How do people understand inequality in Chile? A study of attitudes through network analysis.

# Abstract

This article constitutes the first application of the attitude network approach to peoples' views on inequality. We adopt a network model in which nodes represent survey variables and edges their conditional associations. This allows us to conceptualise perceptions, beliefs and judgments about inequality as a network of connected evaluative reactions. We analyse 2019 ISSP Social Inequality Module data from Chile, since this country is one of the most unequal in the world. Relying on a network approach, we provide a systematic analysis of the wide-ranging indicators measuring subjective inequality. Results show that conceptions regarding inequality, redistribution, taxation and wages form a unified belief system that is moderately connected and displays a small-world structure. In addition, we stratify the sample by education, household income and social class, obtaining six attitude networks. We compare the structures of these networks investigating differences in community membership, node centrality and network connectivity, evidencing that people in lower socioeconomic positions have a more multidimensional understanding of inequality. Our work contributes to social justice research by proposing an innovative conceptualization of these attitudes, and by providing evidence of their structural variation across different social status groups.

Keywords: attitudes towards inequality, social justice research, attitude networks, network analysis, Chile.

# 1 Introduction

Research on attitudes towards inequality has mainly been conducted, paradoxically, in developed countries with lower levels of disparities in the distribution of resources. However, in recent years a significant amount of academic work has focused on understanding how people address inequality within Latin America, one of the regions with highest inequality indexes in the world (Chancel et al., 2022). This literature has allowed us to understand the local particularities of the phenomenon and how various evidence in developed nations holds or not to the Latin American context. For instance, scholars highlighted a paradox according to which legitimation of inequality is stronger in more unequal countries [(Castillo, 2011)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=5619736767725445&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:43645f59-bc3b-48b3-a793-a551a57165bc) where people express higher support for meritocratic beliefs [(Mijs, 2019)](https://app.readcube.com/library/8841a519-4b57-4192-9afd-0d3b615bff40/all?uuid=9672999758477103&item_ids=8841a519-4b57-4192-9afd-0d3b615bff40:3bb0d41a-59ed-42d8-a80d-9438afbec138). In particular, Chile is one of the countries with the highest inequality and income concentration in Latin America (UNDP, 2023). This country is characterized by marked social segregation patterns (Bargsted et al., 2020), high mobility barriers between the elite and the rest of the population (Torche, 2005), and a liberal-productivist welfare regime, with strong divisions between state- and market-dependent citizens (Martínez Franzoni, 2008). These factors make Chile a relevant case study, calling for the investigation of how people understand inequality, since their support is required to maintain an unequal social order.

Attitudes towards inequality are a multidimensional concept comprising perceptions, beliefs, and judgments on the distribution of resources within a society [(Janmaat, 2013)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=6919719111130185&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:a5fe0957-21b3-4f66-991b-a1b55320ca5a). These topics have received copious empirical attention. Scholars have shown that these attitudes are socially patterned according to the individual position across the social structure (Lindh & McCall, 2020) and that these trends are moderated by intersubjective issues, such as personal social networks (Lindh et al., 2021). Moreover, subjective evaluations of redistribution, taxation, and wages, are essential to comprehend how people understand inequality. Indeed, beliefs about redistribution are closely related to people's perceptions of social disparities [(Choi, 2021; Fatke, 2018; García‐Sánchez et al., 2020)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=9375798723153361&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:2d93587f-9510-4e10-b201-fde8c4b1b3a7,0a3c846c-7570-4913-bd72-3afd46468081:9aab537e-96b0-4c30-9d67-7516a018194f,0a3c846c-7570-4913-bd72-3afd46468081:421437b9-406d-4b60-b96d-48904371aa9e), while preferences for taxation are linked to distributional concerns [(Alm & Torgler, 2006; Barnes, 2015; Franko et al., 2013)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=69504339673912&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:e1cf7dce-708e-4e17-a6bb-d392a6e4a512,0a3c846c-7570-4913-bd72-3afd46468081:388b5c1b-5698-4a4b-812f-405b41b205e2,0a3c846c-7570-4913-bd72-3afd46468081:79269b17-8860-441d-bb9e-2ad14c4a7142), and wage allocation constitute an important subfield in subjective inequality literature [(Castillo, 2009; Evans et al., 2010; Frank et al., 2015; Osberg & Smeeding, 2006)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=5062265773555624&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:82038a60-7e56-4476-bf1f-5e139deb9d12,0a3c846c-7570-4913-bd72-3afd46468081:f8444d46-f0f4-42a3-8bcc-c1bbe7c96906,0a3c846c-7570-4913-bd72-3afd46468081:f387503d-0e65-4ed0-991a-035ad167d616,0a3c846c-7570-4913-bd72-3afd46468081:67539644-af05-4052-92bc-bc84bfea1294).

However, social justice research currently has two shortcomings. First, there is a lack of a systematic examination of attitudes towards inequality, since these perceptions, beliefs, and judgments are usually not studied simultaneously [(Janmaat, 2013)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=6919719111130185&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:a5fe0957-21b3-4f66-991b-a1b55320ca5a). Second, these dimensions interact with each other and are co-determined [(Trump, 2023)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=2515132356430031&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:548f8074-084b-410b-816d-44ea49789c66), highlighting the necessity of studying them as part of an integrated belief system. Therefore, we provide the first contribution adopting an innovative network approach to the study of attitudes towards inequality. Within this framework, these attitudes are conceptualized and measured as a network of interacting evaluative reactions. Unlike in standard social network analysis, this approach renders survey variables as nodes and their conditional associations as edges.

This article is structured as follows. First, we present a theoretical framework for a systematic inquiry of attitudes towards inequality, and we discuss the evidence that the literature shows for the Chilean case. Then, we describe the theory underlying the attitude network approach. Second, we expose the research design and the network estimation methods adopted in this research. Third, we present results regarding the network of attitudes towards inequality at the population level, and we compare the attitude networks of individuals with different education, household income and social class. Finally, we discuss our results in light of the social justice and attitude network theories, stressing the limitations and contributions of our research.

# 2 Theory

## 2.1 Attitudes towards inequality

### 2.1.1. What are attitudes towards inequality? A theoretical framework

The empirical study of people’s attitudes towards inequality constitutes a broad field of research, developed by work in two main areas: principles justice research and rewards justice research (Wegener, 1999). The former seeks to understand the support towards general distributional norms, while the latter addresses individual evaluations on specific distributions [(Castillo, 2012)](https://app.readcube.com/library/72f7b9ef-f289-4244-a0ee-52ad6777d0e5/all?uuid=3561768532017363&item_ids=72f7b9ef-f289-4244-a0ee-52ad6777d0e5:dfc55849-b695-481e-bbf0-e0f0143940a6). However, the fact that both areas are closely related and that the indicators used by the literature are varied, makes it necessary to use a global framework to analyze and order the different aspects of how people understand inequality.

In this line, Janmaat’s operationalization [(2013)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=4724733487559969&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:a5fe0957-21b3-4f66-991b-a1b55320ca5a&options=%7B%22items%22%3A%7B%220a3c846c-7570-4913-bd72-3afd46468081%3Aa5fe0957-21b3-4f66-991b-a1b55320ca5a%22%3A%7B%22suppressAuthor%22%3Atrue%7D%7D%7D) is of great importance, as it highlights the multidimensionality of attitudes towards inequality, while systematising the scientific production on the topic. The author argues that views on inequality vary in their *conception* and in their *dimension.* Conceptions of inequality involve individual perceptions, beliefs, and judgments. Perceptions correspond to subjective estimations about existing social inequalities; beliefs refer to normative ideas about how people think inequality should be; judgments represent evaluations on thedesirability of a given distributional asset. Secondly, views on inequality are structured in two dimensions. In fact, attitudes towards inequality are either referred to the magnitude of inequality or to the moral principles that govern the distribution of resources in a society. Thus, this operationalization can be visualised as a typology with six cells, that are obtained by crossing the three types of conceptions and the two dimensions of the views on inequality (See Table 1[[1]](#footnote-1)).

These notions have been widely addressed in social justice literature, often using other nomenclatures. For example, what under Jaanmat's scheme is classified as perceptions on principles regarding inequality refer to what other authors label as *stratification beliefs* [(Kluegel & Smith, 1981)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=04375106187447264&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:7ef40926-f133-44c1-a745-d26fb8eb1d2a) or *inequality beliefs* [(Mijs, 2018)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=30555780139816635&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:57d7bb69-7f39-427c-8623-0f8e8cbbb790). Although the term “beliefs” is used, in reality they correspond to the determinants of inequality perceived by subjects, or explanations of inequality, traditionally differentiated between individualistic -factors linked to the individuals themselves, such as their hard work or education- and structuralist -societal determinants beyond individual control, such as race [(Kluegel & Smith, 1986)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=17032313512702424&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:5cc6cd8e-9784-4936-b989-e74ab81455d3). Likewise, Janmaat’s beliefs on principles are also known as *justice ideologies* [(Wegener & Liebig, 1995)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=8006039309727607&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:64f73899-78ec-422e-b47b-539b9670e30f). These include merit, need, equity or equality, among others principles [(Deutsch, 1975)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=04454265816106384&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:58670b37-6695-45f3-a2c7-64c950fb52df). Researchers usually divide them in two major areas: egalitarianism, which calls for an equal distribution of resources, and individualism, where it is preferred that the distribution be guided by individual performance [(Castillo, 2011)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=3858031672196338&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:43645f59-bc3b-48b3-a793-a551a57165bc).

