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Beyond Income Disparities: Perceived Health and Education Inequities Drive Actions to Reduce Economic Inequality

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ABSTRACT

Perceiving income disparities has a limited impact on attitudes towards reducing economic inequality. In this research, we proposed a novel and alternative strategy by focusing on other aspects intrinsically related to economic inequality, such as unequal access to health and education resources. We investigated whether recognizing inequality in health and education, beyond income disparities, could motivate people to reduce economic inequality. In four preregistered studies (N_{Study1} = 513, N_{Study2} = 1536, N_{Study3} = 443, N_{Study4} = 400), we showed that perceived economic inequality in health and education, over and above perceived income disparities, leads to greater intolerance towards inequality and increased support for redistributive policies and collective actions. Our findings suggest that heightened awareness of economic inequality in aspects meaningful for individuals' lives, such as health or education, may foster support for redistributive policies and engagement in collective actions to mitigate such disparities.

1 | Introduction

Economic inequality has become a focal point of public discourse, highlighting pervasive disparities that exist in societies across the globe. For instance, after the publication of the World Inequality Report by Chancel et al. (2022), multiple newspapers and TV programs in Spain showed that the wealthiest 10% in the country earned eight times more than the poorest 50% (e.g., RTVE 2021). One might expect such information about income disparities to influence political decisions and public opinion, but this might not be the case. The previous research suggests that awareness of the extent of income disparities is not sufficient to mobilize people who tend to legitimize the system (Hoyt et al. 2018). In fact, the effect of such awareness on attitudes towards redistribution, a potential mechanism for addressing inequality, is rather small (Ciani et al. 2021; Kuziemko et al. 2015).

Although income disparities serve as a standard indicator for people to perceive inequality, it is essential to recognize their interconnection with other domains that significantly influence individuals' daily lives, such as health or educational inequalities (García-Castro et al. 2021; García-Sánchez et al. 2022). Nevertheless, most research on perceptions of economic inequality has focused on examining numeric estimates of income gaps or wealth distributions, overlooking a broader spectrum of inequality perceptions (Castillo, Garcia-Castro, and Venegas 2022; García-Sánchez et al. 2018, 2022). In this research, we broadened this focus by including perceived inequality in

health and education between the rich and the poor. In other words, disparities between the affluent and the less affluent in terms of their access to health and education resources. These concepts do not include health disparities arising from genetic factors, lifestyle choices or education disparities resulting from individual differences. Our focus in this research is on economic inequality in these domains. We argue that these perceptions of inequality in health and education may play a key role, over and above perceived income inequality, in shaping public attitudes to reduce economic inequality.

To our knowledge, no other study has delved into the relationship between perceived inequality in health and education and support for actions that reduce economic inequality. In this research, across two correlational studies and two experimental studies, we investigated whether higher perceived inequality in health and education—over and above perceived income inequality—may increase intolerance towards inequality and support for redistribution and collective actions to reduce it.

1.1 | Perceived Economic Inequality can Lead to Attitudes Towards its Reduction

Perceived economic inequality is defined as the perception of how resources are distributed among the people in a given society (Akyelken 2020; Castillo, Garcia-Castro, and Venegas 2022). This definition includes, but is not limited to, monetary resources (e.g., salary gaps, income or wealth distributions). These perceptions, rather than objective indicators of economic inequality, play a key role in our reactions towards it (Willis et al. 2022). More specifically, this research focuses on how perceiving economic inequality in different domains (e.g., income, health or education) could influence attitudes and actions aimed at its reduction. This approach is mainly based on distributive justice theories (Jasso, Törnblom, and Sabbagh 2016), redistribution (Choi 2019) and collective actions models (Jetten et al. 2021). In the following lines, we will outline these frameworks while highlighting some gaps in the literature and practice that our research aims to address.

According to distributive justice theoretical frameworks, justice evaluations (e.g., if inequality is seen as fair or unfair) are partially determined by perceptions of the actual distribution of resources. In turn, these justice evaluations motivate people to engage in actions to reduce inequality, such as support for redistribution and collective actions (Jasso, Törnblom, and Sabbagh 2016). Some empirical studies have shown that greater perceived economic inequality may lead to greater intolerance towards it, which at the same time could promote actions to reduce it (Garcia-Castro, Willis, and Rodriguez-Bailon 2019; García-Castro, Rodríguez-Bailón, and Willis 2020). Although this literature acknowledges that justice evaluations might differ depending on the resources being distributed (e.g., income, health or education; Sabbagh and Schmitt 2016; Walzer 1983), empirical evidence is lacking to ground specific hypotheses regarding how different resources—like health or education—should be distributed between the haves and the haves not.

Collective actions and redistribution can be effective strategies to reduce economic inequality (Doerrenberg and Peichl 2014; Louis 2009). On the one hand, theoretical frameworks of collective actions argue that the perception of illegitimate economic inequality would predict a greater willingness to engage in collective actions to redress inequality (Jetten et al. 2021; van Stekelenburg and Klandermans 2013). On the other hand, redistribution models posit that increasing perceived economic inequality may lead to a higher demand for redistribution (Meltzer and Richard 1981; Choi 2019). In this line, empirical studies consistently demonstrate that higher perceived economic inequality is associated with increased engagement in collective actions (Hoyt et al. 2018; Jo and Choi 2019) and support for redistribution (Choi 2019; García-Castro, García-Sánchez et al. 2022; García-Sánchez et al. 2020).

However, these theoretical models of redistribution or collective actions focus on perceptions of income or wealth inequality, which omits other domains intrinsically related to economic inequalities, such as health and educational disparities. Empirical evidence is also scarce in this respect. As an exception, Soler-Martínez, García-Sánchez, and Willis (2023) found that concerns about inequalities in health, education and income predicted a greater willingness to protest to reduce inequality. However, this study investigated how worried people were about these issues rather than the perceived size of these disparities. Overall, we argue that there is a literature gap on how people perceive and understand health and education disparities and the role of these perceptions on attitudes towards reducing economic inequality.

1.2 | Why Consider Perceived Economic-Based Inequalities in Health and Education to Foster Attitudes to Reduce Economic Inequality?

Scholars and organisations are calling for a more nuanced study of economic inequality, distinguishing among different 'types' of economic-based inequalities beyond income disparities (Jachimowicz et al. 2022; McKnight, Loureiro, and Vizard 2019). For instance, the European Union (European Comission 2024) or the US Census Bureau (Glassman 2019) have elaborated multidimensional inequality measures considering economic-based disparities in health and education, among others, to understand and address the problem of economic inequality (e.g., EU Multidimensional Inequality Monitoring Framework). Moreover, recent empirical evidence has shown that perceptions of economic inequality are not exclusive to income or wealth distributions; people also recognize inequality in access to education or health, which impacts their everyday lives (García-Sánchez et al. 2018, 2022). This research suggests that education and health domains are closer and more meaningful for the people, which may inform their attitudes towards inequality more effectively than thinking about abstract inequalities.

Furthermore, there is an important practical reason for studying the effect of perceiving other domains of economic inequality rather than income disparities alone. The previous research has shown that income inequality is often legitimized and tolerated (García-Sánchez et al. 2021; Starmans, Sheskin, and Bloom 2017; Trump 2020). When this happens, perceiving income disparities has a limited impact on support for redistribution (García-Sánchez et al. 2020, 2021) and social mobilization (Hoyt et al. 2018). People legitimize income inequality, for instance, by thinking that salary gaps are fair as they reflect differences in

merit (Castillo et al. 2019; García-Sánchez et al. 2020). However, these meritocratic principles might not apply to justify economic-based disparities in access to healthcare or education, which might be widely considered universal human rights (United Nations 1948, art. 25 and 26).

Soler-Martínez, García-Sánchez, and Willis (2023) showed disparities in health access, and education opportunities were less tolerated than income disparities. Macchia and Ariely (2021) found similar results. Similarly, Brown, Dietze, and Craig (2023) found that highlighting racial health disparities compared to racial income inequality enhanced support for actions to reduce racial inequality (e.g., protests or support for policies). Importantly, although redistribution encounters some resistance (Bechtel, Liesch, and Scheve 2018; Wienk, Buttrick, and Oishi 2022), policies to reduce health and education disparities may be more popular among the public (Franko 2016; Jensen and Naumann 2016; McCall and Kenworthy 2009; Missinne, Meuleman, and Bracke 2013). Moreover, there have been significant social outbursts against budget cuts in health or education, such as the Spanish 'white wave' and 'green wave' protests (Iglesias-Onofrio et al. 2018). Therefore, perceived inequality in health and education may serve as alternative and more efficient pathways to foster broader support for actions to reduce economic inequality, such as collective actions or redistributive policies.

1.3 | The Present Research

Previous literature suggests that income disparities are often justified, and initiatives to reduce them may encounter resistance (Hoyt et al. 2018). In this research, we considered other important features of economic inequality beyond income disparities that have been relatively understudied, such as health or education disparities. To our best knowledge, no other study has explored the effect of perceived inequality in health and education on intolerance towards inequality and support for redistribution or collective actions.

Furthermore, we studied this issue in Spain, which is a novel and relevant context. Previous studies examining perceptions of health and education have often relied on North American (Day and Norton 2023; Macchia and Ariely 2021) and Latin American samples (Soler-Martínez, García-Sánchez, and Willis 2023), where these disparities are more pronounced. However, the European context of Spain presents a unique scenario, with potentially less noticeable differences, thanks to the presence of public healthcare and education systems (Bernal-Delgado et al. 2018; Egido and Valle 2015).

In the current research, we tested whether perceiving health and education disparities between the rich and the poor, besides perceiving income differences, could reduce tolerance towards inequality and, in turn, increase support actions towards its reduction, such as collective actions and redistribution. We carried out four studies. The first and second studies employed correlational designs, whereas the third and fourth studies adopted an experimental design, strengthening our causal inferences. We pre-registered our hypotheses for all the studies.[1] All preregistrations, data, code and materials can be found at https://osf.io/gna2x/

2 | Study 1

In Study 1, we conducted a correlational study. First, distributive justice frameworks (Jasso, Törnblom, and Sabbagh 2016) and previous evidence suggest that perceived economic inequality predicts attitudes towards inequality (e.g., García-Castro, Rodríguez-Bailón, and Willis 2020, 2022). Extending this approach to other types of inequality, we hypothesized that perceived health, education and income disparities would be positively related to intolerance towards inequality (H1.a). In addition, following preliminary evidence showing that inequality in health and education could be less tolerated than income disparities (Macchia and Ariely 2021; Soler-Martínez, García-Sánchez, and Willis 2023), we expected that perceptions of inequality in health and education would be more strongly related to intolerance towards inequality than perceived income inequality (H1.b). Moreover, psychosocial models of redistribution (Choi 2019) and collective actions (Jetten et al. 2021) state that perceived economic inequality fuels people's support for measures to reduce economic disparities. Similarly, the previous research suggests that intolerance towards inequality mediates this relationship between perceptions of inequality and supporting redistribution and collective actions (García-Castro, Rodríguez-Bailón, and Willis 2020, 2022). Thus, we hypothesized that perceived inequality in health, education and income would be positively related to support for collective actions (H2) and redistribution (H3) via increased intolerance towards inequality.

