

1 Publication Patterns in the Humanities: Generational 2 Shifts and Changing Research Agendas

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12 Abstract

13 The humanities have distinct publication practices compared to the sciences, with books and
14 local language literature being essential. This study aims to identify and analyze the
15 publication patterns of humanities scholars in Spanish-speaking countries, revealing unique
16 publication behaviors and fostering diverse perspectives rather than linear knowledge
17 progression. We analyzed the publication histories of approximately 40,000 scholars from
18 1950 to 2021 using data from the Dialnet database. By identifying archetypal publication
19 profiles, we explored their distribution across generational cohorts and research topics. Our
20 findings reveal substantial generational shifts towards journal-centric publication patterns
21 probably influenced by bibliometric-driven evaluation systems. The also show a relation
22 between publication patterns and research topics. This highlights the need for more inclusive
23 assessment practices that recognize the diverse nature of humanities scholarship. We
24 contribute to ongoing discussions on promoting bibliodiversity in research assessment and
25 the potential impacts of current policies on the humanities.

26 Keywords

27 humanities, publication patterns, bibliodiversity, research evaluation, Spanish-speaking
28 countries, generational shifts

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44 The humanities are distinct from other sciences. Unlike other disciplines, books remain an
45 essential format of scientific publishing¹⁻³, and their target audience is often more scattered
46 and diverse^{4,5} with non-English literature playing an important role in its dissemination⁶. They
47 exhibit different citation patterns compared to those in other research fields⁷: older works are
48 more likely to still be cited⁵, and research primarily involves exploring new perspectives and
49 fostering the coexistence of competing knowledge rather than following a linear process of
50 development characterized by big breakthroughs⁸. Furthermore, solo research is still
51 common⁹. This leads to diverse valuation regimes^{10,11} making research evaluation a highly
52 controversial issue^{12,13}. This lack of consensus is related to the social structure of these fields,
53 generally organized around schools of thought or 'tribes'¹⁴ which compete, contrasting with
54 the 'paradigmatic' organization of the Natural and Exact Sciences¹⁵. These differences have
55 sometimes been interpreted as weakness of humanities^{16,17}, rather than merely different
56 research styles.

57

58 Given the particularities of the humanities, a body of literature has been built within the fields
59 of scientometrics and research evaluation over the last twenty years trying to tackle such
60 challenges. There is a widespread recognition of the need to better understand the dynamics
61 of humanities¹⁸. For this, studies have focused mainly on three issues: differences on
62 publication patterns, database coverage limitations¹⁹⁻²², and the validity of citations as a *proxy*
63 for impact or quality^{8,23} proposing a range of alternative indicators^{3,24,25}.

64

65 This study is framed within the first stream of literature, that is, the understanding of publication
66 patterns within the Humanities. Our goal is to identify types of humanists based on their
67 publication patterns and understand the factors underlying the differences between these
68 types. We want to understand to what extent humanists tend to publish in a diverse range of
69 outlets. Is it common to all fields? How is a journal-centric evaluation culture affecting their
70 publishing habits²⁶? What is the role played by language²⁷, database indexing²⁸⁻³⁰, scope^{31,32}
71 or research topic^{28,31,33}?

72

73 To this aim, we analyze publication patterns of individual scholars during their complete
74 academic career. We examine the publication history of 39,753 scholars from Spanish
75 speaking countries who started publishing from 1950 onwards up to 2021. We consider around
76 1.2 million publications in all outlets and languages, studying 13 different fields from the
77 humanities. Our dataset is extracted from Dialnet (<https://dialnet.unirioja.es/>), a specialized
78 bibliographic database focused on the social sciences and humanities, maintained by the
79 Dialnet Foundation^{34,35}. The uniqueness of this data lies not only on the richness of publication
80 types and languages, but also by the fact that author profiles are manually curated and
81 regularly updated by Spanish university, public and special libraries related to the Dialnet
82 Foundation through a consortium agreement. This allows us tracking their complete
83 publication history, identify their starting publishing date, compute their career length or
84 differentiate between outputs indexed and non-indexed publications in mainstream
85 bibliometric databases (i.e., Scopus and Web of Science).

86

87 Based on this dataset, we built eight variables for each scholar, defining their publication
88 patterns by publication type, language, and database indexing. We then computed an
89 archetypal analysis³⁶ per discipline. This allows us to identify prototypical types of humanists
90 based on their publication patterns. A hierarchical clustering analysis allowed us to group
91 archetypes across fields, identifying six distinct publication profiles in the humanities. We then

92 computed distance measures between each scholar and archetype to measure their
93 resemblance to them. Furthermore, we assigned scholars to their most similar archetype and
94 explored differences between archetypes in terms of generational cohort, and research topic.
95 Topics were identified by applying the Leiden community detection algorithm³⁷ to a co-
96 occurrence network based on keywords extracted from publication titles. Then, we computed
97 the Jaccard distance between archetypes across fields in order to identify differences in the
98 topics studied by humanists based on their publication profiles. Further details are provided in
99 the Data and Methods section.

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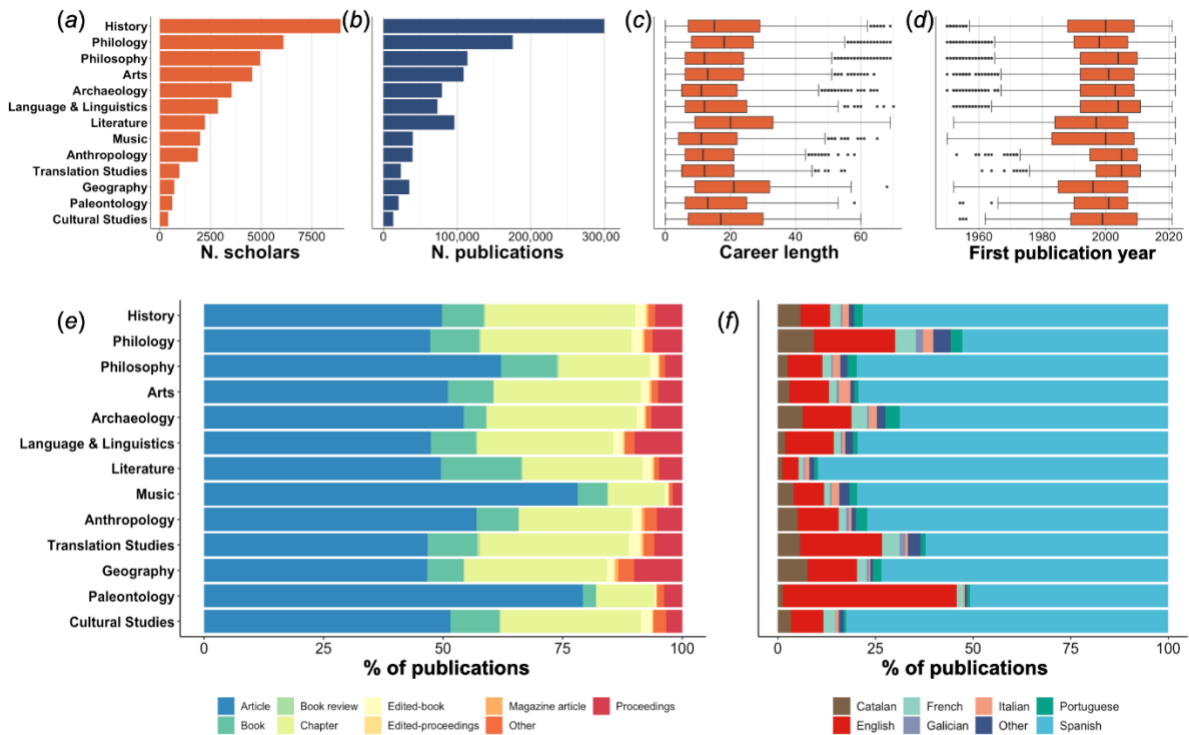
101 We contribute to current literature in several ways. First, we analyze publication patterns at
102 the author level, revealing the extent of variation and contributing to the debate on the diverse
103 literatures within the humanities^{9,38}. Second, we offer novel insights into current research
104 policy discussions on promoting bibliodiversity in research assessment and the potential risks
105 of policies that alter publication habits^{26,39}. Finally, we examine the relationship between
106 research topics, language and geographic outreach—an under-researched issue often
107 mentioned to resist changes in publication patterns within the humanities^{6,31}.

108 Results

109 Distribution of scholars by field and general publication trends

110 We explore the publication patterns of 39,753 humanists distributed among 13 research fields
111 (Fig. 1). Historians, philologists, and philosophers represent half of the population (50.2%),
112 whereas Geography, Paleontology and Cultural Studies account for less than 5% of the
113 population (**a**). This distribution is modified slightly when looking at productivity differences
114 among fields (**b**). The proportion of outputs from the three largest fields increases slightly to
115 52.7%, with History representing more than a quarter of the publications (26.8%), that is 4.3%
116 higher than expected. Literature also produced more publications than expected compared to
117 other fields, with a difference of 3.0 points. Conversely, Philosophy constitutes 12.4% of the
118 workforce but accounts for only 10.2% of all publications.

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Fig. 1 Descriptives of population of scholars and outputs by field. (a) Distribution of scholars by research field and (b) publications. (c) Boxplot of academic ages by field. Career length refers to the difference between their first and last years of publication. (d) Boxplot of the distribution of first year of publication by field. This is used to describe generational differences among scholars. (e) Distribution of publications by publication type and field. (f) Distribution of publication by language and field. Data filtered to scholars with publications since 1950 and with more than one publication and include all publication types.

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The distribution of career lengths and first publication years of scholars across fields reveals significant variations. In terms of career length (c), Literature and Geography stand out with the highest mean values (21.7 and 21.2 respectively), indicating the presence of more senior scholars in these fields. By contrast, scholars from fields such as Translation Studies, Anthropology, and Music have shorter career lengths on average, indicating a younger academic workforce. Regarding generational differences (d), most scholars began their academic career during the 1990s and 2000s; however notable differences exist across fields. Translation Studies and Anthropology show the most recent mean entry points into academia, with means around 2003 and 2002, and medians both in 2005. On the other hand, Literature and Geography have the oldest mean first publication years, around 1995, indicating a more established cohort of scholars.

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Regarding publication patterns (e), articles are the predominant publication type across most fields, particularly in Paleontology (79.2%) and Music (78.1%). Philosophy also shows a high proportion of articles (62.0%). In contrast, fields like Philology and History, while still favoring articles (47.4 and 49.7%, respectively), show a larger presence of book chapters (31.6 and 31.4% respectively). The prevalence of books is particularly notable in Literature (16.8%) and Philosophy (11.7%). Fields like Anthropology and Archaeology exhibit a balanced distribution between articles and chapters, with Translation Studies showing 46.8% articles and 31.3% chapters, Philology with 47.4% articles and 31.6% chapters, and Geography with 46.6% of

149 articles and 29.8% of chapters. In terms of publication language (f), Spanish is the dominant
150 language in most fields. It accounts for 89.8% of publications in Literature, 82.6% in Cultural
151 Studies and 79.9% in Philosophy. In contrast, Paleontology stands out with a significant
152 proportion of outputs in English language publications (44.5%). English also plays a notable
153 role in fields like Translation Studies (30.0%) and Philology (20.8%). Other languages such as
154 Catalan, French and Portuguese are also present but to a lesser extent. Catalan is particularly
155 present in Philology (9.2%) and Geography (7.6%).