### 2.1.2. Understanding attitudes towards inequality in Latin America and Chile

An important avenue of research on social justice focuses on identifying how individuals’ positions across the social structure are related to variations in their attitudes towards inequality (Evans et al., 1992; Kluegel & Smith, 1986). Relying on the importance of economic self-interest and a utility-oriented social actor [(Franko et al., 2013; Meltzer & Richard, 1981; Wegener & Liebig, 1995)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=5257263093877701&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:a8efa3d4-401b-4655-8e9e-b343941697e6,0a3c846c-7570-4913-bd72-3afd46468081:64f73899-78ec-422e-b47b-539b9670e30f,0a3c846c-7570-4913-bd72-3afd46468081:79269b17-8860-441d-bb9e-2ad14c4a7142), several studies evidenced attitudinal differences according to social status, based on measures such as education (Bobzien, 2020), income (Finseraas, 2009; Szirmai, 1986), and social class (Lindh & McCall, 2020). Among them, it was showed that higher socioeconomic positions are related to lower levels of perception of inequality [(Bobzien & Kalleitner, 2020; Evans et al., 1992; Evans & Kelley, 2017)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=7877589205907024&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:1df5fc7d-c219-4474-9bef-8f683cb55137,0a3c846c-7570-4913-bd72-3afd46468081:9297d250-e90d-4296-9925-17128c243ce4,0a3c846c-7570-4913-bd72-3afd46468081:d2a297e8-988d-46ab-bc51-15088fd4c4f4), a lower belief in public redistribution [(Franko et al., 2013)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=6831266329904127&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:79269b17-8860-441d-bb9e-2ad14c4a7142), and lower concerns towards the actual distribution of resources [(Hadler, 2005)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=2686909684203773&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:df71c568-b7b3-4b63-9890-002737dce3b5). Differences that would also be explained by status-related variations in the experiences of relative deprivation [(Edmiston, 2018)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=024485597711594642&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:585d621f-2b40-4a8d-8b91-e01bf236f334) and the availability of distributional information in social environments (Dawtry et al., 2015; Lindh et al., 2021; Mijs, 2018), among other mechanisms.

However, Latin America has positioned itself as a scenario that question the applicability and universality of the mainstream self-interest approach (Dion & Birchfield, 2010). Indeed, it has been found that unlike in European countries [(Schmidt-Catran, 2016)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=7443445448721774&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:4b427cf2-1f59-4193-bc61-e455047de368) in Latin America attitudes towards inequality are not primarily determined by the objective socioeconomic position of individuals (Berens, 2015; Bucca, 2016; Franetovic & Castillo, 2021). Scholars have highlighted the relevance of social affinity and political attitudes in the configuration of peoples’ attitudes towards inequality across the region. For instance, Borges (2022) showed that cultural diversity of Latin American countries decreases individuals’ agreement with redistribution. Franetovic & Castillo (2021), in addition, evidenced that income-based differences in support for redistribution emerges only in certain scenarios of inequality and economic development, while trust in the political system stands out as a more important determinant of it. This behavior within the region adds to a broad literature that destabilizes the direct link between social status positions and attitudes towards inequality, emphasizing the importance of cultural norms and normative values that go beyond mere self-interest (Etzioni, 1988; Feldman & Zaller, 1992).

In particular, Chile is a country with vast research on attitudes towards inequality. Its high levels of economic disparities and its inclusion in 1998 in the International Social Survey Program (ISSP) have promoted a significant amount of academic work in the field. In this regard, it has been seen that in Chile prevails a high perception of inequality, which is mostly expressed by individuals in positions of higher social status, especially in terms of education [(Castillo et al., 2012)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=29252465591923327&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:10305cb5-888d-4e51-876f-11cc0593f8c8). Also, people tend to hold egalitarian beliefs (Garretón & Cumsille, 2000; Méndez, 2016), coexisting simultaneously with individualistic values (Puga, 2010). These meritocratic orientations have been shown to be related to individuals' perception of inequality (Castillo et al., 2019) and a steady legitimization of wage inequalities throughout the last decades (Castillo, 2009, 2012). Interestingly, compared to other countries, Chile has one of the lowest rates of judgments of income distribution as fair (Moya et al., 2023), which differ by income and occupation, but not so much by educational level (Mac-Clure et al., 2019). The belief in public redistribution in Chile is among the highest in Latin America (Franetovic & Castillo, 2021) and have not been found to be explained by people's political party preferences [(Castillo et al., 2013)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=9696042503395136&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:5839deff-6753-41aa-b537-65e53c973424). In addition, most people critically judge the tax system [(Atria, 2022)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=9174087098437864&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:a0b5844b-739b-4db8-a978-68070bc52d00) and the perception of tax regressivity and the agreement with tax progressivity are positively associated with the perception of inequality and the belief in public redistribution [(Castillo & Olivos, 2014)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=1489557818592302&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:058f8dc0-59d9-4642-b32a-847339849372). However, most of these valuable contributions have focused on identifying trends and predictors. To date, no effort has incorporated a holistic approach, capable of understanding how the wide range of attitudes towards inequality are related to each other in Chile and how these structures differ according to the position of individuals on the social ladder.

## 2.2 Attitudes networks

As anticipated above, attitudes towards inequality are usually measured through perceptions, beliefs, and judgments about the magnitude and principles of inequality [(Janmaat, 2013)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=0550601070114457&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:a5fe0957-21b3-4f66-991b-a1b55320ca5a). However, researchers tend to study these components unsystematically, and in isolation. To overcome this limitation, we propose to study attitudes towards inequality through the lens of the Causal Attitude Network [CAN] model [(Dalege et al., 2016)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=7750609497223262&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:a2c9eb4c-32c5-4fe3-9d5b-27c5022c4699). In this framework, attitudes are conceptualized and measured as networks of interacting evaluative reactions. These lower-order reactions are the individual survey items, thus the set of perceptions, beliefs, and judgments about inequality. These are graphically represented as nodes forming a network whose weighted, undirected edges can be estimated from real data [(Dalege et al., 2017)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=10305090434413755&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:5b2491db-b30c-4f58-ab39-c2c7471d3c9c). In this paper, these edges are interpretable as regularised partial correlations between survey items (see Methods section). Importantly, this approach qualifies between-item correlations as indicative of direct causal influence between the components of attitudes towards inequality. This constitutes the main difference between the CAN and latent variable measurement approaches, as the latter assumes that between-item correlations are spurious, being caused by an antecedent, unobservable variable [(Dalege et al., 2018)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=05727287349164689&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:12564573-44ed-454b-a58b-80c7e2932eec).

This work shows that this innovative framework can improve our understanding of the *structure* of attitudes towards inequality in Chile, cumulating on the past research which focused on their *levels* instead. To do so, the remainder of this Section discusses our research hypotheses. Social justice research has shown that attitudes towards inequality are empirically related to the ones towards redistribution [(Choi, 2021; Fatke, 2018; García‐Sánchez et al., 2020)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=9375798723153361&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:2d93587f-9510-4e10-b201-fde8c4b1b3a7,0a3c846c-7570-4913-bd72-3afd46468081:9aab537e-96b0-4c30-9d67-7516a018194f,0a3c846c-7570-4913-bd72-3afd46468081:421437b9-406d-4b60-b96d-48904371aa9e), taxation [(Alm & Torgler, 2006; Barnes, 2015; Franko et al., 2013)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=69504339673912&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:e1cf7dce-708e-4e17-a6bb-d392a6e4a512,0a3c846c-7570-4913-bd72-3afd46468081:388b5c1b-5698-4a4b-812f-405b41b205e2,0a3c846c-7570-4913-bd72-3afd46468081:79269b17-8860-441d-bb9e-2ad14c4a7142), and wages [(Castillo, 2009; Evans et al., 2010; Frank et al., 2015; Osberg & Smeeding, 2006)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=5062265773555624&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:82038a60-7e56-4476-bf1f-5e139deb9d12,0a3c846c-7570-4913-bd72-3afd46468081:f8444d46-f0f4-42a3-8bcc-c1bbe7c96906,0a3c846c-7570-4913-bd72-3afd46468081:f387503d-0e65-4ed0-991a-035ad167d616,0a3c846c-7570-4913-bd72-3afd46468081:67539644-af05-4052-92bc-bc84bfea1294). Since people understand inequality through perceptions, beliefs, and judgments about these topics, we hypothesize that :

*H1:* People’s evaluative reactions towards inequality, redistribution, taxation, and wages will form a fully connected attitude network in Chile.

In the Results section, we will focus on the structural characteristic of the attitudes towards inequality network. We will report on the centrality of its nodes, and on its connectivity. This is rooted in previous research adopting a network approach to the study of other sociopolitical attitudes. Indeed, scholars exploited the CAN model to retrieve the structure of attitudes towards post-national citizenship (Schlicht-Schmälzle et al., 2018), job satisfaction (Carter et al., 2020), preventive behaviors against COVID-19 (Chambon et al., 2022), and bio-based plastic (Zwicker et al., 2020). Among these contributions, those which examined node centrality showed that the most relevant nodes in the attitude network are important predictors of attitude change [(Carter et al., 2020; Chambon et al., 2022; Zwicker et al., 2020)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=4348723439876657&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:cbee107f-f476-44cf-ac6c-c76e7fb5ee99,c61b91da-fa6e-4348-80b6-c2428280b16a:d318829d-ff0c-465e-bc63-02415fe27799,c61b91da-fa6e-4348-80b6-c2428280b16a:8c732dff-5588-4161-b313-520864427349), since change in the status of central -rather than peripheral nodes- trigger larger readjustment processes [(Dalege et al., 2017; Schlicht-Schmälzle et al., 2018)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=8869693220076843&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:5b2491db-b30c-4f58-ab39-c2c7471d3c9c,c61b91da-fa6e-4348-80b6-c2428280b16a:6a9141c6-6628-4444-8af4-2a3e13440629). Therefore, this paper will investigate the centrality metric. Additionally, researchers who focused on the cohesiveness of attitude networks showed that their connectivity predicts attitude strength [(Dalege et al., 2019)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=6044635386436841&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:362898b1-8cf2-4cf7-a649-7ab58198bce5). Indeed, an attitude network is highly connected when respondents express coherent answers to the selected survey items, and internally coherent attitudes are also associated with attitude networks that are stable over time (ibid.). Therefore, this paper investigates the cohesion of the attitude network. As specified in Section 3.3, testing H1 requires the estimation of the attitude network at the population level. Yet, it is possible that estimating CAN on the full sample will hide the heterogeneity characterizing different social status groups. Indeed, scholars have shown that the levels of attitudes towards inequality vary across different conditions of income, education and social class (Bobzien, 2020; Franko et al., 2013; Lindh & McCall, 2020). Yet, whether differences in levels are mirrored in differences in structure is still unclear, since no research has examined this topic until now. Therefore, we investigate the two structural features of attitude networks forecasting that:

*H2:* Structural differences in centrality and connectivity will emerge between the attitude towards inequality networks of low and high social status groups in Chile

Finally, we want to investigate the dimensionality of attitudes towards inequality in Chile. This will give important insights into the associations existing between the selected evaluative reactions. The study of the dimensionality of these attitudes is not new to the social justice literature, where researchers tend to aggregate variables that tap into the same dimension into mean indices [(e.g. Kluegel & Smith, 1986)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=12405919009234356&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:5cc6cd8e-9784-4936-b989-e74ab81455d3&options=%7B%22items%22%3A%7B%220a3c846c-7570-4913-bd72-3afd46468081%3A5cc6cd8e-9784-4936-b989-e74ab81455d3%22%3A%7B%22prefix%22%3A%22e.g.%22%7D%7D%7D), conforming at least implicitly to a latent variable measurement approach. There are two critical flaws in the traditional factor analytic strategy. First, with this operationalization the relationships among indicators of the same dimensions are canceled out, flattening the multidimensionality of the concept. Second, analyses performed on the full sample neglect the population heterogeneity mentioned above. To avoid the first shortcoming, we will perform Exploratory Graph Analysis [EGA] [(H. F. Golino et al., 2017)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=2137697942083273&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:c44c186e-58c2-421b-947c-788ff1d19e21). EGA is a dimensionality assessment technique consisting of two steps. First, EGA estimates a partial correlation network from survey data. Second, it applies a community detection algorithm, and the number of clusters in the network is equated with the number of underlying dimensions of the construct (see Method section). To avoid the second shortcoming, we will fit EGA into subsamples with different social status conditions. This will give us the opportunity to investigate differences in the dimensionality of attitudes towards inequality. Interestingly, assessing the dimensionality of a set of attitudes in different subgroups is a research design that is often adopted in cross-national research (*e.g.*: Durvasula; Davidov), and that -to the best of our knowledge- was never applied in a single country, comparing individuals with different social status. However, considering that peoples’ attitudes towards inequality are shaped by the distributional information available in their social environments (Dawtry et al., 2015; Lindh et al., 2021; Mijs, 2018) and that Chile is characterized by high social segregation and mobility barriers particularly between higher status individuals and the rest of the population (Torche, 2005), we expect that low status groups will understand inequality in a more multidimensional way. Thus, we hypothesize that:

*H3:* The networks of attitudes towards inequality of people belonging to low social status groups in Chile will present more dimensions than those of high-status.

# 3 Methods

## 3.1 Data

We use data from the ISSP 2019 – Social Inequality V module [(ISSP Research Group, 2022)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=4957971161410403&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:55247836-2119-4954-9b7e-8624e750a156). This survey includes questions measuring perceptions, beliefs, and judgments about magnitude and principles regarding inequality and related topics, such as redistribution, taxation and wages. The data is representative of the Chilean population aged 18 years or older. Listwise deletion reduces the original sample from 1,347 to 1,040 individuals.

## 3.2 Variables

## Table 1 shows the list of selected variables and their collocation in Janmaat’s typology, whereas Table 2 reports the survey questions and their descriptive statistics. The analyses feature two perceptions about the magnitude of inequality (ineq\_p) and progressive taxation (reg\_p). Moreover, we include an item measuring respondents’ normative beliefs on the magnitude of the appropriate tax progressivity levels (prog\_b). Finally, we include three variables addressing judgments on the size of existing inequality (ineq\_j), political failure in redistribution (redis\_f), and political disinterest in implementing redistributive policies (redis\_d). We also analyse principles about inequality. We use ten variables tapping respondents’ perceptions of the principles that explain inequality in Chile (family-sex). We further include two variables regarding public and private redistribution (redis\_p, redis\_m), and four concerning beliefs on criteria that should determine pay allocation (resp-merit).

**Table 1: Selected variables and their collocation in Janmaat’s typology**

|  |  |  |
| --- | --- | --- |
|  | **Magnitude** | **Principles** |
| **Perceptions** | 1. Perception of large income inequality (*ineq\_p*) 2. Perception of tax regressivity (*reg\_p*) | 1. Importance of wealthy family (*family*) 2. Importance of parental education (*edupar*) 3. Importance of education (*edu*) 4. Importance of hard work (*work*) 5. Importance of knowing right people (*people*) 6. Importance of political connections (*connec*) 7. Importance of giving bribes (*bribes*) 8. Importance of race (*race*) 9. Importance of religion (*relig*) 10. Importance of sex (*sex*) |
| **Beliefs** | 1. Belief in progressive taxation (*prog\_b*) | 1. Belief in public redistribution (*redis\_p*) 2. Belief in market redistribution (*redis\_m*) 3. Pay criteria: Responsibility (*resp*) 4. Pay criteria: Training (*train*) 5. Pay criteria: Need (*need*) 6. Pay criteria: Merit (*merit*) |
| **Judgments** | 1. Judgment of unfair distribution (*ineq\_j*) 2. Judgment of political disinterest in redistribution (*redis\_d*) 3. Judgment of failure of public redistribution (*redis\_f*) |  |

Variable names in parentheses.

**Table 2: Selected variables and their descriptive statistics**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Question** | **n** | **Mean** | **SD** | **Min** | **Max** |
| ineq\_p | To what extent do you agree or disagree with the following statement: Differences in income in Chile are too large. \* | 1,040 | 4.119 | 0.935 | 1 | 5 |
| reg\_p | Generally, how would you describe taxes in Chile today for those with high incomes? | 1,040 | 3.453 | 1.077 | 1 | 5 |
| prog\_b | Do you think people with high incomes should pay a larger share of their income in taxes than those with low incomes, the same share, or a smaller share? \* | 1,040 | 3.927 | 0.884 | 1 | 5 |
| ineq\_j | How fair or unfair do you think the income distribution is in Chile? | 1,040 | 3.259 | 0.679 | 1 | 4 |
| redis\_d | Most politicians in Chile do not care about reducing the differences in income between people with high incomes and people with low incomes. \* | 1,040 | 3.902 | 1.014 | 1 | 5 |
| redis\_f | How successful do you think the government in Chile is nowadays in reducing the differences in income between people with high incomes and people with low incomes? | 1,040 | 3.446 | 1.255 | 1 | 5 |
| family | How important is coming from a wealthy family for getting ahead in life? \* | 1,040 | 2.792 | 1.135 | 1 | 5 |
| edupar | How important is having well-educated parents for getting ahead in life? \* | 1,040 | 3.213 | 1.074 | 1 | 5 |
| edu | How important is having a good education yourself for getting ahead in life? \* | 1,040 | 3.833 | 0.883 | 1 | 5 |
| work | How important is hard work for getting ahead in life? \* | 1,040 | 3.837 | 0.974 | 1 | 5 |
| people | How important is knowing the right people for getting ahead in life? \* | 1,040 | 3.438 | 0.977 | 1 | 5 |
| connec | How important is having political connections for getting ahead in life? \* | 1,040 | 2.441 | 1.197 | 1 | 5 |
| bribes | How important is giving bribes for getting ahead in life? \* | 1,040 | 1.838 | 1.031 | 1 | 5 |
| race | How important is a person’s race for getting ahead in life? \* | 1,040 | 2.033 | 1.116 | 1 | 5 |
| relig | How important is a person’s religion for getting ahead in life? \* | 1,040 | 1.887 | 1.047 | 1 | 5 |
| sex | How important is being born a man or a woman for getting ahead in life? \* | 1,040 | 1.982 | 1.082 | 1 | 5 |
| redis\_p | It is the responsibility of the government to reduce the differences in income between people with high incomes and those with low incomes. \* | 1,040 | 3.963 | 0.902 | 1 | 5 |
| redis\_m | It is the responsibility of private companies to reduce the differences in pay between their employees with high pay and those with low pay. \* | 1,040 | 3.773 | 0.909 | 1 | 5 |
| resp | How much responsibility goes with the job – how important do you think that ought to be in deciding pay? \* | 1,040 | 3.984 | 0.772 | 1 | 5 |
| train | The number of years spent in education and training. – how important do you think that ought to be in deciding pay? \* | 1,040 | 3.857 | 0.811 | 1 | 5 |
| need | Whether the person has children to support – how important do you think that ought to be in deciding pay? \* | 1,040 | 3.534 | 0.892 | 1 | 5 |
| merit | How well he or she does the job – how important do you think that ought to be in deciding pay? \* | 1,040 | 3.998 | 0.743 | 1 | 5 |

The original polarity of the variables marked with an asterisk was inverted. Higher values for each variable indicate higher magnitudes (e.g., high perception of inequality) or agreement on the importance of a principle (e.g., high importance of coming from a wealthy family for getting ahead in life).