2.1 | Methods

2.1.1 | Participants

A total of 513 people participated in this study. Following the preregistered criteria, participants were excluded from the analysis if they: (a) were younger than 18 years old, (b) did not complete all measures of interest, (c) or were not Spanish. Thus, the final sample was composed of 489 participants (M_{age} = 26.26, SD = 10.45, Min_{age} = 18, Max_{age} = 73), of whom 72.39% self-identified as women, 26.38% as men and 1.23% as 'other' (see Supporting Information section for more sociodemographic information). A sensitivity analysis with G*Power 3.1 (Faul et al. 2007) indicated that this sample size allowed to detect a minimum effect size of f^2 = 0.022 (R^2 = 0.022) with 80% of power for multiple regression analyses (fixed model, R^2 increase) with three tested predictors and three total predictors. Data were collected using an incidental sampling procedure. Participants were recruited through advertisements on social media platforms and university bulletin boards. As an incentive, each participant entered a €50 prize drawing for their participation. Interested participants completed an online survey on the *Qualtrics* platform.

2.1.2 | Measures

2.1.2.1 | Perceived Inequality in Health, Education and Income. We assessed perceived inequality in health, education and income by using three measures consisting of two items each, adapted from Heiserman and Simpson (2021): 'In your judgment, how large or small are the differences in *health/education/income* between the rich and poor in Spain?' (1 *Very small*–7 *Very large*)

and 'In your judgment, how high or low is *economic inequality in health/economic inequality in education/income inequality* in Spain?' (1 *Very low*–7 *Very high*). These items were moderately correlated for each domain (r_{health} = 0.74, $p < 0.001$, M = 5.34, SD = 1.22; $r_{education}$ = 0.67, $p < 0.001$, M = 5.47, SD = 1.13; r_{income} = 0.53, $p < 0.001$, M = 6.29, SD = 0.75).

2.1.2.2 | Intolerance Towards Inequality. We employed the Spanish version of the Support for Economic Inequality Scale (Montoya-Lozano et al. 2023, adapted from Wiwad et al. 2019). The scale consists of five items (e.g., 'The negative consequences of economic inequality have been largely exaggerated.'; Ω = 0.78, M = 5.85, SD = 0.99). Responses ranged from one (*Totally disagree)* to seven (*Totally agree*).

2.1.2.3 | Support for Collective Actions. We used a six items measure adapted from the previous literature on social mobilization (Becker et al. 2013; van Zomeren, Postmes, and Spears 2008; e.g., 'I would be willing to attend a demonstration against economic inequality'; Ω = 0.92, M = 5.06, SD = 1.51). Responses ranged from one (*Totally disagree)* to seven (*Totally agree*).

2.1.2.4 | Support for Redistribution. Participants completed a seven items measure adapted from García-Sánchez et al. (2022) (e.g., 'The government has a responsibility to reduce the income gap between those who have more and those who have less.'; Ω = 0.82, M = 5.53, SD = 1.13). Responses ranged from one (*Totally disagree)* to seven (*Totally agree*).

2.1.3 | Analytical Strategy

We tested H1.a. using a multiple linear regression analysis. Specifically, intolerance towards inequality was regressed on perceived economic inequality in health, education and income. In addition, we conducted Parternoster's tests (Paternoster et al. 1998) to compare the regression coefficients (H1.b). Moreover, we used mediation analyses to test H2 and H3, such that perceived economic inequality in health, education and income were predictor variables, intolerance towards inequality was the mediator and support for redistribution and collective actions were the criterion variables. We conducted mediation analyses simultaneously to account for unique variance for each predictor and outcome variable. Data analyses were performed using R (R Core team 2023).

2.2 | Results

2.2.1 | Preliminary Analyses

As preliminary analyses, we computed means and standard deviations of all variables of interest and conducted analyses of correlation. Consistent with our expectations, perceived inequality in health, education and income was positively associated with intolerance towards inequality. Moreover, perceived inequality in health, education and income was positively related to support for collective actions and redistribution. Lastly, intolerance towards inequality was positively correlated with support for collective actions and redistribution. See Table 1.

2.2.2 | Perceived Inequality in Health, Education and Income and Intolerance Towards Inequality

Confirming H1.a, a multiple analysis of linear regression showed that perceived inequality across all domains positively predicted intolerance towards inequality (b_{health} = 0.13, SE = 0.04, $p < 0.001$; $b_{education}$ = 0.20, SE = 0.04, $p < 0.001$; b_{income} = 0.41, SE = 0.06, $p < 0.001$; R^2 = 0.31). Contrary to our expectations (H1.b), the regression coefficient of perceived income inequality was higher than the regression coefficient of perceived inequality in health (z = 4.11, $p < 0.001$) or education (z = 3.00, p = 0.003). But still, each predictor explained unique variance on intolerance towards inequality.

2.2.3 | Perceived Inequality in Health, Education and Income and Support for Redistribution and Collective Actions Through Intolerance Towards Inequality

Consistent with our hypotheses, mediation analyses revealed that perceived inequality in health, education and income positively predicted support for redistribution (H2) and collective actions (H3) through intolerance towards inequality (see Figure 1). Altogether, perceived inequality in every domain and intolerance towards economic inequality accounted for 45.37% of the variance in support for redistribution and 46.84% in the case of collective actions.

2.3 | Discussion

In Study 1, as expected (H1.a), we found that perceived inequality in health, education and income independently predicted intolerance towards inequality. Unexpectedly (H1.b), the regression coefficient of perceived income inequality was higher than the regression coefficients of perceived inequality in health and education. Our rationale was that health and education inequalities could be less easily justified than income disparities, and, therefore, the relationship with intolerance towards inequality would be stronger for health and education than for income disparities. Trying to find some explanation for this discrepancy, we noticed that the intercepts of perceived inequalities in health (4.07) and education (3.77) were higher than the intercept of perceived income inequality (1.90). These higher intercepts suggest that even at low levels of perceived health and education inequality, there is already a high baseline level of intolerance towards these disparities. This aligns with our theoretical framework, as disparities in health and education are often perceived as fundamental violations of human rights, eliciting immediate and strong disapproval regardless of their extent. (See Section S5.1.). In any case, all these perceptions explained unique variance of intolerance towards inequality. Moreover, intolerance towards inequality mediated the relationship between, on the one hand, perceived inequality in health, education and income and on the other hand, support for redistribution (H2) and collective actions (H3).

Regarding some limitations of this study, it relied on a limited sample with sociodemographic characteristics not representative of the general Spanish population. Furthermore, in the same way that perceptions of inequality in different domains explain

TABLE 1 | Means, standard deviations and correlations in Study 1.

Variable	*M*	SD	1	2	3	4	5
1. Perceived health inequality	5.34	1.22					
2. Perceived education inequality	5.47	1.14	0.50***				
3. Perceived income inequality	6.29	0.75	0.45***	0.42***			
4. Intolerance towards inequality	5.85	0.99	0.41***	0.44***	0.48***		
5. Support for collective actions	5.06	1.51	0.40***	0.39***	0.31***	0.67***	
6. Support for redistribution	5.53	1.13	0.34***	0.38***	0.33***	0.67***	0.72***

Note: M and SD represent mean and standard deviation, respectively.
*$p < 0.05$.
**$p < 0.01$.
***$p < 0.001$.

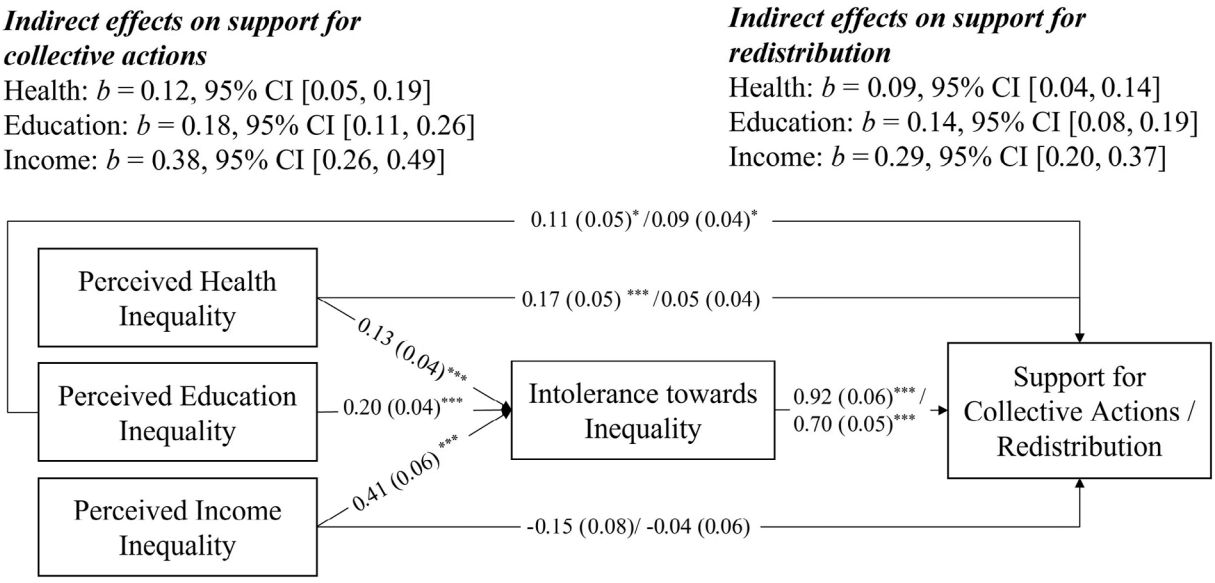

FIGURE 1 | Model depicting the effect of perceived inequality in health, education and income on support for collective actions and redistribution via intolerance towards inequality. Study 1; $N = 489$. Reported values are unstandardized estimates (*b*) and standard errors (between parentheses). * indicates $p < 0.05$. ** indicates $p < 0.01$. *** indicates $p < 0.001$. When two regression coefficients separated by a slash are shown, the first one refers to support for collective actions and the second one to support for redistribution.

unique variance, it might be possible to distinguish between attitudes towards inequality (e.g., intolerance) in different domains. Therefore, in Study 2, we sought to address these concerns.

