The Subjective Inequality Scale: A New Way to Measure Economic Inequality

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Abstract

Economic inequality has become a major topic for the public and policy makers alike. Objective, aggregate indices of inequality have been associated with many social and health ills. But a less investigated question is whether perceptions of inequality are associated with different social and health problems. To this end, we developed the Subjective Inequality Scale (SIS), a measure of perceived inequality and judgments of the (un)fairness of inequality. In Study 1, we reduced an initial pool of 92 items to 19. In Study 2, we further reduced the items and conducted an exploratory factor analysis on the final eight-item scale. We also explored the extent to which the SIS correlates with related measures, and how participants of different demographic backgrounds differ in perceptions of inequality and judgments of fairness of inequality. Finally, in Study 3 a confirmatory factor analysis showed that the 2-factor solution has good psychometric properties including model fit and reliability. We further showed that the SIS is correlated with different mental health and social issues (viz. subjective wellbeing, status anxiety, trust, depression, anxiety, and stress, hope of success, fear of failure, perspective taking, empathy, hubristic pride, authentic pride, and social dominance orientation). Some of these associations with health and social variables were moderated by subjective socioeconomic status. These findings suggest that the SIS is a useful tool in understanding the psychological correlates of perceived inequality and potential demographic moderators. It can further help researchers identify potential consequences of perceived inequality.

Lay Summary

Economic inequality – the extent to which wealth and income are unequally distributed - has dramatically increased over the past four decades. Past research has shown that more inequality coincides with many social and health problems. But little is known about perceptions of inequality and whether such perceptions are also associated with social and health ills. The present research developed a new tool to measure perceptions of economic inequality: the Subjective Inequality Scale (SIS). The SIS captures how much inequality individuals perceive and how (un)fair they find high levels of inequality. Our findings show that inequality is perceived and judged differently by different demographic groups. Perceived inequality was related to mental health and social issues.

Preface

The project presented in this thesis is the original, unpublished work of Anita Schmalor. I was responsible for identifying this research program, designing the studies, and for collecting, analyzing, and interpreting the data. Steve Heine contributed to study design, data collection, interpretation of results, and manuscript revisions. This research was conducted with the permission of the University of British Columbia Office of Research Studies Behavioural Research Ethics Board, certification number H17-03493.

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List of Abbreviations

CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
EFA	Exploratory Factor Analysis
MTurk	Amazon Mechanical Turk
SIS	Subjective Inequality Scale
RMSEA	Root Mean Square Error of Approximation

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Chapter 1: Introduction

The average top-earning CEO in Canada makes 209 times as much as the average worker (Macdonald, 2018). And yet, this level of income inequality is surpassed by that present in the United States. Here, the average compensation of the top 350 CEOs in 2016 was 271 times higher than that of the average worker (Umoh, 2018). Over the last four decades, economic inequality has drastically increased in the United States, Canada, Europe, and other rich, developed nations (e.g., Brandolini & Smeeding, 2011; Piketty, 2014; for Statistics of inequality worldwide see Solt, 2016). One of the key questions for psychologists, is what are the social and psychological implications of this growing inequality?

There has already been much research exploring some of the correlates of inequality. Higher levels of economic inequality have been associated with a host of social ills and health problems. For example, higher income inequality in rich developed countries is related to higher rates of violent crime, imprisonment, teenage pregnancy, illiteracy, mental illness, obesity, and mortality (e.g., Burns, Tomita, & Kapadia, 2014; Hsieh & Pugh, 1993; Messias, Eaton, & Grooms, 2011; Pickett, 2005; Wilkinson and Pickett, 2010; see Wilkinson & Pickett, 2009 for a review). Income inequality also correlates strongly with homicide rates, accounting for around 50% of the variance (Daly, 2016) and it is linked with increased authoritarianism (Solt, 2012), more nationalism (Solt, 2011), and less political participation (Solt, 2010).

The relationship between inequality and these social and health issues has led to growing attention by researchers and the public alike. But we don't know how much inequality people perceive in their environment and whether these *subjective perceptions* of economic inequality themselves lead to problematic health and social outcomes. We know that perceptions matter. In fact, subjective measures of objective economic facts have been successfully used in other areas.

An analogy can be made here to the study of socioeconomic status. Research in this area began utilizing objective measures such as income and education and it was not until later that the "MacArthur" Scale of subjective socioeconomic status was developed (Adler et al., 2000) to complement the objective measures. This subjective measure has become widely used in the research into the effects of socioeconomic status. This measure does not simply reduplicate the results obtained by objective indices such as income or wealth: People who place themselves on a lower rung on a ladder representing one's relative socioeconomic status are statistically removed (e.g., Adler, Epel, Castellazzo, & Ickovics, 2009; Singh-Manoux, Adler & Marmot, 2003). In fact, one's subjective relative standing is often a better predictor of health than are objective indices such as income or education.

In the same way, we argue that there is a methodological gap in the psychological research on inequality and that this gap calls for a subjective measure of inequality to stand alongside objective measures such as the Gini. Such a tool could perhaps be used to deepen our understanding of the effects of objective inequality but also open up new areas of research that are not directly dependent on the strict, objective economic facts – but rather the environment that a person *perceives* themselves to be in. Thus, this project seeks to develop a tool that captures perceptions of inequality.

It is important to note that such perceptions of inequality need not be accurate. Indeed, it is quite possible that perceptions could be *in*accurate. For example, Norton and Ariely (2011) demonstrated that Americans drastically underestimate the degree of wealth inequality (but see Eriksson & Simpson, 2012, 2013 for evidence that this effect is, in part, a methodological artifact) and Osberg and Smeeding (2006) showed that Americans particularly underestimated

the extent of inequality at the top end of the income distribution. This underestimation of economic inequality is not particular to the United States. Kiatpongsan and Norton (2014) showed that income inequality as measured by the estimated pay ratio of CEOs compared to unskilled workers was underestimated in all 16 countries for which they had data. Interestingly, research suggests that unlike actual income inequality, perceived inequality (as measured by calculating an aggregate income distribution from individual responses of participants placing themselves on a 10-point income distribution, Engelhardt & Wagener, 2014; and as measured by choosing one out of five diagrams representing different distributions of resources in society, Gimpelson & Triesman, 2015) positively predicts support for redistributive policies aimed at reducing inequality. Indeed, Gimpelson and Triesman (2015) argue that perceived inequality may not only be a better predictor of attitudes towards inequality but the weak correlation between perceived and actual inequality they find in their data may also explain why actual levels of inequality (despite theories to the contrary) fail to predict support for reducing inequality.

Given that perceived inequality is a better predictor of the kinds of policies citizens are in support of, it stands to reason that perceived inequality may also be an important predictor of different social and health problems. Hence, even if perceptions of inequality are independent of actual levels of inequality, to the extent that they predict meaningful outcomes, they should be studied in their own right. Another point, though, is that even if perceptions of inequality were to reflect an accurate understanding of the level of inequality prevalent in one's environment, it is likely a difficult task to estimate such accuracy. When people estimate the extent of inequality in, say, their state of residence, their perceptions are probably informed by many factors, such as the specific neighborhood they live in, the kind of job they have, the cultural messages they were

exposed to during childhood, and the kind of media they consume. Thus, even if they capture an objective measure such as the Gini to some extent, perceptions are likely informed by many additional factors as well.

1.1 Why a Measure of Subjective Experience of Inequality is Needed

Despite the growing interest in the effects of economic inequality, Buttrick and Oishi (2017) argue that there is currently a dearth of psychological measures to study this topic. Research on the harmful outcomes of inequality has largely relied upon objective measures of economic inequality. For example, in Wilkinson and Pickett's (2010) review of the various social correlates of inequality, inequality was operationalized in two ways. First, they used a 20:20 ratio which simply gives an indication of how much more income the richest 20% make compared to the poorest 20%. The higher the number, the greater income inequality. Second, they also used what is often seen as the gold standard of indices of inequality, the Gini coefficient. This is an index that captures inequality across all income groups. It ranges from zero, which indicates that everyone receives the exact same amount as everyone else, to one, which indicates perfect inequality, such that one person receives everything and everyone else receives nothing. Both of these operationalizations were found to correlate positively with a variety of negative outcomes at both the state and country level.

These objective, group-based measures are of much value at documenting societal trends, but they can't speak to the question of how much inequality individuals experience at a psychological level. Therefore, this thesis aspires to create one such tool – a subjective, individual level measure of perceived inequality. Part of the justification for approaching this topic by looking at subjective perceptions of inequality comes from the early success of extant research on the psychological effects of inequality. Psychologists have used different

experimental designs to this end. For example, Côté and colleagues (2015) have shown American participants what they were told was the wealth distribution of their state of residence; however, unbeknownst to participants, the wealth distribution that they saw was either extremely unequal (the true level of inequality in the United States) or moderately unequal (the true level of inequality in Sweden). Participants of higher income in the unequal condition became less generous than people in the equal condition. The design of this study suggests that different amounts of *perceived economic inequality* can cause different behavior. These results speak to the viability of focusing in on individual subjective perceptions. We argue that there are at least five reasons why a scale measuring subjective inequality is needed.

(1) *Relationship Between Perceived Inequality and Social and Health Problems*. First, such a scale can capture the extent to which perceptions are associated with different social and health problems. It can also point to a potential causal relationship between perceived inequality and other variables that can further be investigated in experimental research.

(2) *Perceptions of Inequality Within a Specific Geographic Area.* Second, a scale that measures inequality as perceived by the individual, allows us to look at differences within a specific geographic area. Objective measures of inequality such as the Gini coefficient assign one number to an entire geographic area (such as a country, state, or ZIP code), so that different areas can be compared with one another with respect to different social and health outcomes. However, it seems plausible that within one geographic area, the extent to which different people are aware of, or perceive inequality differs. For example, imagine Joe and Jim who both make the same annual income, have the same level of education, and are similar in other demographic respects. Joe lives and works in a neighborhood that is highly homogeneous with respect to socioeconomic factors. Jim lives in the same state but in a different neighborhood where

socioeconomic factors, such as level of education or income are highly stratified. If we correlate the Gini coefficient of the states of the US with some variable of interest, then both Joe and Jim are treated as the same with respect to the extent of inequality they are exposed to. But for Jim economic inequality is a reality that he sees everyday while Joe only ever sees it when he leaves his neighborhood. If inequality causes different psychological responses, will Jim and Joe respond differently based on their different subjective perceptions of inequality? Objective measures, such as the Gini, would seem to be unable to answer this question.

(3) Individual Differences and Moderating Variables Between Perceived Inequality and Social and Health Problems. Third, a self-report scale that measures people's subjective perceptions of inequality enables us to look at individual differences and how they relate to perceptions of inequality. It can further help identify potential moderating variables between perceived inequality and social and health problems. For example, suppose Joanne and Jill live in the same neighborhood. Joanne's income puts her in the top 10% of the income distribution while Jill falls in the bottom 10%. While both are exposed to the same level of inequality on a daily basis, they may still perceive different levels of inequality because of their different relative standing. In other words, it is possible that relative standing may affect how much inequality one perceives.

(4) *Ecological Fallacy*. A fourth reason that calls for an individual-level measure of inequality is statistical. Research that correlates aggregate-level inequality indices with different social and health variables could potentially be subject to the ecological fallacy. The ecological fallacy is a bias where correlations that are observed in aggregate data differ from those observed at the level of individual data (Eberstadt & Satel, 2004). Take, for example, the relationship between income and voting behavior. People in poorer states in the United States are more likely

to vote Republican (Gelman, Park, Shor, Bafumi, & Cortina, 2008). The inference made from this data is that poorer people are more likely to vote for the Republicans. But once we look to the voting behavior within states, we find that this conclusion is wrong. The opposite is the case: Poorer people are more likely to vote Democrats. The threat of the ecological fallacy means that we can have no assurance that the inference from the group to the individual is warranted.

Some have argued that research on economic inequality may similarly be affected by the ecological fallacy (e.g., Eberstadt & Satel, 2004; although the use of multilevel models helps decrease the risk of the ecological fallacy, Buttrick & Oishi, 2017). Thus, even though we observe a correlation between aggregate inequality measures and social and health variables, these may be spurious or better explained by third variables. Therefore, a scale that taps into perceptions of inequality on an *individual* level, allows us a way to avoid the risk of committing the ecological fallacy. Of course, if perceptions of inequality are completely independent of objective aggregate measures of inequality, then any positive association between perceived inequality and social and health problems may not be able to speak to associations with objective measures. However, correlations at an individual level data would circumvent the danger of committing the ecological fallacy and suggest that it is warranted to further probe for a causal relationship.

(5) Separating the Effects of Perceived Inequality from Fairness Judgments. Fifth, we argue that it is important to separate the effects of inequality from the effects of fairness judgments. Much research suggests that humans have an inequality aversion (Dawes, Fowler, Johnson, McElreath, & Smirnov, 2007; Fehr, Bernhard, & Rockenbach, 2008; Geraci & Surian, 2011; Kiatpongsan, S. & Norton, 2014; Shaw & Olson, 2012; Schmidt & Sommerville, 2011; for a review see Starmans, Sheskin, & Bloom, 2017). For example, in the study by Norton and

Ariely (2011) described earlier, Americans did not only underestimate the true extent of wealth inequality but the wealth inequality that Americans considered to be ideal was also much lower than what they assumed to be reality. Interestingly, although people who were of lower income, politically liberal, and women preferred less inequality, even people who were of higher income, politically conservative, and men, preferred less inequality than the actual level of inequality in the United States at the time of the study (Norton & Ariely, 2011).

Despite this, policies to mitigate high levels of inequality do not enjoy wide-spread support from Americans (e.g., Alesina & Glaeser, 2004; Bartels, 2008; Kelly & Enns, 2010; Kenworthy & McCall. 2008; Kuziemko, Norton, Saez, Stantcheva, 2015; Sands, 2017; Schröder, 2017; Trump, 2017; Wright, 2017; but see McCall, Burk, Laperrière, & Richeson, 2017 for evidence that lacking support for redistributive policies may stem partly from the methodology employed in past research). One potential moderating variable between inequality and support to mitigate inequality may be perceived fairness. To the extent that an unequal distribution of wealth is considered to reflect differences in effort and/or talent, people may be willing to accept and even support it. For example, Americans who were experimentally made to feel that social mobility was low were *less* tolerant of income inequality (Shariff, Wiwad, & Aknin, 2016; for the role of ideologies in justifying people's tolerance of inequality see Brown-Iannuzzi, Lundberg, Kay, & Payne, 2015; Tyler, 2011; see also Alesina & La Ferrara, 2005; Cruces, Perez-Truglia, & Tetaz, 2013; Jaime-Castillo & Marqués-Perales, 2014; Karadja, Mollerstrom, & Seim, 2014).

Indeed, some have argued that perceived unfairness is the real culprit behind the reported aversion to inequality in previous research. For example, a recent paper argues that past experimental research has conflated unequal outcomes with unfair outcomes (Starmans, Sheskin,

& Bloom, 2017). The authors point to research showing that people prefer fair unequal outcomes over unfair equal outcomes. More specifically, people in different countries (including children and infants) have preferences for resources to be distributed on the basis of merit or some metric of deservingness – and hence unequally (Baumard, Mascaro, & Chevallier, 2012; Hamann, Bender, & Tomasello, 2014; Kanngiesser & Warneken, 2012; Kenward & Dahl, 2011; Kiatpongsan & Norton, 2014; Kimbrough, Sheremeta, & Shields, 2014; Norton, Neal, Govan, Ariely, & Holland, 2014; Sigelman & Waitzman, 1991; Sloane, Baillargeon, & Premack, 2012). As Starmans and colleagues (2017) suggest, people may not be bothered by economic inequality so long as it is not considered unfair and they argue that it has yet to be demonstrated that humans care about economic inequality *per se*.

However, even if fair inequality doesn't concern us much in the moral sense, it is still important to consider the possibility that it could affect our psychology in other ways. Imagine, for example, that you play a card game of Texas Hold'em with a group of friends. Say the rules are such that it's been determined that the winner will get \$100 while everyone else will get nothing. We have created a situation where the outcome will be fair but perfectly unequal. It is easy to imagine that competition would be fierce and everyone would be very motivated to win, and presumably more so than if the inequality of outcome were lower. Now imagine that you learn that one of your friends has an advantage that makes their winning an inevitable outcome; for example, they are able to see the other players' cards. This would surely lead to protests by the other players; people would likely not want to play the game anymore. In this example, unequal outcomes lead to increased competition while the perception of unfairness leads to disengagement. Therefore, there is value in being able to distinguish between people's

perceptions of inequality and their judgments of the fairness of this. Our aim was to create a scale that captures both of these aspects.

In fact, recent research suggests that there are effects of inequality itself apart from the moderating effects of perceived fairness. For example, in a *fair* gambling task, high inequality lead to greater risk-taking than low inequality (Payne, Brown-Iannuzzi and Hannay, 2017, Study 1). This suggests that inequality – independent of fairness perceptions – can affect human psychology. More broadly, psychologists have begun to study the effects of economic inequality *itself* both in correlational and experimental research showing, for example, that perceptions of higher inequality are associated with less prosocial and more aggressive behavior, and a decrease in interdependent self-construals (e.g., Côté, House, & Willer, 2015; DeCelles & Norton, 2016; ; Jetten, Wang, Steffens, Mols, Peters, & Verkuyten, 2017; Krupp & Cook, 2018; Nishi, Shirado, Rand, Christakis, 2015; Sánchez-Rodríguez, Willis, & Rodríguez-Bailón, 2017; although it is important to note that not all of these studies properly controlled for the perceived fairness of the inequality).

What is clear from the research so far is that people both perceive inequality and make judgments about the legitimacy of inequality. But even in a perfectly fair context, perceptions of inequality still influence people's behavior. In sum, the study of the psychological correlates and consequences of inequality would benefit by having a valid and reliable measure of people's perceptions and fairness judgments about inequality. The goal of my thesis is to create such a measure. The next sections are devoted to discussing why psychology, as a discipline, is needed in an area of research that has been so far dominated by economics; more specifically, I describe how both evolutionary and social psychology hold important implications for the psychological study of perceived inequality.