## 3.3 Network methods

This paper is structured in two parts. In the first part of the article, we estimate the network of attitudes towards inequality from Chilean ISSP data. Since most of the selected variables are measured with a 1 to 5 scale, we select the Gaussian Graphical Model [GGM] as our network estimation tool [(Epskamp, Waldorp, et al., 2018)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=864469152981495&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:186fe824-a832-409a-ba25-0d8aa0ee2418). As anticipated above, this method translates the selected survey variables into network nodes and estimates their connections from the data. GGMs are a subclass of Pairwise Markov Random Fields [PMRF] [(Lauritzen, 1996)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=7797133527185797&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:fb3960ee-605d-45a9-b0dd-d6bde7ff7db8). Edges of a PMRF are weighted and undirected. Indeed, the edges of a GGM are interpretable as partial correlations [(Epskamp, Waldorp, et al., 2018)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=7348855248403767&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:186fe824-a832-409a-ba25-0d8aa0ee2418), which are the correlation existing between each pair of network nodes, while controlling for each other variables in the model [(Epskamp & Fried, 2018)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=849925129384999&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:cad7131b-461c-4220-9306-fc87f3c17b11). The GGM also applies regularisation for edge estimation, in order to reduce the risk of including spurious edges in the model, increasing model parsimony and enhancing the interpretability of the network plot [(Borsboom et al., 2021)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=39834875817245774&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:77902d13-3eed-470a-a4fc-1d0e839ca6bb). A common way to apply regularisation for network models is the combination of the graphical LASSO with the Extended Bayesian Information Criteria [EBIC] [(Epskamp, Waldorp, et al., 2018)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=30525300913212905&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:186fe824-a832-409a-ba25-0d8aa0ee2418). The graphical LASSO is an efficient and well-known regularisation technique inducing sparsity in the network matrix by suppressing weak edges to exactly zero [(Friedman et al., 2008)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=1775512692080482&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:550aa465-5f0f-4470-a077-401b8c815afe). The graphical LASSO relies on a tuning parameter, which directly regulates the level of edge shrinkage [(Epskamp, Waldorp, et al., 2018)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=9192213999687137&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:186fe824-a832-409a-ba25-0d8aa0ee2418). To find its optimal value, researchers usually rely on the minimization of the EBIC [(Chen & Chen, 2008)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=2480883739724158&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:a4a20871-770b-4cbb-ba37-8545687a2fc8). This strategy has been shown to perform well in retrieving the network structure of variables surveyed in moderated-sized samples [(Foygel & Drton, 2010)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=851535391795713&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:7e9f389c-5340-492d-a5e2-3ff0bb120d9e).

Network estimation will retrieve the between-person structure of this attitude network in Chile, allowing us to test H1, which will be confirmed if all evaluative reactions will form a fully connected network. Importantly, this first part gives us insights into how perceptions, beliefs, and judgments about inequality relate *at the population level*. Within the first part of the research, we are forced to assume that between-items associations are similar across individuals, as cross-sectional data impedes the estimation of a personalized attitude network [(Borsboom et al., 2021)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=3419544903511311&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:77902d13-3eed-470a-a4fc-1d0e839ca6bb). This is a stringent assumption we want to relax through the second part of the research design, where we investigate differences between attitude networks of different population segments. More precisely, since social status has been shown to influence attitudes towards inequality (See Theory section), we want to explore the differences in the structures of the attitude networks of people with different education, household income, and objective social class.

The second part of the article investigates structural differences in the attitude networks of different population strata. Hence, we split the original sample according to the median values of three socioeconomic measures. First, we build a sample with low (versus high) education. We set the threshold at eleven years of education, differentiating between incomplete secondary or less (N=373), and complete secondary or more (N=660). We repeat the same process for household income setting the splitting thresholds at 448,000 CLP per month. We obtain two samples of 334 and 332 individuals. Finally, we compare manual (N=385) and non-manual workers (N=381). After this procedure, we obtain six samples on which we re-apply the GGM-based network estimation exposed in the previous paragraph. This gives us six different attitude networks, which we will statistically compare to investigate how low and high-status individuals understand inequality in Chile. To investigate their structural differences we undertake two routes, studying node centrality and network connectivity (H2). First, we perform a Network Comparison Test [(Borkulo et al., 2022)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=25935863814607596&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:6cdbeb0a-44c2-4e66-9bf5-1a1dd28578d7) to isolate statistical differences in the Strength centrality values of the same nodes across different attitude networks. This will allow us to observe variations in the importance of single evaluative reactions within the six attitudes networks. The prominence of a node in a network is usually captured through the centrality metric [(Borsboom et al., 2021)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=1072153559325204&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:77902d13-3eed-470a-a4fc-1d0e839ca6bb). Research has shown that the most suitable measure for studying attitude networks is Strength centrality [(Bringmann et al., 2019; Dablander & Hinne, 2019)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=8114781050958585&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:691c37aa-f093-419e-8e63-8282f1e41cb8,c61b91da-fa6e-4348-80b6-c2428280b16a:51ed21cc-a44d-4599-a03e-e56caf0146ea). Strength is the generalization of Degree centrality for weighted networks, and is calculated by summing the absolute value of all edge weights with which a node is involved [(Opsahl et al., 2010)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=7688387125846118&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:f31b5001-2e73-49ee-9a91-383651b2a48e). Since the edges of an attitude network represent the associations existing between the selected items, Strength centrality operationalizes the influence that each node is expected to exercise on each other. Second, we compare network connectivity to observe whether evaluative reactions are associated with the same intensity when stratifying the sample. To do so we calculate the Weighted Average Shortest Path Length [ASPL] of the six attitude networks [(Opsahl et al., 2010)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=6468295483749602&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:f31b5001-2e73-49ee-9a91-383651b2a48e).

Finally, we observe variations at the community level, hence investigating if people belonging to lower socioeconomic groups have a more multidimensional understanding of attitudes towards inequality (H3). To observe these variations, we apply EGA to the six attitude networks, comparing the number of dimensions retrieved in low versus high-status samples. EGA applies the Walktrap community detection algorithm [(Pons & Latapy, 2005)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=1125428550742098&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:347321e6-c9f6-4f3e-8787-a8337843c5e0) to the GGM network. Finally, exploiting the “fundamental rule of network psychometrics” [(H. F. Golino et al., 2017)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=20619109603165808&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:c44c186e-58c2-421b-947c-788ff1d19e21), the number of detected network clusters is equated to the number of dimensions underlying the construct of attitudes towards inequality [(Christensen & Golino, 2021a, 2021b; H. Golino et al., 2020)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=1433391247500294&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:beaa49c8-6603-48e3-8da0-cca3fd1409e2,c61b91da-fa6e-4348-80b6-c2428280b16a:0d9f414f-85ed-4098-861a-8ea098347d45,c61b91da-fa6e-4348-80b6-c2428280b16a:574a0554-d381-4420-a643-6c3e698d1d13). Simulation studies have shown that EGA performs equal to or better than other factor analytic techniques in this regard [(H. Golino et al., 2020)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=28754249195863624&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:beaa49c8-6603-48e3-8da0-cca3fd1409e2).

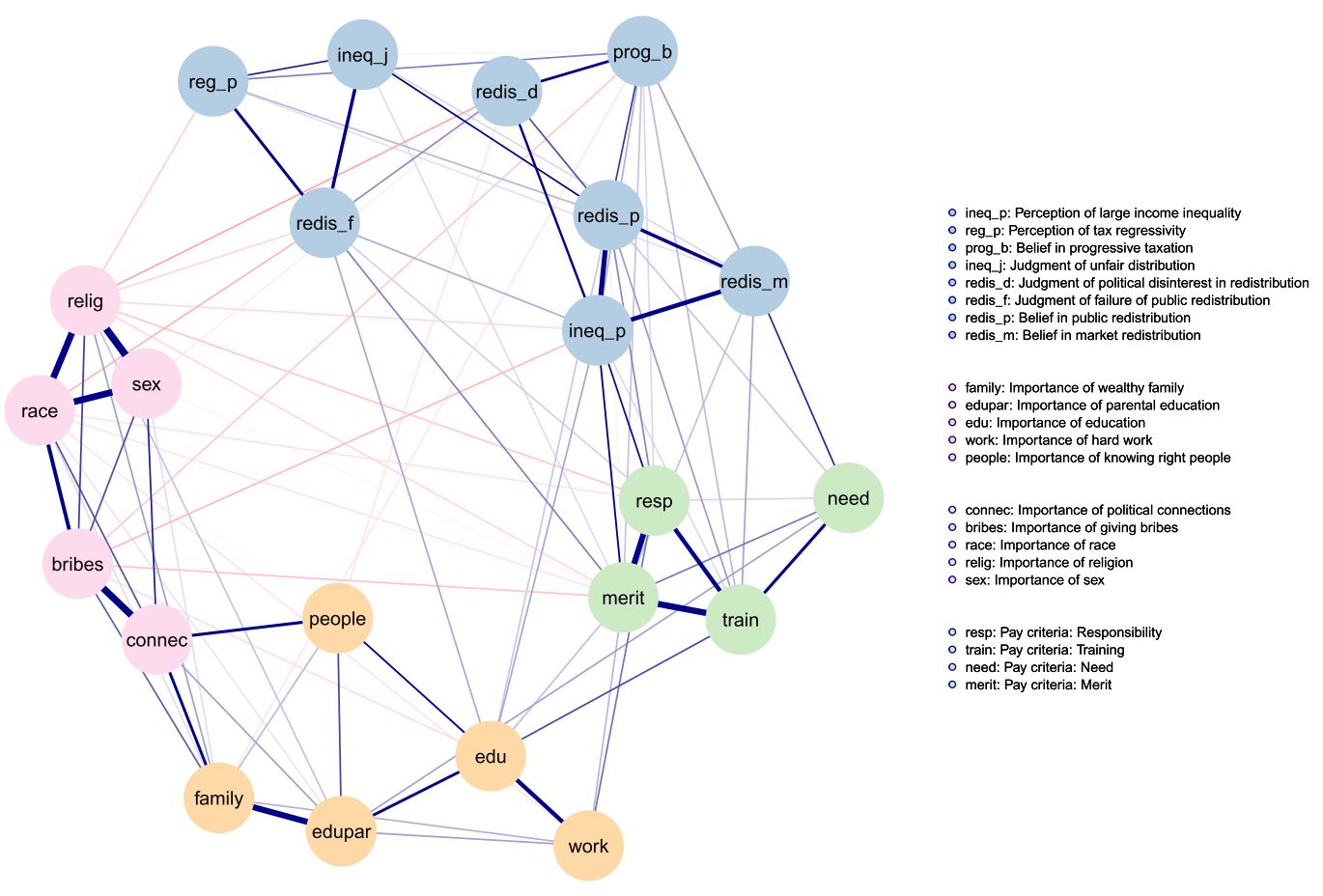
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# 4 Results

## 4.1 Network of attitudes towards inequality

Figure 1 shows the network of attitudes towards inequality in Chile. Network nodes represent the selected ISSP survey variables. Network edges represent positive (blue) and negative (red) linear relationships that are estimated from the data. Edge width is indicative of the strength of each association. Nodes are coloured according to community membership. Confirming H1, the 22 evaluative reactions form a fully connected network, with no isolated nodes. This means that all the perceptions, beliefs and judgments about magnitudes and principles concerning inequality, redistribution, taxation and wages are part of a unified belief system in the Chilean population.