3 | Study 2

In Study 2, we aimed to replicate and extend the findings of the previous study through a nationwide survey conducted in Spain. Moreover, we delved into the specific role of intolerance towards inequality across different domains as a mediator. This time, we also predicted the direct relationship of perceived inequality and intolerance towards inequality in each domain with support for redistribution and collective actions. Specifically, we expected that perceived inequality in health, education and income would positively predict support for redistribution (H1) and collective actions (H2). Likewise, we predicted that intolerance towards inequality in health, education and income would be positively related to support for redistribution (H3) and collective actions (H4). Attending to indirect effects, we hypothesized that perceived inequality in health, education and income would positively affect support for redistribution (H5) and collective actions (H6) through intolerance towards inequality in the corresponding domains.

3.1 | Methods

3.1.1 | Participants

The sample was composed of 1536 participants (M_{age} = 48.41, SD = 17.21, Min_{age} = 18, Max_{age} = 94, 51.4% women and 48.6% men). The sample was stratified by quotas on the basis of gender, age, social class and region of residence to mirror the distribution of the Spanish population. A sensitivity analysis with G*Power 3.1 (Faul et al. 2007) indicated that this sample size allowed to

detect a minimum effect size of $f^2 = 0.007$ ($R^2 = 0.007$) with 80% of power for multiple regression analyses (fixed model, R^2 increase) with three tested predictors and six total predictors. The sample was recruited through the online panel maintained by *Netquest*, a company that collects high quality data for survey research. Participants completed an online survey on the *Qualtrics* platform.

3.1.2 | Measures[2]

3.1.2.1 | Perceived Inequality in Health, Education and Income. We assessed perceived inequality in health, education and income using three measures consisting of one-single item each, adapted from Heiserman and Simpson (2021): 'In Spain, to what extent are there differences in the *health status/education level/income* between the rich and the poor?' ($M_{income} = 6.51$, SD = 0.87; $M_{health} = 5.41$, SD = 1.44; $M_{education} = 5.72$, SD = 1.24). Participants answered using a one (*Any difference*) to seven (*Many differences*) Likert scale.

3.1.2.2 | Intolerance Towards Inequality in Health, Education and Income. We measured intolerance towards inequality in health, education and income using three measures consisting of one-single item each, adapted from Heiserman and Simpson (2021): 'To what extent are you worried about *health/education/income* inequality between the rich and the poor in Spain?' ($M_{income} = 5.38$, SD = 1.40; $M_{health} = 5.25$, SD = 1.48; $M_{education} = 5.35$, SD = 1.43). Responses ranged from one (*Not worried at all*) to seven (*Very worried*).

3.1.2.3 | Support for Collective Actions. We used a four items measure (e.g., 'Participate in demonstrations demanding the reduction of economic inequality', $\Omega = 0.88$, $M = 4.21$, SD = 1.64); with Likert response format ranging from one (*Not at all willing*) to seven (*Totally willing*).

3.1.2.4 | Support for Redistribution. We employed the same seven items measure as in Study 1 to assess support for redistribution ($\Omega = 0.87$, $M = 5.22$, SD = 1.26).

3.1.2.5 | Covariates.

3.1.2.5.1 | Income Level. We operationalized socioeconomic status as income level. Participants indicated the amount of their families' monthly net income in a range of 11 options: (1) <600€; (2) 601–1000€; (3) 1001–1500€; (4) 1501–2000; (5) 2001–2500€; (6) 2501–3000; (7) 3001–3500€; (8) 3501–4000€; (9) 4001–5000€; (10) 5001–8000€ and (11) >8000€.

3.1.2.5.2 | Gender and Age. Participants indicated their self-identified gender and their age.

3.1.3 | Analytical Strategy

We used multiple regression analyses to test H1–H4. For testing H1 and H2, we regressed support for redistribution and collective actions on perceived inequality in health, education and income. Likewise, to test H3 and H4, support for redistribution and collective actions was regressed on intolerance towards inequality in health, education and income. Lastly, we used mediation analyses to test H5 and H6. Thus, perceived inequality in health, education and income served as predictors; intolerance towards inequality in each specific domain as the mediators and support for redistribution and collective actions as outcome variables. We controlled for sociodemographic covariates in all the analyses.

3.2 | Results

3.2.1 | Preliminary Analyses

As preliminary analyses, we calculated means and standard deviations of all variables of interest as well as analyses of correlation. Tests of Pearson's correlation showed significant relationships among all variables of interest (see Table 2).

3.2.2 | Perceived Inequality in Health, Education and Income and Support for Redistribution and Collective Actions

We found partial support for H1 and H2 (see Table 3, Models 1 and 3). As expected, we found that when participants perceived higher levels of economic inequality in terms of health or income, they were more likely to support redistribution and collective actions. However, contrary to our expectations, perceived education inequality did not predict support for redistribution nor collective actions.

3.2.3 | Intolerance Towards Inequality in Health, Education and Income and Support for Redistribution and Collective Actions

Regarding H3 and H4, results revealed that intolerance towards health and income inequality were significant predictors of support for redistribution and support for collective actions. In the case of education, we found no significant relationship with support for collective actions, but those who showed greater intolerance towards education inequality tended to support more redistribution. See Table 3 (Models 2 and 4).

3.2.4 | Perceived Inequality in Health, Education and Income and Support for Redistribution and Collective Actions Through Intolerance Towards Inequality in Each Domain

Regarding H5 and H6, we found the mediational pathway in almost every case (see Figure 2). The only exception was the absence of an indirect association between perceived inequality in health and support for redistribution; however, it was indirectly associated with collective actions through greater intolerance towards health inequality. Moreover, greater perceived education and income inequalities were indirectly related to higher support for redistribution and collective actions via a greater intolerance towards inequality in education and income, respectively.

Additionally, we conducted exploratory tests to examine whether perceived inequality in each domain was associated

TABLE 2 | Means, standard deviations and correlations in Study 2.

Variable	*M*	SD	1	2	3	4	5	6	7
1. Per. health inequality	5.41	1.44							
2. Per. education inequality	5.72	1.24	0.48***						
3. Per. income inequality	6.51	0.87	0.41***	0.31***					
4. Int. health inequality	5.25	1.48	0.50***	0.28***	0.28***				
5. Int. education inequality	5.35	1.43	0.36***	0.39***	0.26***	0.68***			
6. Int. income inequality	5.38	1.40	0.33***	0.19***	0.35***	0.67***	0.55***		
7. Support for collective actions	4.21	1.64	0.20***	0.10***	0.16***	0.35***	0.29***	0.39***	
8. Support for redistribution	5.22	1.26	0.30***	0.19***	0.32***	0.40***	0.37***	0.51***	0.49***

Note: M and SD represent mean and standard deviation, respectively.
Abbreviations: Int., intolerance towards; Per., perceived.
*$p < 0.05$.
**$p < 0.01$.
***$p < 0.001$.

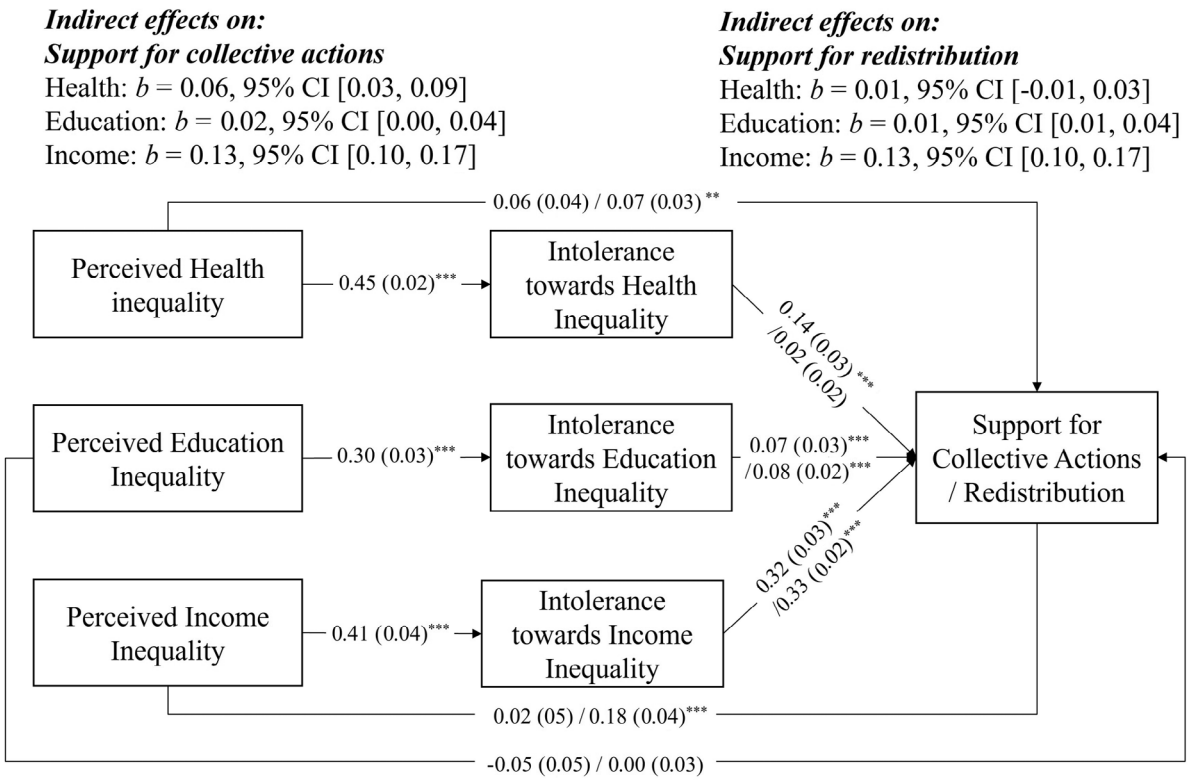

FIGURE 2 | Model depicting the effect of perceived inequality in health, education and income on support for redistribution and collective actions via intolerance towards inequality in each domain. Study 2; $N = 1536$. Reported values are unstandardized estimates (*b*) and standard errors (between parentheses). * indicates $p < 0.05$. ** indicates $p < 0.01$. *** indicates $p < 0.001$. When two regression coefficients separated by a slash are shown, the first one refers to support for redistribution and the second to collective actions.

with intolerance towards inequality in the other domains and how these associations related to collective actions and redistribution. These relationships were also significant in some cases. Specifically, perceived health inequality was indirectly and positively associated with support for collective actions and redistribution through increased intolerance towards education and income inequalities. Similarly, perceived income inequality was indirectly linked to greater support for collective actions via increased intolerance towards health and income disparities and to greater support for redistribution through increased intolerance towards income disparities. See Table S1.

3.2.5 | Covariates

Older participants showed greater intolerance towards inequality in education and more support for redistribution, whereas younger people supported more collective actions. Gender also

TABLE 3 | Predictors of support for redistribution and collective actions in Study 2.

