dimensions evaluations, for each condition and gelotophobia group, in the emotional categorization task

Emotion	Gaze	Trustworthiness			Intensity			Valence		
		High in gelotophobia	Low in gelotophobia	<i>d</i>	High in gelotophobia	Low in gelotophobia	<i>d</i>	High in gelotophobia	Low in gelotophobia	<i>d</i>
Joy	Straight	5.679 (1.261)	6.475 (0.935)	-0.716	6.433 (0.920)	6.539 (1.243)	-0.097	6.589 (1.154)	7.077 (0.665)	-0.518
	Averted	5.285 (1.254)	5.941 (1.162)	-0.543	6.420 (0.866)	6.372 (1.122)	0.048	6.264 (1.119)	6.663 (0.844)	-0.403
	Direct	5.324 (1.271)	5.896 (1.202)	-0.463	6.308 (0.975)	6.324 (1.128)	-0.015	6.154 (1.058)	6.569 (1.010)	-0.400
Anger	Straight	3.353 (1.209)	3.407 (0.915)	-0.050	7.045 (0.861)	6.872 (1.218)	0.164	3.201 (1.222)	3.033 (0.955)	0.154
	Averted	3.198 (1.119)	3.276 (0.950)	-0.075	7.114 (0.824)	6.905 (1.257)	0.197	3.174 (1.052)	3.187 (1.033)	-0.012
	Direct	3.239 (1.289)	3.398 (0.922)	-0.142	6.880 (0.962)	6.952 (1.174)	-0.067	3.236 (1.166)	3.045 (0.860)	0.186
Neutral	Straight	4.514 (0.900)	4.723 (1.098)	-0.208	3.460 (1.865)	3.736 (1.657)	-0.156	4.979 (0.841)	4.824 (0.580)	0.215
	Averted	4.296 (0.894)	4.801 (1.323)	-0.448	3.734 (1.671)	3.931 (1.600)	-0.115	4.904 (0.687)	4.886 (0.692)	0.027
	Direct	4.295 (0.954)	4.726 (1.248)	-0.388	3.638 (1.822)	4.045 (1.530)	-0.242	4.845 (0.664)	4.742 (0.623)	0.159

Note: Means are on the left and standard deviations are given in parentheses. *d* = Standardized effect size

*Regression analyses*

We also calculated the linear relationship (i.e., dimensional approach) of our main expectations regarding gelotophobia. In the TG, the relations of gelotophobia with RTs of cooperation ( $\beta = -0.31, p = 0.308$ ) and non-cooperation ( $\beta = -0.41, p = 0.181$ ) trials with joyful faces were non-significant. As in the categorical approach, gelotophobia was associated with reduced CRs with joyful faces ( $\beta = -0.72, p = 0.016$ ), whereas no gelotophobia-based differences emerged for angry ( $\beta = 0.06, p = 0.843$ ) and neutral faces ( $\beta = 0.11, p = 0.724$ ). Concerning the accuracy in the gaze discrimination task, regression analyses showed that the overall relation between gelotophobia and error rates did not reach statistical significance ( $\beta = 0.55, p = 0.068$ ). However, our analyses revealed an association between gelotophobia and error rates in joyful faces with larger error rates for those high in gelotophobia ( $\beta = 0.60, p = 0.044$ ). Moreover, similar, but non-significant, tendencies emerged for angry ( $\beta = 0.44, p = 0.147$ ) and neutral faces ( $\beta = 0.51, p = 0.092$ ). Finally, and as in the case of the categorical approach, neither modulation of gelotofobia on trustworthiness, nor intensity or valence of joyful faces reached statistical significance (see Supplemental Material).

**Discussion**

The present research examined whether individuals scoring high vs. low in gelotophobia would differ in their interactions with faces displaying joy in a trust-related setting such as the TG. Furthermore, we also tried to confirm whether gelotophobia might bias the processing of gaze direction, as shown in an earlier research (Torres-Marín et al., 2017), and modulate the attributions of affective features as trustworthiness, intensity and valence in faces displaying diverse emotional expressions (especially joy). Four major findings on gelotophobia emerged: (1) this disposition did

not modulate the RTs for cooperation and non-cooperation responses when interacting with joyful faces (H1), but, as anticipated, high-scorers in gelotophobia had lower CRs with these faces than their low gelotophobia counterparts (H2). Furthermore, we obtained further support for the association between gelotophobia and larger error rates in others' gaze discrimination (H3), whereas no significant modulations of gelotophobia over the attributions of affective dimensions such as valence, intensity and trustworthiness emerged (H4). It is worth mentioning that these effects were investigated controlling for the influence of participants' scores on social anxiety.

#### *Gelotophobia-based differences in the TG*

The analyses of the RTs in the TG firstly revealed that participants high in gelotophobia were likelier to be faster in making the decision of trusting (or not), being this effect particularly evident in those emotional experimental conditions where the low-gelotophobia group required more time (i.e. angry and neutral faces). More importantly to our aims, gelotophobia did not yield either a slower RTs (i.e., cost) for cooperation or faster RTs (i.e., facilitation) for non-cooperation decisions with partners displaying joy. This suggests that, in contrast to our expectations (H1), an individual's joyful face did not drive automatically to faster non-cooperation responses, or slower cooperation responses, among the high-gelotophobia group. On the contrary, our results did provided supports for the modulation of gelotophobia over CRs with individuals displaying joy. In line with our hypothesis (H2), the high-gelotophobia group exhibited lower CRs than the low-gelotophobia group in trust-decision with faces displaying joy, whereas no gelotophobia-based differences emerged for either anger or neutral expressions. These results seems to indicate that those scoring high in gelotophobia are less likely to anticipate positive intentions from a trustee, that is, a lower likelihood of



reciprocating; when they confronted someone conveying a positive affective state (i.e., smiling) in the TG.

Although earlier investigations demonstrated that people usually interpret joyful faces as an indicator of trustworthiness (Tortosa et al., 2013b; Winston et al., 2002), our results suggest that this effect can be partially mediated by gelotophobia. This finding is aligned with the presence of a negative interpretation bias toward others' laughs and smiles as one of the prime characteristics of gelotophobia (e.g., joyful faces hiding evil minds: Hofmann et al., 2015; Ruch, 2009). Moreover, our results are consistent with other findings showing that high-scorers in gelotophobia are likelier to attribute groundlessly negative internal affective states to good-natured forms of laughter and humor (Papousek et al. 2014; Platt, 2008, 2019; Ruch et al. 2009), which hamper their integration in diverse interpersonal environments (Ruch et al. 2014). Our findings lent further support to this notion and extended its implications to a different human domain as trust decision-making situations. Given that making the decision to trust or not someone requires individuals to make inferences about others' intentions and mental states (Sripada et al., 2009; Rotenberg et al., 2014), our findings can be interpreted as an additional manifestation of the presence of anomalous mentalizing abilities for explaining negative expectations triggered by gelotophobia when other people laugh or smile. It has been suggested that an atypical development of theory of mind would relate and/or could be seen as an antecedent of the fear of being laughed at (Ruch et al. 2014; Samson, Huber & Ruch, 2011). Moreover, this gelotophobia's decreased tendency to trust in others displaying joy emerged even after controlling for the influence of social anxiety, which suggests that this effect could be seen as more specific or, at least, more directly related to gelotophobia. Prior investigations have pointed out to the presence of unique particularities in gelotophobia that can be

especially used for explaining laughter-related outcomes (Ritter, Brück, Jacob, Wildgruber, & Kreifelts, 2015; Ruch et al. 2014b). The current research expands these implications to trust decision-making situations.

Following with the findings of the TG, in general we replicated the main effects of emotional expression with joyful faces triggering faster RTs (being this effect stronger in cooperation trials) and larger CRs than either angry or neutral facial expressions (Alguacil et al., 2016; Tortosa et al., 2013b). We also found that gaze direction also influenced the RTs and CRs of the TG as straight gaze yielded faster RTs in cooperation trials and higher CRs than averted or direct gazes. Considering that the main distinction between straight gaze and averted-direct gazes is the congruency between the position of the iris and the head orientation, one may argue that the act of integrating inconsistent information in direct and averted gazes may have a processing cost (slower RTs) and increase negative expectations about others' intentions (lower CRs). In line with this notion, it has proven that the incongruence between eyes and body (i.e., head orientation) may alter the correct perception of gaze direction (Moors, Germeys, Pomianowska, & Verfaillie, 2015; Todorović, 2006). Further research is needed to clarify our findings on gaze direction in the TG. Finally, it should be noted that no relevant interactions emerged for gaze direction and emotional expressions, or for gaze direction and gelotophobia in the TG.

#### *Gelotophobia-based differences in the gaze discrimination and emotional ratings*

Furthermore, our results provided further support for previous findings of higher gaze discrimination error rates with elevated scores in gelotophobia (H3) (Torres-Marín et al., 2017). In particular, and according to regression analyses, this association seemed to be more pronounced when those high in gelotophobia had to discriminate gaze

direction of an individual showing a joyful face. Prior research has shown that being able to discriminate the direction of others' eyes enables people to anticipate others' attention and enhance to infer their intentions and future actions (e.g., Baron-Cohen, 1995). Moreover, it has been demonstrated that gaze modulates access to the real meaning of joyful faces (Niedenthal et al., 2010). Hence, according to the conceptualization of gelotophobia, one might surmise that this increased difficulty in distinguishing others' gaze direction (and, thus, their attention) could be related to their tendency to misattribute the mental state of people displaying positive affective expressions (i.e., perceiving them as threatening) and to their suspicious feelings when faced with others individuals laughing around them (e.g., referring to oneself this type of manifestations irrespective of their true target: Ruch et al. 2014). Our finding also fits well with the notion that gelotophobia is linked to an impaired facial mimicry of others' smiles (Hofmann et al. 2015).

Furthermore, gelotophobia did not robustly modulate the subjective assessments of trustworthiness, intensity or valence (H4). There are mixed support for these findings. For instance, whereas Hofmann et al. (2015) indicated that gelotophobia triggered negative perceptions of joyful smiles (i.e., less joyful and more contemptuous), other studies have observed that this laughter-related disposition did not modulate either recognitions or affective evaluations of some dimensions related to others' emotions (Torres-Marín et al., 2017). However, it should be noted that our data showed small evidences, based on effect sizes, for the high gelotophobia-group rating joyful faces as less trustworthy and less positive than the low-gelotophobia group (see Table 2). Future research should clarify this finding by studying gelotophobes' face-processing and social use gaze in more realistic stimuli. Moreover, future replication in larger samples, offering greater statistical power, would be also advisable.

Regarding findings on emotional expressions and gaze direction, faces displaying anger yielded greater error rates in gaze discrimination and were evaluated as less trustworthiness, more intense and more negative than faces displaying either joy or neutral expressions. Indeed, the opposite pattern was observed for joyful faces. Furthermore, faces with straight gaze triggered lower error rates in gaze discrimination and were rated as more trustworthy and more positive than averted and, especially, direct gazes. This latter condition was also associated with more negative rates in terms of valence. The interaction of emotional expressions and gaze direction revealed that joyful faces with straight gaze caused lower error rates and more positive ratings of trustworthiness and valence. These data provide additional support the validity of our emotion and gaze manipulations because were in line with earlier research using a similar experimental designs (Torres-Marín et al., 2017). Moreover, they extended earlier findings suggesting that the processing of emotion and gaze are narrowly interconnected (Chen, Helminen, & Hietanen, 2017; Ganel, Goshen-Gottstein, & Goodale, 2005).

#### *Limitations and future directions*

Several limitations are worth mentioning. Due to the low prevalence of individuals scoring high in gelotophobia the sample size was relatively small. We therefore used an extreme-groups design to maximize primary variance and to yield as larger as possible (potential) effects on the dependent variables. Moreover, it should be noted that the current sample size was similar to other investigations obtaining significant behavioral effects of gelotophobia (e.g., Hofmann et al., 2015; Ruch, Hofmann, & Platt, 2015) and other anxiety-related constructs (e.g., Gaspar & McDonald, 2019; Ritter et al. 2015).