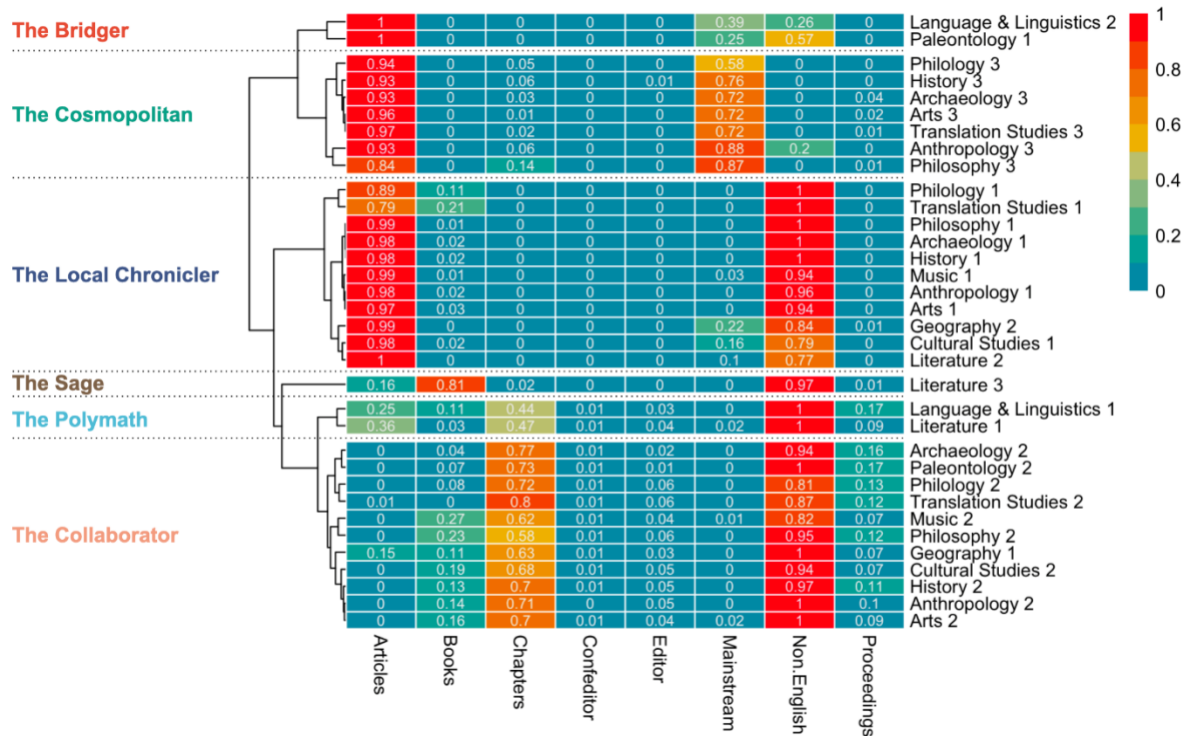
156 Humanists' publication profiles

157 For each scholar, we defined eight variables to describe their publication patterns to better
158 understand their preferred outlets. Six of these variables relate to publication types: four relate
159 to authored publications (journal articles, books, chapters and proceedings), and two with
160 edited publications (edited conference proceedings and edited books). The other two variables
161 relate to the geographic scope of the output. One relates to the number of non-English
162 publications and the second to the number of publications indexed in mainstream international
163 scientific databases (i.e., Scopus and Web of Science). Further details on the data processing
164 and methodological design are provided in the Data and Methods section.

165
166 Using these variables, we applied an archetypal analysis to identify the types of publication
167 profiles exhibited by humanists. Archetypal analysis^{36,40} is a methodology used to identify
168 extreme points in a multidimensional dataset that best represent the diversity of the data.
169 Unlike traditional clustering methods, which group similar data points into clusters, this method
170 identifies pure or idealized examples within the data, providing a convex hull that
171 encompasses the dataset. Furthermore, it provides a similarity measure, called the α -score,
172 which indicates how similar each case is to the identified archetypes. The number of
173 archetypes is defined by following an elbow criterion after plotting the screeplot of a residual
174 sum of squares (RSS) analysis (Appendix, Fig. A1-14). Hence, the number of archetypes
175 identified varies per discipline, with 8 disciplines exhibiting three different archetypes and 5
176 disciplines exhibiting 2. In order to identify similarities across fields, we conducted a
177 hierarchical clustering analysis of all archetype-discipline combinations. In this way, we are
178 able to identify commonalities and differences of profiles across and within disciplines.

179
180 Overall, we have identified six profiles which are spread across the humanities. Figure 2
181 displays a heatmap with the parameters for all archetypes. Archetypes are sorted and grouped
182 according to the hierarchical clustering analysis. Fields on the right side of the y-axis are
183 numbered according to the archetype assigned. To enhance readability and engagement, we
184 gave each cluster of archetypes or profile, a descriptive name that reflects its core
185 characteristics. These are the following: the bridger, the cosmopolitan, the local chronicler, the
186 sage, the polymath and the collaborator. By naming these profiles, we aim to provide a clearer
187 understanding of the diverse publication practices in the humanities and highlight the
188 generational and cultural shifts influencing these patterns.

189



190
 191 **Fig. 2 Clustering of archetypes in the humanities.** Description and characterization of the six clusters
 192 of archetypes identified for the complete population of scholars. Rows show the parameters associated
 193 with each archetype, with labels on the right side of the heatmap indicating the discipline and a number
 194 which corresponds with each of the archetypes identified within the discipline. Rows are grouped based
 195 on a hierarchical clustering with labels on the left side indicating the name of the cluster. Values are
 196 normalized 0-1 based on the proportion of output expected by scholars based on the eight variables
 197 (columns) analyzed.

198
 199 The most widespread profiles are those of the collaborators and the local chroniclers, which
 200 are both present across 11 of the 13 disciplines analyzed. In the case of the collaborators, the
 201 two fields in which they are absent are Language & Linguistics, and Literature. This profile is
 202 characterized by publishing in national languages mainly. We name them collaborators as
 203 they tend to participate in collaborative works with book chapters as their preferred publication
 204 venue. However, researchers exhibiting a collaborator publication profile will occasionally use
 205 any of the other publication venues analyzed, except for journal articles indexed in Web of
 206 Science or Scopus. In the case of the local chroniclers, these are present in all disciplines
 207 except for Language & Linguistics, and Paleontology. They are characterized by publishing
 208 mainly journal articles in national language (i.e., non-English), and only occasionally books or
 209 in indexed journals.

210
 211 The third most common profile is that of the cosmopolitans. Named like that due to the high
 212 proportion of publications which are placed as articles in mainstream journals. Cosmopolitans
 213 are present in 7 disciplines, these are: Philology, History, Archaeology, Arts, Translation
 214 Studies, Anthropology and Philosophy. Next, we observe two publication profiles which are
 215 only present in two disciplines respectively. These are the bridgers and the polymaths.
 216 Bridgers are scholars who primarily publish journal articles, engaging with both national and
 217 mainstream communities by publishing in both, in national and English languages, as well as
 218 in indexed and non-indexed journals. These scholars are present in the disciplines of
 219 Language & Linguistics, and Paleontology. On the other hand, polymaths tend to use a wide

220 variety of publication venues, similarly to the profile of the collaborators, although with a lesser
221 emphasis on book chapters. And again, they publish in non-English languages and in non-
222 mainstream journals. These scholars are present in Language & Linguistics, and Literature.
223 Finally, we observe one profile which is distinctive of just one of the disciplines in the
224 Humanities, that is the sage, which is only present in Literature. These scholars are
225 characterized by publishing mainly monographs in national language, although occasionally
226 also publishing journal articles.

227

228 Overall, we observe how publication choices are varied within the humanities, with different
229 publication patterns observed within and across fields. While many similarities exist among
230 some of the identified profiles, others are unique to specific disciplines, reflecting the richness
231 and diversity of publication habits.

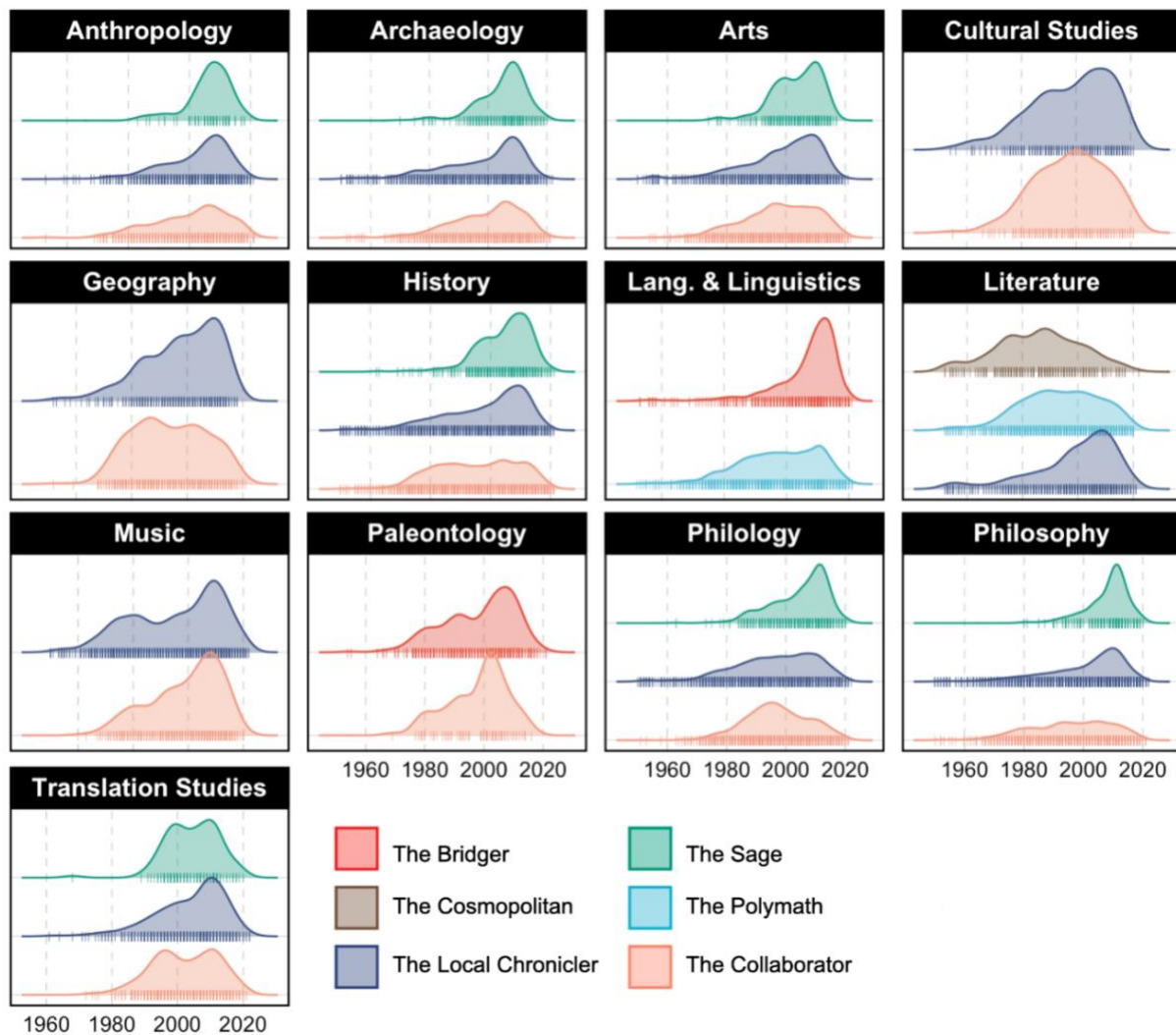
232 Generational differences on publication patterns by field

233 Next, we hypothesize the existence of different profiles within disciplines as a reflection of a
234 generational shift, where publication patterns respond to the context in which they are
235 produced. Phenomena such as bibliometric-driven evaluation systems, a Publish or Perish
236 culture, and a generation of digitally native scholars who may prioritize novelty and shorter
237 communication formats over longer, more reflective works, could be driving these differences
238 across cohorts.