	Support for redistribution				Support for collective actions			
	Model 1		Model 2		Model 3		Model 4	
Predictors	***b* (SE)**	***p***	***b* (SE)**	***p***	***b* (SE)**	***p***	***b* (SE)**	***p***
(Intercept)	1.97 (0.26)	**<0.001**	2.44 (0.16)	**<0.001**	2.20 (0.36)	**<0.001**	1.51 (0.22)	**<0.001**
Per. health inequality	0.16 (0.03)	**<0.001**			0.20 (0.03)	**<0.001**		
Per. education inequality	0.03 (0.03)	0.261			−0.02 (0.04)	0.580		
Per. income inequality	0.33 (0.04)	**<0.001**			0.18 (0.05)	**<0.001**		
Int. health inequality			0.06 (.03)	**0.046**			0.16 (0.04)	**<0.001**
Int. education inequality			0.09 (0.03)	**0.001**			0.06 (0.04)	0.134
Int. income inequality			0.36 (0.03)	**<0.001**			0.32 (0.04)	**<0.001**
Age	0.01 (0.00)	**0.002**	0.00 (0.00)	**0.011**	−0.00 (0.00)	0.158	−0.01 (0.00)	**0.011**
Gender	0.06 (0.06)	0.340	−0.04 (0.06)	0.454	0.00 (0.09)	0.967	−0.12 (0.08)	0.136
Income level	−0.05 (0.01)	**<0.001**	−0.02 (0.01)	0.051	0.01 (0.02)	0.570	0.03 (0.02)	**0.035**
Observations	1534		1536		1533		1535	
R^2/R^2 adjusted	0.149/0.146		0.275/0.272		0.051/0.047		0.174/0.171	

Note: b, SE and *p* represent unstandardized regression coefficients, standard errors and *p* values, respectively. Model 1 shows the direct effects of perceived inequality in each domain on support for redistribution (H1). Model 2 shows the direct effects of intolerance towards inequality in each domain on support for redistribution (H3). Model 3 shows the direct effects of perceived inequality in each domain on collective actions (H2). Model 4 shows the direct effects of intolerance towards inequality in each domain on support for collective actions (H4).

Abbreviations: Int., intolerance towards; Per., perceived.

affected intolerance towards inequality across all domains, with women showing greater intolerance than men. Additionally, income level negatively predicted intolerance towards income inequality and positively influenced support for collective actions. See Table 3.

3.3 | Discussion

In this study, we replicated and extended the findings of Study 1 with a larger sample intended to be more representative of the Spanish population. First, we explored the association between perceived inequality in each domain with support for redistribution and collective actions. Perceived inequality in health and income positively predicted support for redistribution (H1) and collective actions (H2). Nevertheless, perceived inequality in education was not a significant predictor for support for redistribution and collective actions after controlling for perceived inequality in the other domains. Similarly, intolerance towards inequality in each domain was independently and positively associated with support for redistribution (H3). Concerning collective actions (H4), intolerance towards inequality in health and income were significant positive predictors, but this was not observed in the domain of education.

Additionally, we replicated the mediational pathway found in Study 1. We found that, generally, perceived economic inequality in each domain was related to greater support for redistribution and collective actions via increased intolerance towards inequality in each specific domain (H5 and H6). This indirect pathway was only non-significant for perceived health inequality predicting support for redistribution through intolerance towards health inequality, although the direct relationship was still found. In the case of education, we observed an indirect relationship without a direct association, which highlights the significance of considering indirect influences in how perceptions of inequality are related to attitudes and behaviours. Previous studies, such as García-Castro, Rodríguez-Bailón, and Willis (2020), have similarly observed null direct associations but notable indirect associations between perceptions and redistribution via intolerance.

Some of the null findings might be explained by the design of Study 2, which was part of a larger survey containing numerous measures that could have led to respondent fatigue or reduced focus, alongside the use of single-item measures that may lack precision or reliability. Alternatively, it could reflect a broader phenomenon: people's difficulty connecting societal problems, such as disparities in education or healthcare, to political actions or policies aimed at addressing them. For instance, redistribution policies may not be intuitively linked in the public's mind to reducing healthcare disparities, leading to weaker observed associations.

Moreover, one limitation of our previous studies is that we focused on inequality outcomes, specifically health status and educational level. This approach was guided by the research tradition on the measure of perceived income disparities (e.g., salary gaps; Castillo, Garcia-Castro, and Venegas 2022). However, in the case of education and health, previous studies conducted by Macchia and Ariely (2021) and Soler-Martínez, García-Sánchez, and Willis (2023) have primarily investigated inequalities in access to healthcare and education, which subsequently contribute to disparities in these outcomes. Importantly, inequality in access to these resources might be less tolerated than unequal outcomes (Lynch and Gollust 2010). Recognizing this, we adapted our approach in subsequent studies to concentrate on access to healthcare and education as key variables of interest. Furthermore, another important limitation is the inability to establish causal relationships due to the cross-sectional design. Therefore, in Study 3, we sought to address this shortcut by employing an experimental design aimed at manipulating perceived health, education and income inequality.

4 | Study 3

In this study, we implemented an experimental design to find evidence of the causal link between perceptions of economic disparities in health, education and income and support for redistribution and collective actions. In the experimental conditions, we asked participants to think and write about the disparities between a poor person and a rich person in relation to their health, education or income. As main effects, we expected that intolerance towards inequality (H1a), support for collective actions (H2a) and support for redistribution (H3a) would be greater in the conditions of inequality in health, education and income compared to the control condition. Moreover, we retrieved the idea of Study 1 of comparing the effect of the different domains, so we predicted that intolerance towards inequality (H1b), support for collective actions (H2b) and support for redistribution (H3b) would be higher in the conditions or inequality in health and education compared to income inequality condition. Regarding indirect effects, we hypothesized that intolerance towards economic inequality would mediate the effect of the conditions of inequality in health, education and income (vs. the control condition) on support for collective actions (H4a) and redistribution (H5a). Similarly, we expected that the effect of the conditions of inequality in health and education (vs. income inequality condition) on support for collective actions (H4b) and redistribution (H5b) would be mediated by intolerance towards inequality. We believed that using an experimental design, in which the potential effects of third variables is controlled for, could yield the results we initially expected.

4.1 | Methods

4.1.1 | Participants and Design

Four hundred forty-three people participated in this study. The exclusion criteria were the same as in Study 1. The final sample was composed of 392 participants (M_{age} = 23.21, SD = 7.69, Min_{age} = 18, Max_{age} = 72), of whom 74.74% self-identified as women, 22.70% as men and 2.55% as 'other'. We followed an experimental between-groups design. More specifically, we divided participants into four groups (income [$n = 110$] vs. health [$n = 100$] vs. education [$n = 94$] vs. control [$n = 88$]). A sensitivity analysis with G*Power 3.1 (Faul et al. 2007) indicated that a minimum of 88 participants per condition allowed to detect a minimum effect size of $f = 0.177$ with 80% of power for ANCOVA with 4 groups and 5 covariates.

4.1.2 | Procedure

We obtained the sample using an incidental sampling procedure through advertisements on social media platforms and university bulletin boards. Participants entered a €50 prize drawing for their participation. They accessed the experiment through *Qualtrics* platform. First, participants were randomly assigned to one of four conditions. In each experimental condition, they were asked to think about a rich person and another poor person and write for 2 min about the differences between them regarding their health (health condition), education (education condition) or income (income condition). In the control condition, they had to think about a tall person and another small person and write for 2 min about the differences between them regarding their clothing size (see Supporting Information section). After the task, they answered all measures of interest.

4.1.3 | Measures

4.1.3.1 | Manipulation Checks. We included three questions with a 7-point Likert response format to check the manipulation. 'In your opinion, to what extent there are differences in health between rich people and poor people?', 'In your opinion, to what extent there are differences in education between rich people and poor people?', and 'In your opinion, to what extent there are differences in income between rich people and poor people?' (1 *Very few differences*–7 *Many differences*).

Importantly, we were concerned about where to place the manipulation checks in the survey. Placing them before the dependent variables could prime the concept of economic inequality in each domain, also in the control condition, but placing them at the end of the survey could capture an attenuated effect of the manipulation in the experimental conditions (Fayant et al. 2017; Hauser, Ellsworth, and Gonzalez 2018). Thus, in the control condition, participants responded to all questions at the end of the questionnaire, whereas participants in the experimental conditions responded only to the question related to their assigned condition right after the manipulation.

4.1.3.2 | Intolerance towards Inequality. It was assessed by a two items measure adapted from the literature about attitudes towards inequality (Schmalor and Heine 2022): 'In your opinion, to what extent the differences you have described are unfair/fair?' (1 *Very unfair*–7 *Very fair*) and 'In your opinion, to what extent the differences you have described are unacceptable/acceptable?' (1 *Very unacceptable*–7 *Very acceptable)*. Punctuations were reverse coded, such that higher values mean greater intolerance towards inequality ($r = 0.63$, $M = 5.31$, SD = 1.52).

4.1.3.3 | Support for Collective Actions. We used the same measure as in Study 1 ($\Omega = 0.93$, $M = 5.05$, DT = 1.58).

4.1.3.4 | Support for Redistribution. We employed the same measure as in Studies 1 and 2 ($\Omega = 0.86$, $M = 5.49$, DT = 1.23).

4.1.3.5 | Covariates.

4.1.3.5.1 | Political Ideology. We used a single-item measure ('In politics, people normally speak of 'left' and 'right'. On a scale where one means left and seven means right, where would you place yourself?'). Lower scores indicated more inclination to the left political ideology.

4.1.3.5.2 | Income Level. Participants indicated the amount of their families' monthly net income in a range of 10 options: (1) <650€; (2) 651–1300€; (3) 1301–1950€; (4) 1951–2600; (5) 2601–3250€; (6) 3251–3900; (7) 3901–4550€; (8) 4551–5200€; (9) 5201–5800€ and (10) >5800€.

4.1.3.5.3 | Parent's Education. It was assessed through the question, 'What is the education level of your parents?' They indicated it for their mother figure and father figure, and we computed the mean between them. Possible options were (1) without studies, (2) primary studies, (3) secondary studies, (4) superior studies and (5) university studies.

4.1.3.5.4 | Gender and Age. Participants indicated their self-identified gender and their age.

4.1.4 | Analytical Strategy

To test the main effects of condition on intolerance towards inequality, support for collective actions and support for redistribution (H1, H2 and H3, respectively), we conducted between-subjects ANCOVAs followed by post hoc analyses using Tukey's HSD for pairwise comparisons. Lastly, for indirect effects (H4 and H5), we ran mediational analyses by converting experimental conditions into dummy variables representing the effect of health, education and income conditions (vs. control condition). In all analyses, we controlled for covariates.