Furthermore, there are three additional gaps that are not addressed in the present study. First, as mentioned, we only employed static facial emotional expressions, which may reduce ecological validity of our data and hinder the detection of some feasible gelotophobia-related reactions. Future investigations should incorporate alternative stimuli (e.g., films or virtual rituality) that may facilitate the triggering (or contribute to discarding) putative implications of an increased fear of being laughed at. Second, future research could aim to test whether the gelotophobes' difficulty in discriminating others' gaze direction might be exacerbated by some contextual factors such as interpersonal distance or social pressure. Although in this research we controlled for participants' scores on social anxiety, further studies should control for other personality factors that may be partially overlapped with gelotophobia, like paranoia, to examine the potential independence vs. redundancy of the aforementioned effects.

## **Conclusions**

This investigation contains the first empirical evidence that greater levels of gelotophobia might negatively bias the interaction with other anonymous individuals in trust decision-making situations. Although gelotophobia did not alter the usual facilitation to cooperate with individuals displaying joy in terms of RTs, those high in gelotophobia did had lower CRs than their low counterparts when interacting with joyful faces. Importantly, no gelotophobia-based differences emerged for CRs with either anger or neutral expressions. This seems to reflect that people scoring high in gelotophobia are less likely to have positive expectations about the intentions of other individuals (lower reciprocation rates) conveying a positive affective state. Our research also provided further support for the relation between gelotophobia and higher error rates in the gaze discrimination task and for the absence (or small) modulation of this

disposition over subjective assessments of affective features of others' facial expressions such as valence or intensity. Altogether, our findings fits well to the notion that gelotophobia is not only related to potential disturbances in emotional processing, but also to the presence of alterations in high-order/top-down processes as social cognition biases. Finally, as the previously described effects of gelotophobia were beyond the influence of the participants' social anxiety scores, this research also contributes to corroborating that these partially overlapped constructs are not redundant.

# **Chapter X**

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*General Discussion/Discusión General*





La presente tesis doctoral tuvo como objetivo fundamental analizar empíricamente la entidad del constructo gelotofobia, mediante el uso de distintas metodologías y procedimientos, buscando una contribución relevante a su base teórica y operacionalización. Así, con los estudios incluidos en esta tesis se ha pretendido abordar tres objetivos fundamentales que han requerido la implementación de tres líneas de investigación específicas. Cada una de esas líneas ha pretendido avanzar en esos objetivos aportando evidencia que corroboren: (a) la adecuada evaluación del constructo gelotofobia en distintos contextos culturales; (b) su entidad independiente frente a constructos de personalidad ya existentes; y (c) su relevancia en el procesamiento de señales socioafectivas del rostros que son de gran importancia en la comunicación interpersonal (i.e., expresión facial alegre y dirección de la mirada). A continuación, describimos los hallazgos principales y discutiremos su inserción en el marco teórico de referencia de la gelotofobia (Ruch, Hofmann, Platt, & Proyer, 2014a). Para finalizar, sintetizamos algunas de las limitaciones generales y específicas más salientes de nuestros estudios y describimos futuras líneas de investigación.

### **1. Validación de la versión española de la PhoPhiKat-45**

El primer objetivo específico de la presente tesis doctoral fue validar la versión española de la PhoPhiKat-45 mediante una evaluación comprehensiva de sus propiedades psicométricas y validez en muestras independientes de población española. En los Capítulos III y IV se incluyen los estudios realizados para alcanzar este objetivo.

Como se describe en el **Capítulo III**, en primer lugar, se adaptaron y ajustaron los contenidos de los ítems. Siguiendo los estándares marcados en los procesos de traducción y retro-traducción (Hambleton y de Jong, 2003), buscamos dotar a los ítems de la versión española de la PhoPhiKat-45 de un alto grado de correspondencia con los

de la versión original (Ruch & Proyer, 2009a), procurando, además, realizar adaptaciones puntuales en su redacción para garantizar su ajuste al contexto cultural de administración. Posteriormente, con el fin de validar las decisiones tomadas en este proceso y de obtener evidencias de la validez de contenido de los ítems, los sometimos a un juicio de expertos en psicometría siguiendo las pautas de investigaciones previas (Angleitner, John, & Löhr 1986; Delgado-Rico, Carretero-Dios, & Ruch, 2012). Conseguimos valores adecuados de acuerdo inter-jueces sobre la pertenencia ítem-dimensión ( $\kappa \geq .60$ ), así como datos satisfactorios en términos de la representatividad de los ítems en su dimensión objetivo correspondiente. Además, todos los ítems se consideraron adecuados en comprensión, ausencia de ambigüedad y claridad.

Tras finalizar estas fases previas, llevamos a cabo tres estudios dirigidos a testar la estructura factorial, consistencia interna, y evidencias de validez externa de la versión española de la PhoPhiKat-45. En el Estudio 1, o muestra de construcción, analizamos las propiedades métricas de los ítems de nuestro instrumento, encontrando valores adecuados en indicadores de tendencia central (i.e, ausencia de efecto suelo/techo en las puntuaciones) y de dispersión (i.e, adecuada variabilidad), así como en la distribución de las puntuaciones obtenidas (i.e, asimetría y kurtosis en los rangos establecidos como aceptables: West, Finch y Curran, 1995). En el mismo estudio, también encontramos que los ítems mostraban adecuados índices de discriminación/ítem-total corregido ( $\geq .29$ ) y que el análisis exploratorio de la estructura interna de la escala, realizado mediante un análisis de componentes principales (ACP), sugería la existencia de tres factores claramente identificables con las dimensiones de gelotofobia, gelotofilia y katagelasticismo.

Las evidencias sobre la validez factorial del instrumento, así como de su consistencia interna e intercorrelaciones, se obtuvieron de los datos obtenidos en los

Estudios 1, 2 y 3. En primer lugar, los resultados de los análisis factoriales confirmatorios (AFCs) mostraron, de manera consistente con el marco teórico-conceptual de la PhoPhiKat-45 (Ruch & Proyer, 2009a), que el modelo definido por tres factores (i.e., gelotofobia, gelotofilia y katagelasticism) presentaba un mejor ajuste que la propuesta de un modelo bifactorial (i.e., rasgos relativos a la producción de humor [gelotofilia y katagelasticism] *versus* rasgo relativo a la no-producción de humor [gelotophobia]) en tres muestras distintas. En la misma línea, los valores de consistencia interna y las intercorrelaciones entre las tres disposiciones fueron altamente comparables a los obtenidos en la versión original y validaciones en otros países (Chen, Chan, Ruch, & Proyer, 2011; Dursun, Dalğar, Brauer, Yerlikaya, & Proyer, in press; Ruch & Proyer, 2009). Más específicamente, los valores de fiabilidad de las puntuaciones de las tres dimensiones fueron elevados ( $\alpha$ s = .83–.88) y las intercorrelaciones siguieron la dirección esperada, a saber: gelotofilia correlacionó positivamente con el katagelasticismo ( $r_s \geq .36$ ) y negativamente con la gelotofobia ( $r_s \leq -.15$ ), mientras que la gelotofobia existió independientemente del katagelasticismo ( $|r_s| = .01-.08$ ). Por último, como en estudios previos de la versión original, no se observaron efectos sistemáticos de género o edad para la gelotofobia o la gelotofilia. Sin embargo, sí observamos una relación robusta entre ser varón y una mayor inclinación al katagelasticismo ( $r_s \geq .29$ ; véase Ruch & Proyer, 2009a).

En lo que respecta a las evidencias de validez externa, en el Capítulo empírico I de la presente tesis doctoral, estudiamos los correlatos de las tres disposiciones hacia la burla y la ridiculización con variables de distinta naturaleza. En primer lugar, replicamos los hallazgos relativos a estas disposiciones y los *estilos conductuales de humor* (Dursun et al., in press; Ruch, Beermann y Proyer, 2009a: Estudio 2). De acuerdo con nuestros resultados, la gelotofobia fue indicativa de una menor utilización

de estilos conductuales de humor positivos, ya sean de naturaleza interpersonal (i.e., humor prosocial o “*affiliative*”), o centrados en el afrontamiento de situaciones de adversidad (i.e., humor de auto-mejora o como estrategia de *reappraisal*). Estos resultados convergen, además, con postulados teóricos sobre este rasgo, los cuales enfatizan las dificultades para interpretar el humor, incluso en sus formas más positivas, como una característica distintiva de la gelotofobia (Ruch, 2009; Ruch et al., 2014a). Por otro lado, la gelotofilia se asoció positivamente con la utilización de todos los estilos de humor, especialmente aquellos orientados a potenciar las relaciones con los demás (i.e., humor prosocial y humor de auto-denigración). Este hallazgo es consistente con el carácter extravertido de las personas con elevada gelotofilia (Ďurka & Ruch 2015). Por último, en línea con su conceptualización e investigaciones empíricas previas (Dursun et al., in press; Ruch & Proyer, 2009), el katagelasticismo mostró asociaciones positivas con los estilos de humor más aversivos, esto es, con el humor agresivo y el humor de auto-denigración. El constructo katagelasticismo comparte, sin llegar a ser redundante, ciertas características antisociales con el humor agresivo, como podría ser una escasa compasión por los demás (Hampes, 2010; Proyer, Flisch, Tschupp, Platt, & Ruch, 2012a). A su vez, nuestros resultados sugieren que las personas que ridiculizan a los demás, también tienden a un mayor uso del humor de auto-denigración. Sería interesante esclarecer si ciertos factores externos, como la percepción de autoeficacia en ciertas tareas, podrían explicar el uso de la auto-ridiculización entre personas con un katagelasticismo elevado (p.ej., anticiparse a las burlas de los demás mediante la auto-ridiculización en situaciones en las que se tiene un rendimiento pobre).

También replicamos las asociaciones entre estas disposiciones y la presencia de *rasgos autistas* en el rango de lo subclínico (Wu et al., 2015: Estudio 2). En concreto, el autismo-rasgo se asoció positivamente con la gelotofobia, y existió independientemente

de la gelotofilia y el katagelasticismo. Estudios previos ya sugirieron que la asociación entre el miedo excesivo a ser objeto de ridiculización y ciertos trastornos del desarrollo, como el autismo y el síndrome de Asperger, puede deberse a la presencia de mecanismos subyacentes comunes, como las dificultades para procesar estímulos esenciales para la comunicación social o alteraciones en la adquisición de habilidades de mentalización o teoría de la mente (Samson, Huber, & Ruch, 2011; Wu et al., 2015). Siguiendo con variables de naturaleza subclínica, también estudiamos las asociaciones entre estas disposiciones y la ansiedad-rasgo (Estudio 2). Aunque estas asociaciones han sido ampliamente teorizadas (Ruch 2009; Ruch et al., 2014a), no habían sido testadas empíricamente hasta la realización de esta tesis. Encontramos que la ansiedad-rasgo fue indicativa de niveles elevados de gelotofobia, lo que resulta consistente con correlatos anteriores de esta disposición con otras manifestaciones relacionadas con la ansiedad, así como con su vinculación a una mayor vulnerabilidad a estados afectivos negativos (Carretero-Dios et al., 2010b; Papousek et al., 2009). Por el contrario, las personas con elevada gelotofilia mostraron menores niveles de ansiedad-rasgo. Esto podría vincularse con la capacidad de estos individuos de reevaluar situaciones potencialmente negativas, como serían los escenarios de burla o risa despreciativa por parte de otros, como situaciones socialmente relajantes y con un bajo nivel de amenaza (Ruch & Proyer, 2009a). No hubo una asociación sustancial entre el katagelasticismo y la ansiedad-rasgo.