239

240 We explore this in Figure 3, which plots the distribution of publication profiles across disciplines
241 over time. The x-axis represents scholars' first publication year which is used as a proxy for
242 their generational cohort, ranging from 1960 to 2020. The data reveals that generational shifts
243 are taking place both, in terms of dominant archetypes within disciplines, and the emergence
244 of new publication profiles. Similarities can be found in the fields of History, Anthropology,
245 Archaeology and the Arts, where there is a significant rise of the cosmopolitan profile among
246 younger scholars, indicating a stronger preference for publishing articles in indexed journals
247 and engaging in a global academic discourse. Meanwhile, the other two profiles, the
248 collaborator and the local chronicler, remain cross-generational, suggesting a more stable
249 presence in these fields across different cohorts. A similar trend is observed in Philology and
250 Philosophy, where the cosmopolitan profile has become more prominent among newer
251 generations. However, these show that the collaborator profile is adopted by older scholars,
252 with a marked decline especially in Philology since the late 1990s, indicating a shift from
253 publishing in collective monographs.

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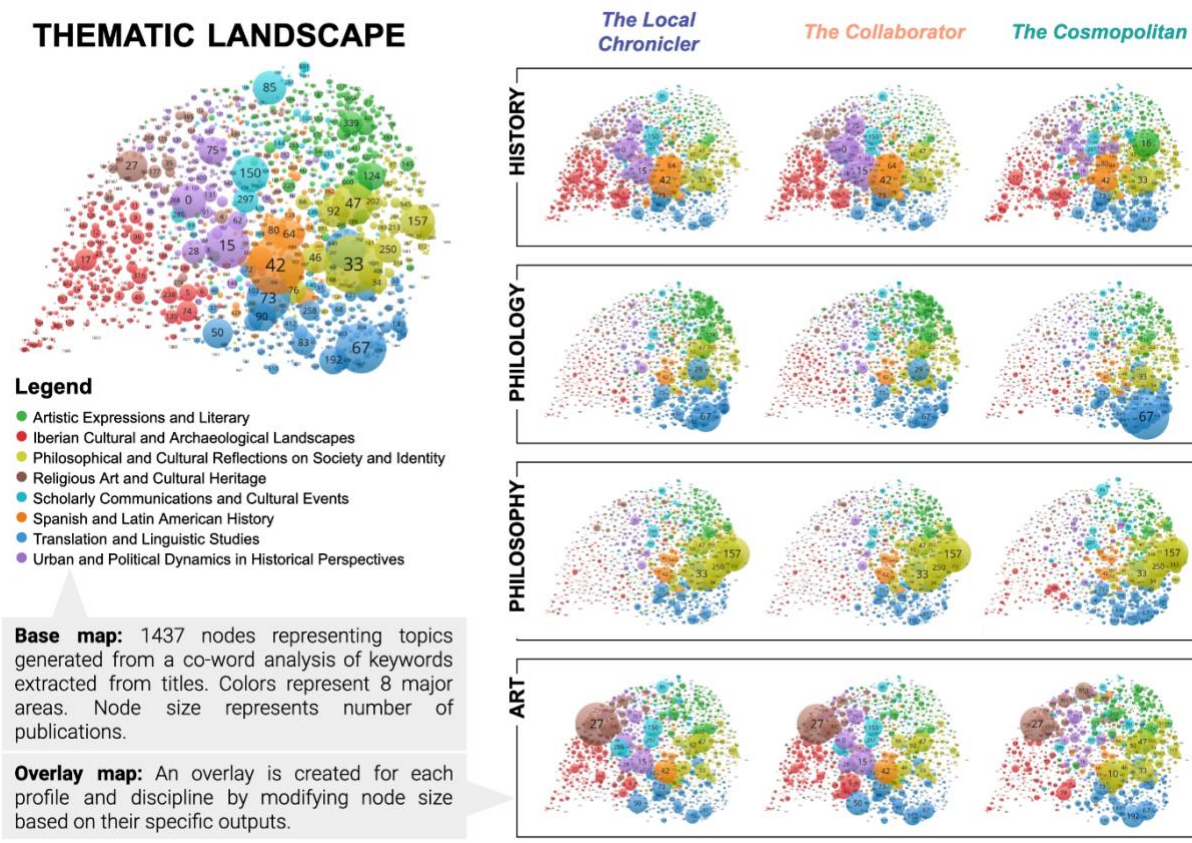
255
 256 **Fig. 3 Generational shifts in publication profiles across disciplines.** Density plots by discipline on
 257 the distribution of scholars based on their first publication year. The color of the density plots
 258 corresponds to the publication profiles identified in Fig. 2 to facilitate comparisons within and across
 259 fields.

260
 261 In Cultural Studies and Geography, we observe a clear generational shift from the collaborator
 262 profile, characterized by publishing mainly book chapters, to the local chronicler, which
 263 prioritizes journal articles in national language. This transition is more pronounced in
 264 Geography, whereas in Cultural Studies, the shift peaks for scholars who began publishing in
 265 the 2010s. But there is no dominant pattern across fields, reflecting the richness and diversity
 266 of the humanities in terms of publication patterns. In the case of Music, for instance, the pattern
 267 is somewhat the reverse, with the local chronicler being a cross-generational profile and the
 268 collaborator profile being adopted by younger generations.

269
 270 Paleontology is a unique case, showing distinct patterns compared to other disciplines. Here
 271 the bridger—who combines publishing in national language with mainstream journals—, and
 272 the collaborator profiles are present across multiple generations, showing a more balanced
 273 distribution of these archetypes. But we do notice a shift between the 2000s and the 2010s
 274 generations towards the bridger profile which could reflect an effort in the field towards
 275 internationalization.

276

277 Other distinct cases include Language & Linguistics, and Literature. In the case of the former,
 278 two profiles are present: the polymath, who tends to use a diversity of publication venues and
 279 formats, and the bridgers. Scholars showcasing the polymath profile are cross-generational,
 280 while there is a clear rise of scholars with a bridger profile among recent generations, pointing
 281 towards an effort to reach wider and more international audiences. Finally, Literature is the
 282 only discipline exhibiting the sage profile, characterized by scholars who primarily publish
 283 books. However, this profile is associated with older generations of scholars. In contrast,
 284 newer generations in the field tend to exhibit a polymath and a local chronicler profile,
 285 suggesting a shift in terms of publication practices. The dominance of the local chronicler
 286 profile still suggests the importance of national-language journals within the field over
 287 mainstream journals.
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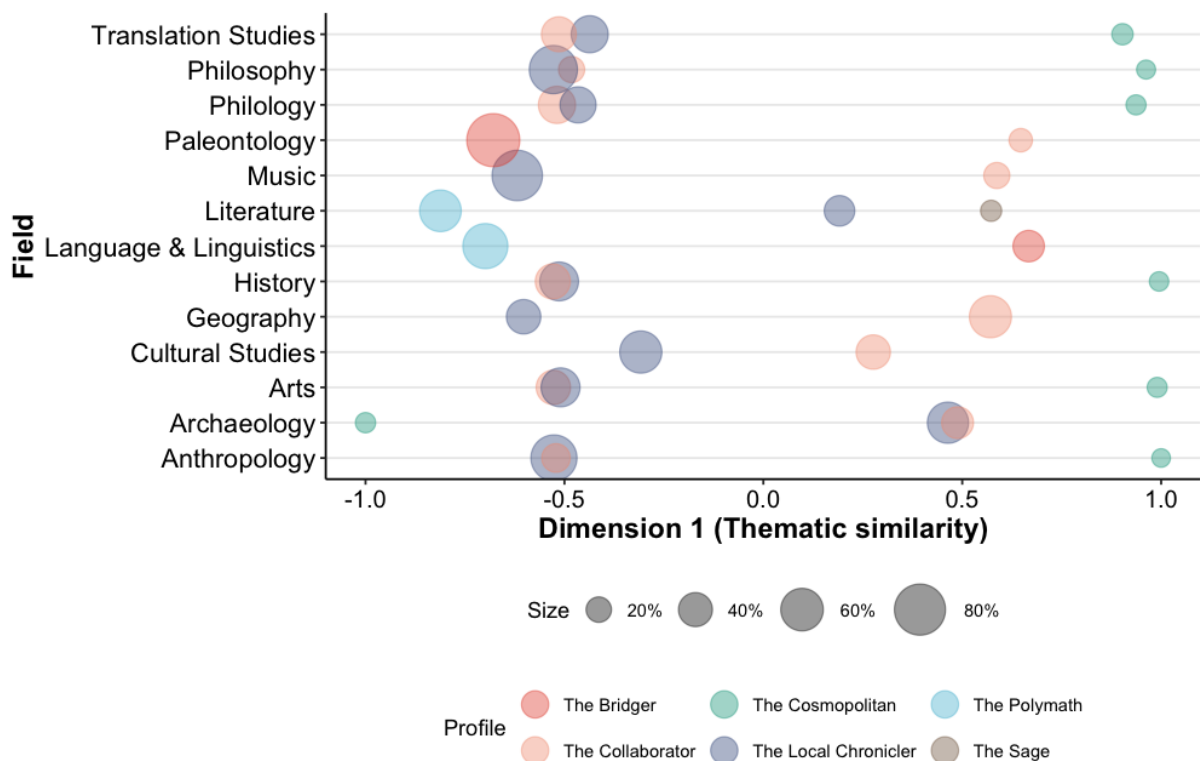
289
 290 **Fig. 4 Thematic landscape and comparison of research portfolios by archetype in History,**
 291 **Philology, Philosophy and Arts.** Top-left shows the base thematic map based on a co-occurrence
 292 matrix of keywords extracted from titles for the complete population. Right side include the research
 293 portfolio of scholars in each discipline by publication profile.

294 **The relation between research topics and publication patterns**

295 Next, we explore how publication patterns may affect topic selection. We translated non-
 296 English titles into English and extracted keywords using the ChatGPT API⁴¹. We then applied
 297 the Leiden community detection algorithm³⁷ to group keywords into clusters or topics. We
 298 identified a total of 1,437 topics (see Supplementary material to read the list of topics) which
 299 were clustered into eight major areas. Based on these topics, we created a vector for each
 300 archetype-discipline combination, representing the distribution of records among topics. A

301 detailed description of the methodological approach followed is provided in the Data and
 302 Methods section.

303
 304 Fig. 4 shows the resulting thematic landscape for the complete dataset along with overlaid
 305 maps of different archetypes and fields as illustrative examples. The top-left of Fig. 4 shows
 306 the thematic landscape for all fields, with numbered nodes representing topics, their size
 307 indicating the number of publications within each topic and colors depicting major areas. The
 308 largest topics are Philosophical Approaches to Cultural Studies (node 33, 43,749
 309 publications), followed by Historiographical Evolution in Spanish-Speaking Contexts (node 42,
 310 43,474 publications) and Teaching and Learning Strategies in Second Language Acquisition
 311 (node 67, 35,199 publications). Topics are linked based on the co-occurrence of keywords
 312 across topics. The right side of Fig. 4 showcases the overlaid maps for the archetypes
 313 identified in the fields of History, Philology, Philosophy and Arts. Overall, we observe how
 314 different fields will concentrate their publications in different major areas. For instance, in the
 315 case of History, we observe a larger concentration within the area of Spanish and Latin
 316 American History, while in Philology, most of the publications revolve around the area of
 317 Translation and Linguistic Studies. A visual inspection of the map within fields does not reveal
 318 clear differences across publication profiles. For instance, archetypes in Philosophy seem
 319 quite similar in terms of topic distribution. However, in the case of the cosmopolitan profile in
 320 Arts or Philology, we do see some differences with the other two profiles.
 321



322
 323 **Fig. 5 Thematic similarity of profiles across academic fields.** This figure shows the results of a one-
 324 dimensional Multidimensional Scaling (MDS) analysis, which projects the thematic similarity between
 325 humanist profiles for each field. Points that are closer together on the X-axis indicate profiles that are
 326 thematically more similar within the same field. The color of each point represents the type of profile,
 327 and the size of the points indicates the percentage of humanists from each field associated with that
 328 profile.
 329

330 In Fig. 5 we look systematically into such differences. For this, we vectorize the distribution of
331 topics among archetype-discipline combinations and compute within each discipline, the
332 similarity between thematic profiles using the Jaccard distance. The distances are available in
333 Table A1. In this way, we assess the extent to which scholars associated with different
334 archetypes share common research topics. To visualize such distance, we apply a one-
335 dimensional Multidimensional Scaling (MDS, see the Data and Methods section). Fig. 5 shows
336 the relative position of each profile within their respective fields, with the x-axis representing
337 the thematic similarity and the size of each bubble corresponding to the proportion of scholars
338 exhibiting each profile.