4.2 | Results

4.2.1 | Manipulation Checks

Unexpectedly, we did not find significant differences in the manipulation check scores between conditions (including control condition) in perceived inequality in health, $F(3,388) = 1.45$, $p = 0.23$, $f = 0.11$ (health: $M_{marginal} = 5.43$, SE = 0.14; control: $M_{marginal} = 5.61$, SE = 0.14); education, $F(3,388) = 2.22$, $p = 0.09$, $f = 0.12$ (education: $M_{marginal} = 5.48$, SE = 0.13; control: $M_{marginal} = 5.68$, SE = 0.14) nor income, $F(3,388) = 2.05$, $p = 0.11$, $f = 0.13$ (income: $M_{marginal} = 5.93$, SE = 0.13; control: $M_{marginal} = 5.68$, SE = 0.14). Despite this result, we proceeded to test our hypotheses as planned.

4.2.2 | Main Effects on Intolerance Towards Inequality, Support for Redistribution and Support for Collective Actions

Regarding H1, a one-way ANCOVA revealed a significant effect of the condition on intolerance towards inequality, $F(3,383) = 37.63$, $p < 0.001$, $f = 0.18$ (control: $M_{marginal} = 4.10$, SE = 0.14; health: $M_{marginal} = 5.66$, SE = 0.13; education: $M_{marginal} = 5.76$, SE = 0.13; income: $M_{marginal} = 5.58$, SE = 0.12). As expected (H1a), Tukey's

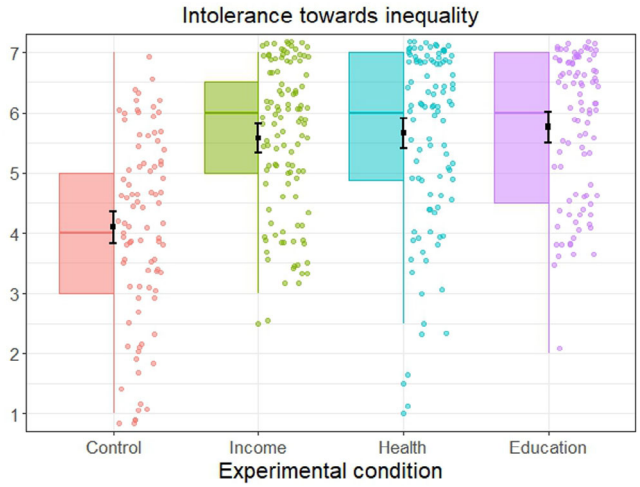

FIGURE 3 | Distribution of intolerance towards inequality across experimental conditions. Study 3; $N = 392$. The boxplot with jittered points illustrates the spread and central tendency of intolerance towards inequality across different experimental conditions. Each box represents the interquartile range (IQR), with the median marked by the bold line inside. The black squared dot inside the box indicates the means, and the black lines represent error bars. Whiskers extend to the minimum and maximum values within 1.5 times the IQR.

HSD revealed that participants in the control condition presented lower intolerance towards inequality compared to those in the health, $d = -1.56$, SE = 0.19, $t\,(383) = -8.33$, $p < 0.001$; education, $d = -1.66$, SE = .19, $t\,(383) = -8.79$, $p < 0.001$ or income inequality conditions, $d = -1.47$, SE = 0.18, $t\,(383) = -8.08$, $p < 0.001$. Nevertheless, contrary to our expectations (H1b), there were no differences in intolerance towards inequality between the income inequality condition and the conditions of health, $d = -0.08$, SE = 0.17, $t\,(383) = -0.47$, $p = 0.967$ or education, $d = -0.19$, SE = 0.18, $t\,(383) = -1.04$, $p = 0.728$). See Figure 3.

Concerning H2 and H3, we found no evidence supporting these hypotheses. One-way ANCOVAs did not show any significant difference between conditions in support for collective actions, $F(3,383) = 0.29$, $p = 0.83$, $f = 0.05$ (control: $M_{\text{marginal}} = 5.00$, SE = 0.14; health: $M_{\text{marginal}} = 5.04$, SE = 0.12; education: $M_{\text{marginal}} = 5.13$, SE = 0.13 and income: $M_{\text{marginal}} = 5.02$, SE = 0.12), nor support for redistribution, $F(3,383) = 0.73$, $p = 0.53$, $f = 0.08$ (control: $M_{\text{marginal}} = 5.41$, SE = 0.11; health: $M_{\text{marginal}} = 5.53$, SE = 0.10; education: $M_{\text{marginal}} = 5.49$, SE = 0.10 and income: $M_{\text{marginal}} = 5.50$, SE = 0.09).

4.2.3 | Indirect Effects on Support for Redistribution and Collective Actions via Intolerance Towards Inequality

Although we did not find a main effect on support for collective actions and redistribution, we found evidence of indirect effects in-line with previous studies and our H4 and H5 (see Figure 4). As expected, health, education and income inequality conditions (vs. control) were linked to greater support for collective actions (H4a) and redistribution (H5a) through increased intolerance towards inequality.

Nevertheless, contrary to our expectations, when comparing health and education conditions to income inequality condition, we did not find an indirect effect on support for collective actions (H4b) nor redistribution (H5b) via intolerance towards inequality. See Table S4.

4.2.4 | Covariates

Political ideology was a strong predictor in all analyses, with participants on the left of the political spectrum exhibiting greater intolerance towards inequality and higher support for redistribution and collective actions. Parent's level of education predicted lower support for redistribution and collective actions. Age emerged as a significant negative predictor of collective actions and support for redistribution only in the mediational model, but this effect was not observed in other analyses. Women showed greater intolerance towards inequality than men. Income level had a negative effect on intolerance towards inequality and support for redistribution and collective actions in some analyses. See Tables S2–S4.

4.3 | Discussion

In Study 3, we found that writing and reflecting on inequality in income, health and education, compared to the control condition, increased intolerance towards inequality (H1a). Although we did not find a main effect on support for collective actions (H2a) or redistribution (H3a), intolerance towards inequality mediated the positive effects of experimental conditions (vs. control) on these variables (H4a and H5a). Thus, we replicated the mediational pathway of the previous studies. This null main effect, but significant indirect effect of perceived economic inequality, has been found in other experiments showing that perceived inequality increases support for redistribution through intolerance towards inequality (García-Castro, Rodríguez-Bailón, and Willis 2020), pointing out its relevant mediating role. Moreover, we did not find that health or education conditions had a greater effect than income condition on the dependent variables (H1b–H5b).

Furthermore, the null effect of the experimental conditions on the manipulation checks and some of the dependent variables suggests that our results may be due to other related processes. We speculate that the experimental intervention may have increased the salience of inequality without necessarily altering participants' perceptions of inequality. As such, participants in the experimental conditions likely reflected on inequality in health, education or income as instructed, but they were not provided further information to adjust their perceptions. For instance, participants who already perceived small health, education or income disparities may have written about these small differences, reinforcing their pre-existing beliefs instead of becoming more aware of significant inequalities in different domains. Furthermore, covariates, such as political ideology and sociodemographic characteristics, also influenced our outcome variables. These individual differences may have played a significant role in shaping participants' responses, overshadowing the effects of the experimental manipulation.

Thus, although Study 3 provides partial support for our hypotheses, the limitations of the manipulation and the significant role of

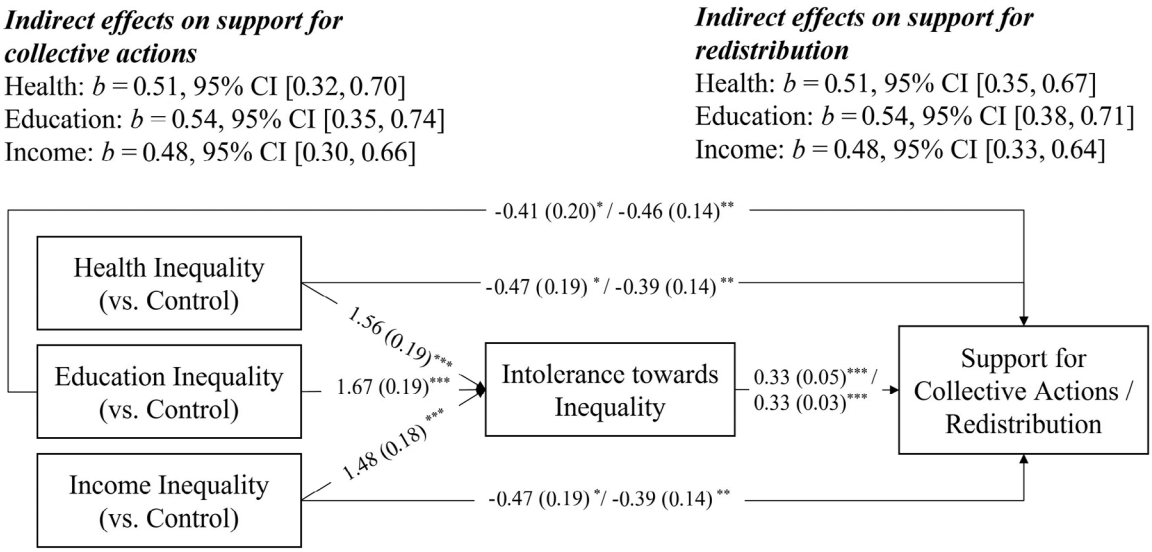

FIGURE 4 | Model depicting the effect of health, education and income inequality conditions (vs. control) on support for collective actions and redistribution via intolerance towards inequality. Study 3; $N = 392$. Reported values are unstandardized estimates (b) and standard errors (between parentheses). * indicates $p < 0.05$. ** indicates $p < 0.01$. *** indicates $p < 0.001$. When two regression coefficients separated by a slash are shown, the first one refers to support for collective actions and the second one to support for redistribution.

covariates warrant careful consideration. We conducted a fourth study with a different design and experimental task to address these concerns and test our hypotheses with a more effective manipulation.

5 | Study 4

In this study, we ran an experiment presenting fictitious scenarios of high (vs. low) inequality in each domain inspired by the text participants filled in the previous study. We hypothesized that intolerance towards inequality (H1a), support for collective actions (H2a) and support for redistribution (H3a) would be greater in the conditions of high (vs. low) inequality in each domain (health, education and income). Moreover, in the conditions of high inequality, we expected that the means of intolerance towards inequality (H1b), support for collective actions (H2b) and support for redistribution (H3b) would be higher in health and education conditions compared to income condition. Regarding indirect effects, we hypothesized that intolerance towards economic inequality would mediate the effect of the conditions of high (vs. low) inequality in health, education and income on support for collective actions (H4a) and redistribution (H5a). Finally, it was expected that intolerance towards inequality would mediate the effect of the conditions of high inequality in health and education (vs. high inequality in income condition) on support for collective actions (H4b) and redistribution (H5b).