Por último, comprobamos la generalización de las asociaciones entre estas tres disposiciones y los *rasgos básicos de personalidad del FFM* (Đurka y Ruch, 2015; Ruch, Harzer y Proyer, 2013: Estudio 3). La gelotofobia se asoció con elevadas expresiones de neuroticismo y bajas de extraversión y de apertura a la experiencia; la gelotofilia se asoció positivamente con la extraversión y negativamente con el

neuroticismo; y el katagelasticismo con bajos niveles de amabilidad y responsabilidad. Atendiendo a la localización de estas disposiciones en el FFM, nuestros resultados fueron claramente comparables a los obtenidos con muestras de otros países (p.ej., Eslovaquia: Ďurka y Ruch, 2015) tanto en términos de varianza total explicada como en la naturaleza (y orden) de los predictores que entraron en la ecuación de regresión. Esto sugiere que las características de personalidad más distintivas vinculadas a estas disposiciones parecen ser culturalmente estables. Adicionalmente, en este Estudio 3, analizamos, de manera exploratoria, las posibles relaciones curvilíneas de la gelotofobia, gelotofilia y katagelasticismo con los rasgos del FFM. Encontramos dos relaciones de U invertida entre gelotofobia-amabilidad, y katagelasticismo-neuroticismo.

En el **Capítulo IV** de la tesis doctoral extendimos las evidencias de validez de constructo de la versión española de la PhoPhiKat-45. Para ello, testamos las asociaciones, hasta la fecha desconocidas, entre las tres disposiciones hacia la burla y la ridiculización y los rasgos del *HEXACO model* (Ashton & Lee, 2004, 2007; Estudio 1) y de la Triada Oscura (Paulhus & Williams, 2002; Estudio 2).

En primer lugar, y aunque no se haga referencia explícita en el capítulo empírico, replicamos los datos obtenidos para la versión española de la PhoPhiKat-45 en términos de distribución de sus puntuaciones, consistencia interna ( $\alpha \geq .84$ ) y validez factorial (i.e., modelo de 3-factores: CFI/TLI  $>.90$ ; RMSEA  $<.10$ ; SRMR  $<.08$ ). De igual manera, también replicamos las intercorrelaciones entre gelotofobia, gelotofilia y katagelasticism, así como los efectos de género y edad previamente descritos.

Con respecto a las asociaciones con el *HEXACO model*, nuestros resultados pusieron de manifiesto que, de manera similar a investigaciones pasadas utilizando el FFM (p.ej., Ruch et al., 2013), la gelotofobia fue principalmente predicha por

expresiones reducidas de extraversión y elevadas de emocionalidad (i.e., dimensión análoga y parcialmente solapada con el neuroticismo del FFM: Ashton & Lee, 2007). Además, en este estudio, los niveles elevados de gelotofobia correlacionaron con expresiones bajas de amabilidad-rasg. Sin embargo, esta dimensión no contribuyó a explicar la varianza inter-individual en gelotofobia de acuerdo con los análisis de regresión. Por otro lado, la varianza en gelotofilia fue parcialmente explicada por niveles altos de extraversión y apertura a la experiencia. Por último, el katagelastismo fue esencialmente predicho por bajas puntuaciones en amabilidad. Además de estos rasgos, el HEXACO *model* incluye la dimensión de honestidad-humildad. Como señalamos en los capítulos empíricos, este rasgo, pobremente representado en el FFM, incluye características personales como la sinceridad, justicia, evitación de la codicia, y la modestia (Ashton, Lee, & de Vries, 2014; Romero, Villar, & López-Romero, 2015). Nuestros hallazgos sugieren que, atendiendo tanto a los análisis de correlación como de regresión múltiple, la gelotofobia y el katagelastismo son indicativos de bajas puntuaciones en honestidad-humildad.

En lo que respecta a la conexión de estos hallazgos con el modelo teórico de estas disposiciones (Ruch et al., 2014a), conjeturamos, por ejemplo, que las personas con elevada gelotofobia podrían utilizar comportamientos deshonestos cuando quieren evitar situaciones sociales incómodas donde el humor y la risa estén presentes (p.ej., mentir para evitar ser foco de la burla de otros). Esto podría entenderse como una manifestación de su inclinación a anticipar intenciones hostiles por parte de los demás (i.e., sensibilidad paranoide: Ruch et al., 2014a; Ruch & Proyer, 2009b). No obstante, cabe señalar que existe apoyo empírico mixto en lo que respecta a esta asociación, ya que si bien la gelotofobia ha sido asociada con comportamientos deshonestos como la manipulación de otras personas (Proyer, Flisch, Tschupp, Platt, & Ruch, 2012a),

también se ha vinculado a niveles elevados de modestia a través de puntuaciones auto y heteroinformadas (Proyer, Wellenzohn, & Ruch, 2014). Por otro lado, existe un apoyo robusto para la relación entre katagelasticismo y la baja honestidad-humildad, ya sea atendiendo a la características conceptuales de este fenómeno (p.ej., engañar a otros para crear situaciones donde puedan ser ridiculizados) o a sus asociaciones con otras manifestaciones socialmente aversivas como expresiones subclínicas psicopáticas o una baja inclinación a sentir culpa (Proyer et al., 2012a; Proyer, Platt, & Ruch, 2010; Proyer & Ruch, 2010).

A fin de esclarecer las diferencias entre la gelotofobia y el katagelasticismo en relación con la presencia de características personales socialmente aversivas, llevamos a cabo el Estudio 2. En éste, analizamos las asociaciones de las tres dimensiones de la PhoPhiKat-45 con la triada oscura (Paulhus & Williams, 2002). En una investigación reciente, Hodson, Book, Visser, Volk, Ashton, y Lee (2018) demostraron la existencia de un alto grado de correspondencia o solapamiento entre el polo negativo de la dimensión honestidad-humildad y el factor latente a los tres rasgos de la triada oscura.

Nuestros resultados mostraron que la gelotofobia correlacionó diferencialmente con los rasgos de la triada oscura, habida cuenta de que las elevadas expresiones de maquiavelismo y las reducidas de narcisismo fueron predictivas de esta disposición. Esto sugiere, de acuerdo con la conceptualización de las dimensiones de la triada oscura (véase Paulhus & Jones, 2014), que las personas con elevada gelotofobia serían tendientes a utilizar estrategias de manipulación de otras personas y a mostrar una cierta frialdad emocional. Sin embargo, al contrario de aquellos con personalidad narcisista, no mostrarían con excesiva frecuencia comportamientos dirigidos a promocionar su ego o manifestaciones de admiración excesiva de sus propios atributos. Estos hallazgos resultan congruentes con estudios anteriores que vincularon esta disposición a



expresiones elevadas de psicoticismo y empleo de estilos de manipulativos (Proyer et al., 2012a; Ruch & Proyer, 2009b), así como con otras investigaciones que sugieren estas personas tienden a ser modestos, infravalorando sus propias capacidades, y evitando conductas dirigidas a potenciar su ego (Proyer et al., 2012a, 2014). Estos resultados, además, permitieron clarificar nuestros resultados del Estudio 1, sugiriendo que son las características relativas a la deshonestidad (e.g., falta de autenticidad, manipulación de otros, uso de la mentira, etc.), y no aquellas concernientes a la humildad (e.g., sentimientos de superioridad o grandiosidad), las que parecen producir la asociación negativa entre gelotofobia y honestidad-humildad.

Por otro lado, y a diferencia de la gelotofobia, el katagelasticismo fue positivamente predicho por los tres rasgos de la triada oscura, esto es, por un alto maquiavelismo, narcisismo y psicopatía. Estos hallazgos cuadran ampliamente con la conceptualización de esta disposición, y con sus correlatos previos que indican que las personas con elevado katagelasticismo muestran una baja propensión a la culpa, así como tendencias psicopáticas a nivel subclínico como, por ejemplo, la exhibición de conductas impulsivas/antisociales (Proyer et al., 2010, 2012a).

Por último, encontramos otra relación teóricamente consistente entre la gelotofilia y el narcisismo. De acuerdo con la conceptualización de esta disposición (Ruch & Proyer, 2009a), las personas con elevada gelotofilia valoran las risas de otros como una señal de reconocimiento. Así pues, se podría argumentar que estas personas aceptarían las risas de otros (incluso las motivadas por situaciones embarazosas o ridículas) como una forma de ser el centro de atención. Estos datos son consistentes con la naturaleza extrovertida que caracteriza a los individuos con gelotofilia, y con estudios empíricos previos que vinculan los niveles elevados de esta disposición con comportamientos orientados a la promoción del ego (Dürka & Ruch 2015; Proyer et al., 2012a).

En suma, los hallazgos de los Capítulos I y II nos permiten defender que la versión española de la PhoPhiKat-45 puede ser considerada como un instrumento prometedor para el estudio de estas disposiciones en población española, reflejando una adecuada fiabilidad de sus puntuaciones y validez de constructo. Consistentemente, nuestra versión fue administrada con éxito en el Capítulo IX. En concreto, este instrumento permitió una discriminación adecuada en función de los niveles en gelotofobia en población no-clínica; arrojó coeficientes satisfactorios de consistencia interna para las tres dimensiones ( $\alpha_s \geq .80$ ); y mostró asociaciones teóricamente consistentes entre las tres disposiciones y criterios externos como, en este caso, el procesamiento diferencial de características socioafectivas del rostro. Esto refuerza la adecuada aplicabilidad de nuestro instrumento en el ámbito experimental. Por último, la difusión de esta herramienta de evaluación ha permitido que sea utilizada con éxito por otros grupos de investigación (p.ej., Blasco-Belled, Rogoza, Torrelles-Nadal, & Alsinet, 2019), encontrándose resultados comparativamente similares en términos de fiabilidad y validez.

Además de esto, nuestros resultados sobre la localización de la gelotofobia en el FFM (Estudio 3: Capítulo III) y en el HEXACO *model* (Estudio 1: Capítulo IV) nos permitieron establecer las bases de nuestra segunda línea de investigación, dirigida a examinar el grado de diferenciación de la gelotofobia frente a otros constructos de personalidad similares, ya sean rasgos básicos, como la introversión y el neuroticismo, o disposiciones más específicas con manifestaciones comparables, como la ansiedad social y la ideación paranoide.

## **2. Diferenciación de la gelotofobia frente a otros constructos de personalidad**

El segundo objetivo específico de la presente tesis doctoral fue contribuir a la diferenciación de la gelotofobia frente a otros constructos de personalidad con manifestaciones similares como la introversión, el neuroticismo, la ansiedad social y la ideación paranoide. En los Capítulos V, VI y VII se describen los estudios realizados para alcanzar este objetivo.

### *2.1. Gelotofobia, rasgos básicos de personalidad e imagen corporal*

En el **Capítulo V** se describen resultados de la capacidad predictiva de la gelotofobia sobre diversas dimensiones de imagen corporal tras controlar la influencia de los rasgos del FFM. Como señalamos en el Capítulo II de la tesis, la selección de la imagen corporal como variable de estudio respondió, por un lado, a la presencia de un respaldo teórico-empírico sólido sobre la relación entre imagen corporal y la presencia reiterada de experiencias de ridiculización (Cash, 1995; Menzel et al., 2010), y, por otro, al interés por estudiar la asociación no analizada hasta la fecha entre la gelotofobia y la representación de la propia apariencia física (Ruch et al., 2014a).

En primer lugar, replicamos las relaciones encontradas entre la gelotofobia y las dimensiones del FFM en muestras españolas (Estudio 3: Capítulo III). En concreto, esta disposición estuvo asociada con elevadas expresiones de neuroticismo y reducidas de extraversión. En lo que respecta a los correlatos entre la gelotofobia y las distintas medidas de imagen corporal, los resultados revelaron que el miedo grave a ser objeto de ridiculización correlacionó positivamente con la vigilancia y la vergüenza corporal, y negativamente con la apreciación del propio cuerpo y las creencias de control de la apariencia. No observamos una asociación significativa entre gelotofobia y la discrepancia entre cuerpo real-ideal. Al controlar la varianza compartida entre la

gelotofobia y los rasgos del FFM (esencialmente neuroticismo y extraversión) en un análisis de regresión jerárquica, comprobamos que esta disposición contribuyó a explicar varianza adicional de las puntuaciones en (alta) vergüenza corporal y (bajas) creencias de control de la apariencia, más allá de la influencia de las dimensiones del FFM.