**Figure 1: Network of attitudes towards inequality in Chile**



Nodes represent the 22 evaluative reactions. An edge is drawn when two variables are correlated, after having controlled for the others. The absence of an edge between two variables means that they are conditionally independent instead. Blue (red) edges represent positive (negative) associations; thicker edges represent stronger relationships. The colour of the nodes corresponds to the detected communities in the network.

EGA shows that attitudes towards inequality in Chile are grouped into four communities. The first and largest of all, in blue, concentrates all the perceptions, beliefs and judgments regarding the magnitude of inequality. In fact, it gathers the perceptions of large income inequality (*ineq\_p*) and tax regressivity (*reg\_p*), the belief in progressive taxation (*prog\_b*), and the judgments about unfair distribution (*ineq\_j*), political disinterest in redistribution (*redis\_d*), and failure of public redistribution (*redis\_f*). Additionally, this cluster is composed of two beliefs on principles concerning public (*redis\_p*) and market redistribution (*redis\_m*).

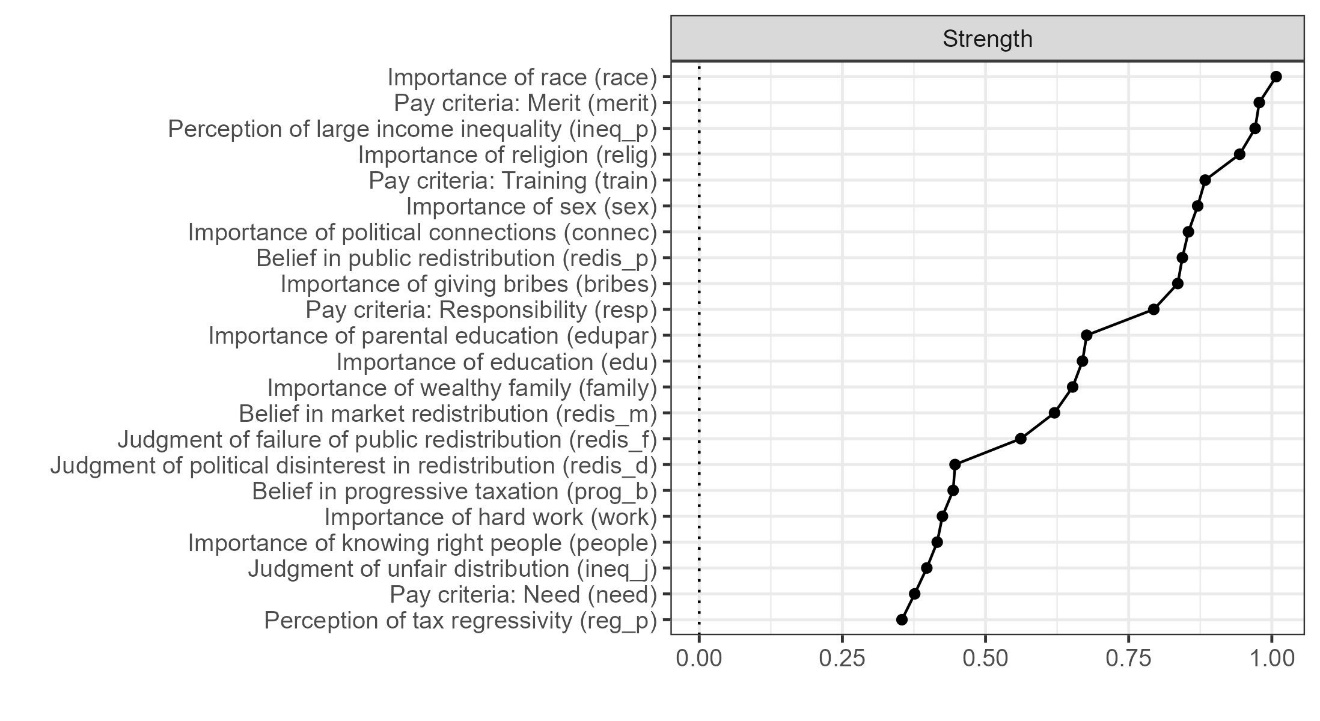
The remaining three communities deal exclusively with conceptions regarding principles about inequality. The pink cluster brings together structuralist explanations of inequality. It includes the perceived importance of the role played by people's race (*race*), sex (*sex*), religion (*relig*), bribes (*bribes*) and political connections (*connec*) in shaping inequalities. The orange one, reunites individualistic explanations, associated with individual or family actions: the importance of hard work (*work*), education (*edu*), parental education (*edupar*), coming from a wealthy family (*family*) and knowing the right people (*people*). The last and smallest community, in green, includes the totality of beliefs about the principles that should determine people's wages: responsibility (*resp*), training (*train*), need (*need*) and merit (*merit*).

This community structure reveals that the attitude network has high clustering, meaning that evaluative reactions tend to gather in enclosed communities, and to interact mainly with neighbouring variables. Moreover, this attitude network also has moderate connectivity (Weighted ASPL = 26.903). These features are usually associated with a small-world network. When compared to a random network, small-world structures are characterised by greater or equal values of connectivity, and by higher clustering coefficients [(Watts & Strogatz, 1998)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=47931186881145893&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:7a99534d-1a13-4396-a198-0e335690a73e). We investigate the small-worldness of the attitude network with a formal test that compares its connectivity and its clustering with those of a simulated random network having the same size (Humphries & Gurney, 2008). The test reveals a small-world index of 1.254, which is compatible with a small-world structure.

Most of the relationships between nodes are positive. Although there are negative associations, represented by red links, these tend to be of lower intensity if compared to the positive ones. The associations between the nodes *relig* and *sex* (edge weight = 0.36), *connec* and *bribes* (0.34), *race* and *sex* (0.33) stand out as the strongest edges. All these links correspond to intra-community associations, i.e., occurring between nodes belonging to the same cluster. However, there are weaker associations that have the particularity of bridging different communities together. Among these inter-community links, the associations of *connec* with the nodes *family* (0.16) and *people* (0.16) stand out, connecting the communities of individualistic and structuralist explanations. In addition, the communities gathering conceptions on magnitude of inequality (blue) and the one featuring principles on pay criteria (green) are mostly linked by the associations *ineq\_p*-*merit* (0.10)*, ineq\_p-resp* (0.10)*, and redis\_m*-*need* (0.08).