5.1 | Methods

5.1.1 | Participants and Design

Four hundred people participated in this study. The exclusion criteria were the same as in the previous study. The final sample was composed of 371 participants (M_{age} = 30.22, SD = 13.94, Min_{age} = 18, Max_{age} = 100), of whom 73.05% self-identified as women, 26.68% as men and 0.27% as 'other'. We followed an experimental mixed design with two conditions between-groups ('high inequality' [$n = 177$] vs. 'low inequality' [$n = 194$]) and three conditions within-subjects ('health inequality' vs. 'education inequality' vs. 'income inequality'). A sensitivity analysis with G*Power 3.1 (Faul et al. 2007) indicated that the sample provided allowed to detect a minimum effect size of $f < 0.119$ with 80% of power for an ANOVA (repeated measures, between factors) with two groups and three repeated measures.

5.1.2 | Procedure

We obtained the sample using an incidental sampling procedure through advertisements on social media platforms and providing QR codes with the survey link in the university cafeterias. As in the previous study, participants entered a €50 prize drawing for their participation, and they accessed the experiment via *Qualtrics* platform. Participants were randomly assigned to either a low inequality condition ($n = 177$) or a high inequality condition ($n = 194$). Then, all participants learned about different fictitious scenarios of inequality in health, education and income, in a randomized order. We presented the case of two people living in a fictitious society, one poor person and the other rich, and we described the differences between them in terms of health, education or income (e.g., Imagine Society Y, where Juan and Mateo live. Because Juan is poorer and Mateo is richer, the differences in their access to healthcare are very large (…); see Supporting Information section). After each scenario, they responded to the measures of the dependent variables.

5.1.3 | Measures

As participants completed the dependent variables three times (one after each scenario of health, education and income

disparities), we utilized a condensed version of the measures used in the previous studies to minimize participant burden and repetition.

5.1.3.1 | Manipulation Checks. We included a question with a 9-point Likert response format after each experimental manipulation. 'In your opinion, how big or small are the disparities in income/access to health/access to education between the richest and poorest people in this society?' (1 *Extremely small*–9 *Extremely large*).

5.1.3.2 | Intolerance Towards Inequality. We employed a two items measure with 9-point Likert response format: 'The differences between the richest and poorest people in this society are unfair' and 'The differences between the richest and poorest people in this society are unacceptable' (r = 0.86; 1 *Totally disagree*–9 *Totally agree*).

5.1.3.3 | Support for Collective Actions. We used a two items measure with 9 points Likert response format: 'I would be willing to protest to reduce the differences between the richest and poorest people in this society' and 'People should organize and work together to reduce the differences between the richest and poorest people in this society' (r = 0.75; 1 *Totally disagree*–9 *Totally agree*).

5.1.3.4 | Support for Redistribution. It was assessed by a two items measure with 9 points Likert response format: 'I would support policies aimed at reducing the differences between the richest and poorest people in this society' and 'The government should reduce the differences between the poorest and richest people in this society' (r = 0.85; 1 *Totally disagree*–9 *Totally agree*).

5.1.3.5 | Covariates. We assessed political ideology, income level, parent's education, gender and age with the same measures as in the previous study.

5.1.4 | Analytical Strategy

To test the effects of high (vs. low) inequality conditions in each domain (health, education and income) on intolerance towards inequality (H1a), support for collective actions (H2a) and support for redistribution (H3a), we conducted between-subjects ANCOVAs. To test the effect of the domains of high inequality health and education (vs. high inequality in income) on the dependent variables (H1b, H2b and H3b), we conducted within-subjects ANCOVAs and post hoc analyses (Tukey's HSD for pairwise comparisons). Moreover, for indirect effects, we ran mediational analyses with condition (high vs. low inequality) in each domain as predictor, intolerance towards inequality as mediator and support for collective actions (H4a) and redistribution (H5a) as criterion variables. Lastly, we also conducted mediational analyses with dummy variables representing the effect of high inequality in health and education (vs. income condition), and the same mediator and criterion variables (H4a and H5b). In all analyses, we controlled for covariates.

5.2 | Results

5.2.1 | Preliminary Analyses

We present descriptive analyses (means and standard deviations) of each variable of interest depending on the experimental condition (see Table 4).

5.2.2 | Manipulation Checks

As expected, means of the manipulation check were higher in the conditions of high (vs. low) inequality for health, $t\,(369) = -14.76$, $p < 0.001$, *Cohen's* $d = -1.53$ ($M_{\text{Low}} = 4.83$, $M_{\text{High}} = 7.81$); education, $t\,(369) = -15.02$, $p < 0.001$, *Cohen's* $d = -1.56$ ($M_{\text{Low}} = 4.51$, $M_{\text{High}} = 7.59$) and income, $t\,(369) = -15.02$, $p < 0.001$, *Cohen's* $d = -1.59$ ($M_{\text{Low}} = 4.38$, $M_{\text{High}} = 7.65$).

5.2.3 | Main Effects on Intolerance Towards Inequality, Support for Collective Actions and Support for Redistribution

As hypothesized (H1a), intolerance towards inequality was greater in the conditions of high (vs. low) inequality in health, $F(1,364) = 69.33$, $p < 0.001$, $f = 0.44$; education, $F(1,364) = 81.85$, $p < 0.001$, $f = 0.47$ and income, $F(1,364) = 73.57$, $p < 0.001$, $f = 0.45$. Similarly, as predicted (H2a), means of support for collective action were higher in the conditions of high (vs. low) inequality in health, $F(1,364) = 50.97$, $p < 0.001$, $f = 0.37$; education, $F(1,364) = 69.24$, $p < 0.001$, $f = 0.44$ and income, $F(1,364) = 52.02$, $p < 0.001$, $f = 0.38$. Lastly, also confirming H3a, support for redistribution was greater in the conditions of high (vs. low) inequality in health, $F(1,364) = 50.97$, $p < 0.001$, $f = 0.37$; education, $F(1,364) = 69.24$, $p < 0.001$, $f = 0.44$ and income, $F(1,364) = 52.02$, $p < 0.001$, $f = 0.38$. See Figure 5. All estimates and effects of covariates can be found in Table S5.

Furthermore, supporting our hypotheses (H1b, H2b and H3b), in the conditions of high inequality, there were significant differences among health, education and income domains in intolerance towards inequality, $F(2,387.26) = 37.35$, $p < 0.001$, $f = 0.44$, support for collective actions, $F(2,386.10) = 37.34$, $p < 0.001$, $f = 0.44$ and support for redistribution, $F(2,386.71) = 36.59$, $p < 0.001$, $f = 0.43$. More specifically, post hoc analyses revealed that participants showed greater intolerance towards inequality in the conditions of high inequality in health, $d = 1.03$, SE = 0.13, $t\,(389) = 8.15$, $p < 0.001$ and education, $d = 0.84$, $SE = 0.13$, $t\,(389) = 6.58$, $p < 0.001$, compared to high income inequality condition. Similarly, there was a greater support for collective actions in the conditions of high inequality in health $d = 0.83$, SE = 0.10, $t\,(388) = 7.77$, $p < 0.001$ and education, $d = 0.76$, SE = 0.10, $t\,(388) = 7.17$, $p < 0.001$, than in the condition of high income inequality. Lastly, support for redistribution was higher in the conditions of high inequality in health, $d = 0.74$, SE = 0.10, $t\,(388) = 7.33$, $p < 0.001$ and education, $d = 0.76$, SE = 0.10, $t\,(388) = 7.50$, $p < 0.001$, compared to the condition of high income inequality. See boxplots in high inequality conditions in Figure 5. All estimates and effects of covariates can be found in Table S6.

TABLE 4 | Means and standard deviations of dependent variables by condition in Study 4.

Condition		Intolerance towards inequality		Support for collective actions		Support for redistribution	
		M	**SD**	***M***	**SD**	***M***	**SD**
Health	Low inequality	5.75	2.45	5.89	2.19	6.55	2.19
	High inequality	7.50	1.93	7.26	1.84	7.61	1.84
Education	Low inequality	5.47	2.31	5.67	2.14	6.41	2.22
	High inequality	7.32	1.91	7.18	1.71	7.64	1.63
Income	Low inequality	4.56	2.44	4.96	2.25	5.77	2.30
	High inequality	6.47	2.07	6.41	1.91	6.86	1.95

Note: M and SD represent mean and standard deviation, respectively.