La presencia de evidencias de validez incremental de la gelotofobia sobre el FFM sugiere que esta disposición contiene elementos específicos, esto es, no previamente representados en modelos de personalidad tradicionales, que contribuyen a la predicción de ciertas variaciones en la percepción del propio cuerpo. Se refuerza, por tanto, la diferenciación y utilidad de la gelotofobia frente a otras predisposiciones, parcialmente solapadas, como la introversión y el neuroticismo.

En lo tocante a la interpretación de las asociaciones entre la gelotofobia y la imagen corporal, nuestros hallazgos son congruentes con el conocimiento teórico y empírico relativo a esta disposición. Por ejemplo, de acuerdo con McKinley & Hyde (1996), la presencia de puntuaciones elevadas en la dimensión de vergüenza corporal indicarían una tendencia generalizada a experimentar sentimientos severos de vergüenza como resultado de una comparación social desfavorable en términos de apariencia. En otras palabras, las personas con gelotofobia mostrarían, con mayor frecuencia, episodios de vergüenza al sentir que su apariencia no se ajusta a los cánones socialmente imperantes (p.ej., comparativas con sus grupos de iguales). Esto es consistente con el rol preponderante de la vergüenza en la vida de los gelotofóbicos (Platt & Ruch, 2009), así como con su inclinación a manifestar creencias negativas sobre ellos mismos, describiéndose como poco atractivos, y a infravalorar en términos generales sus atributos (Führ, Platt, & Proyer, 2015; Proyer et al., 2014; Ruch, 2009).

Otro hallazgo relevante de nuestra investigación fue la asociación entre la gelotofobia y las creencias de que se dispone de pocos recursos de control sobre la apariencia física. En otras palabras, las personas con elevada gelotofobia consideran más frecuentemente que su capacidad para modificar su apariencia mediante sus comportamientos es muy limitada, creyendo que su aspecto está esencialmente determinado por factores no controlables como la genética (McKinley & Hyde, 1996). Este resultado converge con postulados teóricos que enfatizan la aceptación de ser un objetivo válido de las burlas de los demás como una característica central de la gelotofobia (Platt, Ruch, Hofmann, & Proyer, 2012). En este sentido, se podría conjeturar que ciertas características de la apariencia física, susceptibles de ser ridiculizadas, serían percibidas por los gelotofóbicos como inmutables (Ruch et al., 2014a).

En suma, los datos proyectados en este capítulo constituyen la primera evidencia empírica que respalda la relación de la gelotofobia con la percepción (negativa) del propio cuerpo. Estas asociaciones son consistentes con el modelo teórico de referencia de la gelotofobia (Ruch et al., 2014a), reforzando su operativización actual. Además, en estrecha conexión con los objetivos de esta tesis doctoral, las evidencias de validez incremental para esta disposición contribuyen a reforzar la distinción de este constructo frente a rasgos básicos de personalidad. No obstante, considerando la naturaleza novedosa de los datos, la selección no exhaustiva de medidas de imagen corporal, así como el bajo incremento de varianza explicada obtenido, decidimos comprobar el grado de generalización de estos hallazgos utilizando otras muestras y controlando la influencia de estructuras de personalidad alternativas.

En el **Capítulo VI** se describe una investigación que busca replicar y extender los hallazgos descritos en el Capítulo V. En concreto, analizamos la capacidad predictiva de

la gelotofobia sobre diversos indicadores relativos a la imagen corporal tras controlar la influencia de los rasgos del HEXACO *model*. Además, para examinar la consistencia de estas asociaciones, incorporamos un predictor alternativo, estrechamente relación con la gelotofobia, como es la ansiedad social. Por consiguiente, este diseño nos permitió, además, investigar posibles evidencias de diferenciación entre la gelotofobia y la ansiedad social en función de sus correlatos con criterios externos (Singh, 1991).

En primer lugar, nuestros resultados replicaron las asociaciones de la gelotofobia con los rasgos del HEXACO *model* descritos en el Estudio 1 del Capítulo IV, siendo la baja extraversión, la alta emocionalidad y la baja honestidad-humildad los predictores de esta disposición en una regresión múltiple. Adicionalmente, la localización de la ansiedad social en el HEXACO *model* mostró que este constructo fue predicho exclusivamente por una reducida extraversión y una elevada emocionalidad, no siendo la honestidad-humildad un predictor significativo de este constructo.

En cuanto a las asociaciones entre gelotofobia e imagen corporal, de nuevo, se observa que las personas con elevados niveles de este rasgo mostraron mayores puntuaciones en vigilancia y vergüenza corporal, e inferiores en las creencias de control de la apariencia. De manera complementaria, se encontraron asociaciones positivas de la gelotofobia con la orientación a la apariencia y la preocupación por el sobrepeso, así como negativas con la evaluación de la apariencia y la satisfacción con las áreas del propio cuerpo. Similar a nuestros datos con la discrepancia entre cuerpo real-ideal, no se observó una relación significativa entre la gelotofobia y la auto-clasificación del propio peso. En lo que respecta a la comparación de la gelotofobia y la ansiedad social, estas disposiciones mostraron un patrón de correlaciones bastante equivalente, con la excepción de una correlación en torno a cero entre la ansiedad social y la preocupación por el sobrepeso.

Tras controlar la influencia de los rasgos *HEXACO model* en la predicción de las distintas variables de imagen corporal (principalmente la extraversión, la emocionalidad y la honestidad-humildad), observamos que la gelotofobia incrementó la varianza explicada en todas las dimensiones criterio con las que tuvo una correlación significativa. Esto sucedió, incluso, cuando se incorpora la ansiedad social como un predictor alternativo de la varianza restante a la explicada por las dimensiones del *HEXACO model*. Por consiguiente, estos datos proporcionan una replicación y extensión de los obtenidos para la capacidad predictiva de la gelotofobia sobre las dimensiones de vergüenza corporal y creencias de control de la apariencia. Asimismo, el impacto de la gelotofobia sobre la imagen corporal parece ser generalizable a otras manifestaciones, reflejando coeficientes predictivos más elevados que la ansiedad social.

En lo tocante a la cohesión de nuestros datos con el modelo de referencia de Ruch et al. (2014a), creemos que las asociaciones de esta disposición con una evaluación desfavorable del cuerpo y la insatisfacción con las propias áreas del mismo son coherentes. En concreto, el hecho de que las personas con alta gelotofobia hagan más frecuentemente evaluaciones negativas de su apariencia global y de aspectos discretos del cuerpo (p.ej., cara, pelo, tono muscular o altura: Cash, 2000) converge con hallazgos anteriores sobre la tendencia de estos individuos a auto-describirse como poco atractivos o a manifestar niveles bajos de autoestima (Führ et al., 2015; Hiranandani & Yue, 2014; Ruch et al., 2014a). Por otro lado, las asociaciones entre esta predisposición y la mayor orientación hacia la apariencia, paralela a una mayor inclinación a la emisión de conductas relativas a la vigilancia corporal, sugieren que las personas con gelotofobia otorgan una gran importancia a su aspecto, monitorizándolo e invirtiendo un tiempo elevado en su mejora (Cash, 2000). Esto podría estar relacionado con la

necesidad de estos individuos de evitar posibles factores que susciten la ridiculización de otros (Ruch et al., 2014a), buscando ajustar su apariencia en términos de vestimenta e higiene a fin de no llamar la atención de los demás negativamente. De manera similar podría interpretarse la relación entre gelotofobia y la presencia de sentimientos de ansiedad y comportamiento de vigilancia sobre el propio peso (Cash, 2000). Estudios recientes sugieren que la presencia reiterada de episodios de burla sobre el peso podría constituir un posible desencadenante del miedo excesivo a ser ridiculizados por otras personas (véase Kohlmann et al., 2018).

En conjunto, los hallazgos de los capítulos V y VI nos permitieron, en primer lugar, extender la red nomológica de la gelotofobia en relación con las valoraciones realizadas sobre la propia imagen corporal. Asimismo, la localización de la gelotofobia en el FFM y el HEXACO *model* parece ser generalizable a otras muestras españolas, encontrando resultados similares en términos de varianza total explicada y naturaleza de los predictores a los obtenidos en los Capítulos III y IV, respectivamente. Nuestros estudios subrayan, además, la presencia de características únicas de la gelotofobia no recogidas por los modelos tradicionales de personalidad. En concreto, la gelotofobia presentó validez incremental en la predicción de distintas dimensiones de imagen corporal más allá de la varianza compartida con constructos similares como la introversión y el neuroticismo/emocionalidad evaluados en el FFM y el HEXACO *model*. Además, la inclusión de la ansiedad social como predictor alternativo en el Capítulo VI, puso de manifiesto que la gelotofobia y la ansiedad social difieren en su capacidad predictiva sobre la imagen corporal, lo que puede interpretarse como una evidencia adicional de su diferenciación.



## 2.2. *Gelotofobia, ansiedad social e ideación paranoide*

En el Capítulo VII se describe una investigación sobre la estructura latente, y evidencias de validez convergente-discriminante, de los instrumentos de medida de los constructos gelotofobia, ansiedad social y la ideación paranoide mediante una matriz multirrasgo-multimétodo. Si bien investigaciones anteriores habían ofrecido apoyo a las diferenciación (o no redundancia) de la gelotofobia frente a la ansiedad social mediante distintas aproximaciones basadas en el autoinforme (Carretero-Dios et al., 2010b; Edwards et al., 2010), nuestra investigación buscó una replicación de estos datos y una extensión a métodos de evaluación alternativos (i.e., evaluación por pares).

En primer lugar, los análisis factoriales confirmatorios multinivel mostraron que los constructos de gelotofobia, ansiedad social e ideación paranoide son empíricamente homogéneos y suficientemente diferentes atendiendo a puntuaciones auto y heteroinformadas. Asimismo, el estudio de la validez convergente de las medidas empleadas para evaluar estos constructos arrojó niveles adecuados atendiendo a la naturaleza de estas disposiciones (Watson, Hubbard, & Wiese, 2000). No obstante, nuestros datos también sugieren que la ansiedad social, en comparación con la gelotofobia y la ideación paranoide, ocasionó una estimación más precisa, por parte de los grupos de pares, de las puntuaciones “verdaderas” de los participantes. Una posible explicación de estos hallazgos sería que las disposiciones de gelotofobia e ideación paranoide subsumen características más difícilmente identificables para el observador, como, entre otras, desconfiar de las intenciones de otros, o referir las acciones de los demás hacia uno mismo. En este sentido, se ha descrito con anterioridad que los comportamientos no directamente observables, y por consiguiente de difícil acceso para un evaluador externo, pueden ocasionar mayores desviaciones entre puntuaciones auto y

heteroinformadas de un mismo constructo (Funder & Colvin, 1988, 1997; Watson et al. 2000).

Con respecto a las evidencias de validez discriminante, encontramos que la gelotofobia mostró las esperadas asociaciones positivas con la ansiedad social y la ideación paranoide. Sin embargo, la magnitud de dichas asociaciones sugiere que la gelotofobia presenta una mayor cantidad de varianza compartida con la ansiedad social que con la ideación paranoide (sin llegar a ser redundantes para ninguno de los dos constructos). Hasta donde llega nuestro conocimiento, esta investigación constituye la primera evidencia empírica de la asociación entre gelotofobia e ideación paranoide, confirmando una conexión fuerte entre ambos constructos. Este dato es consistente con ciertas manifestaciones centrales de la gelotofobia, entre las que se incluyen la tendencia a referir las risas de los demás hacia uno mismo con independencia del verdadero destinatario u objetivo, una acentuada sensibilidad a la ofensa o la atribución de intenciones negativas a otros individuos ante manifestaciones teóricamente positivas como bromear, reír o sonreír (Ruch et al., 2014a; Ruch & Proyer, 2009b).