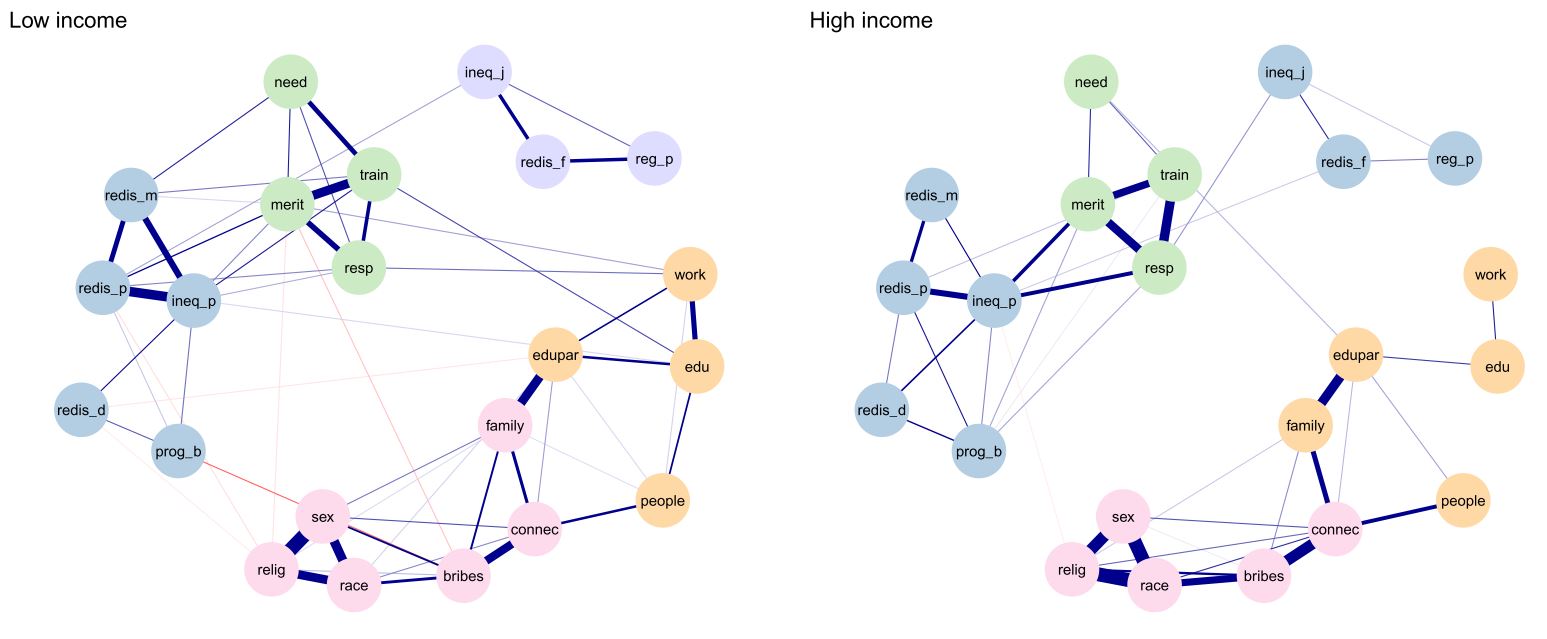
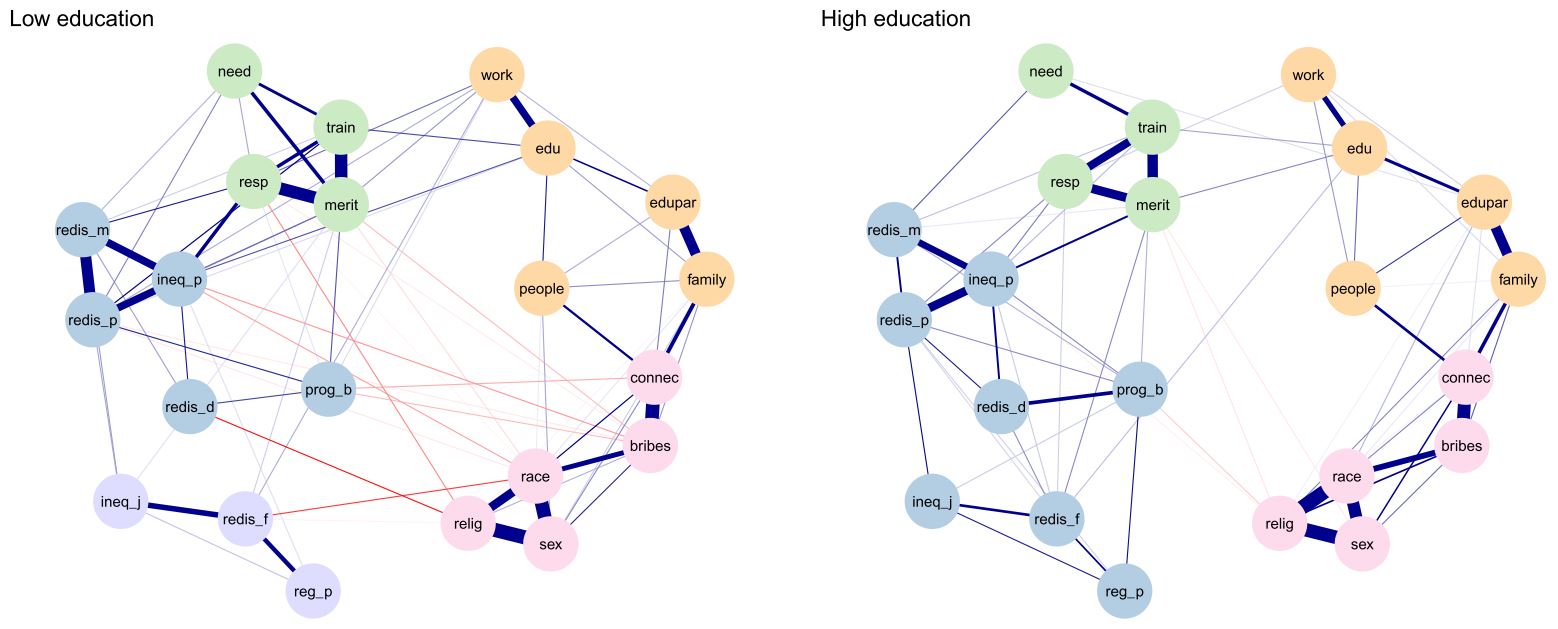
Finally, we investigate the relative importance of each node in the network structure. This can be seen more clearly in Figure 2, which reports the Strength centrality for all the nodes in the network. The nodes *race*, *merit*, *ineq\_p* and *relig* are those with the highest centrality. In the case of *race* and *relig*, this is explained by their triadic interaction with the node *sex*. The same occurs with *merit*, given the relevant links between *merit, resp* and *train*. In the case of *ineq\_p*, a different phenomenon occurs, since its centrality is due to the multiplicity of its associations: of high intensity with nodes of its own community and of medium entity with variables of other communities. On the contrary, *reg\_p, need, ineq\_j* and *people* are the nodes with the lowest centrality in the network.

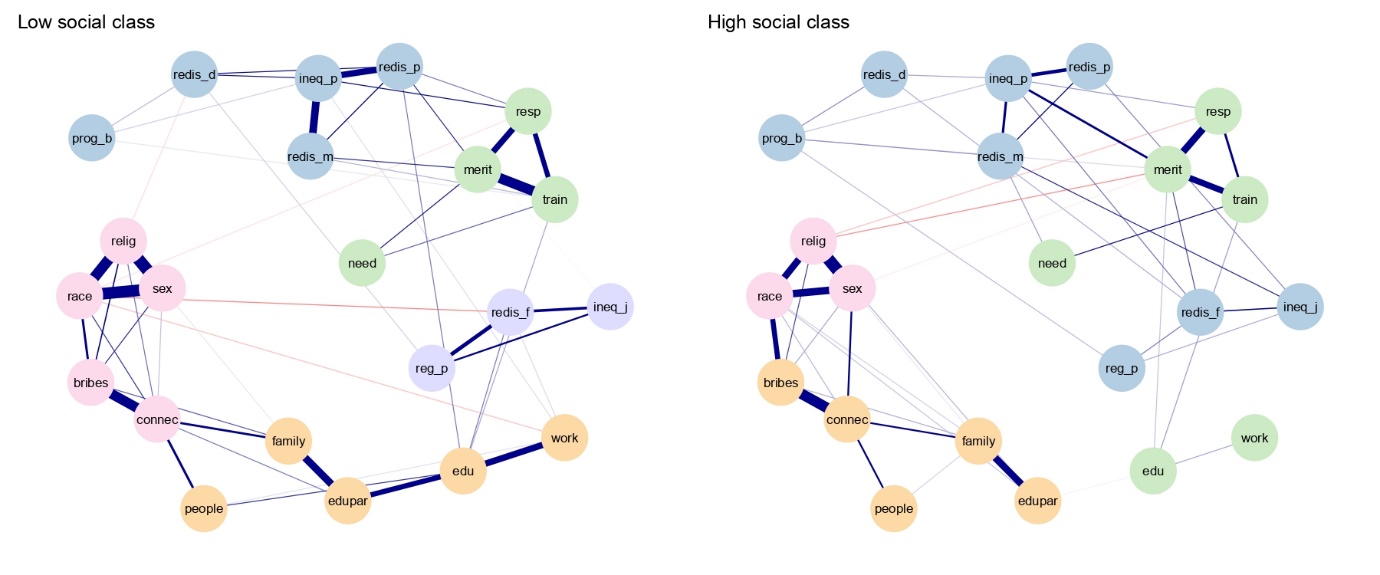
**Figure 2: Strength centrality of network nodes**



## 

## 4.2 Comparing attitude networks across socioeconomic variables

**Figure 3: Networks of attitudes towards inequality across socioeconomic variables**

Six networks of attitudes towards inequality estimated on six samples obtained splitting the original one by education, household income, and social class. The layout of each pair of attitude networks is obtained by averaging those of low and high-status samples.

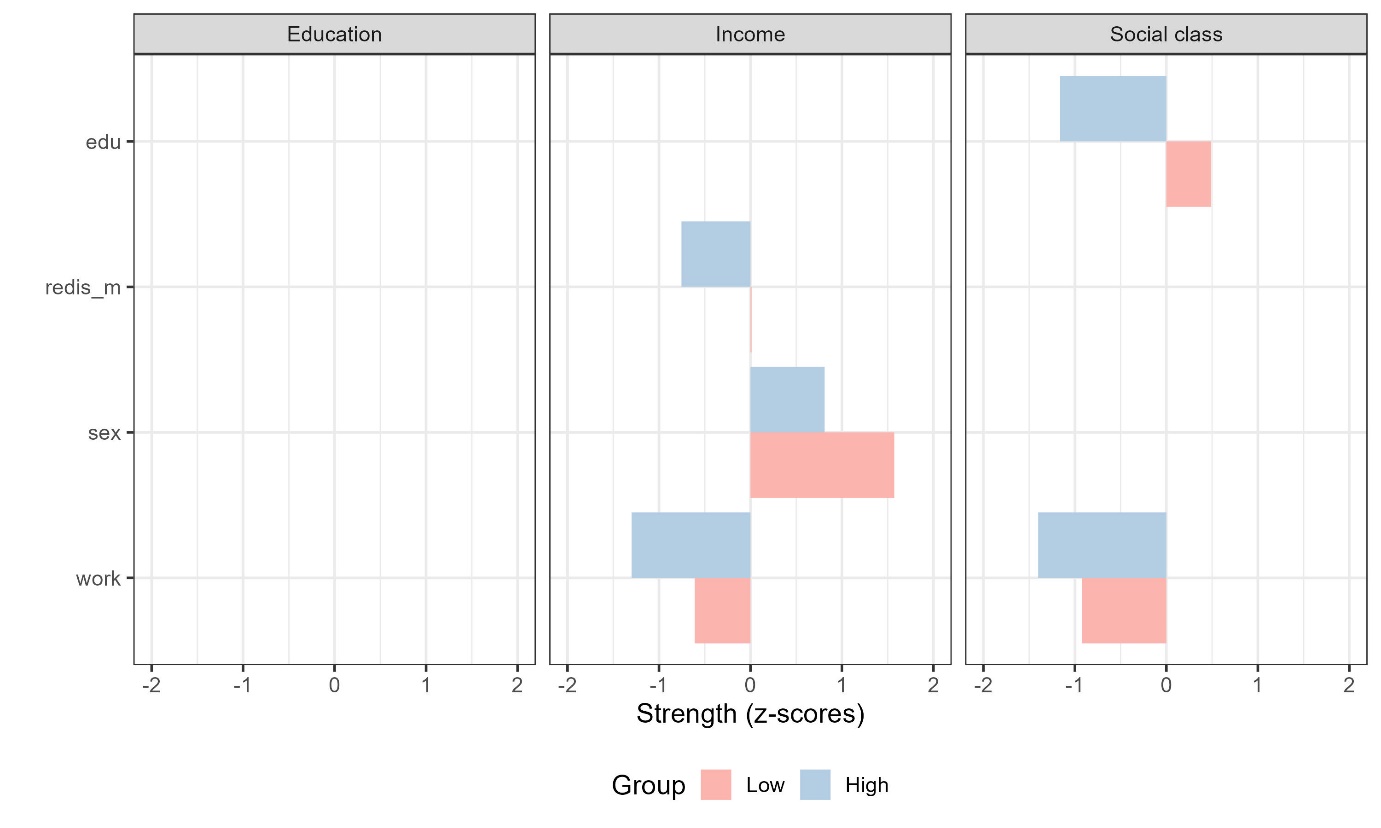
This section presents results regarding differences between attitudes networks estimated on stratified samples. More specifically, we split the original data along three socioeconomic measures: education, household income and social class. As these variables can influence the levels of attitudes towards inequality, we expect to find structural network differences in terms of node centrality and connectivity (H2), as well as in the number of their communities (H3).