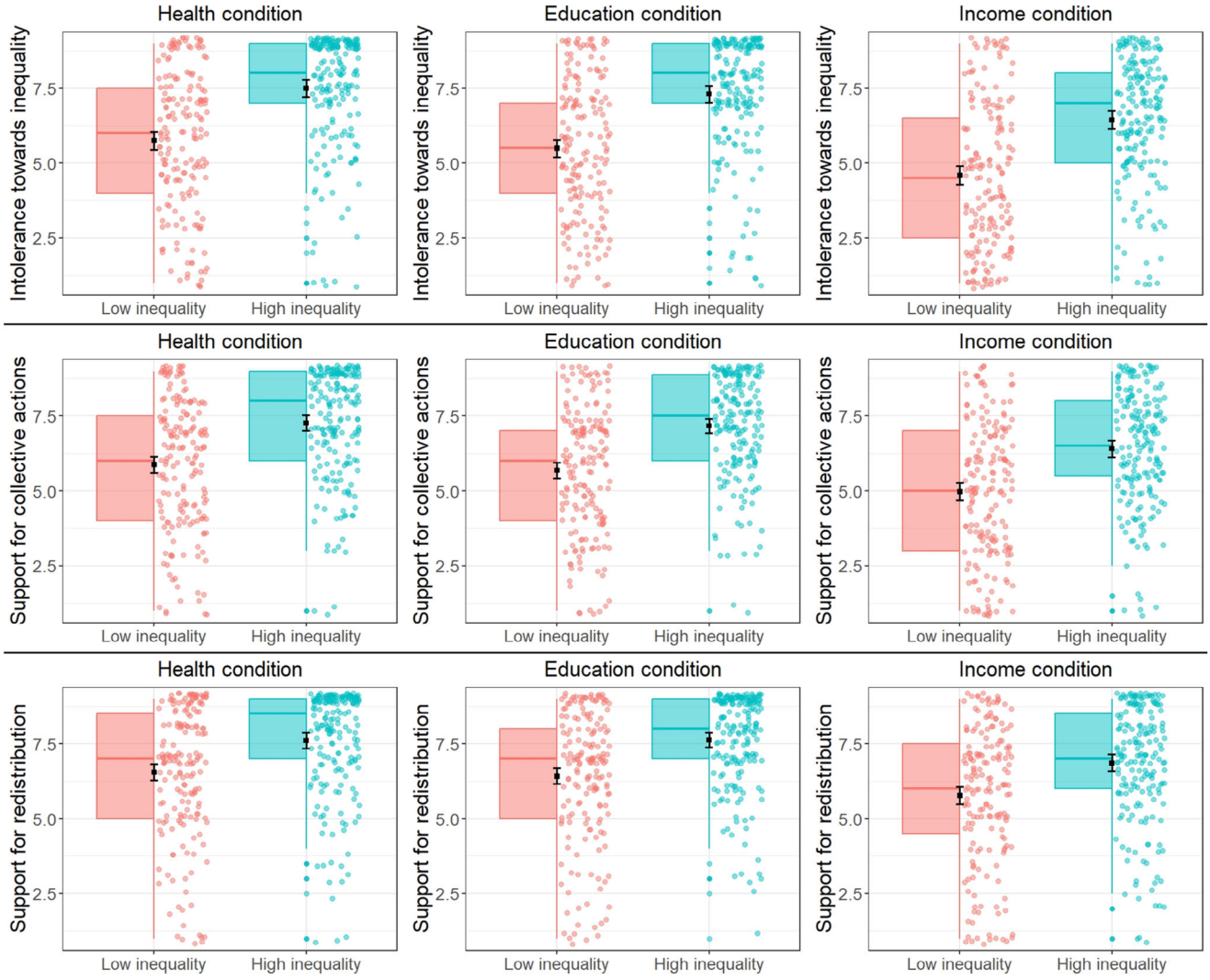

FIGURE 5 | Distribution of intolerance towards inequality (Panel 1), Support for collective actions (Panel 2) and Support for redistribution (Panel 3) across experimental conditions. Study 4; $N = 371$. The boxplot with jittered points illustrates the spread and central tendency of intolerance towards inequality across different experimental conditions. Each box represents the interquartile range (IQR), with the median marked by the bold line inside. The black squared dot inside the box indicates the means, and the black lines represent error bars. Whiskers extend to the minimum and maximum values within 1.5 times the IQR.

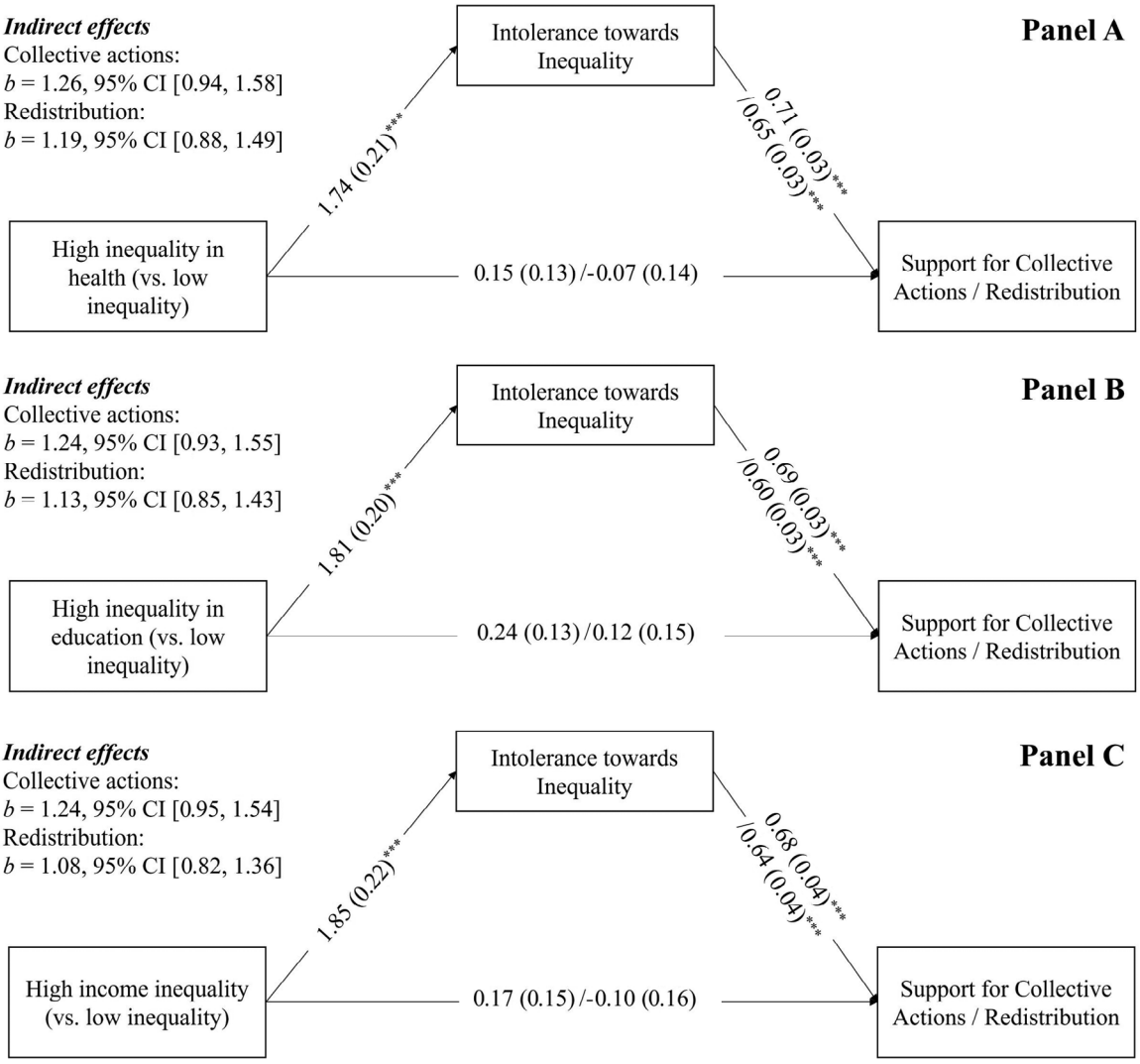

FIGURE 6 | Model depicting the effect of high inequality (vs. low inequality) in health (Panel A), education (Panel B) and income (Panel C) on support for collective actions and redistribution via intolerance towards inequality. Study 4; $N = 371$. Reported values are unstandardized estimates (b) and standard errors (between parentheses). * indicates $p < 0.05$. ** indicates $p < 0.01$. *** indicates $p < 0.001$. When two regression coefficients separated by a slash are shown, the first one refers to support for collective actions and the second one to support for redistribution.

5.2.4 | Indirect Effects on Support for Collective Actions and Support for Redistribution Through Intolerance Towards Inequality

As predicted, in every domain of inequality—health, education and income—the high inequality conditions (vs. low inequality) had a positive indirect effect on support for collective actions (H4a) and support for redistribution (H5a) through increased intolerance towards inequality. More specifically, participants exposed to high levels of inequality in these domains, compared to those who read about low inequality scenarios, demonstrated greater intolerance towards inequality, which, in turn, increased their support for both collective actions and redistribution measures. These results can be seen in Figure 6.

Furthermore, the conditions of high inequality in health and education, compared to high income inequality, showed significant indirect effects on support for collective actions and redistribution through enhanced intolerance towards inequality. Participants faced with high health and education inequality, compared to those in the condition of high income inequality, exhibited more pronounced intolerance towards inequality, which led to greater support for collective actions and redistribution policies. These findings are illustrated in Figure 7.

5.2.5 | Covariates

As in the previous study, participants on the left of the political spectrum showed greater intolerance towards inequality and higher support for redistribution and collective actions. Moreover, women demonstrated higher intolerance towards inequality and higher support for redistribution and collective actions in the ANCOVA analyses comparing high versus low inequality in all domains. See Tables S5–S7.

5.3 | Discussion

In Study 4, we conducted an experiment to address the inconsistencies and shortcomings observed in our previous studies.

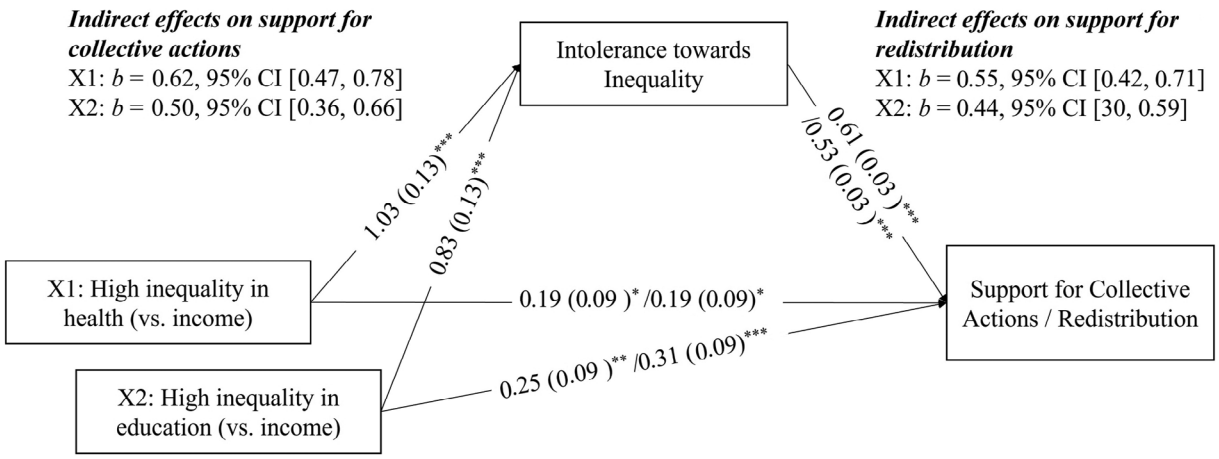

FIGURE 7 | Model depicting the effect of high inequality in health and education (vs. high income inequality) on support for collective actions and redistribution via intolerance towards inequality. Study 4; $N = 196$. Reported values are unstandardized estimates (b) and standard errors (between parentheses). * indicates $p < 0.05$. ** indicates $p < 0.01$. *** indicates $p < 0.001$. When two regression coefficients separated by a slash are shown, the first one refers to support for collective actions and the second one to support for redistribution.

Studies 1 and 2 employed a correlational design, and the experimental manipulation in Study 3 did not work effectively, as indicated by the manipulation checks. However, in Study 4, we successfully manipulated perceived inequality across the domains of health, education and income.

Our findings confirmed all our hypotheses. Participants exposed to scenarios of high inequality exhibited significantly greater intolerance towards inequality (H1a), stronger support for collective actions (H2a) and higher support for redistribution policies (H3a) compared to those exposed to low inequality scenarios. This trend was evident across all three domains. Moreover, our study extended previous findings by showing that, compared to the high income inequality condition, participants in conditions of high inequality in health and education showed greater intolerance towards inequality (H1b) and stronger support for collective actions (H2b) and redistribution (H3b). Thus, we provided novel evidence suggesting that focusing on inequality in health and education, rather than just income disparities, may be more effective in increasing intolerance towards inequality, as well as support for collective actions and redistribution.