Por último, este capítulo empírico nos permitió explorar posibles peculiaridades en los procesos de evaluación por pares de estos rasgos. Dos hallazgos principales emergieron. Por un lado, observamos que, en términos grupales, aquellos evaluadores que tendían a sobredimensionar las puntuaciones en gelotofobia de la persona evaluada o *target*, también sobredimensionaban las puntuaciones de esta persona en ansiedad social e ideación paranoide. Este efecto puede ser ocasionado por la presencia de múltiples manifestaciones compartidas entre estos tres constructos de personalidad (Carretero-Dios et al., 2010b; Ruch et al., 2014a). Por otro lado, mientras que los evaluadores no sobrestimaban o infravaloraban las puntuaciones en ansiedad social e ideación paranoide de aquellos con altas puntuaciones autoinformadas en gelotofobia,

estos evaluadores sí tendían a sobreestimar las puntuaciones en gelotofobia e ideación paranoide de aquellos que mostraban puntuaciones autoinformadas elevadas de ansiedad social. Este hallazgo sugiere que, desde el punto de vista de un observador, las personas que incurren en manifestaciones prototípicas de la ansiedad social (p.ej., aislamiento: Watson & Friend, 1969) también tenderían a mostrar sospecha y desconfianza ante situaciones generales y otras más específicas ligadas a la burla y a la ridiculización. Asimismo, este dato puede interpretarse como una consecuencia adicional de la dificultad de los observadores para estimar la prevalencia de ciertas características difícilmente observables (p.ej., atribuciones de intencionalidad) asociadas preferentemente a la gelotofobia y la ideación paranoide.

En suma, nuestra investigación sugiere que la gelotofobia no constituye un epifenómeno de la ansiedad social y de la ideación paranoide, sino una disposición lo suficientemente distinta como para merecer estudio independiente o, al menos, en combinación con estos fenómenos. Si bien nuestros resultados no implican que estos constructos sean complemente distintos, sí que enfatizan la presencia de particularidades que podrían desencadenar manifestaciones diferenciales en aspectos nucleares de cada constructo. Por este motivo, en nuestra tercera línea de investigación, fundamentada en el estudio de posibles modulaciones de la gelotofobia en el procesamiento de la información socioafectiva del rostro, controlamos la influencia de la ansiedad social de los participantes. El estudio combinado de la gelotofobia y la ansiedad social nos permitió ahondar en su diferenciación en el procesamiento de estímulos relevantes desde un punto de vista interpersonal, como son los rostros alegres, en general, y la sonrisa, en particular, al tiempo que ahondamos en la caracterización del procesamiento de rostros por parte de personas con una elevada (*vs.* baja) gelotofobia.

### 3. Gelotofobia y procesamiento de la información socioafectiva del rostro

El tercer objetivo específico de la tesis doctoral fue investigar el papel que ejerce la gelotofobia sobre el procesamiento de ciertas claves socioafectivas del rostro de otras personas, incluyendo expresiones faciales con distinta carga afectiva (i.e., sonrisa *vs.* rostro neutro) y distintas condiciones de dirección de mirada (p.ej., directa *vs.* evitación). Este objetivo fue abordado en los estudios descritos en los Capítulos VIII y IX.

En el Estudio 1 del **Capítulo VIII** investigamos si las personas con elevada *versus* baja gelotofobia difieren al identificar, con rapidez y precisión, la dirección de la mirada de rostros que expresan alegría, así como otros estados afectivos (i.e., ira, miedo, tristeza o rostro neutro). Además, estos rostros aparecían con dos orientaciones distintas de mirada (p.ej., directa al observador *vs.* evitación-lateral: Cañadas & Lupiáñez, 2012; Jones, 2015). Nuestros resultados mostraron, en primer lugar, la inexistencia de diferencias entre ambos grupos en el tiempo de reacción empleado para identificar la orientación de mirada. No obstante, las personas con elevada (*vs.* baja) gelotofobia sí que cometían más errores al identificar la dirección de la mirada, siendo este efecto más pronunciado en los ensayos de mirada con evitación-lateral. No se observó ninguna interacción entre la gelotofobia y la expresión emocional del rostro. Por consiguiente, no se confirmó la hipótesis principal del estudio, esto es, la obtención de diferencias específicas, basadas en la gelotofobia, en el procesamiento de rostros alegres, aunque sí se observaron otras diferencias no anticipadas, referentes al procesamiento de la dirección de la mirada.

En el Estudio 2 de ese mismo capítulo nos propusimos replicar los datos obtenidos en el Estudio 1 utilizando un mayor tamaño muestral y, sobre todo, maximizando las diferencias entre los grupos en sus puntuaciones en gelotofobia. Además, incluimos la

ansiedad social como covariado a fin de descartar que los efectos en la discriminación de la mirada pudieran ser explicados por esta disposición parcialmente solapada con la gelotofobia. A diferencia del Estudio 1, los resultados revelaron que las personas con elevada (*vs.* baja) gelotofobia fueron más rápidas al discriminar la orientación de la mirada, aunque este efecto estuvo mediado por las puntuaciones en ansiedad social. Con respecto a la tasas de error, y de manera consistente con el Estudio 1, encontramos que la gelotofobia se asoció con mayores tasas de error al identificar la dirección de la mirada en el rostro de otros. Este efecto emergió con independencia de la emoción que expresaba el rostro y, en este estudio, independientemente de la orientación de mirada (resultados comparables en las condiciones de mirada directa y evitación).

En una tarea experimental adicional, en la que los mismos participantes tenían que reconocer/identificar la expresiones emocionales de rostros con distintas cargas afectivas y direcciones de mirada, así como valorar las dimensiones afectivas de valencia, intensidad y *arousal*, los resultados mostraron que las personas con puntuaciones altas en gelotofobia no presentaban dificultades específicas al categorizar las emociones básicas manifestadas en los rostros. Tampoco difirieron de quienes tenían una baja predisposición a la gelotofobia al realizar las atribuciones de las características afectivas de los rostros previamente mencionadas. Los datos de este capítulo sugieren, por tanto, que la gelotofobia puede estar más estrechamente relacionada con ciertos déficits en procesos globales de cognición social (*i.e.*, atribuciones de intencionalidad asociados a la mirada), y no tanto con dificultades en la identificación y evaluación de claves afectivas en los rostros. En el siguiente capítulo de la tesis profundizamos sobre esta cuestión.

En el estudio descrito en el **Capítulo IX** replicamos los resultados del capítulo anterior de una menor capacidad para discriminar correctamente la dirección de la

mirada en los participantes de alta gelotofobia, pero una ejecución similar en las valoraciones de las dimensiones afectivas de confianza, valencia e intensidad del rostro. No obstante, el objetivo principal de este estudio era investigar si la gelotofobia podría mediar procesos de orden superior como la toma de decisiones en un contexto de ganancias económica socialmente relevante. Participantes con alta vs. baja gelotofobia completaron una tarea *Trust Game* (Berg, Dickhaut, & McCabe, 1995) en la que debían decidir si cooperar o no con individuos desconocidos en función de las distintas expresiones emocionales (alegría, ira o rostros neutro) y/o dirección de mirada (al frente, directa o evitación) que mostraran. Al igual que en el capítulo anterior, en esta investigación también controlamos la posible influencia de las puntuaciones en ansiedad social de los participantes.

Los resultados pusieron de manifiesto que la gelotofobia modulaba la interacción con individuos desconocidos durante el juego de confianza. En primer lugar, las personas con elevada (vs. baja) gelotofobia fueron más rápidos en la toma de decisiones con independencia de la naturaleza de su respuesta, siendo este efecto más pronunciado ante aquellas expresiones emocionales en las que el grupo de baja gelotofobia empleó más tiempo: rostros de ira y neutros. No obstante, nuestros datos de tiempos de respuesta no revelaron los efectos esperados de coste de cooperación, ni de facilitación de sus respuestas de no-cooperación ante rostros expresando alegría entre las personas con alta gelotofobia. De acuerdo con estos resultados, la interacción con un individuo que muestra una sonrisa no desencadenarían, de manera automática, una tendencia hacia la no cooperación entre aquellos con elevada gelotofobia, refutando así nuestra hipótesis específica al respecto. Por el contrario, en línea con nuestra hipótesis principal, sí encontramos que las personas del grupo con alta gelotofobia, en comparación con aquellos con bajos niveles de este rasgo, mostraban una tasa inferior de cooperación

ante los desconocidos que manifestaban una expresión facial alegre. Esto parece sugerir que los participantes con alta (*vs.* baja) gelotofobia anticipaban con menor frecuencia intenciones positivas de su pareja en el juego de confianza (*i.e.*, menores respuestas de cooperación recíproca) cuando ésta transmitía un estado afectivo alegre. Sin embargo, esa anticipación no se producía de forma automática, sino de una forma más deliberada y específica al mostrarse sólo en las tasas de cooperación, pero no en la velocidad de las respuestas. Notablemente, este efecto parece ser específico para rostros alegres, dado que no hubo diferencias, en las tasas de cooperación, entre los grupos basados en la gelotofobia para las condiciones de ira y rostro neutro. Además, este efecto emergió incluso controlando las puntuaciones en ansiedad social de los participantes, por lo que parece estar más directamente relacionado con la gelotofobia. Esta tendencia de las personas con elevada gelotofobia a mostrar una menor cooperación con parejas con rostros alegre resulta consistente con estudios previos que señalan que esta disposición se asocia a la anticipación de intenciones o estados afectivos negativos en personas que expresan alegría (*i.e.*, Hofmann, Platt, Ruch, & Proyer, 2015; Platt, 2008; Ruch et al., 2009b). Nuestros resultados son consistentes con estos datos y señalan que las personas con elevada *vs.* baja gelotofobia también difieren en las atribuciones de intencionalidad de individuos con rostros alegres en un contexto socialmente relevante como la toma de decisiones.

En suma, los datos obtenidos en los Capítulos VI y VII sugieren que la gelotofobia no estaría estrechamente vincula a dificultades en la identificación o en el procesamiento *bottom-up* de la alegría. Por el contrario, nuestros resultados parecen indicar que esta disposición estaría asociada con alteraciones en procesos más globales, de naturaleza inferencial, como aquellos presentes en la atribución o mentalización (*top-down*) de las intenciones de aquellas personas que muestran un rostro alegre.

En este sentido, la presencia de dificultades en la identificación de la mirada ha sido asociada a limitaciones en procesos de mentalización-teoría de la mente y, más específicamente, en la realización de juicios sobre la motivación afectiva que desencadena la expresión emocional de otra persona (Baron-Cohen, 1994, 1995; Niedenthal, Mermillod, Maringer, & Hess, 2010). Por tanto, esta restricción en el procesamiento de la mirada entre las personas con elevada gelotofobia podría estar de alguna manera vinculada a la realización de inferencias erróneas sobre la intencionalidad de otros individuos, especialmente cuando estos muestran una expresión emocional alegre (Ruch, 2009). Se ha demostrado que el contacto visual modula los procesos de simulación que facilitan el acceso al significado real de la sonrisa (Niedenthal et al., 2010). Las dificultades de los gelotofóbicos a la hora de discriminar la orientación de la mirada de otros podrían asociarse con una peor ejecución de dichos procesos, lo que es consistente con la ya descrita tendencia de estos individuos a manifestar una reducida actividad facial al ser expuestos a señales alegres de otras personas (“*facial mimicry*”; véase Hofmann et al., 2015).