339

340 As observed, clear thematic distinctions emerge between publication profiles. Scholars
341 exhibiting a cosmopolitan profile tend to publish on topics that are distinctly different from those
342 associated with other profiles. In contrast, when the local chronicler and collaborator profiles
343 coexist, they generally engage with similar research topics, with the notable exceptions of
344 Geography and Cultural Studies, where their thematic focus diverges more substantially. The
345 polymath profile is also another which clearly distinguish itself thematically from other
346 publication profiles. For instance, in Literature we observe a greater similarity between the
347 sage and the local chronicler than with the polymath. Again, the same kind of distinction can
348 be observed in the case of the bridger, which remain thematically distinct from the collaborator
349 and the polymath in Paleontology and Language & Linguistics respectively. In all, this shows
350 a link between publication patterns and research topics.

351 Discussion

352 Research evaluation systems have historically mistreated the humanities¹⁷, often pushing
353 them to adopt the same publication patterns as the sciences and other fields^{28,29}. This trend
354 has persisted despite widespread recognition that the humanities exhibit distinct publication
355 behaviors driven by their unique audiences and communication goals⁹. Our analysis of
356 publication patterns across humanists' publication histories reflects such pressure as well as
357 the coexistence of different profiles of scholars. Through the examination of a large dataset
358 covering the publication history of nearly 40,000 scholars across 13 fields within the
359 humanities, we can identify and point to factors affecting these differences in the choice of
360 publication outlets by humanists.

361

362 The humanities have traditionally been portrayed as exhibiting a broad spectrum of publication
363 patterns across fields and specialties⁴². In fact, different studies have highlighted the
364 distinction between journal-based and book-based disciplines^{5,30}. A key insight from our study
365 is that there is heterogeneity in publication patterns within the humanities with notable
366 differences across disciplines. This challenges the reasoning behind aggregating them and
367 treating them uniformly in most studies. We observe six publication profiles, —the bridger, the
368 cosmopolitan, the local chronicler, the sage, the polymath and the collaborator—, each of them
369 representing different preferences in terms of publication patterns. The collaborator and local
370 chronicler profiles are widely spread, as they are common in 11 of the 13 disciplines analyzed.
371 The cosmopolitan profile is present in more than half of the disciplines. The remaining profiles
372 seem to be more field-specific with the sage profile as the one that is only observed in
373 Literature.

374

375 Our findings highlight distinct generational transitions in publication practices across
376 disciplines. Examples of such changes are the transition from a preference for book chapters
377 (collaborator profile) to journal articles in national language (local chronicler profile) in fields
378 such as Cultural Studies or Geography. These shifts go in different directions and vary in
379 prominence by discipline. For instance, in the case of Music, the transition is observed, but
380 following the reverse direction, with younger generations showing a preference for publishing
381 book chapters in the national language. Hence, differences are not homogeneous across the
382 humanities. In fields such as Anthropology, Archaeology, and Arts, the rise of the cosmopolitan
383 profile among younger scholars indicates a strong orientation toward publishing in indexed
384 journals and engaging in international discourse. Meanwhile, the collaborator and local
385 chronicler profiles remain cross-generational in these fields, suggesting a more stable
386 presence. These examples and many others reflect how different fields are confronting a
387 changing publishing and academic landscape in which internationalization and mainstream
388 publishing are becoming more important for younger generations, while traditional publication
389 outlets continue to play a significant role for scholars across cohorts in many disciplines.

390
391 The preference for publishing venues is, in many cases, determined by the research topic,
392 pointing towards a linkage with the potential audience addressed by humanists⁹. This is
393 especially noticeable with profiles which show a preference for publication in English language
394 or in journals indexed in Web of Science or Scopus, demonstrating that policies oriented
395 towards these publications will inevitably bias the production of knowledge towards topics
396 which may not reflect national interests^{28,43}.

397
398 Our study underscores the ongoing challenges in achieving bibliodiversity within the
399 humanities. Not only it confirms the recognized importance of books and publications in the
400 national language but shows how these publication patterns are evolving; highlighting the
401 importance of introducing policies that maintain such bibliodiversity in order to foster a rich
402 and varied topic portfolio in these fields. Our analysis of publication patterns in the humanities
403 reveals significant generational shifts and the influence of research evaluation policies on
404 shaping academic behavior. The findings suggest an unequal move towards journal-centric
405 publication practices among newer generations, driven by the pressures of current evaluation
406 systems. To foster a truly diverse and inclusive research environment, developing evaluation
407 frameworks that recognize the full spectrum of scholarly contributions in the humanities is
408 imperative. Further research is needed to explore the long-term implications of these trends
409 on the development of knowledge and the sustainability of diverse research agendas in the
410 humanities.

411 Data and methods

412 Data collection and processing

413 We used data from Dialnet, a bibliographic database which indexes social sciences and
414 humanities literature from Spanish-speaking countries since 2001. The Dialnet Foundation
415 provided data encompassing 825,604 publication records from 60,063 authors in the
416 humanities. Our analysis focused on publications from 1950 to 2021, which narrowed the
417 dataset to 806,378 publications and 57,742 researchers across 17 distinct disciplines. To

418 standardize field sizes, some fields were consolidated, resulting in a total of 13 fields. Details
419 of these fields are provided in Table A2 in the Appendix. Additionally, we included only
420 scholars with at least two papers, reducing the final count to 39,753 scholars.

421
422 Researchers' career length was calculated as the difference between the years of their first
423 and last publications. We then categorized their outputs into six types: books, book chapters,
424 articles, conference proceedings articles, edited books, and edited proceedings. Additionally,
425 we examine the outreach of their outlets using two variables: indexing in mainstream
426 databases, specifically Web of Science or Scopus; and publication language, distinguishing
427 between English and non-English publications. It is important to consider that, in principle,
428 these two variables are not mutually exclusive.

429
430 All data processing tasks were conducted using Python (v. 3.11.5). Descriptives, statistical
431 analyses and visualizations were conducted in the R statistical computing language (v.
432 4.2.2)⁴⁴. Thematic landscapes were generated using the visualization software VOSviewer⁴⁵.
433 Data underlying this study and supplementary materials are available at
434 <https://doi.org/10.5281/zenodo.13905465>. Code scripts are available at the GitHub repository
435 https://github.com/Wences91/humanities_patterns.

436 Archetypal analysis

437 In this paper, we have implemented an archetypal analysis. Archetypal analysis does not aim
438 at classifying observations into distinct groups but rather represents each observation as a
439 convex combination of a few extreme points, known as archetypes. Given an $n \times m$ matrix X
440 representing a multivariate data set with n observations and m attributes, the archetypal
441 analysis finds the matrix Z of k m –dimensional archetypes by minimizing the residual sum of
442 squares (RSS):

$$443 \quad \text{RSS} = \|X - \alpha Z^T\|_2$$

444 Here, α represents the coefficients of the archetypes in an $n \times k$ matrix. The elements of α are
445 non-negative and their sum must be 1, i.e., $\sum_{j=1}^k \alpha_{ij} = 1$ with $\alpha_{ij} \geq 0$ for $i = 1, \dots, n$.

446 Additionally, the archetypes Z are themselves convex combinations of the data points:

$$447 \quad Z = X^T$$

448 where β is an $n \times k$ matrix of coefficients. The elements of β are also non-negative and their
449 sum must be 1, i.e., $\sum_{i=1}^n \beta_{ji} = 1$ with $\beta_{ji} \geq 0$ for $j = 1, \dots, k$.

450 Each archetype represents an extreme observation of the dataset, and the remaining
451 observations are interpreted based on their proximity to these archetypes^{36,46}.

452 Profiling humanist archetypes

453 To identify transversal profiles across the archetypes derived from 13 fields, we employed an
454 unsupervised clustering approach. First, the archetype values, expressed as percentiles, were
455 normalized to ensure comparability across different attributes. This normalization adjusted the
456 data so that all attributes, regardless of their original scale, contributed equally to the clustering
457 process. We then applied a hierarchical clustering algorithm, visualized through a clustered
458 heatmap generated using the pheatmap library in R⁴⁷. The clustering was based on Euclidean
459 distance, which measures the dissimilarity between archetypes by calculating the geometric
460 distance between their attribute vectors. By grouping archetypes that exhibited similar patterns

461 across the attributes, this method uncovered latent structural relationships between
462 archetypes from different fields.

463

464 To determine the optimal number of clusters, we tested various configurations, systematically
465 evaluating the interpretability and coherence of the resulting groupings. Ultimately, a six-
466 cluster solution was chosen as the most suitable. Based on the common patterns identified
467 within each cluster, the profiles were labeled to clearly reflect their distinctive characteristics.

468 Keyword extraction

469 Publications were limited to those in Spanish and English language, that 85.79% of the
470 analyzed dataset (708,355 records). To ensure an accurate analysis, all publication titles were
471 first translated into English using the ChatGPT API (GPT-4)⁴¹. Keywords were then extracted
472 from the document titles using the Rapid Keyword Extraction (RAKE) algorithm⁴⁸. RAKE is an
473 unsupervised, domain-independent method that extracts keywords by analyzing the frequency
474 and co-occurrence of words within a text. The process begins with text segmentation, where
475 the input text is divided into candidate keywords by removing stop words and punctuation.
476 Each candidate keyword is then scored based on its frequency and degree of co-occurrence
477 with other words. The degree is defined as the sum of the frequencies of the words that co-
478 occur with the candidate keyword.

479

480 The scoring mechanism of RAKE can be expressed mathematically as follows: for a candidate
481 keyword k , the score $S(k)$ is calculated as:

482

$$483 \quad S(k) = \sum_{w \in k} freq(w) \times deg(w)$$

484

485 Where $freq(w)$ is the frequency of word w in the text, and $deg(w)$ is the degree of word w ,
486 which is the total number of co-occurrences of w with other words in the candidate keywords.
487 The algorithm's final output is a ranked list of keywords, with higher scoring keywords deemed
488 more relevant.

489

490 Creation of thematic landscapes and topic detection

491 We then generated a document-keyword matrix from which we extracted a term co-mention
492 network was generated based on the publications of each author, applying a binary counting
493 method. This means that the co-occurrence of terms across all papers by the same author
494 was considered, but only in terms of whether the keyword was present or not, ignoring the
495 frequency. As a result, a co-occurrence network was obtained, calculating the weight between
496 keywords as the frequency of their appearance in distinct authors. However, we normalized
497 the weights to avoid problems when clustering due to the presence of terms with high
498 frequency. The normalized weight w_{norm} is calculated as follows:

499

$$500 \quad w_{norm} = \frac{2 \times w}{f_x + f_y}$$

501

502 where w is the original weight, and f_x and f_y are the frequencies of co-occurrence of individual
503 terms. This normalization considers the total frequency of term across all authors versus their
504 co-occurrence with each other, helping to balance the weights and reduce the impact of highly
505 frequent terms in the clustering process.