1.2 The Importance of Psychology in Studying the Effects of Inequality

Neo-classic economic theory tacitly assumes that individuals act as rational utility maximizers who are not subject to social influence (Daly, 2016; Frank, 2007). This view of human nature has become known as *Homo economicus*. For example, this perspective would suggest that, as a rational human consumer, your desire to replace your current phone with the latest iPhone is entirely independent of whether other people own the latest version. Of course, no economist would deny that we may want to keep up with others around us, but such considerations simply don't enter into classic economic calculations (Daly, 2016; Frank, 2007; Frank, 1985; Frank & Cook, 1995; Frank, 1999), although the discipline of behavioral economics has gone a long way towards addressing this shortcoming (for reviews see Kahneman, 2003; Kahneman & Tversky, 2000; Thaler, 1991; Thaler, 2000).

In particular, the overly idealized conceptualization of human nature as *Homo economicus* falls flat when it comes to investigating the effects of inequality. Inequality is inherently contextual; it concerns how material resources are distributed across the population as a whole, and not just about what individuals themselves receive. So, if inequality affects social and health outcomes, then understanding such effects would seem to require considering not just the individual – but the individual in the context of the distribution of resources across the entire society (e.g., Daly, 2016; Frank, 1999; Frank, 2007; Frank, 1985; Frank & Cook, 1995). This is by no means a novel claim. In *'The Wealth of Nations'* Adam Smith (1776) recognized the importance of context when he noted that social comparisons affect what people consider to be necessary goods.

By necessaries I understand not only the commodities which are indispensably necessary for the support of life, but whatever the custom of the country renders it

indecent for creditable people, even of the lowest order, to be without. A linen shirt, for example, is, strictly speaking, not a necessary of life. The Greeks and Romans lived, I suppose, very comfortably though they had no linen. But in the present times, through the greater part of Europe, a creditable day-labourer would be ashamed to appear in public without a linen shirt, [...].

In order to do justice to Smith's observation and understand the effects of economic inequality, we argue that a suite of concepts from psychology needs to be added to the tool kit. Specifically, social comparison theory provides a conceptual framework through which to consider the proximal effects of perceiving different levels of inequality, while evolutionary theory provides a framework that address the more distal effects.

1.2.1 Social Comparison Theory

Adam Smith's observation is one that was further elaborated by Leonard Festinger in his influential work on social comparison processes (Festinger, 1954). According to Festinger's social comparison theory, we have a drive to evaluate our own abilities and opinions. Absent objective parameters that allow one to judge the accuracy of one's opinions or level of one's abilities, we turn to subjective assessments. Such subjective evaluations are made by comparing oneself to similar others. If you play basketball with your friends on weekends and you want to evaluate how talented you are, you will neither compare your abilities to your 5-year old kid nor to LeBron James, but rather to the friends with whom you play basketball. Much research in social psychology has explored when and to whom we compare ourselves (for a review see Olson, Herman, & Freedman, 1986; Suls & Miller, 1977; Suls & Wheeler, 2000, 2012). Roper (1940) applied the idea of social comparison to the notion of status. A salary of \$40,000 may place someone subjectively in a high-status category if this person is surrounded by others who

earn only \$20,000. But in a different neighborhood where most people make more money, a \$40,000 salary can feel very poor. Whether we view the amount of money we earn as enough, depends in large part on how much other people around us make. For example, Clark and Oswald (1996) found that one's income relative to people working in a similar job, who have a similar level of education and age, substantially affects one's satisfaction whereas one's actual pay had hardly any impact on satisfaction levels. Hence, even if people have enough money to get by, they may nonetheless feel poor. Research suggests that *feeling* poor leads to negative social and health outcomes. For example, when people are made to feel poor experimentally, they become more short-sighted preferring a lower immediate financial reward over a higher reward in the future (Callan, Shead, & Olson, 2011).

We care so much about status that we are pretty good at guessing the status of others simply by seeing their faces. In one set of studies, participants were better than chance at judging the social class of targets from both naturalistic photos as well as from emotionally neutral photos that were taken in a lab environment (Bjornsdottir & Rule, 2017). In another study, Kraus and Keltner (2009) found that participants could estimate the social class from seeing brief interactions between strangers that were videotaped. Our relative standing also affects reward circuits in our brain. In one study, participants underwent a functional MRI scan while they played a game with another participant (Fliessbach et al., 2012). They could stand to win money if they made correct decisions under time pressure, such as determining which picture had more dots. When players made money their reward circuits were activated but, more interestingly, this activation was even stronger when participants did better than the other participant regardless of how much money they won. As such research attests, we are deeply attuned to our place in the hierarchy – and such perceptions moderate some of our most basic emotional reactions leading

us to act in seemingly irrational ways. Our place on the ladder clearly affects how we understand ourselves and our world: But what about the shape of the ladder itself? It seems plausible that inequality, or the extent to which the ladder is stretched, affects our psychology and that the shape of the ladder actually changes the way we feel about the social comparisons we engage in and the effects those comparisons have (Payne, 2017). In this way, subjective socioeconomic status and perceived levels of inequality may interact in determining some of the negative outcomes that have been associated with economic inequality. When we think about this sensitivity to the shape of the ladder itself, it seems conceivable that this ability may have its origins in our evolutionary past.

1.2.2 Evolutionary Theory

Social comparison describes the importance of relative standing on a personal or proximal level, but there is an evolutionary or distal logic behind this. From an evolutionary perspective, natural selection has shaped our motivation such that we behave in ways that maximize our relative fitness. In other words, the "goal" of the genes in any organism is to contribute the maximum possible share of their own genetic variants to the gene pool of the next generation (Dawkins, 2006). Reproductive success itself is dependent, in large part, on resource acquisition. The more resources individuals can secure, the better are their chances to have surviving offspring. We can observe this relationship both in early human societies as well as some contemporary societies where monogamy has not been enforced by law or social norms. Men with more (material) resources tend to have more wives and more offspring than men who have relatively less resources (e.g., Betzig, 1986; Borgerhoff Mulder, 1987; Frank, 2007; Hopcroft, 2006; Irons, 1979; von Rueden, & Kaplan, 2011). This suggests that those individuals

who were most sensitive to and concerned about advancing their relative share of available resources vis-à-vis other humans were the ones with the greatest reproductive fitness.

Besides the absolute amount of resources available to a group, the (potential) distribution of resources also affects human behavior (Ronay, Maddux, von Hippel, 2018). If it is easy for one or a few individuals to obtain the majority of resources while the rest are left with very little or nothing at all, then this will create different pressures to respond than when resources are distributed more equally. For example, two different small-scale societies, the Hadza (Marlowe, 2010), a hunter-gatherer group, and the Yanamamö (Chagnon, 2013), a hunter-horticulturalist group, differ in the extent of economic inequality they live with. Opportunities for creating high inequality in terms of food resources are limited for the Hadza. They have a nomadic lifestyle and hunt and gather food on a daily basis. To avoid that food is spoiled, they share it with each other. This creates a relatively flat social hierarchy with low inequality, where humility is enforced by social norms (von Rueden, Gurven, Kaplan, & Stieglitz, 2014). Aggressive behavior by individuals aimed at advancing their own standing is not tolerated by others. Furthermore, because resources cannot be easily monopolized, any such attempt is not very tempting in the first place (Apicella, Marlowe, Fowler, & Christakis, 2012; Ronay, 2018). On the other hand, the Yanamamö are much more sedentary. To complement their root crop diet with protein, they compete with rival tribes over specific spots on the river in the Amazon basin (Chagnon, 1968). Since animal protein is concentrated in specific places, it can be monopolized through dominant behavior creating a more unequal society than the Hadza. This has been offered as an explanation for the violent-prone culture that is exemplified by warfare and raids of competing tribes (Gross, 1975).

What this example shows is that the inequality of resources is potentially an important cue to the type of social environment one inhabits. Moreover, if the inequality of the social environment were to change – say by encountering some resource that could be easily monopolized – it would seem to be evolutionary advantageous to adjust one's behavior to respond to this new environment. In other words, it is important for an individual to *perceive* the amount of inequality in the environment and act accordingly. Therefore, if we want to understand whether and how inequality is linked with the different social and health problems described above, it is important to look for both proximal mechanisms and also the distal evolutionary logic that underlie them.

Chapter 2: The Present Research

2.1 Overview of the Present Research

The research presented here was designed with the following goals in mind: 1) to develop a self-report measure assessing people's perceptions of the amount of economic inequality in a specific geographic area and the extent to which people deem high inequality to be unfair; 2) to validate this scale psychometrically; and 3) to empirically test the extent that individual differences in perceptions of inequality are associated with different social and health problems. In a preliminary study, we administered an initial pool of 92 items to a sample on Amazon Mechanical Turk (MTurk) and reduced it to a smaller pool of 19 items. In Study 2, we further reduced the pool to the final set of 8 items, conducted an exploratory factor analysis on this set, and assessed convergent and divergent validity. In Study 3, we conducted a confirmatory factor analysis and tested the predictive validity of the final set of items by including variables we expected to be associated with perceived inequality based on theoretical considerations.

2.2 Study 1

2.2.1 Methods

2.2.1.1 Item Generation

We took an inductive approach to item generation (Hinkin, 1998) whereby we (the author of this thesis and the advising faculty member) developed an extensive initial set of items with the goal of narrowing them down on empirical grounds. Conceptually, the items corresponded to two broad categories: perceptions of economic inequality and judgments of (un)fairness of economic inequality. Economic inequality can be delineated both into perceptions of the inequality of outcome (which corresponds to disparities in income and wealth) and into perceptions of the inequality of opportunity (which corresponds to disparities in access to resources that allow one to acquire the necessary knowledge and skills that are relevant in the labor market; "Concepts of Inequality", 2015.). These two categories are highly correlated in practice, as the greater inequality of opportunity should ultimately lead to a greater inequality of outcome (Lefranc, Pistolesi, & Trannoy, 2008). Since both outcome and opportunity fall under a broader conceptual category of inequality of 'resources' we included items covering both facets. We also created items tapping into perceptions of unfairness of inequality of outcome and unfairness of inequality of opportunity. These items used language pertaining to the perceived fairness, justice, and morality of high levels of inequality.

2.2.1.2 Item Reduction

Since our inductive approach generated so many items, the goal of Study 1 was to reduce the number of items to a more manageable number. Exploratory factor analysis was used to reveal how the different items hung together. Items were chosen that displayed good face validity (that is, conceptually correspond to their factor), loaded highly on their respective factor (over .5) and had low cross-loadings (below .3).

2.2.1.2.1 Participants

The preliminary pool of 92 items was given to 1230 American adults on Amazon Mechanical Turk (MTurk) in exchange for \$0.50. Twenty participants were excluded because they indicated that they had not taken the survey seriously in response to a question that asked this. This resulted in a final sample of 1210 participants (M age = 38.73, SD = 12.79; 63.8% female, 36.0% male, 0.2% other; 73.9% European American, 8.3% African American, 6.5% Asian American, 6.0% Hispanic, 5.3% Native American/ mixed/or other.).

2.2.1.2.2 Materials

Responses to all items are provided on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*). In order to allow the scale to be used in different geographic regions, the instructions can be changed to apply to the country, state, ZIP/postal code or any other geographical area (see Table 1 for specific instructions). In the studies presented here, participants were asked to use their *current state of residence* as their reference point in responding to the items.

For exploratory purposes, we also included a few questions to assess the extent to which people trust others, are concerned about their status, report subjective wellbeing, experience brand consciousness, feel competitive, and want to be dominant. Because we did not have a final set of items after Study 1, the correlations with these items are not reported here.

2.2.2 Results

In step one of item reduction, we utilized maximum likelihood with an oblimin rotation. We began with a first exploratory factor analysis which yielded 9 factors with eigenvalues over 1 (see scree plot in Appendix A). Inspection of the pattern matrix yielded six interpretable factors. Two factors consisted of items pertaining to inequality of outcome (e.g., "Almost all of the money that is earned goes to only a few people"). Since one of these two factors showed better and explained more of the variance, we retained only items from this factor that exhibited loadings above .50 and cross-loadings below .30. Another factor referred to perceptions of inequality of opportunity (e.g., "Real opportunities to succeed in life are only available to the wealthy"). Items that lacked face validity (i.e., that pertained to a different construct such as inequality in status or access to education) were dropped. Items on this factor were retained if they loaded at or above .50 (all cross-loadings were below .30). A third interpretable factor we retained contained items referring to inequality of access to education (e.g., "Chances for a good

education for children depend entirely on the income of their parents"). Items that loaded above .50 (with one item loading at .49; all cross-loadings were below .30) were retained in this first step. Two final interpretable factors contained items pertaining to the unfairness of inequality. The first referred to the unfairness of inequality of opportunity (e.g., "It is extremely unjust if children of affluent parents get a better education). All items loaded over .50 (all cross-loadings were below .10). The second fairness factor referred to the unfairness of inequality of outcome ("Overall, the amount of economic inequality is extremely unfair"). Although the loadings of the items on this factor were lower (at or above .43; all cross-loadings were again below .10), we retained them since they were of theoretical interest. Finally, two factors contained all but two of the reverse-scored items. Thus, in total we had five interpretable factors referring to inequality of outcome, inequality of opportunity, and fairness of inequality of income and opportunity. Since we were only interested in including reverse-scored items that would load on a factor together with other items we decided to drop all reverse-scored items (except for one loading on another factor;¹ see Appendix A.1 for a list with all items and their loadings on the different factors).² This first exploratory factor analysis cut the initial pool of items in one third reducing it to the 30 remaining items. This was consistent with our goal: the initial 92 items were not only broad in content but also broad in the way the underlying construct was conceptualized. For example, items about wealth inequality contained both wording describing perceptions that cannot be tested empirically (e.g., "Wealth is concentrated in the hands of a very few people"; for an empirical test, one would first need to define "a very few people") and perceptions that can be

¹ A second reverse-scored item loading on the same factor was dropped because of its low loading.

 $^{^{2}}$ For the second exploratory factor analysis in Study 1, we also looked at the results including the reverse-scored items but they still hung together and loaded onto two separate factors.

tested empirically (e.g., "The bank accounts of the top one percent are bigger than all the rest combined"; this is a statement that is at least theoretically, easy to verify, however, the answer will vary based on the geographic region). Next, we conducted a second exploratory factor analysis on these 30 items with the goal to cut them further down.

We again used maximum likelihood with an oblimin rotation. Four factors had eigenvalues over 1 (see scree plot in Appendix B). Inspection of the pattern matrix showed that all four factors were interpretable. The first factor pertained to fairness judgments of inequality, the second to inequality of outcome, the third to inequality of opportunity, and the fourth to inequality of education. Since all items loaded highly onto their respective factor and had low cross-loadings (all loadings were above .50 .and all cross-loadings below .30), we further reduced the items for each factor based on content. This led to a final set of six items for the fairness factor (five items were dropped because they were similar in wording to other items creating redundancy, contained wording that could be considered biased such as "haves or havenots", or that could be confusing because it contained a double negation). A final set of seven items pertaining to inequality of outcome were retained (three items were dropped because they were similar in content to others and one because it referred to the one percent making it qualitatively different from the other items which don't specify a particular percentage). We further retained three items referring to inequality of opportunity (one was dropped because it was too similar in content to another) and three items referring to inequality of access to education (one was dropped because it was too similar in content to another). Thus, we had a final set of 19 items.

2.3 Study 2

In Study 2, we generated new items that were more difficult to endorse bringing the total from 19 up to 24. Using exploratory factor analysis on the set of 24 items led to a final eight-item version of the Subjective Inequality Scale (SIS). To examine construct validity, we included a number of additional scales. Some of these scales tap into similar constructs and we therefore expected them to correlate with the SIS while others were expected to be less correlated. These scales included another scale (created for the purpose of this study) assessing perceptions of inequality and judgments of the fairest distribution of resources, support for economic inequality, support for the wealthy to contribute relatively more to society, belief in a just world, people's moral concerns regarding harm, fairness, loyalty, authority, and purity, as well as social dominance orientation and right-wing authoritarianism. Our predictions were the following. We expected that perceptions of inequality as measured by the SIS would correlate positively with perceptions of inequality as measured by the additional scale. Since the particular scale is quite different in both kind (images of differently shaped ladders) and, to some extent, content (relatively more weight on inequality of opportunity), we expected a positive but somewhat modest correlation. We further expected the two fairness judgments subscales to correlate. Since the additional scale measures which society is considered most fair and endorsing lower numbers indicates that less inequality is most fair (i.e., 1 implies most fair society) while higher numbers on the SIS indicate that more unequal societies are more unfair, we expected a negative correlation. We did not have specific expectations of how perceptions of inequality of either scale would correlate with fairness judgments of the other. Because support for economic inequality is a scale that asks to what extent people support economic inequality "as they

perceive it" (Wiwad, Mercier, Shariff, Aknin, & Robinson, 2018, p. 4), we expected that this scale would correlate highly with both of our subscales.

We expected that judging high inequality to be unfair would be associated with endorsing a noblesse oblige. One way to reduce economic inequality is through a greater relative contribution of economic resources by people who are financially better off. To the extent that inequality is judged as unfair, it would thus seem reasonable to endorse the idea of a noblesse oblige. We were less certain how perceptions of inequality would correlate with the endorsement of a noblesse oblige, especially after partialing out unfairness judgments.

We expected that judging high levels of inequality to be unfair would be associated with less belief in a just world. For subjective inequality, we had no a priori expectations. However, one other consideration is that belief in a just world would be low specifically for people who both perceive a lot of inequality and judge high inequality to be unfair. Therefore, we also assessed the correlation of belief in a just world with the two subscales of the SIS combined.

We further expected that judging high inequality to be unfair would be positively correlated with considering both harm and fairness moral domains. This seems at least intuitively plausible because being concerned about avoiding harming others and treating everyone fairly and judging high inequality to be unfair would seem to be related constructs. It seems likewise plausible that judging high inequality to be unfair would be negatively associated with considering respect for authority a moral domain; after all, if authorities deem inequality to be legitimate despite one's personal views about it, one may be less inclined to respect such authorities. We had no a priori expectations for the correlations between unfairness judgments and loyalty and purity. We also didn't have clear expectations for the correlations between perceived inequality and these five moral domains. In general, it is possible that the correlations
would be in the same direction as those with unfairness judgments, however, once unfairness judgments are partialed out, the correlations might become non-significant or at least very small in magnitude.