Por otro lado, discriminar correctamente la dirección de la mirada ofrece información relevante sobre la localización de la atención de otras personas, mediando la percepción subjetiva de sentirse observado y ayudando a clarificar posibles situaciones sociales ambiguas (Baron-Cohen, 1995; Cañadas & Lupiáñez, 2012; Phillips, Baron-Cohen, & Rutter, 1992; Senju & Hasegawa, 2006). En consecuencia, una mayor dificultad en conocer dónde está focalizada la atención de los demás, podría conectarse con características distintivas de la gelotofobia como la tendencia a referir las risas de los demás hacia ellos mismos (Ruch & Proyer, 2008a). Futuros estudios deberán explorar si las dificultades en la discriminación de la mirada entre las personas con elevada gelotofobia podrían verse exacerbadas por ciertos factores contextuales.



Por otro lado, el hecho de que las personas con elevadas puntuaciones en gelotofobia muestren menores expectativas de cooperación recíproca ante aquellos individuos que manifiestan un rostro alegre en el juego de confianza, también parece indicar la presencia de modulaciones de este rasgo sobre procesos de atribución de intencionalidad (Sripada et al., 2009; Rotenberg et al., 2014). A diferencia de las personas con baja gelotofobia, estas personas no estimarían una mayor probabilidad de cooperación por parte de individuos con rostro alegres, lo que resulta congruente con su tendencia a anticipar estas señales afectivas como menos positivas e incluso amenazantes (Ruch, 2009; Ruch, Altfreder, & Proyer, 2009b; Papousek et al., 2014).

Para finalizar, cabe destacar que nuestros resultados de los Capítulos VI y VII no ofrecen apoyo empírico robusto de la modulación de la gelotofobia sobre la evaluación subjetiva de dimensiones afectivas como la valencia, intensidad, *arousal* o confianza del rostro. No obstante en el Capítulo VII sí observamos diferencias basadas en el tamaño del efecto, con los gelotofóbicos evaluando las caras alegres como menos positivas y de menor confianza. Futuras replicaciones de estos hallazgos deberán considerar muestras más amplias, ofreciendo un poder estadístico mayor, así como la utilización de otros estímulos, más ecológicos, para confirmar/descartar estos efectos.

En suma, nuestros datos respaldan investigaciones anteriores que sugieren la necesidad de estudiar la relación de la gelotofobia con un desarrollo atípico de habilidades de mentalización/teoría de la mente (véase Samson et al., 2011). Asimismo, la inclusión de la ansiedad social como covariado nos permite defender la presencia de modulaciones diferenciales o, al menos, más directamente relacionadas con la gelotofobia, en el procesamiento de la información socioafectiva del rostro de otras personas, especialmente ante manifestaciones alegres.

#### **4. Limitaciones generales y específicas de cada línea de investigación**

Las investigaciones descritas en los distintos capítulos empíricos de la presente tesis doctoral no están exentas de ciertas limitaciones. Por ejemplo, en lo que respecta a la conformación de las distintas muestras, optamos por tipologías de muestreo no probabilístico, lo que dificulta la generalización de estos hallazgos al conjunto de la población. Sin embargo, cabe señalar que gran parte de los resultados obtenidos en las tres líneas de investigación han sido replicados en muestras independientes. Por otro lado, la naturaleza no experimental de los diseños de investigación implementados no permite clarificar el sentido causal de las relaciones descritas en esta tesis. No obstante, esta limitación resulta inherente a la naturaleza de la gelotofobia.

Por otro lado, existen otras limitaciones, específicas a cada una de las líneas de investigación, que también merecen ser señaladas. Por ejemplo, con respecto a los estudios dirigidos a validar la versión española de la PhoPhiKat-45 (Capítulos III y IV), cabe considerar que nuestra versión fue únicamente administrada en muestras españolas, por lo que no disponemos de datos sobre la validez transcultural de nuestro instrumento (véase futuras líneas de investigación). En otro orden de cosas, los estudios relativos a las nuevas evidencias de validez externa solo incorporan medidas de autoinforme. Sería conveniente que estas relaciones se confirmasen utilizando otros métodos de evaluación (p.ej., puntuaciones heteroinformadas) y se validasen en estudios comportamentales (p.ej., Rosenbaum, Billinger, & Stieglitz, 2014).

Con respecto a las limitaciones de las investigaciones centradas en la diferenciación de la gelotofobia frente a otros constructos similares de personalidad, también resulta necesario hacer alguna consideración. En lo que afecta a los estudios descritos en los Capítulos V y VI, además de haber utilizado exclusivamente medidas autoinformadas, cabe señalar que la selección de dimensiones de imagen corporal no fue exhaustiva.

Asimismo, ante la dificultad para establecer el sentido causal de la relación entre la gelotofobia y la presencia de representaciones negativas del propio cuerpo, es necesario incorporar estudios longitudinales para dilucidar si esta disposición se relaciona con un déficit general en la percepción de la propia apariencia física. Con respecto al Capítulo VII, nuestra investigación solo consideró la ansiedad social y la ideación paranoide, por lo que debe ser extendida a otros constructos parcialmente solapados con la gelotofobia como el miedo a la evaluación negativa. Además, también pueden incorporarse otro tipo de evaluadores externos, como familiares (*vs.* amigos cercanos), que, quizá, tengan acceso a indicadores poco visibles ligados a la gelotofobia (Ruch & Proyer, 2008a).

Por último, en lo tocante a los estudios sobre el modulación que ejerce la esta disposición en el procesamiento de la información socioafectiva de los rostros (Capítulos VIII y IX) existen dos limitaciones fundamentales. En primer lugar, y como resultado de la baja prevalencia de personas con elevada gelotofobia, el tamaño de la muestras fue relativamente pequeño. Esto, además de limitar la generalización de nuestros resultados, afecta a la potencia estadística de nuestros diseños, reduciendo la probabilidad de detectar efectos de magnitud pequeña (Error tipo II). Para tratar de paliar esta cuestión, utilizamos valores extremos con base en sus puntuaciones en gelotofobia en la conformación de los grupos de comparación. De esta manera, pretendíamos maximizar las posibles diferencias basadas en la gelotofobia, generando tamaños del efecto de moderados a altos. No obstante, cabe señalar que el número de participantes de nuestra investigación, así como la estrategia de formación de grupos, es muy similar a otras investigaciones sobre gelotofobia (Hofmann et al., 2015; Papousek et al., 2014; Ruch, Hofmann, & Platt, 2015), o sobre constructos similares como la ansiedad-rasgo (Gaspar & McDonald, 2018). Asimismo, merece la pena destacar que algunos de los hallazgos importantes de esta tesis, como la precisión disminuida en la

discriminación de la mirada en personas gelotofóbicas, fue replicado en tres estudios distintos con muestras diferentes.

En segundo lugar, otra limitación de estos capítulos empíricos se deriva de la utilizations de imágenes prototípicas para manipular las expresiones faciales emocionales (Goeleven, De Raedt, Leyman, & Verschuere, 2008). El principal problema de estos estímulos es que no nos permite estudiar ciertos aspectos esenciales de la emoción como son sonidos y movimientos corporales asociados. En este sentido, la ausencia de estos elementos pudo provocar que ciertos efectos, potencialmente asociados a la gelotofobia, no estuvieran presentes o emergieran con una intensidad menor. Asimismo, la influencia de ciertos factores externos en la manifestación de la gelotofobia, como la distancia social con el interlocutor, la presencia de diversos actores (i.e., interacción individual *versus* grupo) o el contexto específico donde se produce una interacción social, también, permanecen inexplorados.

## **5. Futuras líneas de investigación**

Las investigaciones descritas a lo largo de la presente tesis doctoral deben considerarse un punto de partida para seguir profundizando en la naturaleza y relevancia de la gelotofobia. Dadas las limitaciones señaladas, muchas de ellas connaturales al estudio de constructos psicológicos, cabe señalar de manera general que, en primer lugar, sería recomendable una extensión y replicación de nuestros hallazgos en otras muestras y en otros contextos culturales.

Como primera línea de investigación futura, queremos hacer referencia a la necesidad de obtener evidencias sobre la validez transcultural de la versión española de la PhoPhiKat-45. Su administración en otros países hispanohablantes como Colombia o Chile, entre otros, nos permitiría testar el grado de invarianza factorial de nuestra

validación, siendo de especial interés confirmar su estructura interna (así como las relaciones entre factores) y conocer cómo contribuye cada manifestación específica (items) a su factor general correspondiente. Estos datos darían soporte adicional a la operacionalización actual de la gelotofobia, gelotofilia y katagelastismo, y servirían de base para futuras investigaciones transculturales, más amplias, en las que estudiar empíricamente cómo ciertos factores macro-sociales (véase Davies, 2009) influyen en la manifestación de estas disposiciones. Por otro lado, futuros estudios deberán seguir extendiendo la red nomológica de estas disposiciones a fin de reforzar su validez de constructo (Singh, 1991).

En lo tocante a la segunda línea de investigación, queremos seguir profundizando en la búsqueda de evidencias de validez convergente-discriminante entre la gelotofobia, ansiedad social e ideación paranoide. Por ejemplo, de acuerdo con la literatura previa, existen divergencias entre estos constructos atendiendo a sus relaciones con el narcisismo-rasgo. Mientras que la paranoia ha sido positivamente asociada con algunas facetas de este rasgo (Cicero & Kerns, 2011), la gelotofobia (esta tesis, capítulo IV) y la ansiedad social (Akehurst & Thatcher, 2010) han mostrado relaciones negativas con este constructo. Por consiguiente, una línea de investigación futura sería explorar las posibles diferencias entre estas disposiciones a través de sus relaciones con distintas facetas del narcisismo-rasgo (Back et al., 2013; Gebauer, Sedikides, Verplanken, & Maio, 2012). Esta matriz de datos nos permitiría, además de estudiar las asociaciones entre estos fenómenos y el narcisismo mediante análisis de correlación tradicional, realizar aproximaciones analíticas más complejas, como modelos de ecuaciones estructurales, a fin de comprobar, no solo la naturaleza predictiva de las distintas facetas de narcisismo sobre estos fenómenos, sino también las posibles diferencias en términos de la magnitud predictiva de cada faceta del narcisismo-rasgo (véase Rogoza &

Fatfouta, 2020). En otras palabras, examinar las posibles diferencias de los coeficientes de regresión o peso específico (coeficientes beta) de cada faceta en la predicción de las puntuaciones en gelotofobia, ansiedad social e ideación paranoide. Esta estrategia de análisis podría ser extrapolable a otras clasificaciones de personalidad como, por ejemplo, los rasgos de la tétada oscura (Buckels, Jones, & Paulhus, 2013; Paulhus & Williams, 2002), o estructuras alternativas de personalidad básica como las basadas en la creación de meta-rasgos (Baumeister & Tice, 1988; Ciecuch & Strus, 2017).

Por último, en lo relativo a nuestra tercera línea de investigación, dos posibles continuaciones son planteadas. Por un lado, buscaremos replicar nuestros datos sobre identificación de expresiones emocionales y evaluación de características afectivas utilizando estímulos más ecológicos que las fotografías prototípicas utilizadas en los capítulos VIII y IX. En concreto, pretendemos utilizar clips cortos de vídeo (duración 15 segundos) en los que un actor o actriz reflejan estados afectivos alegres, de ira o muestran un rostro neutro en condiciones de contacto visual directo y de evitación. Preguntaremos a los participantes por la identificación de la emoción expresada (respuesta de categoría cerrada), valencia, intensidad y confianza del rostro. También incorporaremos un juicio subjetivo sobre la percepción de sentirse observados. Adicionalmente, utilizaremos registros de *eye tracking* a fin de conocer con mayor precisión el patrón de escudriñamiento de información que realizan las personas con elevada *versus* baja gelotofobia. Es interesante conocer si el patrón de exploración de los rostros alegres difiere entre personas con elevada *versus* baja gelotofobia, con un interés especial en la exploración de la zona de los ojos y la sonrisa.