506

507 The resulting network was filtered to include only terms that co-occur at least twice. Using the
508 Leiden community detection algorithm³⁷, clusters were identified, resulting in a total of 4,829
509 clusters ($Q = 0.825$), representing thematic clusters that correspond to research topics.
510 However, since many clusters were composed of only a few terms, we further filtered to
511 include only clusters with more than four terms, reducing the total to 1,452 topics. Following
512 this, the co-occurrence network was aggregated by summing the normalized weights w_{norm}
513 within each topic, resulting in a network of 1,437 nodes, representing the thematic landscape
514 of the humanities. This network encompasses the keywords from 676,489 publications (81.5%
515 of total publications). We then use VOSviewer to visualize the network and apply the Leiden
516 community detection algorithm to further cluster topics into 8 major fields. From the general
517 map, an overlay was created for each archetype within each discipline, showcasing the
518 research fronts where they publish the most.

519 Thematic profile similarity

520 Finally, we represented each humanist profile as a vector, where each entry corresponds to
521 the total number of publications in a specific research topic. Pairwise distances between these
522 topic vectors were then computed using the Jaccard distance, which quantifies dissimilarity
523 by comparing shared and unique topics between profiles. The Jaccard distance d_j between
524 two sets A and B is defined as:

$$525 \quad d_j(A, B) = 1 - \frac{|A \cap B|}{|A \cup B|}$$

526

527 where $|A \cap B|$ is the size of the intersection (i.e., the number of shared topics) and $|A \cup B|$ is
528 the size of the union (i.e., the total number of unique topics across both profiles).
529 Subsequently, for each field, we applied a one-dimensional Multidimensional Scaling (MDS)⁴⁹
530 analysis to visualize how profiles align based on thematic similarity within each field. This
531 analysis allowed us to assess whether the observed thematic patterns at the field level were
532 consistent across the broader dataset.

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539

540 Authors contribution

541 NRG: Conceptualization; Funding acquisition; Investigation; Methodology; Project
542 administration; Writing – original draft; Writing – review & editing
543 WAM: Data curation; Formal analysis; Investigation; Methodology; Software; Resources;
544 Visualization; Writing – review & editing
545 EGS: Writing – original draft; Writing – review & editing
546 DTS: Supervision; Validation; Writing – review & editing

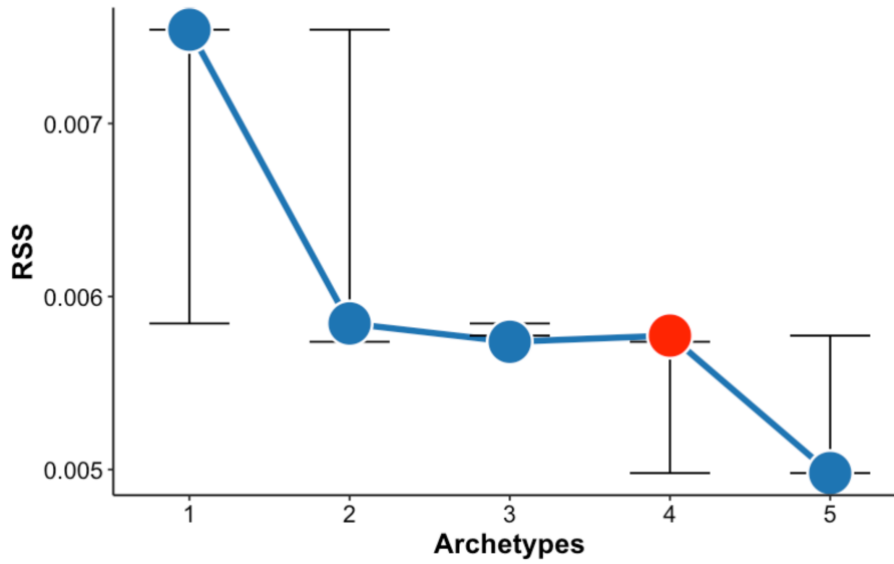
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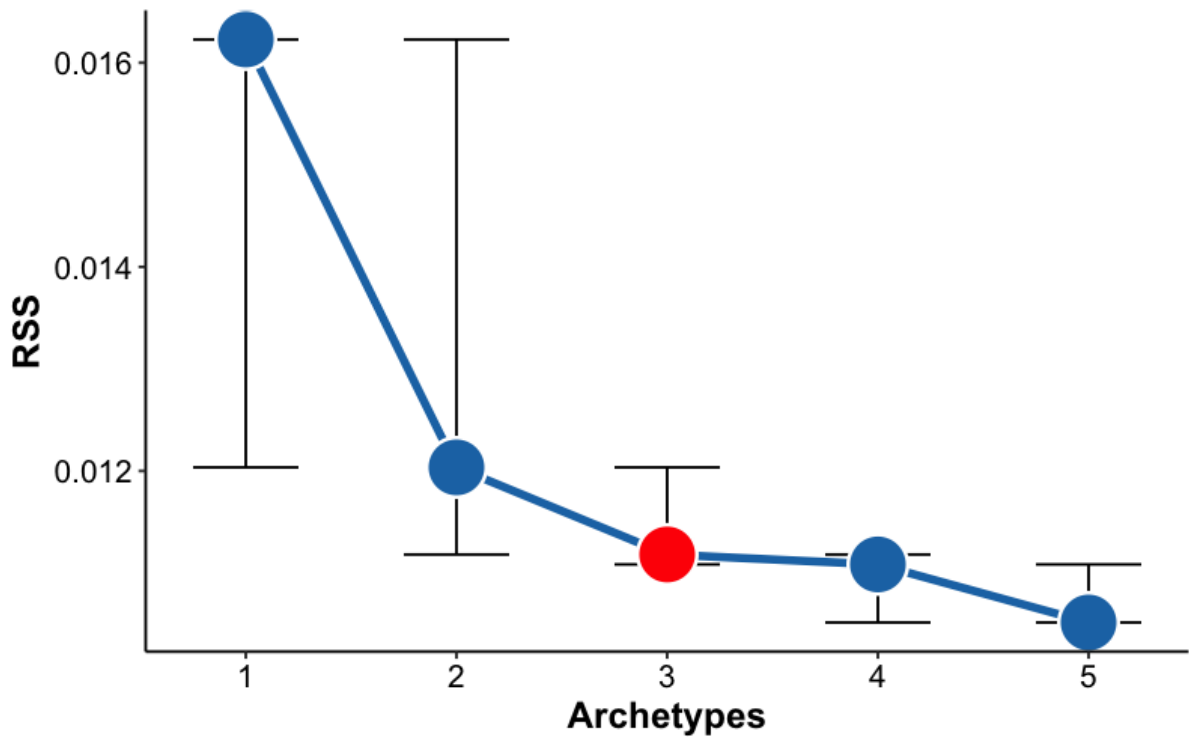
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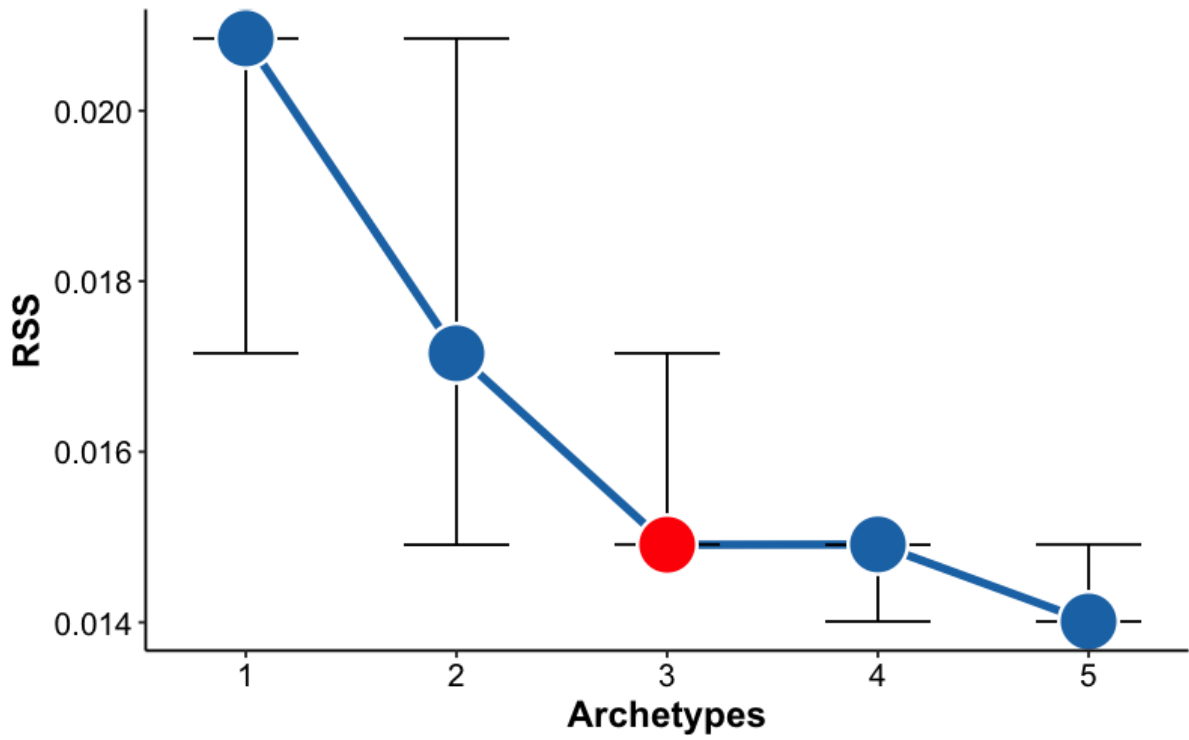
671 Appendix



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673 **Fig. A1** Screplot of the residual sum of squares (RSS) of Humanities. The red dot represents the
674 value chosen for the analysis.
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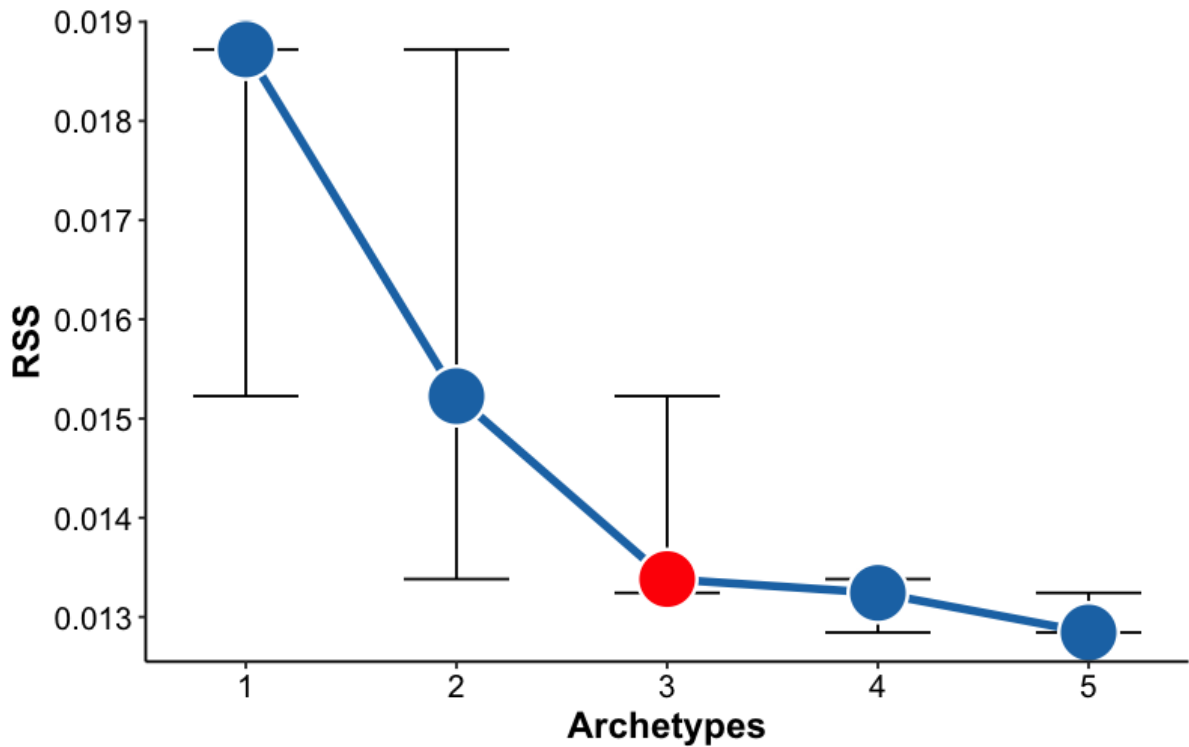


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678 **Fig. A2** Screplot of the residual sum of squares (RSS) of History. The red dot represents the
679 value chosen for the analysis.