For social dominance orientation, we expected that unfairness judgments would correlate negatively with social dominance. The more unfair economic inequality is considered to be, the less acceptable it would seem to be to dominate other social groups. While these two constructs concern separate domains (the individual's material circumstances vs. a social group's circumstances in general in society), they seem related in that both tap into the unequal treatment of different people. We had no a priori expectations for the correlation between perceived inequality and social dominance. While the zero-order correlation might be likewise negative, an interesting question is what the correlation looks like when political orientation or unfairness judgments are partialed out. The two main reasons to include this scale was that 1) it is widely used and 2) it relates to how different groups of people are treated unequally.

Last, we expected that unfairness judgments would correlate negatively with right wing authoritarianism. Greater right wing authoritarianism means greater support for a "tough" leader who will suppress any dissenting voices in society. People who judge high inequality to be unfair would seem to be unlikely to support right wing authoritarianism. However, the correlation is likely to be weaker when political orientation is partialed out. We had again no a priori expectation for the correlation between perceived inequality and right wing authoritarianism. This scale was also mainly included because it is so common in social psychology research.

In sum, for all variables above, we assessed the zero-order correlations with the two subscales of the SIS. Because we expected that both people's responses to the SIS and to many of the additional scales included would be affected by their political attitudes, we also assessed

the partial correlations controlling for social political orientation. Finally, as argued above, one goal of this scale is to separate the effects of inequality from the effects of unfairness. Therefore, we also assessed the correlations between perceptions of inequality and these variables partialing out fairness perceptions and vice versa.

We further looked at how different demographic variables are associated with perceiving inequality and judging the (un)fairness of inequality. As described above, individual differences in, for example, one's relative socioeconomic standing, could affect the extent to which one perceives economic inequality but also how unfair it is considered to be. Demographic variables could further be important moderating variables between perceived inequality and different social and health problems. Therefore, we discuss them separately from the variables assessing convergent and divergent validity even though both groups of variables fall under the broader conceptual umbrella of 'individual differences'. We included income, subjective socioeconomic status, social and economic political orientation, age, gender, and religiosity. Our predictions were as follows.

We expected that greater income would be correlated with perceiving less inequality and judging high inequality to be less unfair. Having more income could lead to perceiving less inequality for at least two reasons. First, as people become better off financially, they may be less aware of the struggles others may have in paying their bills and affording different goods. Someone who has less income, may see people who drive more expensive cars, live in bigger houses, own luxury goods, and be (painfully) aware that one cannot afford these things. Second, richer people might be more likely to live in better neighborhoods where they rarely see less well-off people. Poorer people, on the other hand, may live in more diverse neighborhoods, and they will see the lifestyles of the rich through popular media and might therefore experience a

greater contrast between the haves and have-nots. We also expected unfairness judgments to be negatively correlated with income. From a self-serving bias, it would seem logical that those who are less well-off would find high inequality more unfair than those who benefit more from it. For subjective socioeconomic status, we likewise expected negative correlations with perceived inequality and unfairness judgments. The rationale for these expectations is the same as for income.

Because liberals traditionally support more government intervention and higher taxes especially on the rich, we expected both for social and economic political orientation that liberals would perceive more inequality and judge high inequality as more unfair. We had no a priori expectations for age. Because Norton and Ariely (2011) found that women would prefer a more equal wealth distribution than men, we expected that they would judge high inequality as more unfair. We had no expectations for subjective inequality and gender. Last, we also had no a priori expectations for the correlation between religiosity and perceptions of inequality and judgments of unfairness.

Finally, we wanted to assess whether perceived inequality as measured by the SIS would correlate with an objective inequality measure. Therefore, we assigned each participant the Gini coefficient of their state of residence and correlated it with their perceived inequality.

2.3.1 Methods

For this second study, we generated new items for two different reasons. Because many of the items from our initial pool turned out to be too easy to endorse (as indicated by a high mean and skewed response pattern), we decided to include a few more items that are much harder to agree with such that we can discriminate among those people who tend to agree that inequality is high. To accomplish this, we used more extreme language (for example, "Only

those at the top own any wealth at all"). We first turned to our initial pool of 92 items to see whether any of the items we had dropped appeared more difficult to endorse. We assessed both the mean of items that contained more extreme wording and compared it to our set of 19 items to avoid that wording was too similar. This led to the inclusion of one more item ("Besides those at the very top, no one else has much money at all", M = 3.99, SD = 1.62). Next, we created five more items that would be much harder to agree with. The second goal of this round of item creation concerned the fairness subscale. In Study 1, some of the items tapping into fairness separated the notion of fairness from the perceived hypothetical level of inequality (i.e., it is unfair *if* inequality is high) while others conflated the two (i.e., inequality is too high). After the first study, we decided that it would make better theoretical sense to separate out the perceived amount of inequality from judgments of fairness. In other words, the purpose of the scale is to measure people's sense of unfairness of inequality *in principle*, regardless of how much inequality they perceive to be prevalent in their environment (of course, these two factors should nonetheless correlate).

Because we wanted to assess whether a scale including reverse-scored items would yield a different response pattern, we decided to administer the remaining items along with reversescored items to half of the participants. We therefore decided to keep the one reverse-scored item that was part of the remaining 19 items from Study 1 but only administer it to half the participants along with another eight reverse-scored items we chose from Study 1. These items were chosen such that they were most similar in content to the 24 positively worded items.

In sum, after rewording three of the fairness items of the pool of 19 positively worded items and creating another five new items, we had a total of 24 items that we gave to a new sample (and half the respondents were additionally given eight reverse-scored items).

2.3.1.1 Participants

We administered a survey to 687 Americans on MTurk in exchange for \$0.50. Twelve participants indicated that they had not taken the survey seriously upon a binary question posed at the end of the study and were excluded from further analyses. This left a final sample of 675 participants (M age = 38.73, SD = 12.79; 64.4% female, 35.1% male, 0.4% other; 74.8% European American, 7.6% African American, 7.0% Asian American, 6.8% Hispanic, 3.9% Native American/ mixed/or other.).

2.3.1.2 Materials

Participants were given the 24 items that tap into subjective inequality and unfairness of high inequality; 19 of which came from Study 1 and 5 of which were new. To evaluate the construct validity of the final items, we included a number of different measures as described below.

Perceptions of Inequality and Unfairness. We gave participants 4 items pertaining to inequality of wealth, income, education and opportunity and asked them to choose one of five pictures on which a ladder representing society was more or less stretched (M = 3.53, SD = 0.95, Cronbach's alpha = .83). Four additional items asked participants to indicate which ladder they would find most fair (M = 2.54, SD = 1.08, Cronbach's alpha = .91).

Support for Economic Inequality. Participants completed the 5-item Support for Economic Inequality Scale (Wiwad et al., 2018) which assesses the extent to which people support the current level of economic inequality on a 7-point Likert scale ranging from "strongly disagree" to "strongly agree" (M = 2.98, SD = 1.33, Cronbach's alpha = .89).

Noblesse Oblige. We administered the Noblesse Oblige Scale (Form A), a measure originally included in Pratto, Sidanius, Stallworth, and Malle's 1994 Social Dominance Scale construction

paper. People in many societies hold the belief that the better-off should share a larger proportion of their resources with the rest of society which is sometimes referred to as *noblesse oblige*. Participants answered items on a 7-point scale from "strongly disagree" to "strongly agree" (M = 5.15, SD = 1.09, Cronbach's alpha = .79).

Belief in a Just World. Participants completed the four-factor Belief in a Just World Scale (Lucas, Zhdanova, & Alexander, 2011), measuring procedural justice beliefs for the self (M = 4.69, SD = 1.25, Cronbach's alpha = .94), for others (M = 4.06, SD = 1.24, Cronbach's alpha = .92) and distributive justice beliefs for the self (M = 4.57, SD = 1.29, Cronbach's alpha = .93) and for others (M = 4.19, SD = 1.39, Cronbach's alpha = .94) on a 7-point scale from "strongly disagree" to "strongly agree".

Moral Foundations Questionnaire. Participants took the 20-item Moral Foundations Questionnaire (Graham, Haidt, & Nosek, 2008) on a 6-point scale from "not at all relevant"/"strongly disagree" to "extremely relevant"/"strongly agree". The Moral Foundations Questionnaire assesses to which extent harm (M = 4.7, SD = 0.87, Cronbach's alpha = .69), fairness (M = 4.83, SD = 0.82, Cronbach's alpha = .71), loyalty (M = 3.54, SD = 1.07, Cronbach's alpha = .68), authority (M = 3.71, SD = 1.08, Cronbach's alpha = .74), and purity (M= 3.73, SD = 1.24, Cronbach's alpha = .81) are considered moral domains by different people. **Social Dominance Orientation.** We administered the 16-item Social Dominance Orientation Scale (Pratto et al., 1994) to participants. Participants responded on a 7-point scale from "very negative" to "very positive" (M = 2.36, SD = 1.18, Cronbach's alpha = .95).

Right Wing Authoritarianism. Participants were also given a shortened 15-item version of the Right Wing Authoritarianism Scale (Zakrisson, 2005) on a 7-point scale from "strongly disagree" to "strongly agree" (M = 3.27, SD = 1.11, Cronbach's alpha = .90).

Demographic Variables. Participants indicated their annual household income on a scale from 1 ("less than \$10,000) to 13 ("over 120,000) in \$10,000 increments (M = 5.95, SD = 3.42), their subjective socioeconomic status (Adler et al., 2000) on a ladder with 10 rungs where each rung represents one's relative standing in society (M = 4.92, SD = 1.84), their political orientation on social issues on a 7-point scale from "very liberal" to "very conservative" (M = 3.32, SD = 1.72), their political orientation on economic issues on a 7-point scale from "very liberal" to "very conservative" (M = 3.78, SD = 1.74), their age (M = 37.15, SD = 12.47), their gender (64.4% women, 35.1% men, 0.4% other), and their religiosity on a 7-point scale from "not religious at all" to "very religious" (M = 3.61, SD = 2.21).

Gini coefficient. Each participant was assigned the Gini coefficient of their state of residence from 2016 (data from the United States Census Bureau).

2.3.2 Results

2.3.2.1 Exploratory Factor Analysis

From the initial 24 items, we used exploratory factor analysis with maximum likelihood and an oblimin rotation to prune down the items to the final 2-factor solution consisting of 8 items.³ There were four eigenvalues over 1 (see Appendix C for scree plot). Inspection of the pattern matrix yielded three interpretable factors. The first pertained to inequality of outcome. The second pertained to fairness judgments of inequality and a third to inequality of opportunity. However, this factor was dropped for two reasons. First, one of the three items pertaining to

³ Note that participants were randomly assigned to see either only the 24 positively worded items or another eight reverse-scored items in addition to the positively worded items. Since responses to these did not differ based on political orientation, we dropped reverse-scored items based on previous research showing that reverse-scored items are interpreted differently and often create unwanted method effects (Distefano & Motl, 2006; Lindwall et al., 2012; Rodebaugh, Woods, Heimberg, Liebowitz & Schneier, 2005).

inequality of opportunity had high cross-loadings with inequality of outcome. Second, the items about fairness of inequality of outcome and inequality of opportunity loaded on the same factor, and we wanted to keep the structure across the subscales of perceptions of inequality and judgments of unfairness of inequality parallel. Furthermore, the factor pertaining to perceptions of inequality included both items about inequality of outcome and inequality of opportunity. We then picked four items from the factor pertaining to perceptions of inequality. We chose items that had high loadings/low cross-loadings (above .70/below .30) and that capture a broad spectrum of inequality perceptions (i.e., wealth inequality, income inequality and unequal opportunities). Even though one item pertaining to unequal opportunities only loaded at .42 onto this factor (and had a high cross-loading of .41 on the factor we dropped), we retained this item in order to capture the broadest array of economic inequality. We also picked four items from the factor pertaining to the fairness judgments of inequality, two of those items were about judgments of inequality of outcome and two about judgments of inequality of opportunity (all factor loadings were above .60 and cross-loadings below .20 (see Appendix C.1 for all items and their loadings).

An exploratory factor analysis with an oblimin rotation using maximum likelihood on the final set of items revealed two factors (eigenvalue 4.30 and 1.23, accounting for 53.8% and 15.4% of the variance, respectively, see Appendix D for scree plot). The final 2 factors have four items each, one captures perceptions of inequality and the other judgments of unfairness if inequality is high. The two factors are correlated with each other, r = .64 (the two subscales of the SIS are correlated at r = .56). Table 1 shows the items and their factor loadings along with the instructions participants read. We will refer to the two factors as Inequality (referring to items

pertaining to people's perceptions of inequality) and Unfairness (pertaining to judgments of finding it unfair if inequality is high).

Fable 1. Results from a Factor	Analysis of the 8-Item	Subjective Inequ	ality Scale (SIS)
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	Fac	ctor
SIS Item	1	2
Factor 1 (Inequality)		
Almost all of the money that is earned goes to only a few people.	.67	.14
Besides those at the very top, no one else has much money at all.	.88	04
Real opportunities to succeed in life are only available to the wealthy.	.69	.07
Only those at the top own any wealth at all.	.85	03
Factor 2 (Unfairness)		
It is extremely unfair if the overall amount of economic inequality is very high.	.01	.81
It is not fair at all if there are large differences in income between the rich and poor.	.05	.77
It is immoral if your income is dependent on where you grew up.	09	.69
It is extremely unjust if children of affluent parents get a better education.	.04	.67

Note. N = 675. Extraction method was maximum likelihood with an oblique (oblimin) rotation. Factor loadings above .6 are bolded.

Participants were given the following instructions: 'Please indicate how much you disagree or agree with the following statements. We want to know how you feel about these statements. There are no right or wrong answers. When responding to these statements, please consider how well you think they describe THE STATE YOU CURRENTLY LIVE IN.' Note that the SIS can be adapted to any geographic region by substituting 'the state' with another geographic region.

2.3.2.2 Convergent and Divergent Validity

Table 2 shows the zero-order correlations between the two subscales of the SIS and additional measures of individual differences, partial correlations between the same variables controlling for social political orientation and the partial correlations between subjective inequality and additional measures of individual difference controlling for unfairness judgments as well as the partial correlations between unfairness judgments and additional individual difference measures controlling for subjective inequality. Correlations of r = .08 or higher are significant at p < .05.

Perceptions of Inequality and Unfairness. As hypothesized, indicating that one perceived inequality to be high on the SIS was positively correlated with indicating the same on the Ladder scale (r = .24). Likewise, the more unfair participants found inequality to be the more inequality they perceived to exist according to the ladder scale (r = .24). The more unfair participants found inequality as measured by the SIS, the less unequal the ladder they indicated to represent the fairest society (r = ..24). However, perceived inequality was not correlated with the question of selecting which ladder represents the fairest society (r = ..06).

Support for Economic Inequality. Consistent with our hypothesis, perceiving high levels of inequality was negatively correlated with support for economic inequality (r = -.50) and judging high levels of inequality as unfair was also negatively correlated with support for economic inequality (r = -.69).

Noblesse Oblige. Both the Inequality (r = .39) and the Unfairness (r = .59) subscales of the SIS correlated positively with the Noblesse Oblige Scale. The more subjective inequality participants reported and, as hypothesized, the more unfair they considered high inequality to be, the more they endorsed the idea of a noblesse oblige.

Belief in a Just World. Belief in procedural justice for the self was negatively correlated with the Inequality factor of the SIS (r = -.27) and the Unfairness factor (r = -.21). Likewise, belief in procedural justice for others was negatively correlated with both the Inequality factor of the SIS (r = -.18) and the Unfairness factor (r = -.25). Belief in distributive justice for the self was also negatively correlated with the Inequality factor of the SIS (r = -.28) and the Unfairness factor (r = -.31) and belief in distributive justice for others was likewise negatively correlated with both the Inequality factor of the SIS (r = -.31) and belief in distributive justice for others was likewise negatively correlated with both the Inequality factor of the SIS (r = -.21) and the Unfairness factor (r = -.37). The more inequality factor of the SIS (r = -.21) and the more unfair they considered high inequality to be, the less likely they were to believe the world is just. When the two subscales of the SIS were combined, the zero-order correlations were likewise negative (r = -.27, -.24, -.33, -.32, same order as above, not shown in Table 2).

Moral Foundations Questionnaire. Higher perceived inequality was positively correlated with considering harm (r = .17) and fairness (r = .13) to be important moral domains while it was negatively correlated with loyalty (r = -.13), authority (r = -.21), and purity (r = -.08). Similarly, judgments of the unfairness of inequality was positively correlated with considering (r = .38) and fairness an important moral domain (r = .39) but it was negatively correlated with loyalty (r = -.12).

Social Dominance Orientation. Higher subjective inequality correlated negatively with Social Dominance Orientation (r = -.15) as did finding high inequality unfair (r = -.50). Interestingly, once fairness judgments were partialed out, subjective inequality correlated *positively* with social dominance orientation (r = .18).

Right Wing Authoritarianism. More subjective inequality was negatively associated with Right Wing Authoritarianism (r = -.20) and so was finding high inequality to be unfair (r = -.38).