Otra potencial línea de investigación, entendida como una continuación de nuestros datos sobre los efectos de la gelotofobia en procesos de toma de decisión en contexto de juego económico (Berg et al., 1995), es investigar si esta disposición modula la

ejecución de esta tarea al interactuar con desconocidos que manifiesta distintos tipos de sonrisas. Más concretamente, utilizaremos como marco de referencia el modelo de Niedenthal y cols. (2010) que categoriza las sonrisas como: *enjoyment smiles* (producidas por una emoción positiva), *affiliative smiles* (producida por motivos sociales positivos) y *dominance smiles* (una forma de comunicar y mantener el estatus social). Estudios previos sugieren que las sonrisas más genuinas (i.e., *enjoyment*) generan tasas de cooperación más altas (p.ej., Krumhuber et al., 2007). De acuerdo con la conceptualización de la gelotofobia, esperaríamos que los gelotofóbicos no discriminen entre estos tipos de sonrisa, mostrando un patrón de cooperación similar. Además, evaluaremos, mediante una categoría cerrada, si la gelotofobia modula el estado emocional inferido que motiva la sonrisa siguiendo la clasificación propuesta en el modelo de Niedenthal y colaboradores. Cabría esperar que las personas con elevada gelotofobia (vs. baja) realicen juicios parecidos para los tres tipos de sonrisas.

## 6. Conclusiones finales

Con la presente tesis doctoral se ha intentado contribuir a reforzar la entidad empírica del constructo gelotofobia, con especial énfasis en su diferenciación frente a otros constructos preexistentes con manifestaciones similares. En primer lugar, hemos puesto a disposición de la comunidad científica un instrumento de evaluación que permite estudiar la gelotofobia, en relación con la gelotofilia y katagelasticismo, en población española. Nuestras investigaciones centradas en la versión española de la PhoPhiKat-45 evidencian su validez factorial y externa, así como la fiabilidad de sus puntuaciones en muestras independientes. En segundo lugar, extendimos la red nomológica de la gelotofobia testando sus asociaciones con diversas medidas de imagen corporal. Nuestros datos sugieren que la gelotofobia presenta asociaciones substanciales

con las representaciones negativas del propio cuerpo, incluso tras controlar la influencia de los rasgos básicos de personalidad del FFM y el HEXACO *model*. Estos datos ofrecen evidencia adicional de la validez incremental de la gelotofobia sobre dimensiones similares como la introversión y el neuroticismo, sugiriendo la presencia de particularidades asociadas a este constructo no representadas en sistemas globales de personalidad. Además, la inclusión de la ansiedad social no alteró estos resultados, lo que sugiere que la gelotofobia es una dimensión relevante para la predicción de la imagen corporal más allá de la varianza compartida con la ansiedad social. Siguiendo con esta línea, la aplicación de análisis factorial confirmatorios multinivel en una matriz multirrasgo-multimétodo con datos de gelotofobia, la ansiedad social y la ideación paranoide, nos permitió demostrar que estos constructos representan fenómenos suficientemente distintos como para merecer estudio independiente. Nuestra investigación también puso de manifiesto que los instrumentos utilizados para medir estos constructos arrojaron evidencias adecuadas de validez convergente-discriminante. Por último, escudriñamos las posibles modulaciones de la gelotofobia en el procesamiento de la información socioafectiva del rostro. Nuestros resultados sugieren que las personas con elevada gelotofobia muestran mayores dificultades que sus homólogos con baja gelotofobia para discriminar correctamente la dirección de la mirada de otras personas. No observamos, por el contrario, que esta disposición modulara la identificación de la alegría, ni las evaluaciones de características afectivas como la valencia, intensidad, *arousal*, o confianza percibida del rostro. Por último, si bien la gelotofobia no afectó a los tiempos de respuesta con caras alegres en una tarea de juego económico, sí se asoció a menores expectativas positivas en las acciones (i.e., respuestas de respuesta recíproca) de aquellos que expresan un rostro alegre en esta tarea. Cabe mencionar que estos efectos se estudiaron controlando las puntuaciones en



ansiedad social de los participantes. En conjunto, los datos de esta línea de investigación son congruentes con estudios anteriores que muestran la vinculación de la gelotofobia con ciertas alteraciones a la hora de juzgar las intenciones de otros (véase Samson et al., 2011; Ruch, 2009).

En suma, los distintos capítulos empíricos que componen esta tesis doctoral dan soporte a la pertinencia de la gelotofobia como objetivo de estudio psicológico. Nuestros hallazgos respaldan la operativización actual de la gelotofobia, su adecuada medición en el contexto español, su diferenciación frente a otros constructos similares y su papel diferencial en el procesamiento de información socioafectiva del rostro. Estas evidencias, unidas al innegable desarrollo teórico-empírico acumulado hasta la fecha, hacen necesario un debate amplio sobre la necesidad de continuar estudiando rasgos de personalidad específicos al afrontamiento de la burla y la ridiculización. Al igual que otros autores, creemos que la gelotofobia merece un estudio riguroso equivalente al de otras predisposiciones de personalidad como la ansiedad social o la paranoia.



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# **Annexes**

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*Anexos*





## Supplemental Material (Chapter III)

### Instrucciones

Las siguientes afirmaciones se refieren a tus sentimientos, acciones y percepciones **en general**. Por favor, trata de describir lo mejor posible con tus respuestas tus patrones de comportamiento y actitudes **habituales** marcando con una X **una** de las cuatro opciones. Utiliza por favor la siguiente escala:

- (1) Totalmente en desacuerdo
- (2) Moderadamente en desacuerdo
- (3) Moderadamente de acuerdo
- (4) Totalmente de acuerdo

### Ejemplo:

Soy una persona alegre.....(1) (2) (3) (4)

Si la afirmación te describe adecuadamente, es decir, si eres **en general** una persona alegre, **marca por favor con una cruz la opción (4)**. Si esta afirmación **no te describe en absoluto**, entonces **marca por favor la opción (1)**. En caso de tener problemas para la elección de una respuesta, marca por favor la opción que **más se aproxime** a tus actitudes y forma habitual de comportarte.

Por favor contesta **todas** las preguntas sin omitir ninguna.

	<b>Totalmente en desacuerdo</b>			<b>Totalmente de acuerdo</b>
1. Si se ríen en mi presencia, me hace sospechar.....	(1)	(2)	(3)	(4)
2. Cuando estoy con otras personas, disfruto contando chistes a mi costa para hacerles reír.....	(1)	(2)	(3)	(4)
3. Me divierto poniendo en evidencia a otras personas, y disfruto cuando se ríen de ellas.....	(1)	(2)	(3)	(4)
4. Evito exponerme en público porque temo que la gente reconozca mi inseguridad y se puedan burlar de mí.....	(1)	(2)	(3)	(4)
5. No dudo en contarles a mis amigos o conocidos algo embarazoso o desafortunado que me haya ocurrido, aun a riesgo de que se rían de mí.....	(1)	(2)	(3)	(4)
6. A menudo surgen enfrentamientos por comentarios graciosos o bromas que hago sobre otras personas.....	(1)	(2)	(3)	(4)
7. Si desconocidos se ríen en mi presencia, frecuentemente lo refiero a mí.....	(1)	(2)	(3)	(4)
8. Me da igual que la gente se ría de mí o se ría conmigo.....	(1)	(2)	(3)	(4)
9. Cuando se trata de contar chistes o hacer comentarios graciosos sobre los demás, prefiero el “Ojo por ojo, diente por diente” que “poner la otra mejilla”.....	(1)	(2)	(3)	(4)
10. Cuando hacen comentarios en broma sobre mí, me siento paralizado/a.....	(1)	(2)	(3)	(4)
11. Disfruto si otras personas se ríen de mí.....	(1)	(2)	(3)	(4)
12. A veces me ha ocurrido que personas sin sentido del humor se han molestado conmigo porque me he excedido ridiculizándolas por algo vergonzoso o desafortunado que les había pasado.....	(1)	(2)	(3)	(4)
13. Creo que sin pretenderlo les resulto ridículo/a a los demás.....	(1)	(2)	(3)	(4)
14. En mi grupo de amigos soy el/la que cuenta los chistes, el/la que divierte a los demás (frecuentemente con chistes o bromas a mi costa).....	(1)	(2)	(3)	(4)
15. Si otras personas se burlan de mí, les pago con la misma moneda pero con mayor intensidad aún.....	(1)	(2)	(3)	(4)
16. Me controlo intensamente para no llamar la atención de manera desagradable y hacer el ridículo.....	(1)	(2)	(3)	(4)

	<b>Totalmente en desacuerdo</b>			<b>Totalmente de acuerdo</b>
17. Disfruto cuando otras personas se burlan de mí ya que esto también podría ser entendido como una señal de reconocimiento.....	(1)	(2)	(3)	(4)
18. Si se trata de divertir a los demás está justificado contar chistes o hacer comentarios graciosos que podrían ser hirientes o crueles para otras personas.....	(1)	(2)	(3)	(4)
19. Si en algún sitio llamé la atención de manera embarazosa, después evito ese lugar.....	(1)	(2)	(3)	(4)
20. Si alguien me grabase con una cámara mientras me pasa algo embarazoso o desafortunado, no me importaría que mandase la grabación a un programa de televisión de los que emiten este tipo de videos.....	(1)	(2)	(3)	(4)
21. Considero que algunas personas se merecen que se burlen de ellas.....	(1)	(2)	(3)	(4)
22. Si una persona se burla de mí no puedo volver a tratarla relajadamente.....	(1)	(2)	(3)	(4)
23. Tengo talento para dedicarme a la comedia, para trabajar como humorista o payaso de circo.....	(1)	(2)	(3)	(4)
24. Al ser sólo diversión, no veo ningún problema en comprometer a los demás de una forma graciosa.....	(1)	(2)	(3)	(4)
25. Cuando se burlan de mí me lleva mucho tiempo recuperarme.....	(1)	(2)	(3)	(4)
26. Con el fin de que la gente se ría, me encanta sacarle el máximo partido a cosas embarazosas o desafortunadas que me han ocurrido, y que a otras personas avergonzarían.....	(1)	(2)	(3)	(4)
27. Reírse de los demás forma parte de la vida. A las personas que no les guste que se rían de ellas solo les queda defenderse como puedan.....	(1)	(2)	(3)	(4)
28. Precisamente en el momento en el que me siento relativamente despreocupado/a, es mayor el peligro de que llame la atención de los otros de manera negativa y les parezca raro/a.....	(1)	(2)	(3)	(4)
29. Disfruto haciendo que los demás se rían contándoles cosas embarazosas o desafortunadas que me han ocurrido.....	(1)	(2)	(3)	(4)