Furthermore, consistent with previous findings, intolerance towards inequality served as a significant mediator. Specifically, the effect of high inequality conditions on support for collective actions (H4a) and redistribution (H5a) was mediated by increased intolerance towards inequality. This mediation effect was consistent across all three domains. Likewise, intolerance towards inequality partially explained the differences between high income inequality condition and high inequality in health and education conditions on support for collective actions (H4b) and redistribution (H5b).

6 | General Discussion

Perceiving income disparities might have a limited mobilizing power to reduce economic inequality to some segments of the population (Ciani, Fréget, and Manfredi 2021; Hoyt et al. 2018). But people perceive economic inequality not only in terms of income distributions (García-Castro et al. 2021; García-Sánchez et al. 2018). Instead, they also recognize and are concerned about the impact of economic inequality on other important domains of their lives, such as health or education (Macchia and Ariely 2021; Soler-Martínez, García-Sánchez, and Willis 2023). However, the previous research on the role of perceiving inequality in these domains on attitudes towards reducing economic inequality is scarce. In this research, we aimed to explore whether perceiving inequality in health and education—beyond perceived income disparities—could act as additional fuel for mobilizing the public to reduce economic inequality. Furthermore, we studied this issue in the European context of Spain, where these disparities could be potentially less noticeable than in other countries like North America (e.g., Macchia and Ariely 2021) or Latin America (e.g., Soler-Martínez, García-Sánchez, and Willis 2023) due to the presence of a strong system of public healthcare and education.

Overall, we found that perceptions of health and education inequities may have an independent effect—over and above perceived income disparities—on attitudes towards economic inequality and support for actions to reduce it. In Studies 1 and 2, following a correlational design, we found that perceptions of inequality in health, education and income explained unique variance of support for redistribution and collective actions via intolerance towards inequality. Next, Study 3 followed an experimental design to find evidence of causality. Although this mediational effect was replicated, manipulation checks failed, showing problems with the experimental manipulation and main effects of the experimental condition on support for redistribution or collective actions were not significant. Thus, we ran Study 4 with a different experimental manipulation where participants in high inequality conditions (vs. low) in each domain demonstrated higher intolerance towards inequality and, in turn, greater support for collective actions and redistribution.

Furthermore, we compared the role of health, education and income. In Study 1, we found that the coefficient of regression on intolerance towards inequality was higher for perceived income disparities than the predictive value of health or education perceptions. Although it is contrary to what we expected, we

believe that this might signal that low perceptions of health and education inequalities could already elicit high levels of intolerance (see Section S5.1 for a more detailed discussion). In Study 3, there were no differences among income, health or education conditions, but it might be due to limitations of the experimental manipulation (e.g., failed manipulation check). Nevertheless, in Study 4, we found that the conditions of high inequality in health and education (vs. high income inequality), arouse greater intolerance towards inequality, and higher support for redistribution and collective actions. Thus, although more research is needed on this question, it seems that this alternative strategy of focusing on health and education instead of income disparities alone could be a more efficient way of increasing intolerance towards inequality and fostering more actions to reduce it.

Regarding the effect of covariates, political ideology and gender were the most consistent predictors across studies. Left-wing political ideology consistently predicted greater intolerance towards inequality and more support for redistribution and collective actions, and women consistently showed greater intolerance towards inequality. In contrast, the effects of age, income level and parent's level of education on intolerance towards inequality and support for redistribution and collective action were less consistent across the different studies and analyses.

6.1 | Theoretical Implications

Our findings are aligned with several theoretical models of distributive justice (Jasso, Törnblom, and Sabbagh 2016), support for redistribution (Choi 2019) and support for collective actions (Jetten et al. 2021; van Stekelenburg and Klandermans 2013). In the realm of collective action, the previous research identifies perceived injustice as a key motivator (van Stekelenburg and Klandermans 2013). Regarding support for redistribution, prior literature often emphasizes perceptions of income distribution or socioeconomic position, largely assuming that people act in line with self-interest. Our findings broaden these frameworks by demonstrating that perceptions of disparities in health and education—beyond income disparities—lead to lower tolerance for inequality, which, in turn, fuels collective actions and support for redistribution.

In this line, our research supports and extends previous empirical evidence. For instance, García-Castro, Jimenez-Moya, et al. (2022) also found a mediational pathway in which higher perceived economic inequality was related to a greater desire for redistribution via increased intolerance towards economic inequality. Other studies have also highlighted the positive relationship between perceptions of economic inequality and support for redistribution (Choi 2019; Gimpelson and Treisman 2018) or collective actions to reduce economic inequality (Hoyt et al. 2018; Jo and Choi 2019). Our findings contribute to this literature showing that disparities in healthcare and education also play a significant role to foster intolerance towards inequality and support for actions to reduce it. However, it is important to note that studying intentions for collective action and redistribution does not directly correspond to examining actual behaviour. Although our findings provide insights into the attitudinal precursors to mobilization and redistributive policies, future research should investigate how these intentions translate into real-world actions.

Moreover, our results serve as a complement to recent evidence (García-Sánchez et al. 2018; Macchia and Ariely 2021; Soler-Martínez, García-Sánchez, and Willis 2023) endorsing a multidimensional approach to the study of economic inequality. We argue that this multidimensional approach is of great importance because of two main reasons. First, we address an existing gap in literature almost exclusively focused on the income domain, although people indeed perceive economic inequality embedded in several domains of their lives, such as health or education (García-Sánchez et al. 2018). Second, perceived income inequality has shown to have a limited impact on attitudes towards its reduction (Ciani, Fréget, and Manfredi 2021) and is often tied to ideological differences (García-Sánchez et al. 2020; Hoyt et al. 2018). But on the other hand, as shown by our study and previous research, health and education disparities might be less tolerated (Macchia and Ariely 2021; Soler-Martínez, García-Sánchez, and Willis 2023) and arise more actions to reduce them than income disparities alone (Brown, Dietze, and Craig 2023).

6.2 | Limitations and Future Research

Our research has some limitations worth discussing. First, the samples in Studies 1, 3 and 4 were composed primarily of students and university staff, restricting the generalizability of our findings to the broader population. Although Study 2 included a national sample, its participants were drawn from an online panel that may not fully reflect the characteristics of the general population. Moreover, our findings might be influenced by the Spanish context, where public healthcare and education reinforce norms of equal access, making disparities in these areas particularly impactful. However, similar findings in the United States suggest that these effects could generalize across contexts (Brown, Dietze, and Craig 2023; Day and Norton 2023). Future research would need to study these perceptions across diverse settings to better understand their broader applicability.

Another consideration involves the potential overlap among perceived inequalities across domains. Indeed, perceptions of health, education and income disparities are interrelated ($r = 0.50$ in some cases). Furthermore, in Study 3, although most participants predominantly focused on their assigned domain of inequality, a few cases also mentioned the other domains (see Supporting Information section to see some original quotes). Nevertheless, despite this interrelatedness, perceived inequality in each domain emerged as a significant predictor of the variables of interest when accounting for the effects of perceived inequality in the other domains. Thus, although perceptions of inequality across domains may exhibit interrelatedness, differentiation among them is feasible and offers several advantages. Examining inequality in health, education and income could contribute to a more nuanced understanding of attitudes towards inequality, as perceived inequality in each domain may explain additional variance of this phenomenon. Subsequent studies could delve into the potential interdependence of these domains.

Furthermore, our rationale for exploring alternative pathways to mobilize the public is partly grounded in evidence suggesting that messages about income disparities alone may prove ineffective or insufficient when people endorse system-justifying beliefs (Hoyt et al. 2018). Although our research represents a preliminary step

towards addressing this issue, we did not directly test whether perceived inequities in health and education are conditional on people's ideologies. Future research should investigate whether presenting messages about inequality in health and education can reduce ideological polarization on attitudes towards inequality compared to traditional messages framing income and wealth inequality. We believe this may be the case, as our results indicate that health and education inequalities might be less easily tolerated than income disparities. Thus, it is plausible that messages concerning health and education inequities may encounter less resistance among the public.

6.3 | Practical Implications

Overall, this research has some practical implications. Our findings suggest a pathway from individual perceptions of economic inequality to policy advocacy and implementation. First, raising awareness about health and education disparities through media or public campaigns could help individuals recognize the extent and impact of these inequalities beyond income disparities. This increased awareness can lead to greater public concern and stronger intolerance towards inequality. In turn, these changes in public opinion could fuel social change through collective actions, activism and demand for policies aimed at reducing inequality. Lastly, these social demands could influence legislators to prioritize policies that address economic inequality, such as progressive taxation or increased funding for public health and education. By outlining this pathway, we highlight the practical implications of our findings and provide a clear strategy for translating individual perceptions of inequality into meaningful policy advocacy and implementation.

7 | Conclusion

In conclusion, our research emphasizes a multidimensional approach to the study of perceptions of economic inequality, advocating for a strategic shift from an exclusive focus on income disparities to a more inclusive consideration of economic inequality in health and education. Instead of concentrating solely on income disparities in public discourse, redirecting attention to universally valued domains such as health and education could provide a pragmatic strategy to overcome potential resistance and mobilize broader public support. Our research suggests that besides the fact that 'The richest 10% earns eight times more than the poorest 50%' (RTVE 2021), messages like 'Life expectancy gap between the rich and the poor is up to 11 years' (Antena 3 Noticias 2019) or 'Poor students repeat a grade 4 times more' (El País) could also play an important role on people's attitudes towards economic inequality. This alternative perspective opens avenues for implementing effective measures, including redistributive policies and collective initiatives, to tackle the multifaceted challenge of economic inequality.

Author Contributions

Francisco Miguel Soler-Martínez, Efraín García-Sánchez and Guillermo B. Willis contributed to conception and design of the studies and data collection. Francisco Miguel Soler-Martínez performed analysis and wrote the first draft of the manuscript. All authors made contributions to manuscript revision, read and approved the submitted version.

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Ethics Statement

This research received approval from the institutional research ethics committee of the University of Granada (969/CEIH/2019), and all procedures were in accordance with the ethical standards of the Declaration of Helsinki.

Consent

Participants provided their written informed consent to participate in this study.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are openly available in OSF at https://osf.io/gna2x/.

Endnotes

[1]We also preregistered other hypotheses, but we did not include them in this paper to maintain consistency across the studies. We also slightly modified variable names from the preregistration for the same purpose (see Supporting Information section).

[2]This study is a part of a bigger survey. Thus, other variables than those described in this study were included in the survey. See Questionnaire Study 2 [https://osf.io/gna2x/] to see the other measures.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.