Table 2. Correlations between SIS Inequality and SIS Unfairness with Different Variables

	SIS Inequality	SIS Unfairness	SIS Inequality partialing out social political orientation	SIS Unfairness partialing out social political orientation	SIS Inequality partialing out SIS Unfairness	SIS Unfairness partialing out SIS Inequality
SIS Inequality		0.56***		0.51***		
SIS Unfairness	0.56***		0.51***			
Inequality Ladder	0.24***	0.24***	0.20***	0.18***	0.13**	0.13**
Fairness Ladder	-0.06	-0.24***	-0.03	-0.20***	-0.08*	-0.25***
Support for Economic Inequality	-0.50***	-0.69***	-0.44***	-0.60***	-0.19***	-0.57***
Noblesse Oblige	0.39***	0.59***	0.32***	0.50***	0.09^{*}	0.49***
BJW – DJO	-0.21***	-0.37***	-0.13**	-0.26***	-0.00	-0.31***
BJW – PJO	-0.18***	-0.25***	-0.12**	-0.15***	-0.05	-0.18***
BJW – DJS	-0.28***	-0.31***	-0.25***	-0.25***	-0.14***	-0.19***
BJW – PJS	-0.27***	-0.21***	-0.24***	-0.17***	-0.18***	-0.07
MFQ - Harm	0.17***	0.38***	0.12**	0.32***	-0.05	0.34***
MFQ - Fairness	0.13***	0.39***	0.08^{*}	0.34***	-0.11**	0.39***
MFQ - Loyalty	-0.13***	-0.18***	-0.02	-0.01	-0.03	-0.13***
MFQ - Authority	-0.21***	-0.32***	-0.08*	-0.10**	-0.04	-0.24***
MFQ - Purity	-0.08*	-0.12**	0.03	0.07	-0.01	-0.09*
Social Dominance Orientation	-0.15***	-0.50***	-0.01	-0.35***	0.18***	-0.49***
Right Wing Authoritarianism	-0.20***	-0.38***	-0.03	-0.11**	0.01	-0.32***

Assessing Convergent and Divergent Validity

Computed correlation used pearson-method with listwise-deletion.

Note. *** < .001, **< .01, * < .05, non-significant correlations in grey color. Abbreviations: BJW = Belief in a Just World, DJO = Distributive justice for others, PJO = Procedural justice for others, DJS = Distributive justice for self, PJS = Procedural justice for self, MFQ = Moral Foundations Questionnaire.

2.3.2.3 Demographics and Perceptions of Inequality

Table 3 shows the correlations between the two factors of the SIS and different demographic variables. The table reports zero-order correlations. As hypothesized, participants of lower income (r = -.18) and subjective socioeconomic status (r = -.29) perceived inequality to be higher and also tended to find it more unfair if inequality is high (r = -.14, r = -.24, r = -.24)respectively). If we use a ladder representing society as a metaphor, then those who are closer to the bottom of the ladder see the rungs as further apart than those closer to the top. This relationship is not surprising insofar as economically more vulnerable people stand to lose more from living in an unequal society. Thus, they may be more attuned to perceiving inequality compared with those who are economically better off. People who identify as politically liberal on social issues perceived more inequality (r = -.27) and found higher levels of inequality to be unfair (r = -.47). Likewise, people who identify as politically liberal on economic issues perceived more inequality (r = -.35) and found higher levels of inequality unfair (r = -.56). Similarly, younger participants perceived more inequality (r = -.11) and found inequality to be more unfair (r = -.09) than did older people. There was no correlation between gender and subjective inequality (r = -.03), but women tended to find high levels of inequality to be more unfair than men (r = .08). Last, people who are more religious perceived less inequality (r = .24) and found inequality less unfair than those who are less religious (r = -.20).

Table 3. Correlation SIS Inequality and SIS Unfairness with Different DemographicVariables

	SIS Inequality	SIS Unfairness
SIS Inequality		.56***
SIS Unfairness	.56***	
Income	18***	14***
Subjective socioeconomic status	29***	24***
Political Orientation (social issues)	27***	47***
Political Orientation (economic issues)	35***	56***
Age	11**	09*
Gender	03	.08*
Religiosity	24***	20***

Computed correlation used pearson-method with listwise-deletion.

Note. *** < .001, **< .01, *< .05, non-significant correlations in grey color. Political Orientation was coded as 1= very liberal, 7 = very conservative. Gender correlation after excluding three participants who indicated something other than male or female as their gender identity. Gender was coded 1 = male, 2 = female.

2.3.2.4 The Gini Coefficient and Subjective Inequality

To assess whether perceptions of inequality could, in part, be predicted by the Gini coefficient, we correlated the Gini coefficient of each person's state of residence with their score on the Inequality subscale of the SIS. We found a small but significant positively association, r = .09, p < .05. Even though this association is small in magnitude, it points to the possibility that perceptions are partly informed by the objective levels of inequality. However, it is also important to consider that the level of inequality one perceives is comprised of an individual's

environment, and this environment is not only made up of the state level Gini coefficient but many other factors as well such as the media one consumes and one's social network. Furthermore, even a tiny but reliable correlation can have important real-world implications. In sum, while the correlation found here does not demonstrate that perceived inequality is informed by objective inequality levels, the result found here is consistent with the possibility that perceptions of inequality are partially informed by objective levels in one's environment.

2.4 Study 3

In Study 3, we conducted a confirmatory factor analysis on the SIS to determine its model fit and we sought to test whether perceived inequality is associated with different psychological constructs.

If you picture a society as a ladder, then each rung represents a person's relative standing within that society.⁴ Economic inequality is the extent to which the rungs of the ladder are stretched apart. The further stretched the ladder, the greater the amount of inequality. From this it follows that the greater the distance to the next rung, the more consequential is one's relative standing. More is to be gained by climbing up the status hierarchy, but there is also more at stake when falling down. This metaphor is useful in considering potential social and health consequences from perceptions of economic inequality. We had two sets of variables for which

⁴ Note that the metaphor of the ladder as a society only serves to provide an easy way to think of inequality and to describe how inequality may be experienced differently from different rungs; in reality inequality is more complex. If there was perfect inequality with one person owning everything and everyone else nothing, then all rungs of the ladder would be at the very bottom with the exception of one rung at the very top. Generally, with increasing inequality (all else being equal) more and more of the rungs will be crunched further down the ladder and fewer rungs will be at the top. Another way of thinking about this is that wealth (or income) will be more skewed. This is important to keep in mind for the theoretical expectations for the different variables described below. They are based on the simplified metaphor of the ladder (with rungs in equal distance to one another).

we had specific predictions. The first are subjective wellbeing, status anxiety, and trust, and the second depression, anxiety, and stress. They are described in turn.

If people perceive more inequality, they may realize that it will be harder to climb up the ladder, but also that falling down will have more negative implications. These perceptions may cause people to experience less subjective wellbeing than people who perceive lower levels of inequality. Similarly, subjective inequality may also cause greater status anxiety. Status anxiety is the preoccupation with one's rung on the ladder (e.g., Delhey & Dragolov, 2014). If more perceived inequality implies that one realizes that one's rung is more consequential, then it seems plausible that this will also lead to increased status anxiety. Last, when the rungs of the ladder are farther apart – and the status differential from one person to the next is greater – then the perceived distance from oneself to other people of society who are on different rungs is also greater. If people experience a greater social distance to others, trust in other people may be lowered. We had no clear a priori expectations for perceptions of unfairness for either subjective wellbeing, status anxiety, or trust. But to account for the possibility of confounding the effects of judging inequality as unfair with perceiving inequality, we wanted to test whether perceived inequality shows the relationships in the predicted directions after controlling for perceived unfairness.

While we predicted an association between perceived inequality, subjective wellbeing, status anxiety, and trust on theoretical grounds, we also had a more practical reason for including these variables. Thus far, research on economic inequality has largely used objective aggregate inequality indices such as the Gini coefficient to investigate potential social and health implications. Since little is known about perceptions of inequality and how they relate to different outcomes, we took a conservative approach by starting with social and health outcomes

that have been studied with objective measures. This is not to say that the mechanism through which objective and subjective measures affect the individual are necessarily the same, but that e this seemed a reasonable first step in this line of research.

Economic inequality has been associated with decreased subjective wellbeing both in the United States (Oishi, Kesebir and Diener, 2011) and Japan (Oshio and Kobayashi, 2011). Verme (2007) found a negative association in longitudinal analyses in different countries around the world. Wilkinson and Pickett (2010) have argued extensively that increased economic inequality leads to decreased psychological wellbeing. However, when it comes to subjective wellbeing, others have argued that inequality either has no or a positive impact (e.g., Hirschman & Rothschild, 1973). Indeed, the evidence on the relationship between inequality and subjective wellbeing is controversial. For example, in 119 countries, inequality was positively associated with subjective wellbeing after average income was accounted for (Berg & Veenhoven, 2010; see also Haller & Hadler, 2006; Clark, 2003; see Helliwell, 2003 for no relationship between inequality and happiness). But differences in subjective wellbeing across different countries are likely impacted by other factors such as evaluations of what comprises a fair amount of inequality (Gijsberts, 2002; Hadler, 2005; Kelley and Evans, 2009) and ideologically influenced views on social mobility (Alesina, Di Tella and MacCulloch, 2004) suggesting that longitudinal studies and within-country analyses may be better suited in studying the effects of inequality on subjective wellbeing (Delhey & Dragolov, 2014; Verme, 2007).

Higher inequality has also been linked to less trust (e.g., Alesina & LaFerrera, 2000; Rothstein & Uslaner, 2005; Uslaner & Brown, 2005; although see Fairbrother & Martin, 2013; and Steijn & Lancee, 2011) and more status anxiety (e.g., Layte & Whelan, 2014; Paskov, Gërxhani, & van de Werfhorst, 2013; see Wilkinson & Pickett, 2010 for a theoretical argument

for this association). Delhey and Dragolov (2014) found a negative association between income inequality as measured by the Gini coefficient and subjective wellbeing and trust, and a positive association between the Gini and status anxiety in 30 European countries. They further showed that both trust and status anxiety mediate the relationship between inequality and subjective wellbeing – a relationship that has been suggested by researchers in the past (e.g., Oishi, Kesebir, & Diener, 2011; Wilkinson & Pickett, 2010). Therefore, we wanted to test whether subjective inequality is likewise associated with decreased subjective wellbeing, trust and heightened status anxiety, and, if so, whether trust and status anxiety would mediate the relationship between subjective inequality and wellbeing.

Furthermore, we explored subjective socioeconomic status (and income in the footnote) as potential moderating variables. It seems plausible that subjective wellbeing would suffer particularly for people of lower socioeconomic status because their situation would seem to be bleaker than that of people who are better off. On the other hand, one's relative standing may be of less relevance for the extent of status anxiety and trust one feels. Since falling down the ladder is more consequential in a more unequal society, even people who are better off might be more worried about their own standing. Similarly, if everyone experiences greater social distance from others, trust in other people may be lowered for people regardless of their own relative standing.

For depressive, anxious, and stress symptoms, we predicted a positive association with perceived inequality. If one's relative standing matters more, such that falling down the status hierarchy has severe implications while climbing up appears to be that much harder, it is possible that perceiving high inequality leads to greater depression, anxiety, and stress. We had no a priori predictions for the relationship between perceptions of unfairness with depression, anxiety, or stress. However, to account for the possibility of confounding the effects of judging inequality as

unfair with perceiving inequality, we wanted to test whether perceived inequality shows a positive association with these mental health indices even after controlling for perceived unfairness.

Besides the theoretical reasons for investigating the relationship of subjective inequality with depression, anxiety, and stress, we again had practical reasons, too, namely starting with associations that have been extensively studied with objective aggregate inequality indices in the extant literature. In a recent meta-analysis, Patel et al. (2018) showed that higher inequality as measured by the Gini coefficient is associated with an increased risk of depression (see also Ahern & Galea, 2006; Cifuentes, 2008; Fan, 2011; Muramatsu, 2003; Pabayo, Dunn, Gilman, Kawachi, & Molnar, 2016; but see for example Patel et al., 2018 for a review of studies that found no association). There is also some evidence that objective measures of economic inequality are associated with an increase in anxiety disorders (e.g., Wilkinson & Pickett, 2010). This seems plausible insofar as status anxiety could be considered as a specific form of anxiety more broadly. However, evidence for this relationship is mixed, and some studies have failed to find an association between inequality and anxiety (e.g., Filho, Kawachi, Wang, Viana, & Andrade, 2013; Sturm & Gresenz, 2002). Furthermore, inequality has been associated with an increase in health issues more generally (e.g., Kondo, Sembajwe, Kawachi, van Dam, Subramanian, & Yamagata, 2009; Wilkinson & Pickett, 2007; 2010; see Wilkinson & Pickett, 2006; and Pickett & Wilkinson, 2015 for a review) and increased mortality specifically (e.g., Biggs, King, Basu, & Stuckler, 2013; Elstad, 2011; Marmot & Bobak, 2000; Zheng, 2012). One potential pathway linking inequality with these health issues could be heightened stress (e.g., Pickett & Wilkinson, 2015; Wilkinson & Pickett, 2007, 2010).

We again explored subjective socioeconomic status (and income in the footnote) as potential moderating variables. It seems plausible that depression and stress would be increased when subjective inequality is high particularly for people of lower socioeconomic status because their situation would seem to be bleaker than that of people who are better off. On the other hand, one's relative standing may be of less relevance for the extent of anxiety one feels. Because falling down the ladder is more consequential in a more unequal society, even people who are better off might be more worried about their own standing.

In addition to these variables, we also wanted to explore some other variables for which we had less clear expectations on theoretical grounds and that, to the best of our knowledge, have not yet been investigated with objective measures. We looked at hope of success and fear of failure, perspective taking and empathy, and at hubristic pride, authentic pride, and social dominance orientation. The rationale for these sets of variables is described in turn.

To the extent that people experience more status anxiety with increased inequality, one open question is how inequality affects people's approach and/or avoidance tendencies. Individuals differ both in the ways they pursue success and they avoid potential failure (Heckhausen, 1991). Thus, we wanted to explore how subjective inequality is associated with the fear of failure and the hope to succeed. On the one hand, it seems possible that more perceived inequality is associated with decreased hope of success. It is further possible that this effect is most pronounced for people of lower status. If they perceive the rungs of the ladder above them to be further away and hence harder to reach, they may be less hopeful to succeed. Furthermore, the fear to fail may be exacerbated by heightened inequality perceptions given that failing would seem to have worse implications. Such fear of failure could be most pronounced for people of low socioeconomic status, but it could also be prevalent across all socioeconomic groups because

failing would lead to negative outcomes for everyone. We had no expectations for the relationship between perceptions of unfairness with hope of success and fear of failure.

Another question we wanted to explore was how perceived inequality relates to perspective taking and empathy. Across almost 70 different cultures, greater perspective taking as measured by the Perspective Taking Subscale of the Interpersonal Reactivity Index⁵ has been associated with more volunteerism, which can be viewed as one indicator of prosocial behavior (Chopik, O'Brien, & Konrath, 2016). Jordan, Amir, & Bloom (2016) provide evidence that compassion (caring about the wellbeing of others) but not empathy (experiencing the same feelings someone else feels) is associated with prosocial behavior. They further show that empathic concern or compassion is consistently tied to perspective taking but not empathy. Past research shows that volunteerism and other forms of prosocial behavior have decreased in the United States over the past decades (Putnam, 2001) which coincides with an increase in economic inequality. Thus, one question that can be posed is how perceived inequality relates to perspective taking and empathy. Since inequality seems to be associated with less volunteerism while perspective taking is associated with more volunteerism, it is possible that more perceived inequality is associated with less perspective taking. From a more theoretical perspective, subjective inequality could lead to less perspective taking because as the rungs of the ladder representing society are seen as more apart, the distance to other people also seems greater. And as the social distance increases, perspective taking might decrease. For the same reason, it is also possible that empathy could decrease. To explore these questions, we measured people's

⁵ Note that the authors use the term "empathy" for the perspective taking subscale (as well as the empathic concern subscale). However, I follow Jordan, Amir, & Bloom's (2016) example in using a narrow definition of empathy (see main text) and treating perspective taking as a separate construct.

perspective taking and empathy. We had no a priori expectations for the relationship between these social cognitive processes and unfairness judgments. We again explored subjective socioeconomic status (and income in the footnote) as potential moderator, but we had no prediction.

Lastly, we were interested to test whether we can find initial support for the hypothesis that higher inequality is associated with increased dominance. As Ronay and colleagues (2018) argue, when resources are easier to monopolize, people become more likely to pursue strategies such that they can get a maximum share of those resources. This, in turn, favors an aggressive, more dominant strategy over one that is more cooperative and based on prestige. A dominant strategy is characterized by intimidation and coercion (Henrich & Gil-White, 2001). Dominant individuals tend to rate higher on narcissism, aggression, and disagreeableness. Prestigious individuals, on the other hand, tend to rate higher on genuine self-esteem, conscientiousness, agreeableness, achievement, and prosocial behavior.

There is at least some indirect support for this hypothesis in the extant literature. As reviewed above, in small scale human societies higher levels of inequality (in the form of access to food) have been shown to correlate with more dominant behavior (e.g., Ronay et al., 2018). Further, the Gini coefficient has been associated with increased homicide rates (e.g., Daly, 2016) and homicides are arguably one of the most aggressive acts. High inequality has also been associated with decreased agreeableness (de Vries, Gosling, & Potter, 2011). Dominant individuals – as assessed by both peer- and self-reports - further tend to be high in hubristic pride while prestigious individuals tend to be high in dispositional authentic pride (Cheng, Tracy, & Henrich, 2010). Indeed, these two facets of pride may have evolved to attain status via either a dominant or prestigious strategy, respectively. People high in hubristic pride report feeling

higher in superiority and arrogance, disagreeableness, neuroticism, and lower in conscientiousness (Tracy & Robins, 2007). People high in authentic pride, in turn, report high levels of agreeableness, conscientiousness, self-esteem, and good interpersonal relationships. If higher inequality does indeed lead to increased dominance, then we would expect that it would also lead to more hubristic pride. Therefore, we sought to test how perceived inequality relates to hubristic and authentic pride. We explored subjective socioeconomic status as a moderator, but we had no a priori predictions. We also had no predictions for the relationship between unfairness judgments and hubristic and authentic pride.

Besides this individual behavior we also wanted to investigate how perceived inequality relates to Social Dominance Orientation. To the extent that inequality leads to more dominant behavior it is also conceivable that the dominance of other social groups becomes more acceptable. Sidanius and Pratto (1999) have proposed that the dominance of different social groups and the acceptance thereof by society at large stems from inequality enabling discrimination both at an individual and institutional level. Wilkinson and Pickett (2010) have argued that such downward prejudice aimed at social groups that are perceived to be inferior will be exacerbated with increased inequality. We again explored subjective socioeconomic status (and income in the footnote) as a moderator but we had no a priori expectation. Based on Study 2, we expected that unfairness judgments would be negatively associated with a social dominance orientation.