	<b>Totalmente en desacuerdo</b>			<b>Totalmente de acuerdo</b>
<b>30.</b> Si estoy con un grupo de gente y soy el/la único/a que se da cuenta de que alguien ha hecho o le ha ocurrido algo embarazoso, no dudo en contárselo a los demás.....	(1)	(2)	(3)	(4)
<b>31.</b> Me es difícil mantener contacto visual, porque temo que seré evaluado/a de manera despectiva.....	(1)	(2)	(3)	(4)
<b>32.</b> Cuando estoy con otras personas y me sucede algo embarazoso (por ejemplo, me trabo al hablar o me pasa algún contratiempo) me siento más contento/a que enfadado/a, llegando a reírme de ello.....	(1)	(2)	(3)	(4)
<b>33.</b> No me siento mal cuando me río de las meteduras de pata de los demás (por ejemplo, cuando alguien se traba al hablar).....	(1)	(2)	(3)	(4)
<b>34.</b> A pesar de que frecuentemente me siento solo/a, tiendo a evitar participar en actividades sociales para protegerme de las burlas.....	(1)	(2)	(3)	(4)
<b>35.</b> Cuando meto la pata disfruto un poco de la situación ya que estoy deseando contarles a mis amigos lo que me ha ocurrido.....	(1)	(2)	(3)	(4)
<b>36.</b> No hay nada mejor que bajar de las nubes a un fanfarrón con un comentario divertido.....	(1)	(2)	(3)	(4)
<b>37.</b> Cuando hago el ridículo frente a otros, me tenso totalmente y soy incapaz de comportarme adecuadamente.....	(1)	(2)	(3)	(4)
<b>38.</b> No me importa contar en un grupo algo embarazoso que me haya pasado si sé que a los demás les resultará divertido.....	(1)	(2)	(3)	(4)
<b>39.</b> Para mí es más fácil reírme de los demás que reírme de mí mismo/a.....	(1)	(2)	(3)	(4)
<b>40.</b> Me siento incómodo/a bailando porque estoy convencido/a de que les parezco ridículo/a a los que me observan.....	(1)	(2)	(3)	(4)
<b>41.</b> No podría sucederme nada que me hiciera sentir tan avergonzado/a como para que no se lo contara a los demás.....	(1)	(2)	(3)	(4)
<b>42.</b> En mi grupo de amigos me conocen por mi “lengua afilada” (por ejemplo, por hacer comentarios cínicos y contar chistes sobre los demás).....	(1)	(2)	(3)	(4)

	<b>Totalmente en desacuerdo</b>			<b>Totalmente de acuerdo</b>
<b>43.</b> Hablaría mucho más en público si no tuviera miedo de hacer el ridículo.....	(1)	(2)	(3)	(4)
<b>44.</b> Mis amigos saben que no me da vergüenza contarles situaciones embarazosas que me hayan ocurrido.....	(1)	(2)	(3)	(4)
<b>45.</b> Me doy cuenta de que a veces me paso de la raya y hago bromas que, aunque comienzan siendo inofensivas, resultan hirientes/molestas para otras personas (al menos desde el punto de vista de las personas pudorosas).....	(1)	(2)	(3)	(4)

**Por favor, comprueba que has respondido a todas las afirmaciones**

**SCORING KEY**

GELOTOPHOBIA (15 items) = MEAN = 1 + 4 + 7 + 10 + 13 + 16 + 19 + 22 + 25 + 28 + 31 + 34 + 37 + 40 + 43

GELOTOPHILIA (15 items) = MEAN = 2 + 5 + 8 + 11 + 14 + 17 + 20 + 23 + 26 + 29 + 32 + 35 + 38 + 41 + 44

KATAGELASTICISM (15 items) = MEAN = 3 + 6 + 9 + 12 + 15 + 18 + 21 + 24 + 27 + 30 + 33 + 36 + 39 + 42 + 45

## Supplemental Material (Chapter IX)

Table 1 shows that the interaction among the type of trust-decision (i.e., cooperation vs. non-cooperation trials), emotional expression (joyful, anger and neutral expressions), gaze direction (straight, averted, and direct gazes) and gelotophobia (high- vs. low-gelotophobia group for the reaction times in the TG).

**Table 1.** Means and standard deviations of reaction times (in ms) along with effect sizes for the each experimental condition of the Trust Game.

Cooperation Decision	Emotional Expression	Gaze Direction	High gelotophobia	Low gelotophobia	<i>p</i>	Effect Size
			<i>M (SD)</i>	<i>M (SD)</i>		
Cooperation	Joy	Straight	621 (240)	652 (258)	0.205	-0,123
		Averted	630 (205)	696 (256)	0.043	-0.286
		Direct	649 (215)	686 (257)	0.129	-0.156
	Anger	Straight	681 (288)	709 (299)	0.319	-0.096
		Averted	678 (279)	785 (370)	0.056	-0.325
		Direct	680 (242)	749 (364)	0.097	-0.224
	Neutral	Straight	649 (218)	712 (275)	0.027	-0.256
		Averted	672 (261)	778 (382)	0.124	-0.322
		Direct	667 (256)	847 (624)	0.009	-0.379
Non-cooperation	Joy	Straight	708 (309)	790 (692)	0.120	-0.155
		Averted	686 (270)	636 (207)	0.393	0.208
		Direct	613 (205)	756 (440)	0.050	-0.416
	Anger	Straight	623 (219)	736 (392)	0.031	-0.356
		Averted	678 (251)	685 (261)	0.138	-0.028
		Direct	660 (216)	786 (507)	0.022	-0.324
	Neutral	Straight	748 (328)	696 (315)	0.300	0.161
		Averted	645 (209)	860 (664)	0.029	-0.438
		Direct	687 (279)	783 (457)	0.098	-0.253

*Note:* Means are on the left and standard deviations are given in parentheses; *d* = Standardized effect size.

Table 2 shows that the interaction among emotional expression (joyful, anger and neutral expressions), gaze direction (straight, averted, and direct gazes) and gelotophobia (high- vs. low-gelotophobia group for the cooperation rates in the TG).

**Table 2.** Means and standard deviations of cooperation rates, for each condition and gelotophobia group, in the trust game

Emotion	Gaze	Cooperation Rates		
		High in gelotophobia	Low in gelotophobia	<i>d</i>
Joy	Straight	0.582 (0.151)	0.689 (0.121)	-0.777
	Averted	0.550 (0.138)	0.658 (0.153)	-0.744
	Direct	0.584 (0.127)	0.672 (0.156)	-0.622
Anger	Straight	0.468 (0.182)	0.452 (0.130)	0.104
	Averted	0.438 (0.159)	0.439 (0.122)	-0.004
	Direct	0.472 (0.178)	0.414 (0.106)	0.399
Neutral	Straight	0.571 (0.101)	0.583 (0.127)	-0.100
	Averted	0.524 (0.149)	0.561 (0.148)	-0.253
	Direct	0.547 (0.138)	0.562 (0.133)	-0.111

Note: Means are on the left and standard deviations are given in parentheses; *d* = Standardized effect size

Tables 3-8 show regression analysis predicting all experimental conditions by gelotophobia (controlling for social anxiety), gelotophilia and katagelasticism.

**Table 3.** Regression standardized coefficients of gelotophobia (controlling for social anxiety) for the REACTION TIMES of all experimental conditions of the Trust Game

	Gelotophobia
Total	
Total	-0.467
Trust-decision	
Cooperation	-0.465
Non-cooperation	-0.496
Emotion	
Joy	-0.273
Anger	-0.518
Neutral	-0.543
Gaze	
Straight	-0.347
Averted	-0.399
Direct	-0.604*
Trust-decision X Emotion	
Coop X Joy	-0.323
Coop X Anger	-0.359
Coop X Neutral	-0.619*
Non-Coop X Joy	-0.415
Non-Coop X Anger	-0.580
Non-Coop X Neutral	-0.472
Trust-decision X Gaze	
Coop X Straight	-0.353



Coop X Averted	-0.367
Coop X Direct	-0.627*
Non-Coop X Straight	-0.385
Non-Coop X Averted	-0.451
Non-Coop X Direct	-0.603*
Emotion X Gaze	
Joy X Straight	-0.190
Joy X Averted	-0.174
Joy X Direct	-0.434
Anger X Straight	-0.443
Anger X Averted	-0.446
Anger X Direct	-0.598*
Neutral X Straight	-0.370
Neutral X Averted	-0.489
Neutral X Direct	-0.642*
Trust-decision x Emotion X Gaze	
Coop X Joy X Straight	-0.262
Coop X Joy X Averted	-0.446
Coop X Joy X Direct	-0.392
Coop X Anger X Straight	-0.157
Coop X Anger X Averted	-0.376
Coop X Anger X Direct	-0.470
Coop X Neutral X Straight	-0.532
Coop X Neutral X Averted	-0.418
Coop X Neutral X Direct	-0.740*
Non-Coop X Joy X Straight	-0.377
Non-Coop X Joy X Averted	-0.051

Non-Coop X Joy X Direct	-0.602*
Non-Coop X Anger X Straight	-0.580
Non-Coop X Anger X Averted	-0.329
Non-Coop X Anger X Direct	-0.632*
Non-Coop X Neutral X Straight	-0.152
Non-Coop X Neutral X Averted	-0.644*
Non-Coop X Neutral X Direct	-0.459

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$N = 40$ . Coop = Cooperation decision; Non-Coop = Non-cooperation decision; \*  $p < .05$ ;

\*\*  $p < .01$ ; \*\*\*  $p < .001$

**Table 4.** Regression standardized coefficients of gelotophobia (controlling for social anxiety) for the COOPERATION RATES of all experimental conditions of the Trust Game.

	Gelotophobia
Total	
Total	-0.302
Emotion	
Joy	-0.718*
Anger	0.061
Neutral	0.076
Gaze	
Straight	-0.485
Averted	-0.226
Direct	-0.088
Emotion X Gaze	
Joy X Straight	-0.626*
Joy X Averted	-0.649*
Joy X Direct	-0.571
Anger X Straight	-0.185
Anger X Averted	0.063
Anger X Direct	0.326
Neutral X Straight	-0.068
Neutral X Averted	0.128
Neutral X Direct	0.106

$N = 40$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

**Table 5.** Regression standardized coefficients of gelotophobia (controlling for social anxiety) for the ERROR RATES of all experimental conditions of the gaze discrimination task.

	Gelotophobia
Total	
Total	0.548
Emotion	
Joy	0.600*
Anger	0.441
Neutral	0.509
Gaze	
Straight	0.201
Averted	0.537
Direct	0.553
Emotional X Gaze	
Joy X Straight	0.317
Joy X Averted	0.521
Joy X Direct	0.679*
Anger X Straight	0.128
Anger X Averted	0.541
Anger X Direct	0.265
Neutral X Straight	-
Neutral X Averted	0.474
Neutral X Direct	0.695*

*N* = 40. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

**Table 6.** Regression standardized coefficients of gelotophobia (controlling for social anxiety) for TRUSTWORTHINESS of all experimental conditions of the emotional ratings task

	Gelotophobia
Total	
Total	-0.369
Emotion	
Joy	-0.419
Anger	-0.352
Neutral	-0.008
Gaze	
Straight	-0.342
Averted	-0.383
Direct	-0.338
Emotional X Gaze	
Joy X Straight	-0.524
Joy X Averted	-0.390
Joy X Direct	-0.304
Anger X Straight	-0.238
Anger X Averted	-0.361
Anger X Direct	-0.420
Neutral X Straight	0.105
Neutral X Averted	-0.105
Neutral X Direct	-0.014

$N = 40$ . \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

**Table 7.** Regression standardized coefficients of gelotophobia (controlling for social anxiety) for INTENSITY of all experimental conditions of the emotional ratings task

	Gelotophobia
Total	
Total	0.309
Emotion	
Joy	0.268
Anger	0.110
Neutral	0.272
Gaze	
Straight	0.332
Averted	0.346
Direct	0.231
Emotional X Gaze	
Joy X Straight	0.152
Joy X Averted	0.348
Joy X Direct	0.291
Anger X Straight	0.229
Anger X Averted	0.178
Anger X Direct	-0.084
Neutral X Straight	0.299
Neutral X Averted	0.261
Neutral X Direct	0.241

*N* = 40. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

**Table 8.** Regression standardized coefficients of gelotophobia (controlling for social anxiety) for VALENCE of all experimental conditions of the emotional ratings task

	Gelotophobia
Total	
Total	-0.009
Emotion	
Joy	-0.071
Anger	-0.070
Neutral	0.203
Gaze	
Straight	-0.015
Averted	-0.096
Direct	0.090
Emotional X Gaze	
Joy X Straight	-0.137
Joy X Averted	-0.032
Joy X Direct	-0.038
Anger X Straight	-0.042
Anger X Averted	-0.205
Anger X Direct	0.045
Neutral X Straight	0.212
Neutral X Averted	0.128
Neutral X Direct	0.218

*N* = 40. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