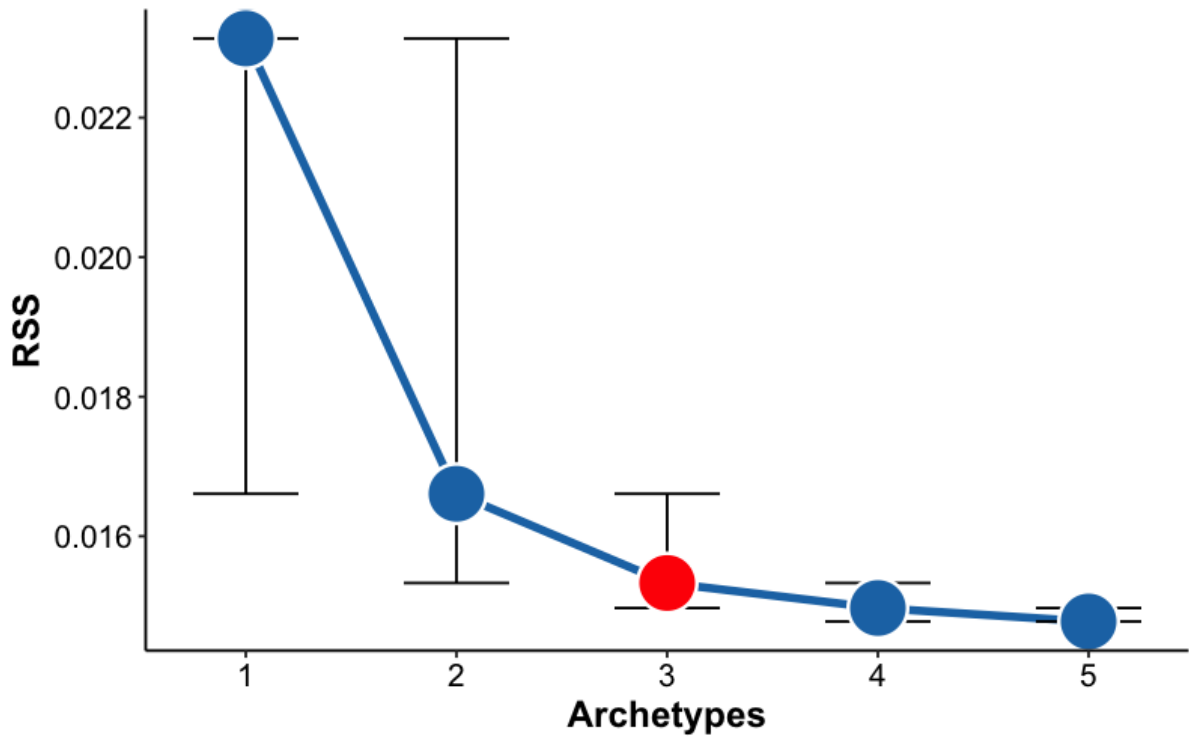
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Fig. A3 Screeplot of the residual sum of squares (RSS) of Philosophy. The red dot represents the value chosen for the analysis.



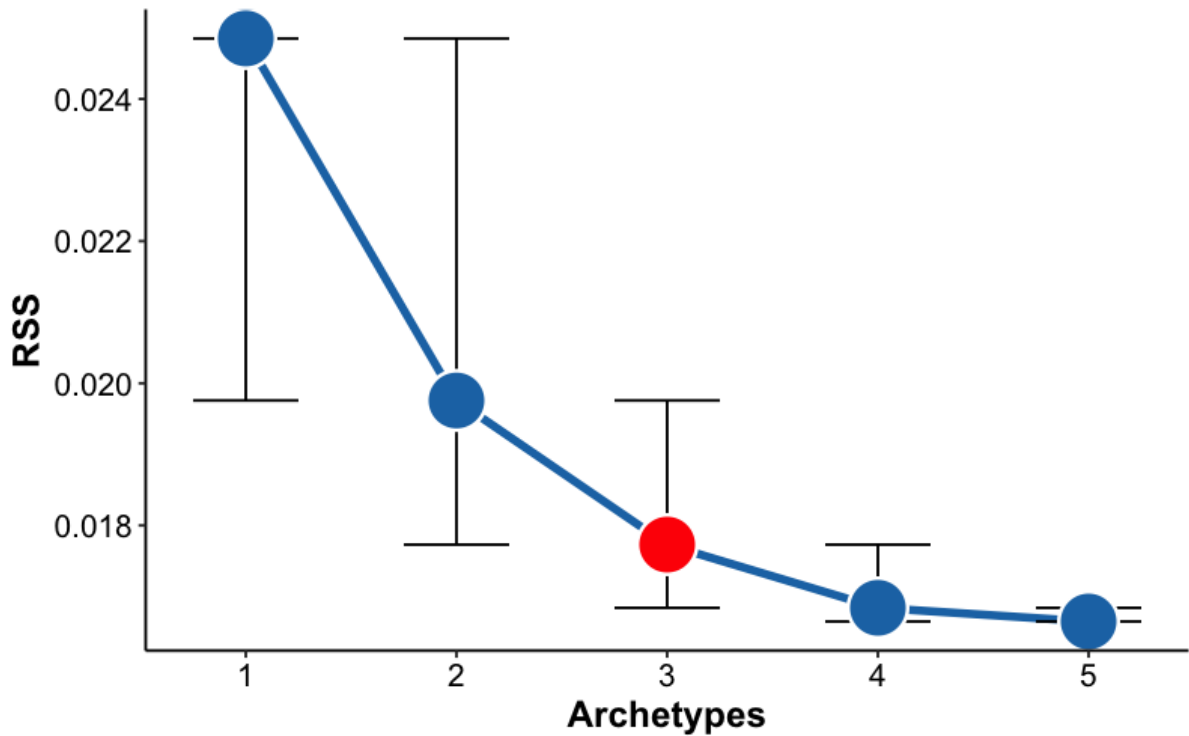
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Fig. A4 Screeplot of the residual sum of squares (RSS) of Philology. The red dot represents the value chosen for the analysis.



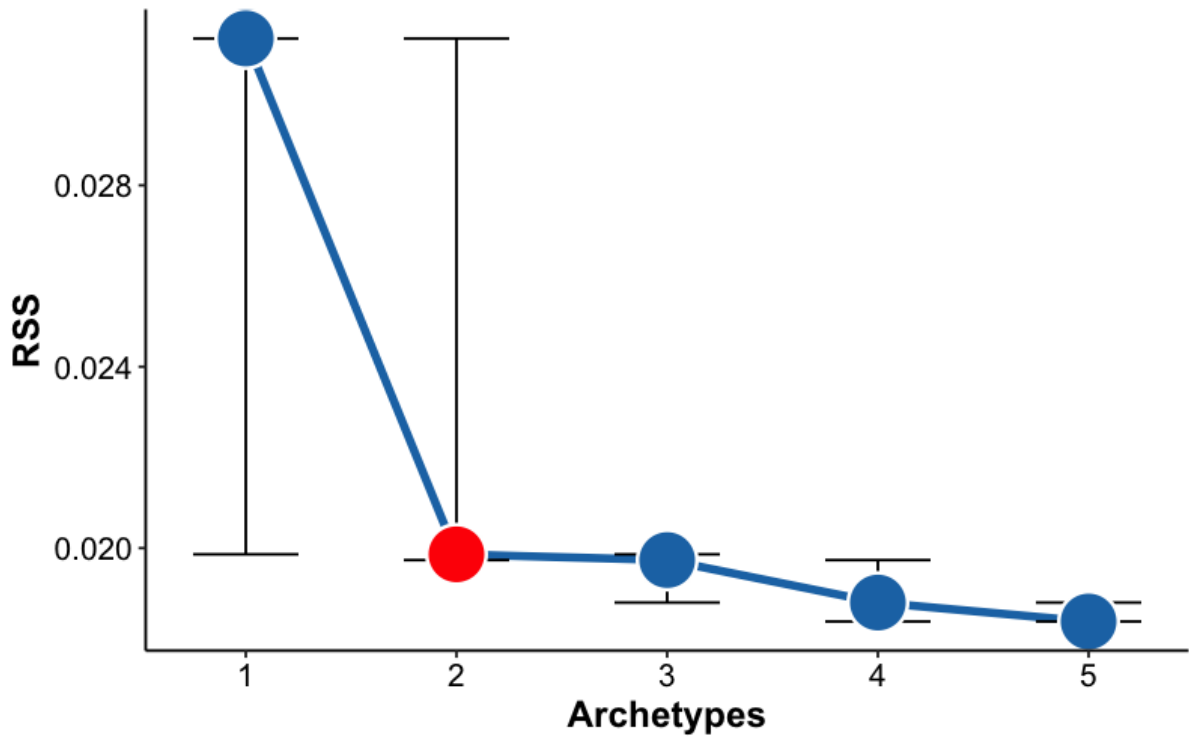
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Fig. A5 Screeplot of the residual sum of squares (RSS) of Arts. The red dot represents the value chosen for the analysis.



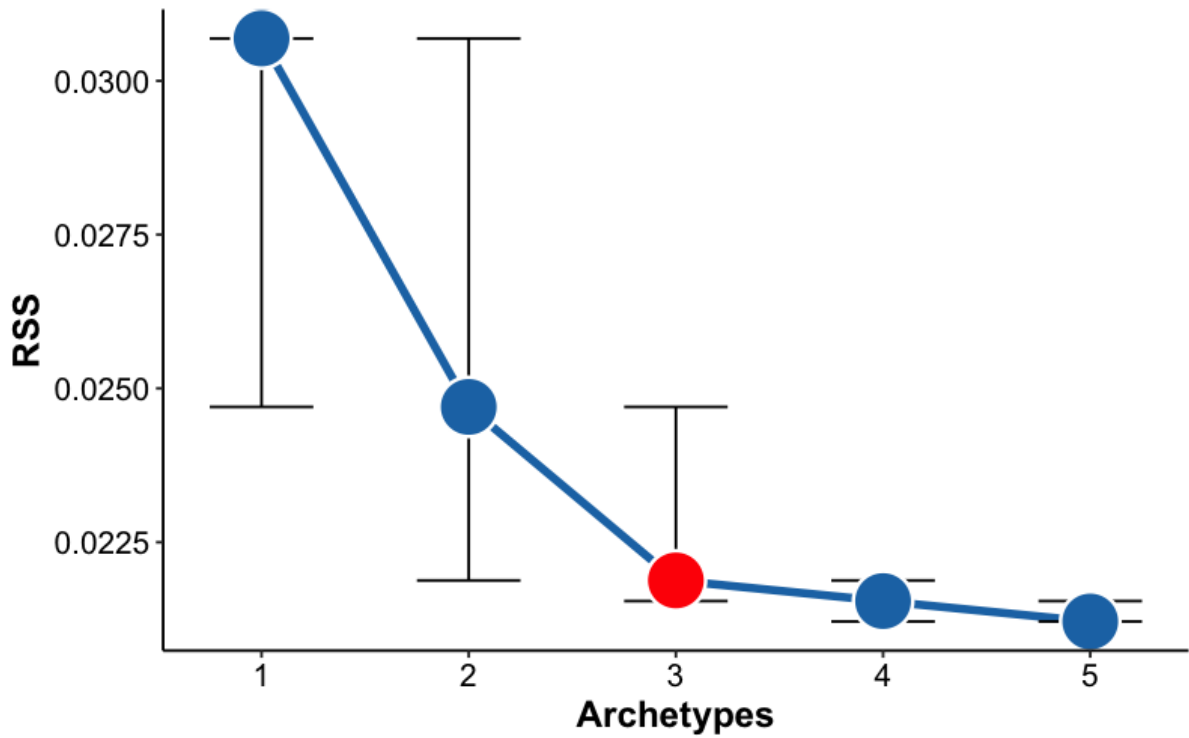
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Fig. A6 Screeplot of the residual sum of squares (RSS) of Archaeology. The red dot represents the value chosen for the analysis.