Figure 3 plots the result of six network estimations. All networks are fully connected. This further supports H1, since regardless of their socioeconomic conditions, Chileans organize their attitudes towards inequality in a single belief system. The figure highlights an important pattern regarding the dimensionality of the attitudes in question. Indeed, EGA indicates that the attitude networks of people with lower social status are systematically characterised by a greater number of network communities, thus, a more multidimensional comprehension of inequality. This confirms H3, as the attitude networks of people with low and high education show five and four clusters respectively (top panel of Figure 3). In the attitude network of the low education sample, the perception of tax regressivity (*reg\_p*) with the judgments of unfair distribution (*ineq\_j*) and failure of public redistribution (*redis\_f*) form a new violet cluster, gathering critical evaluations of the magnitude of Chilean inequalities. In the highly educated sample, these variables are instead part of the blue cluster. This is due to a combination of two factors. First, the partial correlations between these three items are stronger in the lower education sample. Second, in the attitude network of the most educated, these three nodes vigorously interact with the blue cluster, whereas in those of the less educated nodes of these communities weakly interact.

The pattern repeats for the income samples, where we find two attitude networks with five and four clusters. Here the main difference also lies in the membership of the nodes *ineq\_j*, *redis\_f*, and *reg\_p*. In the sample with low household income, these variables are more strongly correlated. Moreover, their judgment about the failure of public redistribution, and their perception about tax regressivity are almost uncorrelated with the other variables in the network. Indeed, the node *ineq\_j* bridges between the violet cluster and the rest of the network. More precisely, the judgment of unfair distribution (*ineq\_j*) is positively correlated with the belief in public redistribution (*redis\_p*) in the low-income sample. The structure of the attitude network of the high-income sample differs in that these three items are only loosely correlated, and in that the judgment about the failure of public redistribution (*redis\_f)* is positively correlated with the perception of large income inequality (*ineq\_p*).

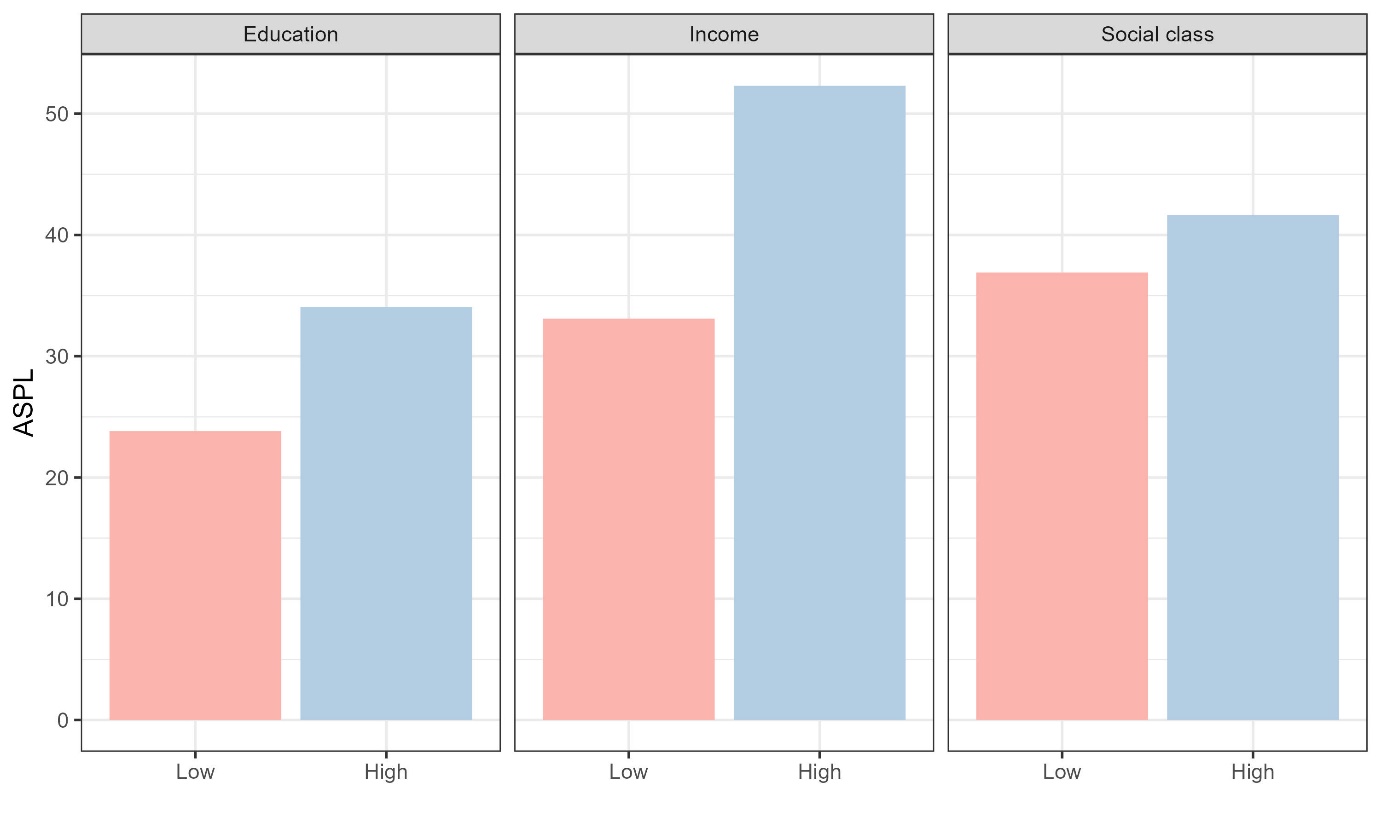
Finally, the attitude network of manual workers displays five clusters, whereas that of the non-manual sample shows four communities. These are the networks differing the most in their community structure, as the composition of each cluster is different. In the lower-class sample, the blue cluster features five variables, since judgment of unfair distribution (*ineq\_j*), those about the failure of public redistribution (*redis\_f*), and the perception of tax regressivity (*reg\_p*) form a separate cluster, the violet one. This mirrors the community structure of the attitude networks estimated on the low and high education samples. Indeed, among the people with lower class, these variables strongly interact, whereas in the other sample their relationships are looser, and their connections with the other nodes became stronger. Another difference is the community memberships of the nodes *edu* and *work*. In the high class sample these nodes are completely detached from the other explanations of inequality, belonging to the green cluster. Conversely, these variables are linked to the other inequality beliefs in the lower-class sample. Finally, the pink cluster is smaller in the higher-class sample, as the nodes *bribes* and *connec* gravitate with the yellow one. This reveals that low class individuals perceive a greater number of structural factors governing inequalities.

**Figure 4: Differences in nodes’ Strength centrality**



Another aspect in which the six attitude networks can structurally differ is node centrality. Therefore, we investigate the importance of each network node by comparing its values of Strength centrality scored in the network estimated on low and high-status samples. Figure 4 plots differences in the values of Strength centrality in z-scores to enhance comparability between different networks. The Network Comparison Test detects statistically significant differences by income and social class. Strength scores are higher in the low income and low social class samples. Indeed, the nodes *redis\_m*, *sex*, and *work* have higher values of centrality within the attitude network of the poorer, and the nodes *edu* and *work* are more central in the attitude network of manual workers. These values are explained by their stronger connections in the attitude networks of lower status individuals. Moreover, it is important to highlight that the centrality metric does not describe the endorsement of each item, but only its relative importance within its attitude network. This is clear if comparing the mean values and the Strength centrality of these items. For example, the mean value of the variable *edu* is equal to 3.803 in the lower social class sample, and to 3.890 in the higher class one. Although having comparable mean values, these nodes widely differ in their centrality, as its Strength scores are 0.10 and 0.64 in the high and low sample respectively.