Finally, as in Study 2, we again wanted to test whether perceived inequality is correlated with the Gini coefficient.

2.4.1 Methods

2.4.1.1 Participants

1044 Americans on MTurk participated in this survey for \$0.60. Sixteen participants were excluded from the analyses because they indicated that they had not taken the study seriously to a question posed at the end, and one participant was excluded for indicating an age below the minimum age indicated in the consent form (M age = 39.19, SD = 13.27; 62.1% female, 37.6% male, 0.3% other; 76.4% European American, 8.3% African American, 5.8% Asian American, 4.2% Native American/Hispanic/mixed/or other.).

2.4.1.2 Materials

Subjective Wellbeing. To measure subjective wellbeing, participants were given two items adapted from the World Values Survey (Inglehart, Basañez, & Moreno, 1998): 1) 'Taking all things together, how happy would you say you are these days?' 2) All things considered, how satisfied would you say you are with your life these days? Responses were recorded on a 10-item scale from "very unhappy/dissatisfied" to "very happy/satisfied" and responses were averaged across both items (M = 6.38, SD = 2.26, Cronbach's alpha = .93).

Status Anxiety. Participants completed two items taken from the European Quality of Life Survey (Boehnke, 2005): 1) I don't feel the value of what I do is recognized by others. 2) Some people look down on me because of my job situation or income.' Responses were recorded on a 5-point scale from "strongly disagree" to "strongly agree". Responses were averaged across both items (M = 2.93, SD = 1.04, Cronbach's alpha = .69).

Trust. Participants responded to one item from the World Values Survey (Inglehart, Basañez, & Moreno, 1998): 'Generally speaking, would you say that most people can be trusted, or that you

can't be too careful in dealing with people?' Responses were recorded on a 11-point scale from "can't be too careful" to "most people can be trusted" (M = 5.60, SD = 2.64).

Depression, Anxiety, and Stress. Participants completed the 21-item Depression Anxiety Stress Scale (Henry & Crawford, 2005). Participants responded how much each statement applied to them over the past week on a 4-point scale from "never" to "almost always". The scale has a factor assessing self-reported depressive symptoms (M = 1.72, SD = 0.71, Cronbach's alpha = .93), self-reported anxious symptoms (M = 1.54, SD = 0.56, Cronbach's alpha = .87), and self-reported stress symptoms (M = 1.85, SD = 0.62, Cronbach's alpha = .88).

Achievement Motives Scale. We administered the 10-item version of the achievement motives scale (Lang & Fries, 2006) to participants. Participants responded on a 7-point scale from "strongly disagree" to "strongly agree". The Scale has a factor assessing hope for success (M = 5.47, SD = 1.00, Cronbach's alpha = .90) and a factor assessing fear of failure (M = 4.23, SD = 1.42, Cronbach's alpha = .90).

Interpersonal Reactivity Index. Participants completed the 7-item Perspective Taking and the 7-item Empathy subscales of the Interpersonal Reactivity Index (Jordan et al., 2016). Responses were recorded on a 5-point scale from "does not describe me very well" to "describes me very well" (perspective taking: M = 3.62, SD = 0.77, Cronbach's alpha = .84; empathy: M = 2.75, SD = 0.78, Cronbach's alpha = .77).

Authentic and Hubristic Pride. Participants were administered the trait version of the 14-item Authentic and Hubristic Pride Scale (Tracy & Robins, 2007). Participants responded on a 5-point scale from "not at all" to "extremely" (authentic pride: M = 2.99, SD = 0.98, Cronbach's alpha = .94; hubristic pride: M = 1.33, SD = 0.59, Cronbach's alpha = .91).

Social Dominance Orientation. Participants completed the 16-item Social Dominance Orientation Scale (Pratto et al., 1994). Responses were recorded on a 7-point scale from "very negative" to "very positive" (M = 2.36, SD = 1.18, Cronbach's alpha = .95).

Subjective Socioeconomic Status. Participants chose their subjective socioeconomic status (Adler et al., 2000) on a ladder with 10 rungs where each rung represents one's relative standing in society (M = 5.03, SD = 1.78).

Income. Participants indicated their annual household income on a scale from 1 ("less than \$10,000") to 13 ("over 120,000") in \$10,000 increments (M = 6.04, SD = 3.42).

Gini. Each participant was assigned the Gini coefficient of their state of residence from 2016 (data from the United States Census Bureau).

2.4.2 Results

2.4.2.1 Confirmatory Factor Analysis

We conducted a confirmatory factor analysis using the two factors obtained in the previous EFA. We then calculated indices of model fit for the two-factor solution. The chisquare goodness was significant indicating a lack of model fit, $\chi^2(19) = 105.83$, p < .001. However, with such a large sample size the difference between covariance matrix and model is expected to be significant and it is now widely recognized that other indices are better suited to assess model fit (e.g., Byrne, 2005, Revelle, 2018). Next, we calculated, the Root Mean Square Error of Approximation (RMSEA) and the Comparative Fit Index (CFI), two alternative ways of assessing model fit. Values below .08 for the RMSEA (Browne & Cudeck, 1993) and above .90 for the CFI (Hu & Bentler, 1999) are deemed acceptable. We obtained a RMSEA of .07 and CFI of .98 suggesting adequate model fit. Next, we computed the reliability of the scale as a whole as well as for each of the subscales. Both subscales demonstrated good reliability (Cronbach's alpha for Inequality = .89, Cronbach's alpha for Unfairness = .85). Since Cronbach's alpha tends to underestimate reliability estimates when the underlying construct is not unidimensional (Revelle, 2018), we used omega in calculating reliability of the scale as a whole. Omega was .92 indicating good reliability.

2.4.2.2 Confirmatory Analyses

2.4.2.2.1 Subjective Inequality and Wellbeing, Status Anxiety, and Trust

Subjective Wellbeing. To test our hypothesis that more perceived inequality is associated with less subjective wellbeing, we first regressed subjective wellbeing on only Inequality and Unfairness (Model 1). As hypothesized, more perceived inequality was associated with less wellbeing $\beta = -0.21$, p < .001, 95%CI [-0.29, -0.14]. We then included subjective socioeconomic status, political orientation, age, gender, and religiosity as covariates and included an interaction term between perceived inequality and subjective socioeconomic status (Model 2). The test of the interaction reveals whether the association between subjective wellbeing and inequality varies depending on a person's socioeconomic status. The association between inequality and wellbeing remained significant, $\beta = -0.12$, p < .001, 95%CI [-0.19, -0.04], and the interaction between inequality and socioeconomic status was also significant, $\beta = 0.09$, p < .01, 95%CI [-0.3, 0.15] (see Table 4 for all results described above). People whose subjective socioeconomic status was one standard deviation below the mean showed a stronger relationship between perceived inequality and wellbeing, $\beta = -0.20$, p < .001 than people whose status was at the mean, $\beta = -0.12$, p < .01, and there was no association for people who were one standard

deviation above the mean on socioeconomic status, $\beta = -0.03$, p = .58 (Figure 3).⁶ This suggests that the negative relationship between perceived inequality and subjective wellbeing is driven by people who consider themselves around the mean or below the mean in socioeconomic status while people high in subjective socioeconomic status don't show an association between perceived inequality and wellbeing. Hence, high levels of perceived inequality may be especially adverse for people low in socioeconomic status, at least with respect to how happy and satisfied people consider themselves to be. The association between perceived unfairness and subjective wellbeing was neither significant in Model 1, $\beta = -0.05$, p = .19, 95%CI [-0.12, 0.02], nor in Model 2, $\beta = -0.04$, p = .29, 95%CI [-0.11, 0.03].⁷

⁶ The interaction is only marginally significant when income rather than subjective socioeconomic status is used as moderator, $\beta = -0.06$, p = .064, 95% CI [-0.12, 0.00]. People whose income was one standard deviation below the mean showed a stronger relationship between perceived inequality and depression, $\beta = 0.26$, p < .001 than people whose income was at the mean, $\beta = 0.21$, p < .001 or one standard deviation above the mean, $\beta = 0.15$, $p < .01^6$ ⁷ Note that when perceptions of inequality is not included in the regression, then unfairness of inequality becomes a significant predictor, $\beta = -0.10$, p < .01, 95% CI [-0.17, -0.04].

	Model 1				Model 2		
	β	CI	р	β	CI	р	
(Intercept)	-0.00	-0.06 - 0.06	1.00	-0.19	-0.39 - 0.01	.061	
SIS Inequality	-0.21	-0.290.14	<.001	-0.12	-0.190.04	.002	
SIS Unfairness	-0.05	-0.12 - 0.02	.193	-0.04	-0.11 - 0.03	.290	
SES				0.36	0.30 - 0.41	<.001	
Political Orientation				-0.01	-0.08 - 0.06	.831	
Age				0.12	0.06 - 0.18	<.001	
Gender				0.13	0.01 - 0.25	.034	
Religiosity				0.11	0.05 - 0.17	<.001	
SIS Inequality*SES				0.09	0.03 - 0.15	.002	
Observations		1009			938		
\mathbf{R}^2 / adj. \mathbf{R}^2		.059 / .057			.236 / .230		

Table 4. Regression Predicting Subjective Wellbeing from Perceptions of Inequality andDifferent Covariates

Note. For model 1, F(2,1006) = 31.69, p < .001. For model 2, F(8,929) = 35.94, p < .001 (the sample sizes are smaller than N = 1024 because of missing data). SES = subjective socioeconomic status. Political Orientation = social political orientation. Gender was coded as 1 = male, 2 = female. The regression model remains essentially the same when income is included instead of subjective socioeconomic status and when economic political orientation is included instead of social political orientation.

Figure 1. Relationship between Subjective Inequality and Subjective Wellbeing at Different Levels of Subjective Socioeconomic Status



Note. SES = subjective socioeconomic status; *** p < .001, ** p < .01, * p < .05.

Status Anxiety. To test our hypothesis that more perceived inequality is associated with more status anxiety, we first regressed status anxiety on only Inequality and Unfairness (Model 1). Consistent with our hypothesis, more perceived inequality was associated with more status anxiety, $\beta = 0.24$, p < .001, 95% CI [0.17, 0,32]. We then included subjective socioeconomic status, political orientation, age, gender, and religiosity as covariates and an interaction term between perceived inequality and subjective socioeconomic status to test whether socioeconomic status moderates the relationship between inequality and status anxiety (Model 2). The association between inequality and status anxiety remained significant, $\beta = 0.19$, p < .001, 95% CI [0.11, 0,26], but the interaction between inequality and socioeconomic status was not

significant β = -0.02, p = .40, 95% CI [-0.08, 0.03].⁸ The association between perceived unfairness and status anxiety was neither significant in Model 1, β = 0.04, p = .25, 95%CI [-0.03, 0.12], nor in Model 2, β = 0.06, p = .09, 95%CI [-0.01, 0.14]⁹ (see Table 5 for all results described above).

⁸ Note that the interaction between perceived inequality and income is significant, $\beta = -0.06$, p < .05, 95% CI [-0.12, -0.00]. At one standard deviation below the mean on income, the association between subjective inequality and status anxiety is stronger, $\beta = 0.27$, p < .001, than at the mean, $\beta = 0.21$, p < .001, and at one standard deviation above the mean, $\beta = 0.15$, p < .01.

⁹ Note that when perceptions of inequality is not included in the regression, then unfairness of inequality becomes a significant predictor, $\beta = 0.16$, p < .001, 95% CI [0.10, 0.23].

	Model 1				Model 2		
	β	CI	р	β	CI	р	
(Intercept)	0.00	-0.06 - 0.06	1.00	-0.14	-0.35 - 0.07	.187	
SIS Inequality	0.24	0.17 - 0.32	<.001	0.19	0.11 – 0.26	<.001	
SIS Unfairness	0.04	-0.03 - 0.12	.249	0.06	-0.01 - 0.14	.093	
SES				-0.29	-0.350.23	<.001	
Political Orientation				0.08	0.01 - 0.15	.036	
Age				-0.12	-0.180.06	<.001	
Gender				0.08	-0.04 - 0.21	.189	
Religiosity				-0.01	-0.07 - 0.06	.829	
SIS Inequality*SES				-0.02	-0.08 - 0.03	.401	
Observations		1009			938		
\mathbf{R}^2 / adj. \mathbf{R}^2		.074 / .072			.175 / .168		

 Table 5. Regression Predicting Status Anxiety from Perceptions of Inequality and Different

 Covariates

Note. For model 1, F(2,1006) = 39.96, p < .001. For model 2, F(8,929) = 24.68, p < .001 (the sample sizes are smaller than N = 1024 because of missing data). SES = subjective socioeconomic status. Political Orientation = social political orientation. Gender was coded as 1 = male, 2 = female. The regression model remains essentially the same when income is included instead of subjective socioeconomic status and when economic political orientation is included instead of social political orientation.

Trust. We first regressed trust on only Inequality and Unfairness (Model 1). Consistent with our hypothesis, more perceived inequality was associated with less trust, $\beta = -0.10$, p = .01, 95% CI [-0.17, -0.02]. We then included subjective socioeconomic status, political orientation, age, gender, and religiosity as covariates and an interaction term between perceived inequality and subjective socioeconomic status to test whether socioeconomic status moderates the relationship

between inequality and trust (Model 2). The association between inequality and trust remained significant, $\beta = -0.09$, p = .02, 95% CI [-0.17, -0.01], but the interaction between inequality and socioeconomic status was not significant $\beta = 0.03$, p = .34, 95% CI [-0.03, 0.09].¹⁰ The association between perceived unfairness and trust was neither significant in Model 1, $\beta = -0.00$, p = .96, 95% CI [-0.08, 0.07], nor in Model 2, $\beta = -0.05$, p = .25, 95% CI [-0.13, 0.03]¹¹ (see Table 6 for all results described above).

¹⁰ The interaction looks essentially the same when income rather than subjective socioeconomic is used as moderator, $\beta = 0.01$, p = .77, 95% CI [-0.05, 0.07].

¹¹ Note that when perceptions of inequality is not included in the regression, then unfairness of inequality becomes a significant predictor, $\beta = -0.09$, p < .01, 95%CI [-0.16, -0.03].

Table 6.	Regression	Predicting	Trust from	Perceptions	of Inequality	and Different

Covariates

	Model 1				Model 2		
	β	CI	р	β	CI	р	
(Intercept)	-0.00	-0.06 - 0.06	1.00	0.10	-0.12 - 0.32	.365	
SIS Inequality	-0.10	-0.170.02	.010	-0.09	-0.170.01	.024	
SIS Unfairness	-0.00	-0.08 - 0.07	.960	-0.05	-0.13 - 0.03	.248	
SES				0.11	0.05 - 0.18	<.001	
Political Orientation				-0.16	-0.230.08	<.001	
Age				0.13	0.07 - 0.20	<.001	
Gender				-0.08	-0.21 - 0.05	.254	
Religiosity				0.06	-0.02 - 0.13	.124	
SIS Inequality*SES				0.03	-0.03 - 0.09	.337	
Observations		1009			938		
\mathbb{R}^2 / adj. \mathbb{R}^2		.010 / .008			.061 / .052		

Note. For model 1, F(2,1006) = 5.09, p < .01. For model 2, F(8,929) = 7.49, p < .001 (the sample sizes are smaller than N = 1024 because of missing data). SES = subjective socioeconomic status. Political Orientation = social political orientation. Gender was coded as 1 = male, 2 = female. The regression model remains essentially the same when income is included instead of subjective socioeconomic status and when economic political orientation is included instead of social political orientation.

Status Anxiety and Trust as Mediators between Subjective Inequality and Subjective

Wellbeing.

To test whether status anxiety and trust mediate the relationship between perceived

inequality and subjective wellbeing, we ran separate analyses for each mediator. Beginning with

status anxiety, status anxiety was heightened with greater subjective inequality, $\beta = 0.27$,

p < .001, 95% CI [0.21, 0.33], and subjective wellbeing was lower with heightened status anxiety, $\beta = -0.48$, p < .001, 95% CI [-0.0.53, -0.43]. Subjective inequality was negatively associated with subjective wellbeing, $\beta = -0.24$, p < .001, 95% CI [-0.30, -0.18], but once the effects of the potential mediator, status anxiety, were taken into account, the relationship between subjective inequality and wellbeing became significantly smaller suggesting that status anxiety partially mediated this relationship, $\beta = -0.12$, p < .001, 95% CI [-0.18, -0.06]. Using a bootsrap estimation approach with 10,000 samples (Preacher & Hayes, 2004), we found that the mediator rather than directly from subjective inequality) was significant, $\beta = -0.12$, p < .001, 95% CI [-0.16, -0.09]. The proportion mediated through status anxiety was .51, p < .001, 95% CI [0.34, 0.69] (see Figure 2, top panel).

For trust, there was a negative association between subjective inequality and trust, $\beta = -0.09, p < .01, 95\%$ CI [-0.15, -0.03] and a positive association between trust and subjective wellbeing, $\beta = 0.30, p < .001, 95\%$ CI [0.24, 0.35]. Subjective inequality was negatively associated with subjective wellbeing, $\beta = -0.24, p < .001, 95\%$ CI [-0.30, -0.18], but once the effects of the potential mediator, trust, were taken into account, the relationship between subjective inequality and wellbeing became smaller suggesting that trust partially mediated this relationship, $\beta = -0.21, p < .001, 95\%$ CI [-0.27, -0.15]. Using a bootsrap estimation approach with 10,000 samples (Preacher & Hayes, 2004), we found that the mediation effect was significant, $\beta = -0.03, p < .01, 95\%$ CI [-0.05, -0.01]. The proportion mediated through trust was .12, p < .01, 95% CI [0.04, 0.20] (see Figure 2, bottom panel).

Figure 2. Models for the Relationship between Subjective Inequality and Subjective Wellbeing as Mediated by Status Anxiety and Trust



Note. Models for the relationship between subjective inequality and subjective wellbeing as mediated by status anxiety (top panel) and trust (bottom panel). Indirect effect after accounting for mediator in parentheses.