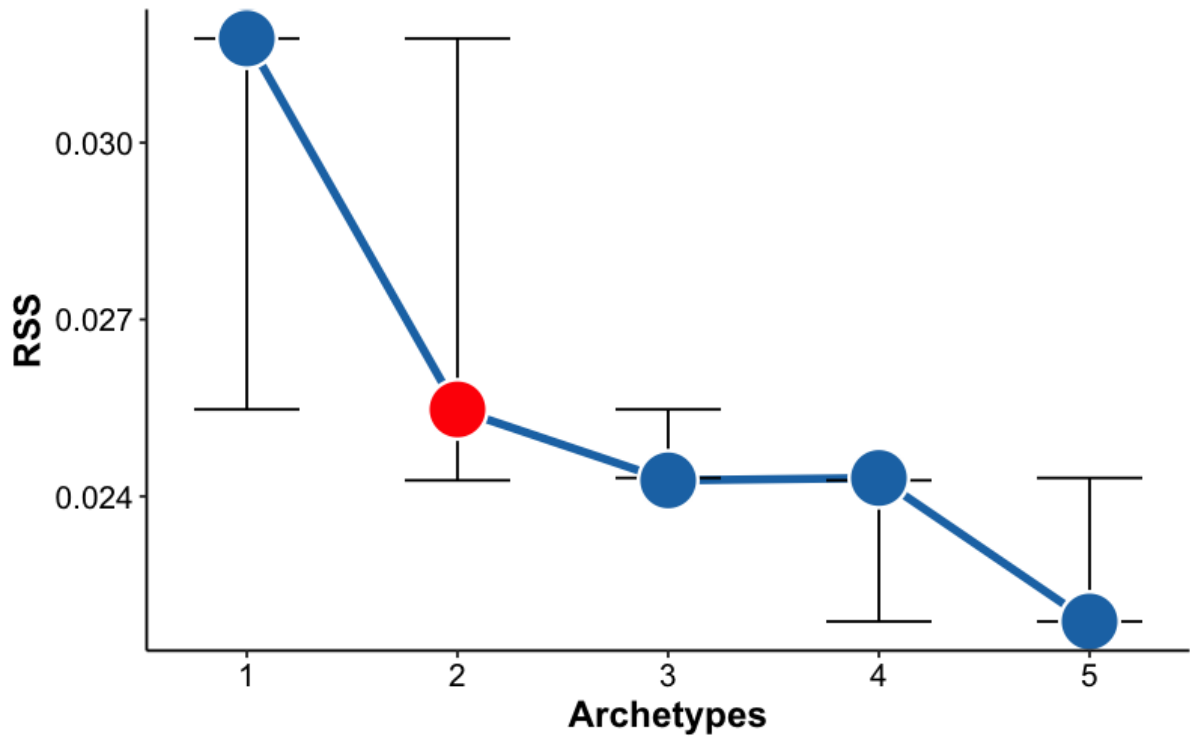
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Fig. A7 Screplot of the residual sum of squares (RSS) of Language & Linguistics. The red dot represents the value chosen for the analysis.



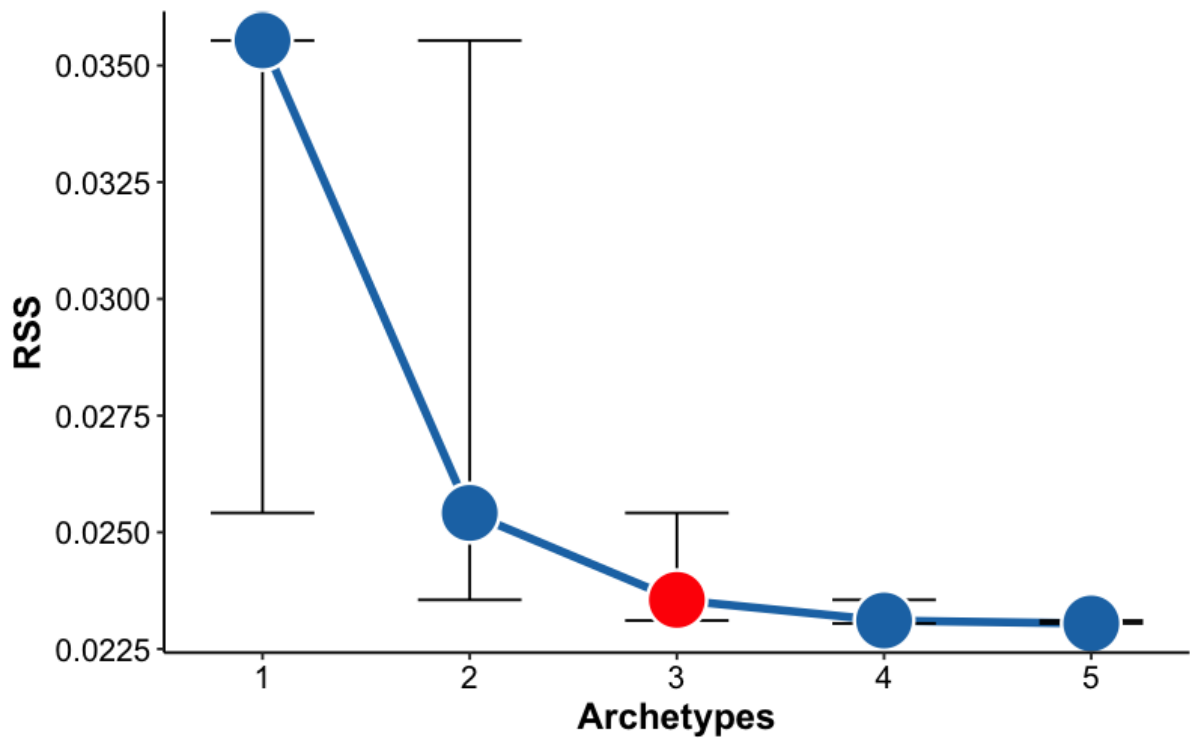
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Fig. A8 Screplot of the residual sum of squares (RSS) of Literature. The red dot represents the value chosen for the analysis.



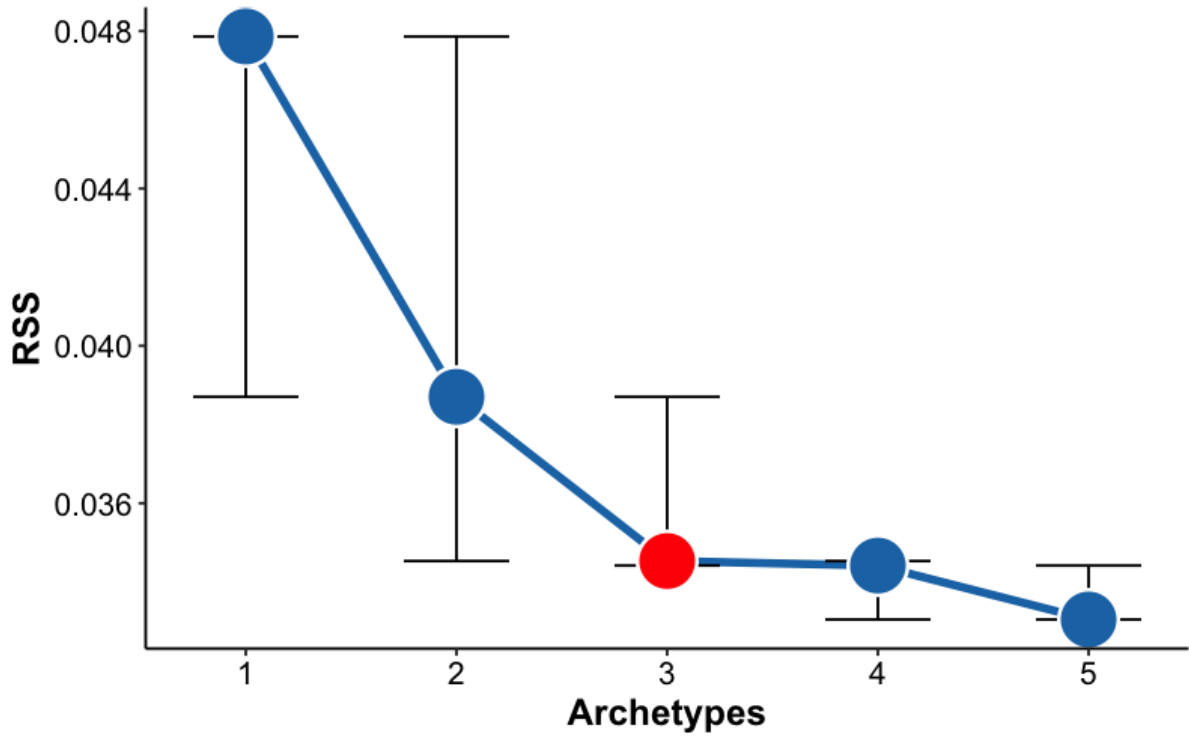
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Fig. A9 Screplot of the residual sum of squares (RSS) of Music. The red dot represents the value chosen for the analysis.



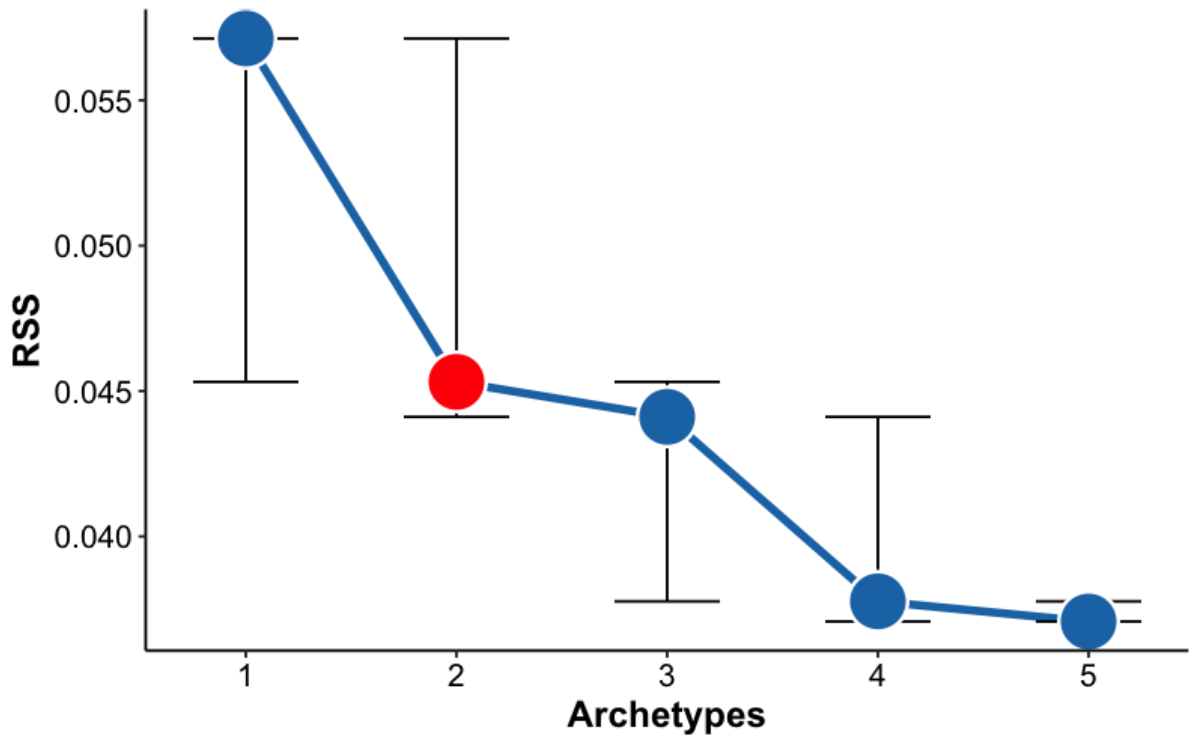
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Fig. A10 Screplot of the residual sum of squares (RSS) of Anthropology. The red dot represents the value chosen for the analysis.