**Figure 5: Differences in networks’ connectivity**



Finally, we investigate network connectivity. Figure 5 plots the six values of the weighted ASPL. Being a measure of distance, lower values indicate higher connectivity. The attitude networks of lower status groups systematically show higher connectivity. This difference is particularly striking regarding the stratification by income. These results are also intelligible from a closer inspection of Figure 3. The bottom panel of this figure shows that the attitude network estimated on the lower and higher class samples are not particularly different in this regard. Indeed, here we find a comparable number of nodes bridging between network clusters. An intermediate situation occurs with the networks by education, with moderate differences in terms of intra-community links. The gaps are even stronger for income networks. In the network of the high income sample the explanations of existing inequality are almost completely detached from the other variables. Here only the connections *need-edupar* and *relig-ineq\_p* bridge the four network clusters. These results confirm H2, since we find statistically significant differences in the Strength centrality of some nodes while also isolating important differences in the ASPLs of the six attitude networks.

# 5 Discussion

Our paper aimed to describe the structure of the attitudes towards inequality in a highly unequal country such as Chile. We applied a network model to 22 ISSP survey variables to examine people’s understanding of inequality. This approach allowed us to examine how perceptions, beliefs, and judgments about the magnitude and principles regarding inequality relate at the population level.

Results confirmed that all items form a fully connected attitude network. This validates what social justice literature have been establishing, where people’s understandings of inequality include related topics such as redistribution, taxation and wages them (Converse, 2006). The attitude network was organised in four communities. One cluster gathered structuralist explanations of inequality, such as race, religion, and sex. A second one featured individualist explanations according to which unequal outcomes are mostly due to factors influenceable by individuals and their families, such as hard work and parental education. Moreover, a third cluster reunited beliefs about justice principles of wage allocations. Finally, we detected a fourth cluster, which grouped all conceptions regarding the magnitude of inequality. In fact, this community encompasses perception and judgment of income inequality, evaluations of the taxation system, and attitudes towards redistribution.

The structure, the associations between variables, and the communities detected in the network of attitudes towards inequality confirm and challenge various evidence on distributive justice research. First, our results support the dominant distinction between individualistic and structuralist explanations of inequality (Kluegel & Smith, 1986). In Chile, individuals tend to differentiate personal-familial dispositions from structural factors such as race, religion, or sex discrimination, forming separate communities. Second, we provide support for the idea of “dual consciousness” which has been seen in the international (Hunt, 1996; McCall, 2013; Mijs, 2018) and in the Chilean context (Puga, 2010), since the majority and strongest relationships between these two clusters are positive. In Chile, individualistic and structuralist explanations of inequality tend to coexist and be held simultaneously. Third, we show that both perceptions and judgments about income distribution tend to relate to conceptions about the magnitude of inequality, rather than the principles by which people explain it. This dissonance with other previous evidence showing structuralist explanations associated with a greater evaluation of the distribution as unfair (Schneider & Castillo, 2015), could be related to particularities of Chilean society, differences in the indicators used or a suppression of these associations when using a belief system approach such as ours. Finally, our attitude network confirms the importance of perceived inequality in shaping support for redistribution (Trump, 2023). Perception of large income inequality and beliefs in public and market redistribution are part of a strong, intra-community, positively associated triad, However, contrary to previous non-network, country-level evidence (Alesina & Angeletos, 2005) we reveal that, in Chile, belief in public redistribution is mostly influenced by assessments regarding magnitude rather than explanations of inequality.

In addition to high clustering, the network of attitudes towards inequality exhibited moderate connectivity. In social network analysis, ASPL captures the extent to which network nodes are distant from each other. However, rather than measuring distances, the edges of an attitude network are indicative of causal influence between evaluative reactions. Therefore, the connectivity of an attitude network correlates with the strength of the attitude in question [(Dalege et al., 2019)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=6044635386436841&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:362898b1-8cf2-4cf7-a649-7ab58198bce5). Moreover, a structure combining high clustering and high connectivity is usually described as a small-world network [(Watts & Strogatz, 1998)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=6069034170605213&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:7a99534d-1a13-4396-a198-0e335690a73e). Empirically, numerous attitude networks were observed to possess such a structure [(Carter et al., 2020; Schlicht-Schmälzle et al., 2018; Turner-Zwinkels & Brandt, 2022)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=30886843230459027&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:6a9141c6-6628-4444-8af4-2a3e13440629,c61b91da-fa6e-4348-80b6-c2428280b16a:e5df995a-5b3c-4248-922e-78ca10ebdc1d,c61b91da-fa6e-4348-80b6-c2428280b16a:cbee107f-f476-44cf-ac6c-c76e7fb5ee99), and the Chilean network of attitudes towards inequality follows this trend.

The stratification by social status allowed us to relax the homogeneity assumption on which we based the first part of the research. Since socioeconomic measures such as education, income, and social class influence the contents of attitudes towards inequality (Bobzien, 2020; Franko et al., 2013; Lindh & McCall, 2020), we stratified the sample into six subgroups to observe structural variations in their attitude networks. More generally, two patterns emerged comparing understandings of inequality by social status. First, we found structural differences between these attitude networks. Indeed, the centrality of a subset of nodes was significantly higher in the attitude networks of people with low income and from low social class. Moreover, we showed that attitude networks of the low social status groups are more highly connected. These results are consistent with two other contributions adopting the CAN model to study sociopolitical attitudes. Indeed, also attitudes towards post-national citizenship (Schlicht-Schmälzle et al., 2018) structurally differ between different population strata. Unfortunately, these authors only investigated variations in edge weights, thus making hard the comparison with our systematic investigation of differences in node centrality and network connectivity. Moreover, the fact that networks of the lower social status groups exhibit higher connectivity could indicate that individual belonging to them may have higher attitude strength, as the ASPL of an attitude network was confirmed to predict attitude intensity and stability (Dalege et al., 2019). This is an important research hypothesis which is left unanswered by our contribution, and that needs to be tested by following studies.

Second, the attitude networks of lower status groups are systematically characterized by a greater number of communities. Given that EGA equates the number of network clusters with the number of dimensions underlying a construct, this finding highlights that Chileans in lower socioeconomic positions have a more multidimensional understanding of inequality. This pattern is due to an emerging community that groups critical evaluations of the magnitude of inequalities. In the networks of low status attitudes, the judgment of unfair distribution, the perception of tax regressivity, and the judgment of failure of public redistribution, show higher partial correlations with each other, and are less related to the other variables of the other clusters. Social justice research has already highlighted the relevance of individuals' social environments in providing distributional information to individuals through personal social networks (Lindh et al., 2021) and socializing institutions (Mijs, 2018), among others. Although the data do not allow us to test or control for these factors, the marked social barriers between individuals in high social status positions and the rest of the population in Chile (Torche, 2005) may explain why lower social status groups have a greater capacity to construct a more multidimensional understanding of inequality. However, considering that this is the first application of attitude networks to people's attitudes towards inequality, this is a tentative explanation. Therefore, it is essential that new research seeks to explain this phenomenon in greater depth in Chile.

This paper has four main limitations. First, due to data availability we included items belonging to survey batteries. This entailed the occurrence of an instrument effect, since we observed high partial correlations between items measured jointly. However, important associations between items of different survey batteries occurred, and items measured jointly were not always part of the same community. Second, the GGM model required the inclusion of items measured in a similar scale. Therefore, we excluded variables praised by the literature, such as the perception of inequality measured by a salary gap or a diagram-based indicator [(Castillo et al., 2022)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=18752550349727093&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:9bd8c586-f281-4955-8f3c-6e51987088c3). Third, by splitting the sample according to median values of socioeconomic variables we effectively tested for a stepwise moderation. Thus, we are unable to capture all the heterogeneity existing across the social structure. However, dividing the sample in more than two groups at the time would have hindered network estimation, which requires adequate size samples to be stable [(Epskamp, Borsboom, et al., 2018)](https://app.readcube.com/library/c61b91da-fa6e-4348-80b6-c2428280b16a/all?uuid=4799201034782794&item_ids=c61b91da-fa6e-4348-80b6-c2428280b16a:1d710043-b7c6-4fa1-93a5-7aa13c36cd98). Finally, in our research design the three measures of social status (education, income, and social class) are hierarchically placed at the same level. This is problematic since social class could be thought as an antecedent variable with education and income as intervening ones. Moreover, our strategy does not consent to study the interactions between these three variables, and their joint effect on the structure of attitudes towards inequality. This is an additional field in which future research can improve.

This work provided two main contributions. By selecting a wide-ranging set of indicators, we introduced a holistic approach to the study of how people understand inequality. As highlighted by Janmaat [(2013)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=3867172252540053&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:a5fe0957-21b3-4f66-991b-a1b55320ca5a&options=%7B%22items%22%3A%7B%220a3c846c-7570-4913-bd72-3afd46468081%3Aa5fe0957-21b3-4f66-991b-a1b55320ca5a%22%3A%7B%22suppressAuthor%22%3Atrue%7D%7D%7D) social justice literature was waiting for a systematic investigation of attitudes towards inequality. Moreover, by applying EGA to different social status groups, we undercovered a pattern in the dimensionality of these attitudes. Specifically, we showed that low-status individuals have a more multidimensional comprehension of inequality in Chile.

# Disclosure statement

The authors declare that there is no conflict of interest.

# Supplemental material

This article is fully reproducible. The replication code is available at the link: AFTER PUBLICATION, TO PRESERVE OUR ANONYMITY. The repository also contains the robustness analysis of the seven attitude networks.

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1. Table 1 collocates the variables that are analysed in this article in Jaanmat’s typology. Note that this work did not include judgments on principles governing inequality, and that this cell is empty even in Jaanmat’s systematic review. This is due to the lack of survey questions and research dealing with this topic [(Janmaat, 2013)](https://app.readcube.com/library/0a3c846c-7570-4913-bd72-3afd46468081/all?uuid=09351715514098102&item_ids=0a3c846c-7570-4913-bd72-3afd46468081:a5fe0957-21b3-4f66-991b-a1b55320ca5a). [↑](#footnote-ref-1)