In sum, using a subjective measure of inequality, we found similar results as Delhey and Dragolov (2014) did using the Gini coefficient. These findings suggest that the subjective experience of inequality seems to show a similar pattern of relationships as do objective measures of inequality.
2.4.2.2.2 Subjective Inequality and Mental Health

Depression. To test our hypothesis that more perceived inequality is associated with more selfreported depression, we first regressed depression on only Inequality and Unfairness (Model 1). As hypothesized, more perceived inequality was associated with more depression, $\beta = 0.27$, p < .001, 95% CI [0.20, 0.34]. We then included subjective socioeconomic status, political orientation, age, gender, and religiosity as covariates and included an interaction term between perceived inequality and subjective socioeconomic status (Model 2). The test of the interaction reveals whether the association between depression and inequality varies depending on the extent of socioeconomic status. The association between inequality and depression remained significant, $\beta = 0.20$, p <.001, 95% CI [0.12, 0.27], and the interaction between inequality and socioeconomic status was also significant $\beta = -0.07$, p = .021 95% CI [-0.12, -0.01]. People whose subjective socioeconomic status was one standard deviation below the mean showed a stronger relationship between perceived inequality and depression, $\beta = 0.26$, p < .001 than people whose socioeconomic status was at the mean, $\beta = 0.20$, p < .001 or one standard deviation above the mean, $\beta = 0.13$, $p < .01^{12}$ (Figure 3). This suggests that high perceived levels of inequality may be associated with more depression especially for people low in socioeconomic status. But interestingly, the relationship remains significant for people of higher subjective socioeconomic status suggesting that more perceived inequality is associated with poor mental health outcomes for everyone. The association between perceived unfairness and depression was neither

¹² The interaction is only marginally significant when income rather than subjective socioeconomic status is used as moderator, $\beta = -0.06$, p = .064, 95% CI [-0.12, 0.00]. People whose income was one standard deviation below the mean showed a stronger relationship between perceived inequality and depression, $\beta = 0.26$, p < .001 than people whose income was at the mean, $\beta = 0.21$, p < .001 or one standard deviation above the mean, $\beta = 0.15$, $p < .01^{12}$

significant in Model 1, $\beta = 0.02$, p = .52, 95% CI [-0.05, 0.10], nor in Model 2, $\beta = 0.02$, p = .54, 95% CI [-0.05, 0.10]¹³ (see Table 7 for all results described above).

Table 7. Reg	ression Predicting	g Depression fro	m Perceptions	of Inequality and	l Different
Covariates					

		Model 1		Model 2			
	β	CI	р	β	CI	р	
(Intercept)	-0.00	-0.06 - 0.06	1.00	0.06	-0.15 - 0.26	.577	
SIS Inequality	0.27	0.20 - 0.34	<.001	0.20	0.12 - 0.27	<.001	
SIS Unfairness	0.02	-0.05 - 0.10	.520	0.02	-0.05 - 0.10	.541	
SES				-0.21	-0.270.15	<.001	
Political Orientation				0.01	-0.06 - 0.09	.702	
Age				-0.18	-0.240.12	<.001	
Gender				-0.05	-0.17 - 0.07	.417	
Religiosity				-0.07	-0.140.01	.029	
SIS Inequality*SES				-0.07	-0.120.01	.021	
Observations		1009			938		
\mathbf{R}^2 / adj. \mathbf{R}^2		.082 / .080			.178 / .171		

Note. For model 1, F(2,1006) = 44.85, p < .001. For model 2, F(8,929) = 25.09, p < .001 (the sample sizes are smaller than N = 1024 because of missing data). SES = subjective socioeconomic status. Political Orientation = social political orientation. Gender was coded as 1 = male, 2 = female. The regression model remains essentially the same when income is included instead of subjective socioeconomic status and when economic political orientation is included instead of social political orientation.

¹³ Note that when perceptions of inequality is not included in the regression, then unfairness of inequality becomes a significant predictor, $\beta = 0.13$, p < .001, 95% CI [0.06, 0.19]

Figure 3. Relationship between Subjective Inequality and Depression at Different Levels of





Note. SES = subjective socioeconomic status; *** p < .001, ** p < .01, * p < .05.

Anxiety. To test our hypothesis that more perceived inequality is associated with more selfreported anxiety, we first regressed anxiety on only Inequality and Unfairness (Model 1). Consistent with our hypothesis, more perceived inequality was associated with more anxiety, $\beta = 0.21$, p < .001, 95% CI [0.14, 0.29]. We then included subjective socioeconomic status, political orientation, age, gender, and religiosity as covariates and an interaction term between perceived inequality and subjective socioeconomic status to test whether status moderates the relationship between inequality and anxiety (Model 2). The association between inequality and anxiety remained significant, $\beta = 0.16$, p < .001, 95% CI [0.09, 0.24], but the interaction between inequality and socioeconomic status was not significant significant, $\beta = 0.01$, p = .14, 95% CI [-0.10, 0.01].¹⁴ The association between perceived unfairness and anxiety was neither significant in Model 1, $\beta = -0.01$, p = .89, 95% CI [-0.08, 0.07], nor in Model 2, $\beta = 0.02$, p = .51, 95% CI [-0.05, 0.10]¹⁵ (see Table 8 for all results described above).

Table 8. Regression Predicting Anxiety from Perceptions of Inequality and Different

Covariates

		Model 1			Model 2			
-	β	CI	р	β	CI	р		
(Intercept)	-0.00	-0.06 - 0.06	1.00	-0.07	-0.27 - 0.14	.532		
SIS Inequality	0.21	0.14 - 0.29	<.001	0.16	0.09 - 0.24	<.001		
SIS Unfairness	-0.01	-0.08 - 0.07	.888	0.02	-0.05 - 0.10	.514		
SES				-0.12	-0.180.06	<.001		
Political Orientation				0.04	-0.03 - 0.11	.262		
Age				-0.27	-0.330.21	<.001		
Gender				0.03	-0.10 - 0.15	.684		
Religiosity				0.02	-0.04 - 0.09	.506		
SIS Inequality*SES				-0.04	-0.10 - 0.01	.142		
Observations		1009			938			
R^2 / adj. R^2		.045 / .043			.142 / .135			

Note. For model 1, F(2,1006) = 23.64, p < .001. For model 2, F(8,929) = 19.26, p < .001 (the sample sizes are smaller than N = 1024 because of missing data). SES = subjective socioeconomic status. Political Orientation = social political orientation. Gender was coded as 1 = male, 2 = female. The regression model remains essentially the same when income is included instead of subjective socioeconomic status and when economic political orientation is included instead of social political orientation.

¹⁴ The interaction looks essentially the same when income rather than subjective socioeconomic is used as moderator, $\beta = 0.01$, p = .76, 95% CI [-0.05, 0.07].

¹⁵ Note that when perceptions of inequality is not included in the regression, then unfairness of inequality becomes a significant predictor, $\beta = 0.11$, p < .001, 95% CI [0.05, 0.18]

Stress. We first regressed stress on only Inequality and Unfairness (Model 1). Consistent with our hypothesis, more perceived inequality was associated with more stress, $\beta = 0.20$, p < .001, 95% CI [0.12, 0.27]. We then included subjective socioeconomic status, political orientation, age, gender, and religiosity as covariates and an interaction term between perceived inequality and subjective socioeconomic status to test whether status moderates the relationship between inequality and stress (Model 2). The association between inequality and stress remained significant, $\beta = 0.15$, p < .001, 95% CI [0.08, 0.23], but, unlike hypothesized, the interaction between inequality and socioeconomic status was not significant $\beta = -0.04$, p = .15, 95% CI [-0.10, 0.02].¹⁶ The association between perceived unfairness and stress was neither significant in Model 1, $\beta = 0.04$, p = .32, 95% CI [-0.04, 0.11], nor in Model 2, $\beta = 0.05$, p = .19, 95% CI [-0.03, 0.13]¹⁷ (see Table 9 for all results described above).

¹⁶ The interaction looks essentially the same when income rather than subjective socioeconomic status is used as moderator, $\beta = 0.02$, p = .43, 95% CI [-0.04, 0.08].

¹⁷ Note that when perceptions of inequality is not included in the regression, then unfairness of inequality becomes a significant predictor, $\beta = 0.13$, p < .001, 95% CI [0.07, 0.20]

		Model 1			Model 2			
_	β	CI	р	β	CI	р		
(Intercept)	0.00	-0.06 - 0.06	1.00	-0.14	-0.35 - 0.07	.188		
SIS Inequality	0.20	0.12 - 0.27	<.001	0.15	0.08 - 0.23	<.001		
SIS Unfairness	0.04	-0.04 - 0.11	.324	0.05	-0.03 - 0.13	.192		
SES				-0.10	-0.160.04	.002		
Political Orientation				0.04	-0.03 - 0.11	.290		
Age				-0.23	-0.290.17	<.001		
Gender				0.07	-0.05 - 0.20	.260		
Religiosity				-0.01	-0.08 - 0.05	.697		
SIS Inequality*SES				-0.04	-0.10 - 0.02	.149		
Observations		1009		938				
R^2 / adi. R^2		.049 / .047			.117 / .110			

 Table 9. Regression Predicting Stress from Perceptions of Inequality and Different

 Covariates

Note. For model 1, F(2,1006) = 26.03, p < .001. For model 2, F(8,929) = 15.43, p < .001 (the sample sizes are smaller than N = 1024 because of missing data). SES = subjective socioeconomic status. Political Orientation = social political orientation. Gender was coded as 1 = male, 2 = female. The regression model remains essentially the same when income is included instead of subjective socioeconomic status and when economic instead of social political orientation is included.

In summary, we found the following results for the confirmatory analyses we conducted. As hypothesized, greater perceived inequality was associated with decreased subjective wellbeing and trust and with increased status anxiety. Furthermore, both status anxiety and trust partially mediated the relationship between subjective inequality and wellbeing. Consistent with our hypothesis, we also found that greater perceived inequality was associated with more depression, anxiety, and stress. Subjective socioeconomic status was a significant moderator only for subjective wellbeing and depression. Judgments of unfairness of inequality was not significantly associated with any of the variables reported here.

2.4.2.3 Exploratory Analyses

2.4.2.3.1 Subjective Inequality and Achievement Motives

Hope of Success. To explore the association between subjective inequality and hope of success, we first regressed hope of success on only Inequality and Unfairness (Model 1). Perceptions of inequality were significantly negatively associated with self-reported hope of success, $\beta = -0.13$, p = .03, 95% CI [-0.21, -0.06]. Next, we included subjective socioeconomic status, political orientation, age, gender, and religiosity as covariates and an interaction term between perceived inequality and subjective socioeconomic status to test whether socioeconomic status moderates the relationship between inequality and hope of success (Model 2). The association between inequality and hope of success remained significant, $\beta = -0.09$, p < .05, 95% CI [-0.16, -0.01], but the interaction between inequality and socioeconomic status was not significant $\beta = -0.03$, p = .30, 95% CI [-0.09, 0.03].¹⁸ The association between perceived unfairness and hope of success was significant in Model 1, $\beta = 0.08$, p = .03, 95% CI [0.01, 0.06], but not in Model 2, $\beta = 0.04$, p = .37, 95% CI [-0.04, 0.12] (see Table 10 for all results described above).

¹⁸ The interaction is likewise not significant when income rather than subjective socioeconomic status is used as moderator, $\beta = -0.04$, p = .20, 95% CI [-0.11, 0.02].

		Model 1			Model 2			
-	β	CI	р	β	CI	р		
(Intercept)	0.00	-0.06 - 0.06	1.00	-0.12	-0.34 - 0.11	.304		
SIS Inequality	-0.13	-0.210.06	<.001	-0.09	-0.160.01	.031		
SIS Unfairness	0.08	0.01 - 0.16	.027	0.04	-0.04 - 0.12	.373		
SES				0.14	0.07 - 0.20	<.001		
Political Orientation				-0.08	-0.150.00	.048		
Age				0.04	-0.02 - 0.10	.197		
Gender				0.08	-0.05 - 0.21	.255		
Religiosity				0.11	0.04 - 0.18	.003		
SIS Inequality*SES				-0.03	-0.09 - 0.03	.298		
Observations		1009			938			
\mathbb{R}^2 / adj. \mathbb{R}^2		.012 / .010			.047 / .039			

Table 10. Regression Predicting Hope of Success from Perceptions of Inequality and

Different Covariates

Note. For model 1, F(2,1006) = 6.09, p < .01. For model 2, F(8,929) = 5.78, p < .001 (the sample sizes are smaller than N = 1024 because of missing data). SES = subjective socioeconomic status. Political Orientation = social political orientation. Gender was coded as 1 = male, 2 = female. The regression model remains essentially the same when income is included instead of subjective socioeconomic status and when economic political orientation is included instead of social political orientation.

Fear of Failure. To explore the relationship between subjective inequality and fear of failure, we regressed fear of failure on Inequality and Unfairness (Model 1). Perceptions of inequality were not associated with self-reported fear of failure, $\beta = 0.06$, p = .10, 95%CI [-0.01, 0.13]. Next, we included subjective socioeconomic status, political orientation, age, gender, and religiosity as

covariates and an interaction term between perceived inequality and subjective socioeconomic status to test whether socioeconomic status moderates the relationship between inequality and fear of failure (Model 2). The association between inequality and fear of failure was not significant, $\beta = 0.05$, p = .23, 95% CI [-0.03, 0.12]¹⁹, nor was the interaction between inequality and socioeconomic status, $\beta = -0.04$, p = .25, 95% CI [-0.10, 0.02].²⁰ The association between perceived unfairness and fear of failure was significant in Model 1, $\beta = 0.18$, p < .001, 95% CI [-0.10, 0.25], but not in Model 2, $\beta = 0.19$, p < .001, 95% CI

[0.11, 0.27] (see Table 11 for all results described above).

These results suggest that more subjective inequality may be associated with decreased hope of success, and thus, possibly, a decrease in an approach strategy but not with increased fear of failure or an avoidance strategy. However, more research with different methodological approaches is needed.

¹⁹ Note that when judgments of unfairness is not included in the regression, then perceptions of inequality becomes a significant predictor, $\beta = 0.14$, p < .001, 95% CI [0.07, 0.21]

²⁰ The interaction is likewise not significant when income rather than subjective socioeconomic status is used as moderator, $\beta = -0.04$, p = .18, 95% CI [-0.10, 0.02].

_		Model 1			Model 2			
	β	CI	р	β	CI	р		
(Intercept)	-0.00	-0.06 - 0.06	1.00	-0.48	-0.700.27	<.001		
SIS Inequality	0.06	-0.01 - 0.13	.103	0.05	-0.03 - 0.12	.234		
SIS Unfairness	0.18	0.10 - 0.25	<.001	0.19	0.11 - 0.27	<.001		
SES				-0.10	-0.170.04	.001		
Political Orientation				0.09	0.02 - 0.16	.018		
Age				-0.18	-0.240.12	<.001		
Gender				0.29	0.16 - 0.42	<.001		
Religiosity				-0.00	-0.07 - 0.06	.894		
SIS Inequality*SES				-0.04	-0.10 - 0.02	.249		
Observations		1009			938			
\mathbf{R}^2 / adj. \mathbf{R}^2		.048 / .046			.116 / .108			

Table 11. Regression Predicting Fear of Failure from Perceptions of Inequality and

Different Covariates

Note. For model 1, F(2,1006) = 25.19, p < .01. For model 2, F(8,929) = 15.19, p < .001 (the sample sizes are smaller than N = 1024 because of missing data). SES = subjective socioeconomic status. Political Orientation = social political orientation. Gender was coded as 1 = male, 2 = female. The regression model remains essentially the same when income is included instead of subjective socioeconomic status and when economic political orientation is included instead of social political orientation.

2.4.2.3.2 Subjective Inequality, Perspective Taking and Empathy

Perspective Taking. To explore whether more perceived inequality is associated with less

perspective taking, we first regressed perspective taking on only Inequality and Unfairness

(Model 1). More subjective inequality was associated with less perspective taking, $\beta = -0.16$,

p < .001, 95% CI [-0.23, -0.08]. We then included subjective socioeconomic status, political orientation, age, gender, and religiosity as covariates and included an interaction term between perceived inequality and subjective socioeconomic status (Model 2).

The association between inequality and perspective taking remained significant, $\beta = -0.14$, p < .001, 95% CI [-0.22, -0.06], but the interaction between inequality and socioeconomic status was not significant $\beta = -0.01$, p = .75, 95% CI [-0.07, 0.05].²¹ The association between perceived unfairness and perspective taking was significant in Model 1, $\beta = 0.13$, p < .001, 95% CI [0.05, 0.20], but not in Model 2, $\beta = 0.05$, p = .20, 95% CI [-0.03, 0.13] (see Table 12 for all results described above).

²¹ The interaction looks essentially the same when income rather than subjective socioeconomic status is used as moderator, $\beta = -0.05$, p = .12, 95% CI [-0.12, 0.01].

		Model 1			Model 2			
	β	CI	р	β	CI	р		
(Intercept)	-0.00	-0.06 - 0.06	1.00	-0.36	-0.580.14	.001		
SIS Inequality	-0.16	-0.230.08	<.001	-0.14	-0.220.06	<.001		
SIS Unfairness	0.13	0.05 - 0.20	<.001	0.05	-0.03 - 0.13	.198		
SES				-0.02	-0.08 - 0.05	.616		
Political Orientation				-0.14	-0.210.06	<.001		
Age				-0.04	-0.10 - 0.03	.270		
Gender				0.23	0.10 - 0.36	<.001		
Religiosity				0.11	0.04 - 0.18	.002		
SIS_Inequality*SES				-0.01	-0.07 - 0.05	.747		
Observations		1009			938			
\mathbb{R}^2 / adj. \mathbb{R}^2		.018 / .017			.048 / .040			

Table 12. Regression Predicting Perspective Taking from Perceptions of Inequality andDifferent Covariates

Note. For model 1, F(2,1006) = 9.47, p < .001. For model 2, F(8,929) = 5.84, p < .001 (the sample sizes are smaller than N = 1024 because of missing data). SES = subjective socioeconomic status. Political Orientation = social political orientation. Gender was coded as 1 = male, 2 = female. The regression model remains essentially the same when income is included instead of subjective socioeconomic status and when economic political orientation is included instead of social political orientation.