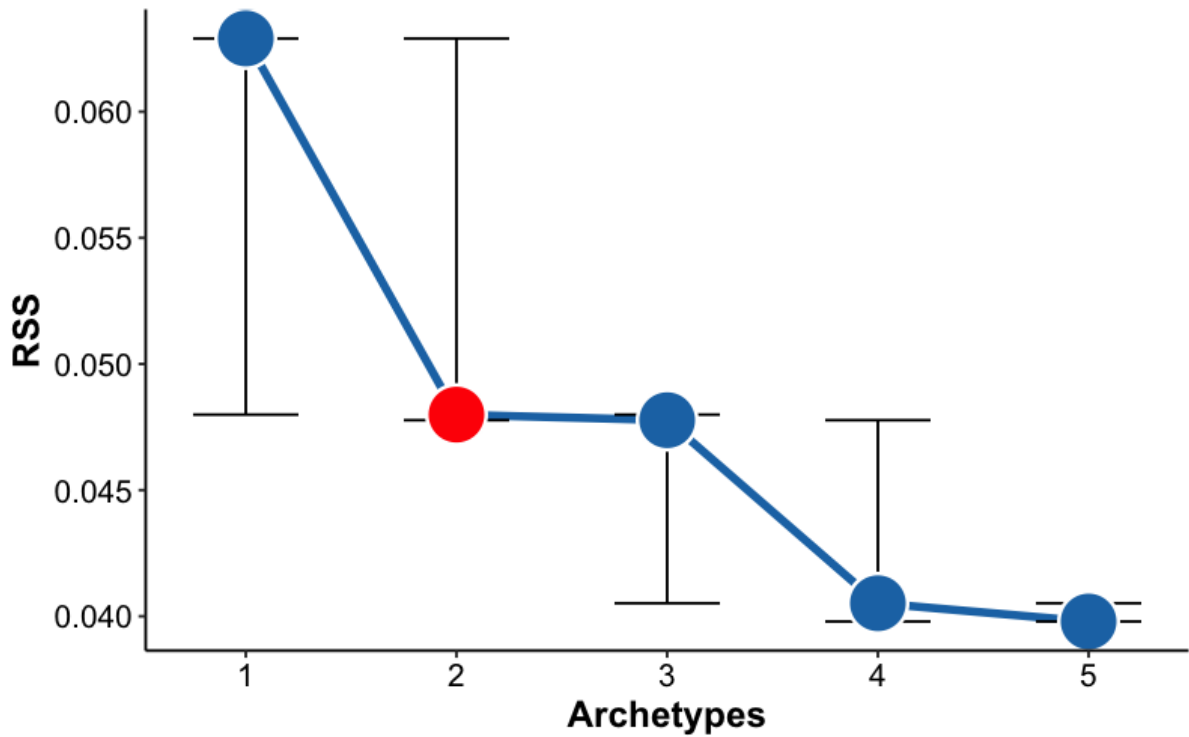
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Fig. A11 Screplot of the residual sum of squares (RSS) of Translation Studies. The red dot represents the value chosen for the analysis.



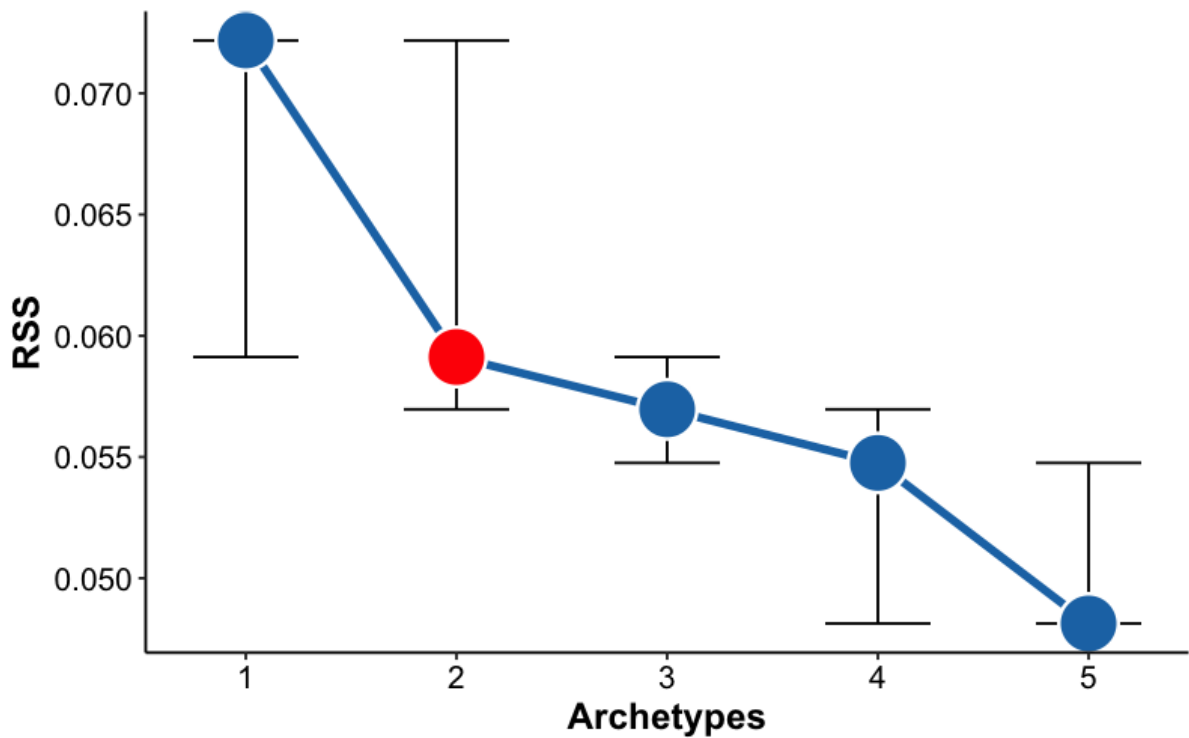
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Fig. A12 Screplot of the residual sum of squares (RSS) of Geography. The red dot represents the value chosen for the analysis.



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Fig. A13 Screplot of the residual sum of squares (RSS) of Paleontology. The red dot represents the value chosen for the analysis.



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Fig. A14 Archetypes for the rest of fields not included and generational distribution. Colors are linked to archetypes. Red represents the Digital Chronicler; green the Traditionalist and blue the global scholar

732 **Table A1** Jaccard distances matrices between thematic profiles of archetype-discipline
 733 combinations.

Archaeology				Anthropology			
	<i>TLC</i>	<i>TCB</i>	<i>TCS</i>		<i>TLC</i>	<i>TCB</i>	<i>TCS</i>
<i>TLC</i>	0			<i>TLC</i>	0		
<i>TCB</i>	0,355	0		<i>TCB</i>	0,297	0	
<i>TCS</i>	0,947	0,960	0	<i>TCS</i>	0,980	0,977	0
Arts				Cultural Studies			
	<i>TCS</i>	<i>TCB</i>	<i>TLC</i>		<i>TLC</i>	<i>TCB</i>	
<i>TCS</i>	0			<i>TLC</i>	0		
<i>TCB</i>	0,979	0		<i>TCB</i>	0,371	0	
<i>TLC</i>	0,969	0,356	0				
Geography				History			
	<i>TLC</i>	<i>TCB</i>			<i>TLC</i>	<i>TCB</i>	<i>TCS</i>
<i>TLC</i>	0			<i>TLC</i>	0		
<i>TCB</i>	0,745	0		<i>TCB</i>	0,373	0	
				<i>TCS</i>	0,976	0,984	0
Language & Linguistics				Literature			
	<i>TPM</i>	<i>TBG</i>			<i>TLC</i>	<i>TPM</i>	<i>TSG</i>
<i>TPM</i>	0			<i>TLC</i>	0		
<i>TBG</i>	0,867	0		<i>TPM</i>	0,750	0	
				<i>TSG</i>	0,589	0,890	0
Music				Paleontology			
	<i>TLC</i>	<i>TCB</i>			<i>TBG</i>	<i>TCB</i>	
<i>TLC</i>	0			<i>TBG</i>	0		
<i>TCB</i>	0,765	0		<i>TCB</i>	0,841	0	
Philology				Philosophy			
	<i>TCB</i>	<i>TLC</i>	<i>TCS</i>		<i>TCB</i>	<i>TLC</i>	<i>TCS</i>
<i>TCB</i>	0			<i>TCB</i>	0		
<i>TLC</i>	0,371	0		<i>TLC</i>	0,591	0	
<i>TCS</i>	0,940	0,911	0	<i>TCS</i>	0,967	0,986	0
Translation Studies				Abbreviations			
	<i>TCS</i>	<i>TLC</i>	<i>TCB</i>				
<i>TCS</i>	0			<i>TBG</i>	The Bridger		
<i>TLC</i>	0,882	0		<i>TCB</i>	The Collaborator		
<i>TCB</i>	0,921	0,439	0	<i>TCS</i>	The Cosmopolitan		
				<i>TLC</i>	The Local Chronicler		
				<i>TPM</i>	The Polymath		
				<i>TSG</i>	The Sage		

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742 **Table A2** Equivalence between disciplines and research fields.

Discipline	Field
Social Anthropology	Anthropology
Archaeology	Archaeology
Architectural Graphic Expression	Arts
Graphic Expression in Engineering	Arts
Art History	Arts
Painting	Arts
Arab and Islamic Studies	Cultural Studies
East Asian Studies	Cultural Studies
Hebrew and Aramaic Studies	Cultural Studies
German Philology	Philology
Catalan Philology	Philology
Slavic Philology	Philology
French Philology	Philology
Galician and Portuguese Philology	Philology
Greek Philology	Philology
English Philology	Philology
Italian Philology	Philology
Latin Philology	Philology
Romance Philology	Philology
Basque Philology	Philology
Philosophy	Philosophy
Moral Philosophy	Philosophy
Logic and Philosophy of Science	Philosophy
Human Geography	Geography
Historiographical Sciences and Techniques	History
Ancient History	History
Contemporary History	History
American History	History
History of Science	History
History of Thought and Movements	History
Medieval History	History
Modern History	History
Prehistory	History
Spanish Language	Language & Linguistics
General Linguistics	Language & Linguistics
Indo-European Linguistics	Language & Linguistics
Spanish Literature	Literature
Music	Music
Paleontology	Paleontology
Translation and Interpretation	Translation Studies

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