Empathy. To explore whether subjective inequality would be associated with decreased empathy, we regressed empathy on Inequality and Unfairness (Model 1). Subjective inequality was not associated with empathy, $\beta = 0.06$, p = .12, 95% CI [-0.01, 0.13]. We next included subjective socioeconomic status, political orientation, age, gender, and religiosity as covariates and included an interaction term between perceived inequality and subjective socioeconomic status (Model 2). The association between inequality and empathy became significant, $\beta = 0.11$,

p <.01, 95% CI [0.03, 0.19], and the interaction between inequality and socioeconomic status was also significant $\beta = 0.06$, p = .04, 95% CI [0.00, 0.12] (see Table 13 for all results described above), such that the relationship between perceived inequality and empathy is only significant one standard deviation above the mean on subjective socioeconomic status, , $\beta = .17$, p < .001, and at the mean, , $\beta = 0.11$, p < .01, but not at one standard deviation below the mean, $\beta = 0.04$, p= .38 (see Figure 4).²² The association between perceived unfairness and empathy was significant in Model 1, $\beta = 0.11$, p < .01, 95% CI [0.04, 0.18], as well as in Model 2, $\beta = 0.08$, p< .05, 95% CI [0.00, 0.16].

In sum, high subjective inequality was associated with decreased perspective taking but not with empathy. There was, however, an interaction between subjective socioeconomic status and inequality in predicting empathy, such that the relationship was predominantly driven by people high (or around the mean) in socioeconomic status. Judging high inequality as unfair was positively associated with empathy but not with perspective taking.

²² Income also significantly moderates the relationship between perceived inequality and empathy, $\beta = 0.08$, p = .01, 95% CI [0.02, 14], such that only people at one standard deviation above the mean of income show a relationship between inequality and empathy, $\beta = 0.19$, p < .001, as well as people at the mean of income, $\beta = 0.11$, p < .01, but not people whose income is at one standard deviation below the mean of income, $\beta = 0.03$, p = .54.

		Model 1			Model 2			
_	β	CI	р	β	CI	р		
(Intercept)	0.00	-0.06 - 0.06	1.00	-0.63	-0.850.41	<.001		
SIS Inequality	0.06	-0.01 - 0.13	.116	0.11	0.03 – 0.19	.007		
SIS Unfairness	0.11	0.04 - 0.18	.004	0.08	0.00 - 0.16	.047		
SES				0.04	-0.02 - 0.10	.227		
Political Orientation				-0.03	-0.10 - 0.05	.513		
Age				-0.08	-0.140.01	.018		
Gender				0.40	0.27 - 0.53	<.001		
Religiosity				0.12	0.05 - 0.19	<.001		
SIS_Inequality*SES				0.06	0.00 - 0.12	.039		
Observations		1009			938			
\mathbb{R}^2 / adj. \mathbb{R}^2		.023 / .021			.086 / .078			

Table 13. Regression Predicting Empathy from Perceptions of Inequality and DifferentCovariates

Note. For model 1, F(2,1006) = 11.94, p < .001. For model 2, F(8,929) = 10.88, p < .001 (the sample sizes are smaller than N = 1024 because of missing data). SES = subjective socioeconomic status. Political Orientation = social political orientation. Gender was coded as 1 = male, 2 = female. The regression model remains essentially the same when income is included instead of subjective socioeconomic status and when economic political orientation is included instead of social political orientation.

Figure 4. Relationship between Subjective Inequality and Empathy at Different Levels of Subjective Socioeconomic Status



Note. SES = subjective socioeconomic status; *** p < .001, ** p < .01, * p < .05.

2.4.2.3.3 Subjective Inequality, Pride and Social Dominance

Hubristic Pride. To explore whether more perceived inequality is associated with more hubristic pride, we regressed hubristic pride on Inequality and Unfairness (Model 1). Subjective inequality was positively associated with more hubristic pride, $\beta = 0.19$, p < .001, 95% CI [0.12, 0.27]. We next included subjective socioeconomic status, political orientation, age, gender, and religiosity as covariates and an interaction term between perceived inequality and subjective socioeconomic status (Model 2). The association between inequality and hubristic pride remained significant, $\beta = 0.16$, p < .001, 95% CI [0.09, 0.24], but the interaction between inequality and socioeconomic status was not significant, $\beta = 0.04$, p = .16, 95% CI [-0.02,

0.10].²³ There was a negative association between perceived unfairness and hubristic pride in Model 1, $\beta = -0.19$, p < .001, 95%CI [-0.26, -0.11], which remained significant in Model 2, $\beta = -0.15$, p < .001, 95%CI [-0.23, -0.08] (see Table 14 for all results described above). Thus, while more perceived inequality is associated with more hubristic pride, judging high inequality as unfair is associated with less hubristic pride.

²³ Note that income significantly moderates the relationship between perceived inequality and hubristic pride, $\beta = 0.10, p < .01, 95\%$ CI [0.04, 16], such that people of higher income show a strong relationship between inequality and hubristic pride, $\beta = 0.25, p < .001$ (for people one standard deviation above the mean on income), as do people at the mean level of income, $\beta = 0.15, p < .001$, while there is no association between income and hubristic pride one standard deviation below the mean of income, $\beta = 0.05, p = .29$. This suggests that the positive association between perceived inequality and income is driven by people whose income is around or above the mean.

		Model 1			Model 2			
-	β	CI	р	β	CI	р		
(Intercept)	0.00	-0.06 - 0.06	1.00	0.48	0.28 - 0.68	<.001		
SIS Inequality	0.19	0.12 - 0.27	<.001	0.16	0.09 - 0.24	<.001		
SIS Unfairness	-0.19	-0.260.11	<.001	-0.15	-0.230.08	<.001		
SES				0.15	0.09 - 0.21	<.001		
Political Orientation				-0.03	-0.10 - 0.04	.337		
Age				-0.17	-0.230.11	<.001		
Gender				-0.31	-0.430.19	<.001		
Religiosity				0.05	-0.01 - 0.11	.132		
SIS Inequality*SES				0.04	-0.02 - 0.10	.155		
Observations	1009			938				
\mathbf{R}^2 / adj. \mathbf{R}^2		.030 / .028		.119 / .111				

 Table 14. Regression Predicting Hubristic Pride from Perceptions of Inequality and

Different Covariates

Note. For model 1, F(2,1006) = 15.76, p < .001. For model 2, F(8,929) = 15.64, p < .001 (the sample sizes are smaller than N = 1024 because of missing data). SES = subjective socioeconomic status. Political Orientation = social political orientation. Gender was coded as 1 = male, 2 = female. The regression model remains essentially the same when income is included instead of subjective socioeconomic status and when economic instead of social political orientation is included.

Authentic Pride. To explore the relationship between perceived inequality and authentic pride, we first regressed authentic pride on Inequality and Unfairness (Model 1). Subjective inequality was negatively associated with authentic pride, $\beta = -0.17$, p < .001, 95% CI [-0.25, -0.10]. We next included subjective socioeconomic status, political orientation, age, gender, and religiosity as covariates and included an interaction term between perceived inequality and subjective socioeconomic status (Model 2). The association between inequality and authentic pride

remained significant, $\beta = -0.08$, p = .03, 95% CI [-0.15, -0.01], and the interaction between inequality and socioeconomic status was also significant, $\beta = 0.07$, p = .01, 95% CI [0.01, 0.12], such that the relationship between perceived inequality and authentic pride was only significant one standard deviation below the mean on subjective socioeconomic status, $\beta = -.15$, p < .001, and at the mean, , $\beta = -0.09$, p = .01, but not at one standard deviation above the mean, , $\beta = -$ 0.02, p = .610 (see Figure 5).²⁴ These results suggest that it is specifically people whose subjective socioeconomic status puts them around or below the mean whose sense of authentic pride is decreased with increasing subjective inequality. There was a significant negative association between perceived unfairness and authentic pride in Model 1, $\beta = -0.11$, p < .01, 95% CI [-0.18, -0.04], as well as in Model 2, $\beta = -0.09$, p = .01, 95% CI [-0.16, -0.02] (see Table 15 for all results described above).

²⁴ Income also significantly moderates the relationship between perceived inequality and authentic pride, $\beta = 0.08$, p < .01, 95% CI [0.02, 14], such that people of lower income show a strong relationship between inequality and authentic pride, $\beta = -0.20$, p < .001 (for people one standard deviation below the mean on income), as do people at the mean level of income, $\beta = -0.12$, p < .01, while there is no association between income and authentic pride one standard deviation below the mean of income, $\beta = -0.04$, p = .39. This suggests that the negative association between perceived inequality and income is driven by people whose income is around or below the mean.

		Model 1			Model 2			
	β	CI	р	β	CI	р		
(Intercept)	-0.00	-0.06 - 0.06	1.00	0.09	-0.10 - 0.29	.353		
SIS Inequality	-0.17	-0.250.10	<.001	-0.08	-0.150.01	.026		
SIS Unfairness	-0.11	-0.180.04	.003	-0.09	-0.160.02	.013		
SES				0.37	0.32 - 0.43	<.001		
Political Orientation				-0.03	-0.10 - 0.04	.405		
Age				0.06	0.01 - 0.12	.027		
Gender				-0.06	-0.18 - 0.06	.337		
Religiosity				0.17	0.11 - 0.23	<.001		
SIS Inequality*SES				0.07	0.01 - 0.12	.014		
Observations		1009			938			
\mathbf{R}^2 / adj. \mathbf{R}^2		.065 / .063			.251 / .244			

 Table 15. Regression Predicting Authentic Pride from Perceptions of Inequality and

Different Covariates

Note. For model 1, F(2,1006) = 34.83, p < .001. For model 2, $F(8,929) = 38.89 \ p < .001$ (the sample sizes are smaller than N = 1024 because of missing data). SES = subjective socioeconomic status. Political Orientation = social political orientation. Gender was coded as 1 = male, 2 = female. The regression model remains essentially the same when income is included instead of subjective socioeconomic status and when economic political orientation is included instead of social political orientation.

Figure 5. Relationship between Subjective Inequality and Authentic Pride at Different





Note. SES = subjective socioeconomic status; *** p < .001, ** p < .01, * p < .05.

Social Dominance Orientation. To explore whether perceived inequality is associated with increased social dominance orientation, we first regressed social dominance orientation on Inequality and Unfairness (Model 1). Subjective inequality was positively associated with social dominance, $\beta = 0.15$, p < .001, 95%CI [0.09, 0.21]. We next included subjective socioeconomic status, political orientation, age, gender, and religiosity as covariates and included an interaction term between perceived inequality and subjective socioeconomic status (Model 2). The association between inequality and social dominance remained significant, $\beta = 0.15$, p < .001, 95%CI [0.03, 0.13], such that the association is strongest for people high in subjective socioeconomic status, $\beta = 0.22$, p < .001 (at one standard deviation above the

mean), followed by people at the mean, $\beta = 0.15$, p < .001, and only marginally significant for people one standard deviation below the mean on subjective socioeconomic status, $\beta = 0.07$, p = .09 (see Figure 6).²⁵ The relationship between perceived inequality and the willingness to dominate different social groups is strongest for people of higher socioeconomic status, which suggests that higher perceived inequality could be associated with increased oppression of minorities. There was a significant negative association between perceived unfairness and social dominance orientation in Model 1, $\beta = -0.62$, p < .001, 95%CI [-0.68, -0.56], as well as in Model 2, $\beta = -0.47$, p < .001, 95%CI [-0.53, -0.40] (see Table 16 for all results described above). Thus, while more perceived inequality is associated with a higher social dominance orientation, judging high inequality as unfair is associated with a lower social dominance orientation. This relationship is also noteworthy in another sense. Recall from Study 2 that Social Dominance Orientation correlates negatively with perceived inequality (we replicate this relationship in Study 3, r = -.21). However, once we remove the effect of fairness judgments the relationship between social dominance and perceived inequality becomes positive.

²⁵ Note that income does not moderate the relationship between perceived inequality a social dominance orientation, $\beta = 0.02$, p = .36, 95% CI [-0.03, 07].

Table 16. Regression Predicting Social Dominance Orientation from Perceptions of

Inequa	lity	and	Different	Cov	variates
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		Model 1			Model 2			
_	β	CI	р	β	CI	р		
(Intercept)	-0.00	-0.05 - 0.05	1.00	0.38	0.21 – 0.56	<.001		
SIS Inequality	0.15	0.09 - 0.21	<.001	0.15	0.08 - 0.21	<.001		
SIS Unfairness	-0.62	-0.680.56	<.001	-0.47	-0.530.40	<.001		
SES				0.02	-0.04 - 0.07	.558		
Political Orientation				0.32	0.26 - 0.38	<.001		
Age				-0.02	-0.07 - 0.03	.450		
Gender				-0.24	-0.340.13	<.001		
Religiosity				-0.06	-0.110.00	.042		
SIS Inequality*SES				0.08	0.03 - 0.13	.002		
Observations		1009			938			
\mathbf{R}^2 / adj. \mathbf{R}^2		.301 / .300			.389 / .384			

Note. For model 1, F(2,1006) = 216.9, p < .001. For model 2, F(8,929) = 74.02, p < .001 (the sample sizes are smaller than N = 1024 because of missing data). SES = subjective socioeconomic status. Political Orientation = social political orientation. Gender was coded as 1 = male, 2 = female. The regression model remains essentially the same when income is included instead of subjective socioeconomic status and when economic political orientation is included instead of social political orientation.

Figure 6. Relationship between Subjective Inequality and Social Dominance Orientation at



Different Levels of Subjective Socioeconomic Status

Note. SES = subjective socioeconomic status; *** p < .001, ** p < .01, * p < .05, † p < .10.

In sum, in these exploratory analyses, we found that more perceived inequality was associated with less hope of success but not associated with fear of failure. Judging high inequality as unfair, on the other hand, was associated with greater fear of failure and, unexpectedly (when only subjective inequality was included as covariate), with increased hope of success. Furthermore, more subjective inequality was associated with decreased perspective taking but not with empathy while judging high inequality as unfair was associated with increased empathy and (when only subjective inequality was included as covariate) with increased perspective taking. And finally, subjective inequality was associated with increased social dominance and hubristic pride but decreased authentic pride while unfairness judgments were negatively associated with social dominance, hubristic pride, and authentic pride. The

association between subjective inequality and social dominance was strongest for people high in subjective socioeconomic status.

2.4.2.4 The Gini Coefficient and Subjective Inequality

Perceptions of inequality were positively correlated with the Gini coefficient, r = .06, p < .05. While this is a small correlation, it replicates the findings from Study 2. This lends further support to the possibility that perceptions of inequality could partly be affected by objective inequality measures. Nonetheless, the small size of this association over two studies shows that, even if objective levels of inequality do affect perceptions, other factors are more important. However, perceptions of inequality are certainly made up of the inequality an individual perceives in his or her environment and one's environment is comprised of different factors. Hence, to what extent perceptions should be better described as *mis*perceptions remains an open question. It is also possible that the correlation between objective and subjective inequality is greater at the country level.

Chapter 3: Conclusion

3.1 Discussion

Despite the interest in the possible effects of increasing levels of economic inequality on a variety of social ills, little is known about perceptions of economic inequality and to what extent such perceptions predict such social problems. Most research on the effects of economic inequality has either used aggregate objective measures of inequality or manipulated inequality (e.g., Burns, Tomita, & Kapadia, 2014; Buttrick & Oishi, 2017; Côté et al., 2015; Hsieh & Pugh, 1993; Messias, Eaton, & Grooms, 2011; Payne et al., 2017; Pickett, 2005; see Wilkinson & Pickett, 2009; Wilkinson and Pickett, 2010). The goal of this research was therefore to develop a scale to measure people's *subjective* experience of the level of inequality present as well as the extent to which they consider high inequality to be unfair. As described above, the SIS has good psychometric properties. By both the RMSEA and the CFI, model fit was found to be good, and the reliability of the scale as a whole, as well as its two factors, was high.

We tested the association between perceived inequality and different mental health and social variables. Perceptions of more inequality may make one perceive people higher up and lower down the status hierarchy to be farther away implying that it is both harder to increase one's status as well as more consequential if one loses status. At the same time with increasing inequality, one's status holds more consequences, all else being equal. Therefore, we predicted that more perceived inequality would be associated with less subjective wellbeing and trust and increased status anxiety. A second reason why we were interested in these variables, in particular, is because past research using objective inequality measures has found the same relationships (e.g., Delhey & Dragolov, 2014). Because little is known about perceptions of inequality, we decided to begin this research by turning to associations that have been used in

research on economic inequality. Greater perceived inequality was associated with less subjective wellbeing, trust and more status anxiety. Further, there was an interaction between subjective socioeconomic status and subjective wellbeing such that people of lower status showed a stronger association between perceived inequality and subjective wellbeing suggesting that the costs of inequality on wellbeing are especially borne by the poor. We further found that both status anxiety and trust partially mediated the relationship between subjective inequality and subjective wellbeing – an effect that past research has found with the Gini (Delhey & Dragolov, 2014).

We further predicted that increased subjective inequality would be linked with more depression, anxiety, and stress because perceiving people higher up the status hierarchy as farther away may make one's own economic situation seem bleaker. Depression (e.g., Patel et al., 2018) and anxiety and stress (e.g., Wilkinson & Pickett, 2010) have also been associated with objective measures of inequality and we thus considered them to be a good start for this line of research. We found a positive relationship between perceptions of inequality and depression, anxiety, and stress. Furthermore, subjective socioeconomic status interacted with perceived inequality in predicting depression; people of lower status showed a stronger relationship.

In an exploratory spirit, we investigated the relationship between the SIS and the fear of failure and hope of success. If more perceived inequality leads one to perceive it harder to climb up the status hierarchy and the consequences of falling down to be more consequential, then it seems plausible that one has a greater fear of failure and a lower hope of success. While there was a negative relationship between perceived inequality and hope of success, there was no association with fear of failure. Fear of failure, however was positively associated with finding high inequality unfair.

We also explored the relationship between subjective inequality and perspective taking and empathy. If more perceived inequality is associated with perceiving a greater distance between one's self and others further up or down the hierarchy, then it is plausible that both perspective taking and empathy would be decreased. We found that perceived inequality was negatively related to perspective taking but not associated with empathy (unless various covariates were included in which case the association became positive). However, finding high inequality unfair was positively related to empathy. Socioeconomic status furthermore moderated the relationship between perceived inequality and empathy, such that the relationship was driven by people higher in socioeconomic status.

Last, we also explored the relationship between the SIS and authentic and hubristic pride as well as social dominance orientation. We found that both a social dominance orientation (after controlling for fairness judgments) and self-reported hubristic pride were greater when subjective economic inequality was higher, lending some initial support for the hypothesis that greater inequality increases dominance. Fairness judgments of inequality were associated both with less hubristic pride and less social dominance orientation. Furthermore, the relationship between perceived inequality and hubristic pride was moderated by income and mostly driven by people higher in income. The relationship between perceived inequality and social dominance orientation, on the other hand, was moderated by subjective socioeconomic status; people of higher subjective socioeconomic status showed a stronger association between perceived inequality and social dominance orientation than did people of lower socioeconomic status. Both perceived inequality and fairness judgments showed a negative association with authentic pride. Furthermore, both subjective socioeconomic status and income moderated the relationship between authentic pride and perceived inequality such that people low in these constructs

reported less authentic pride if they perceived more inequality while people high in socioeconomic status or income showed no association between perceived inequality and authentic pride.

The results described here show that subjective socioeconomic status at times moderated the relationship between perceived inequality and a variable of interest. When there was an interaction, further inspection of the simple slopes suggests that it was at times people of higher subjective socioeconomic status or income while at other times people of lower status or income predominantly showed an association between perceived inequality and another variable of interest. Often, there was no interaction at all. This points to the importance of possible moderators: Potential (adverse) effects of inequality may sometimes be mostly carried by people who are worse off, sometimes by people who are better off, and sometimes by everyone alike. From a more theoretical perspective, these results demonstrate the need to consider how perceived inequality and relative social standing interact. One point to consider, however, is that the participants were recruited from MTurk, and thus, even people above the mean on subjective socioeconomic status and income are unlikely to be representative of the well-off in the United States.

One strength of the SIS is that we can look at individual differences in subjective inequality *within* one area whereas objective measures of inequality merely assign one number to an entire area to compare the effects of inequality *between* different areas.²⁶ What's more, people of different demographic backgrounds perceived inequality differently. For example, people of lower income or subjective socioeconomic status perceived more inequality and found high

²⁶ They do, however, control for different demographic variables.

inequality more unfair than people of higher income. This suggests that individual differences may play an important role in how inequality is perceived and, in turn, that it might be necessary to understand these individual differences when studying the effects of inequality. Similarly, liberals perceived more inequality than conservatives. Generally, liberals are in greater support of policies aimed at reducing inequality such as redistributive taxation (e.g., Barton, n.d.; Fingerhut, 2017). Perhaps this can be partly explained by the present findings: Liberals literally see more inequality than conservatives.

Because the SIS taps into both people's perceptions of inequality and the extent to which high inequality is thought to be unfair, we hope that it can aid researchers into teasing apart the effects of inequality per se from the effects of finding inequality to be unfair. As Starmans and colleagues (2017) have argued, humans don't really care so much about inequality - they primarily care that resources are distributed fairly. However, even if we do not have any inequality aversion so long as we deem the prevalent level of inequality to be fair, the stratification of resources may nonetheless affect us. For example, if competition over resources becomes more consequential, then regardless of how one feels about its unequal distribution, one may still be motivated to compete because it is the only way to improve one's lot. Thus, inequality itself and perceived unfairness may sometimes pull in opposite directions. Indeed, we saw this with two variables in Study 3. Perceived inequality was associated with more hubristic pride while judgments of fairness were associated with less hubristic pride. People who find high levels of inequality unfair may be the type to experience less hubristic pride; however, as people perceive more inequality in their environment they may, nonetheless, react by switching to a more dominant strategy and, hence, experience *more* hubristic pride. Similarly, perceived inequality was associated with greater social dominance orientation while judgments of fairness

were associated with less social dominance orientation. Interestingly, the zero-order correlation between perceived inequality and social dominance orientation is negative. Only when the effects of fairness were removed, did the relationship between perceived inequality and social dominance orientation become positive. This points to the possibility that fairness judgments may at times confound the effects of inequality itself, and that it is important to tease these apart and look at both separately.

Of course, many other factors such as the degree of social mobility (or perceived social mobility), cultural beliefs, such as the belief in a meritocracy or *Noblesse oblige*, and institutional regulations, such as the strength of unions, likely mediate both perceptions of inequality and potential effects of inequality. Therefore, the SIS should be used in different countries both to further establish its psychometric properties and predictive utility, and to investigate which other cultural variables affect perceptions of inequality and unfairness and how this relates to different social and health problems.

3.2 Limitations

While these findings appear promising, there are of course important limitations. Even though perceptions of inequality may have important implications, we don't know what constitutes such perceptions. For example, perhaps an increasing awareness of inequality affects the ways that people think about it. As the topic of inequality becomes more widely discussed on different forms of media, people might begin to notice more inequality. It is possible that perceptions are, at least in part, affected by actual inequality levels. Indeed, across two studies, we did find a small but significant correlation between state-level Gini coefficients and perceived inequality. However, perceptions tend to be inaccurate (Norton & Ariely, 2011) and the fact that these correlations were so small suggests just that. Thus, even if the subjective experience of

inequality is affected by the actual level of inequality, it is certainly also affected by many other factors.

Another limitation to consider is that inequality may exert its influence not only through conscious perceptions but also through more basic unconscious cognitive processes. While the SIS can help to investigate correlates of perceived inequality that are available to self-report, it cannot speak to the possibility of such unconscious effects. Because of this, the scale should be used in concert with other methodological approaches. To this end, we are currently developing different experimental manipulations of economic inequality. Furthermore, the SIS can be helpful in determining to what extent the level of inequality prevalent in the environment is available to self-report and to what extent these perceptions specifically can be associated with different social and health variables.

Finally, an important limitation is that we cannot conclude that the relationships described here are causal. While it is implausible that higher levels of depression, for example, lead to an increase in the Gini coefficient, it is certainly possible that higher self-reported depression causes more perceived inequality simply because one's outlook on the world in general is bleaker. This is a limitation inherent to all correlational research and one that cannot be addressed with this scale. However, while the SIS will certainly not be able to answer any questions of causality, we hope that it will nonetheless be a useful tool in the study of inequality. For example, it could be used in combination with some behavioral outcome measure such as economic games so that causality is at least less likely to go the other way.

3.3 Open Questions

Many questions remain unanswered and await future research. Perceptions of inequality can surely be influenced by public debate and media coverage. Likewise, it is possible that the

level of inequality one is exposed to in early childhood shapes many psychological processes. Research shows that people of lower socioeconomic status have a faster life-history strategy than people of higher status (Pepper & Nettle, 2017). One proposed explanation is that the extrinsic mortality risk (i.e., the risk to die unexpectedly from causes external to the person such as getting shot or a car accident) is higher for people of lower status who tend to live in less safe neighborhoods, drive less safe cars etc. Therefore, their focus is stronger on the present rather than the future. For example, they save less money, engage more in risky health behaviors such as smoking and drinking, and have children at an earlier age. From an evolutionary perspective, this strategy makes sense: If your risk to die early is high, you should make sure your genes make it to the next generation now. People of high status, on the other hand, can afford to wait until they have the financial means to secure a partner with "good genes" and to raise children most successfully. Similarly, the extent of inequality one is exposed to in childhood may affect the life-history strategy one pursues. This raises the possibility of a window of sensitivity where we are most likely to be affected by the inequality we perceive in our environment.

Another open question is the geographic area that is most appropriate in studying perceptions of inequality. Do people look to their country, their state, their neighborhood, or specific people such as their family or peers? People probably use a combination of all these, and it also depends on the nature of the comparison. Future research is needed to understand the contributions of these different levels of reference. Since the SIS can be adapted to any geographical area, it may be a useful tool in uncovering which reference group correlates strongest with different variables of interest.

Other important open questions that await answers are whether the SIS can predict actual behavior or concrete mental health outcomes. For example, does the SIS correlate with the use of

antidepressants, fights, incarceration rates or the like? In general, it will be important to implement a multi-trait, multi-method approach to corroborate some of the self-report findings presented here.

3.4 Concluding Remarks

Research on economic inequality is quickly increasing. We created and validated the SIS across three studies. The SIS affords researchers an instrument that can measure differences in perceived inequality and fairness judgments at the individual level. We hope that the SIS will be a useful tool that aids researchers in the study of the effects of economic inequality.

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Appendices

Appendix A Scree Plot EFA 1 Study 1



A.1 Initial 92 Items and their Factor Loadings

Items retained for second EFA highlighted in grey

Items					Factors				
	ML2	ML1	ML4	ML3	ML6	ML8	ML5	ML7	ML9
IQ_I1	-0.115	0.733							
IQ_I2		0.665							0.176
IQ_I3		0.438				0.134	0.104		0.153
IQ_I5	0.300		0.142			0.510			
IQ_I6		0.210				0.401		0.197	0.187
IQ_I8	0.122	0.352	0.178			0.392			
IQ_I10	0.217	0.151				0.447			
IQ_I11		0.551	0.128	-0.115	0.135				0.147
IQ_I13	0.275	0.158	0.190			0.430	0.118		
IQ_W1	0.173	0.160				0.375		0.139	0.125
IQ_W3		0.735							
IQ_W4		0.452	0.103		0.419	-0.109			
IQ_W5		0.591				0.163			-0.103
IQ_W6	0.126	0.425				0.326			
IQ_W8	0.124				0.318	0.265			0.170
IQ_W11		0.621		0.117	-0.135	0.224			
IQ_W12		0.660			0.177				
IQ_W13		0.650			0.187				
IQ_W14	0.279	0.136				0.475			
IQ_W15	0.205		-0.239	0.140		0.249			
IQ_W16	0.331					0.479			
IQ_E1		0.138		0.522					
IQ_E2		0.112				0.135	0.489		
IQ_E3						0.207	0.228	0.379	
IQ_E4	-0.134				0.399		0.461		
IQ_E5	-0.122					0.189	0.290	0.456	0.157
IQ_E7	-0.120	0.102			0.243		0.569		
IQ_E10							0.712		
IQ_01	-0.117	0.152			0.576		0.173		
IQ_O2	-0.121		0.160	0.230	0.458		0.127	0.106	
IQ_03	-0.188			0.189	0.496	0.115		0.182	
IQ_04		0.163			0.589		0.172		0.110
IQ_08		0.186		0.105		0.231		0.288	0.314
IQ_010		0.119		0.121	0.630		0.164		
IQ_011			0.127	0.176	0.386	0.126	0.235	0.117	
IQ_P1		0.562		-0.107	0.242				
IQ_P2	0.133	0.519				0.125			
IQ_P4		0.581				0.179			

IQ_P5		0.372			0.260			0.121	
IQ_S1	0.256	0.148				0.439			0.181
IQ_S3	0.216	0.141			0.148	0.410		0.133	0.136
IQ_S4	0.188			-0.172	0.574				0.120
IQ_S5		0.157			0.412	0.107			
IQ_F1			0.224	0.134					0.429
IQ_F3		0.117	0.252	0.147		0.104			0.479
IQ_F5		0.108	0.261				0.104		0.477
IQ_F6	-0.150	0.160	0.189	0.268					0.510
IQ_F7			0.659		0.167				
IQ_F8			0.598	0.123		0.106			0.142
IQ_F9			0.411						0.278
IQ_F10			0.754		0.103				
IQ_F11			0.440			0.102			0.331
IQ_F12			0.754				0.102		
IQ_F14			0.624		-0.134				0.124
IQ_F15			0.711						
IQ_F16			0.596			0.109			
IQI4_R	0.694								
IQ_I7_R	0.785								0.110
IQ_I9_R	0.540			0.105					
IQ_I12_R	0.690							0.132	0.103
IQ_W2_R	0.556			0.150		0.120			
IQ_W7_R	0.568			0.121		0.129			
IQ_W9_R	0.639			0.149		0.120			
IQ_W10_R	0.627			0.165		0.150			
IQ_W17_R	0.726			0.105					
IQ_W18_R	0.274	0.110		0.209				0.290	
IQ_W19_R	0.731								
IQ E6 R	0.125			0.290			0.271	0.382	
IQ_E8_R	0.176				0.128		0.424	0.304	
IQ_E9_R	0.174			0.131			0.665	0.109	
IQ E11 R	0.341						0.192	0.370	
IQ E12 R	0.184						0.241	0.510	
IQ E13 R				0.153		-0.108		0.507	-0.121
IO E14 R	0.538				-0.133		0.157		
IO O5 R				0.467	0.306			0.234	
IQ_06 R	0.348			0.274			0.262	-	
IQ_07 R	0.211			0.326			0.166	0.298	
IO 09 R			1	0.631	0.214			0.139	1
IO P3 R	0.363	0.140	1	0.185				0.252	1
IO P6 R		0.210			0.200	-0.173		0.317	
IO S2 R			1	1			1		1
$IQ D_2 R$	0.462	0.139						0.314	

IQ_F2_R	0.229		0.159	0.400		-0.108		0.291
IQ_F4_R	0.168		0.123	0.516				0.144
IQ_F13_R	0.303	0.101	0.489	0.217		-0.235		
IQ_F17_R			0.137	0.355	0.153	-0.195		0.227
IQ_F18_R	0.165		0.149	0.368	0.108	-0.152		0.130
IQ_F19_R				0.539				0.185
IQ_F20_R				0.691				
IQ_F21_R	0.107			0.557	-0.102			
IQF22_R			0.114	0.571				0.216
IQ_F23_R				0.276		-0.234		0.119

Appendix B Scree Plot EFA 2 Study 1



B.1 30 Items and their Factor Loadings

Items	Factors						
	ML2	ML1	ML3	ML4			
IQ_I1		0.733	0.106				
IQ_I2		0.653	0.217				
IQ_I11	0.177	0.559	0.160				
IQ_W3		0.738					
IQ_W5		0.662					
IQ_W11	0.118	0.750	-0.212				
IQ_W12		0.640	0.278				
IQ_W13		0.628	0.293				
IQ_P1		0.625	0.175				
IQ_P2		0.675	-0.213	0.107			
IQ_P4		0.754	-0.172	0.109			
IQ_E2		0.205		0.504			
IQ_E7			0.298	0.583			
IQ_E10				0.785			
IQ_E9_R				0.740			
IQ_01		0.140	0.626	0.216			
IQ_O4		0.187	0.569	0.180			
IQ_010			0.663	0.180			
IQ_03	0.130		0.510	0.125			
IQ_F1	0.619	0.119		0.101			
IQ_F3	0.660	0.162		0.117			
IQ_F5	0.652	0.109	0.111	0.106			
IQ_F6	0.631	0.117	0.165				
IQ_F7	0.688		0.152				
IQ_F8	0.776						
IQ_F10	0.745			-0.119			
IQ_F12	0.740						
IQ_F14	0.710		-0.192				
IQ_F15	0.733						
IQ_F16	0.658		-0.141				

Items retained for Study 2 highlighted in grey

B.2 List of 19 Items

	Items
IQ_I1	Almost all of the money that is earned goes to only a few people.
IQ_P2	Most of the policy decisions are made by a small handful of people.
IQ_P4	Power is concentrated in the hands of a few.
IQ_I11	While a few people get paid extremely well, the vast majority get paid very little.
IQ_W11	Wealth is concentrated in the hands of a very few people.
IQ_W3	I think that a few people own almost everything.
IQ_W4	Besides those at the very top, no one else has much money at all.
IQ_W12	A few people own all the wealth while the rest are left with no wealth at all.
IQ_01	Real opportunities to succeed in life are only available to the wealthy.
IQ_010	Success is entirely restricted to high-income families.
IQ_E7	Chances for a good education for children depend entirely on the income of their parents.
IQ_E10	The quality of one's education is largely dependent on one's parent's income.
IQ_O3	People are just wrong to think that regular people have good opportunities.
IQ_F3	Overall, the amount of economic inequality is extremely unfair.
IQ_F5	The differences in income between the rich and the poor are not fair at all.
IQ_F6	I think that income should be distributed more evenly.
IQ_F8	I find it very unfair if people of different backgrounds have very different opportunities to
	get ahead.
IQ_F10	It is immoral if your income is dependent on where you grew up.
IQ_F7	It is extremely unjust if children of affluent parents get a better education.

Appendix C Scree Plot EFA 1 Study 2



C.1 19 Items and their Factor Loadings

Final Items selected for scale highlighted in grey

Items	Loadings						
	ML1	ML2	ML4	ML3			
IQ_I1	0.797			-0.110			
IQ_P2	0.515		0.110	-0.362			
IQ_P4	0.610		0.102	-0.403			
IQ_I11	0.734	0.141					
IQ_W11	0.749			-0.291			
IQ_W3	0.694			-0.153			
IQ_W4	0.805			0.237			
IQ_W12	0.762						
IQ_W20	0.755			0.111			
IQ_W21	0.764			0.193			
IQ_I14	0.736						
IQ_01	0.417		0.407	0.309			
IQ_010	0.366		0.404	0.357			
IQ_E7			0.811				
IQ_E10			0.862				
IQ_O3	0.463		0.249	0.314			
IQ_F3new	0.172	0.652		-0.163			
IQ_F5new	0.182	0.629					
IQ_F6new	0.127	0.479		0.403			
IQ_F8		0.683					
IQ_F10		0.776					
IQ_F7		0.717		0.105			
IQ_F25		0.310	0.186	0.376			
IQ_F26		0.758					

Appendix D Scree Plot Final 8 Items of the SIS

