

KEEPING UP WITH THE JONESES:  
HOW COGNITIVE AVAILABILITY BIASES EVERYDAY SOCIAL COMPARISONS

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This dissertation documents the role that cognitive availability plays in distorting the conclusions that people reach about how they measure up to others in domains of everyday concern. The first chapter provides a review of the social comparison literature and an explanation of how my account of social comparison is novel. The second chapter (N=3,293, 11 studies, 3 pre-registered) documents the fact that most people feel others' social lives are livelier than theirs, and that this is because they can't help but to bring to mind highly social exemplars when making such comparisons. The third chapter (N= 2,747, 12 studies, 4 pre-registered) documents a robust tendency to compare to above average standards, which cannot solely be explained by motivational factors like social desirability or self-enhancement—adding a wrinkle to the standard above average effect literature by showing that, although people tend to think of themselves as above average in many domains, they also hold and compare themselves to above average standards. The fourth chapter (N=1,703, 3 studies, 1 pre-registered) documents the fact that people feel they are financially worse off than others when thinking about positive instances of wealth (e.g. having a lot in savings) and that this effect can be reversed if people are made to think of positive instances of low economic standing (e.g. having a lot of debt). The fifth and final chapter synthesizes these empirical findings, summarizes my cognitive availability account of social comparison, reviews why it is a novel contribution, and addresses any outstanding concerns.

## **BIOGRAPHICAL SKETCH**

I am Sebastian Deri. My family is from Budapest, Hungary. In 1979, my parents, Gabor and Ildiko Deri, emigrated to Brooklyn, New York, working in grocery stores and nail salons after having lost the fortune they amassed in their 20s in Hungary, which at the time was a Soviet satellite state. 12 years later, I was born. Through the accumulated efforts of their continual hard work, I grew up in an upper-middle class suburb on Long Island, where I went to Great Neck South High School, a school within a community that emphasized academic achievement. This, more than anything, set me on a good path. I arrived in Ithaca in 2009, the first in my immediate family to go to college. I then remained at Cornell for over a decade, mostly bumbling about and being distracted by interesting things. Amid this bumbling and distraction, I did eventually complete a bachelor's, two master's, and finally this PhD degree. In 2020, during the COVID-19 pandemic, I moved to San Francisco, and completed this dissertation remotely. I now live in San Francisco. Sometimes I feel it is the greatest place on earth.

*To my parents, Gabor and Ildiko Deri,  
who've done much harder things than write a dissertation.*

*And to my grandfather, Déri Róbert.*

*This dissertation is for you.*

*I hope I've made you proud.*

*(Remélem, hogy büszkék vagytok rám.)*

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## CHAPTER 1: GENERAL INTRODUCTION

When do people feel like they don't measure up to others? And why? This dissertation explores some meaningful domains in which people don't feel that they measure up to others and proposes a novel account for why this is.

The dissertation is structured as follows. In this introduction, I summarize the guiding claim, review previous research on the factors that determine who people compare themselves to, and elaborate on the psychological processes at the heart of my account in more detail. The bulk of the dissertation then presents three lines of research on how people make everyday social comparisons—which provide support for this claim and demonstrate several notable cases (social life and wealth) where people reach pessimistic conclusions about how they measure up to others. I conclude with a summary and discussion of the implications of these findings.

### **Summary of Central Claim**

The essence of my claim is this. Previous accounts of social comparison are functional—that is, people select comparison targets in service of some goal, such as accurately evaluating their own ability or making themselves feel better. I propose a novel, involuntary, and automatic cognitive factor that influences who people compare themselves to when making social comparisons in domains of everyday concern. Most simply, the claim essentially boils down to the argument that when people are asked (or are ask themselves) questions like “Who is richer, me or others?” or “Who goes to more parties, me or others?”, they think of other people who are social or who are rich, not simply “other people”. That is, when people attempt or are asked to compare themselves to other people, they bring to mind comparison targets who the question has made more mentally available—exemplars who exhibit the trait in question, for example, others who are rich or social. This stacks the deck. People end up comparing themselves to a mental

representation of others, constructed from these available exemplars that is, on average, above average. As a result, they come to pessimistic conclusions about how they stack up to others.

This account posits and documents the sometimes critical role that the availability bias can play in determining the outcomes of social comparisons. In this dissertation, I show that availability not only biases frequency or probability judgments by bringing unrepresentative instances to mind more frequently than they occur, but also biases social comparative judgments by bringing to mind a distorted set of exemplary comparison targets, against which people end up (unfairly) judging themselves.

The availability bias (or availability heuristic) is the tendency to judge the frequency or prevalence of an event or object based on the number and ease of instances of that event or object that come to mind (Schwarz & Vaughn, 2002; Tversky & Kahneman, 1973, 1974). In a classic demonstration, Tversky & Kahneman (1974) show that people judge there to be more words with “r” as the first letter (e.g. road) than words with “r” as the third letter (e.g. car), because it is easier to bring to mind instances of words that begin with the letter “r” than instances in which the third letter of a word is “r”. In reality, there are a greater number of words with “r” as a third letter than a first letter. Countless other judgments are distorted by availability. For example, people overestimate their risk of dying from tornados and lightning strikes because instances easily come to mind and moreover are disproportionality available relative to their actual frequency, while they underestimate their risk of dying from heart disease and cancer because instances of such deaths are less disproportionality available relative to their actual frequency (Lichtenstein et al., 1978).

In a similar fashion, regardless of the relative frequencies of “rich” and “poor” people in the population, the mere act of asking a question like “Who is richer, me or others?” makes rich

people more mentally available than poor people. It is from this biased sample of rich people who come to mind that people construct a mental representation of their comparison target, and against which they compare themselves. This often leads people to conclude that they are doing relatively worse than others in domains of everyday concern.

### **Major Accounts of Social Comparison**

My claim is distinct from the previous accounts of the processes that determine who people compare themselves to. I will now review these accounts.

Most major theories and perspectives about the determinants of social comparison are functional (exceptions are discussed in a later section). That is, who people compare themselves to serves some goal, whether conscious or unconscious. These goals can be roughly grouped as follows: (1) self-assessment, (2) self-enhancement, and (3) aspiration, coping and self-improvement.

#### ***Self-assessment***

The social psychological research tradition on social comparison begins with, as nearly every paper on social comparison will remind you, Leon Festinger's (1954) theory of social comparison processes. The theory, which is laid out as a set of hypotheses, claims that people have an innate drive to assess their abilities (Hypothesis I), and in the absence of objective information about these abilities<sup>1</sup>, they compare themselves with others of roughly similar ability (Hypotheses II, III and Corollary IIIA).

Subsequent studies in which people were asked to choose the rank of their comparison target, after performing task in which they were uncertain of their performance, seem to bear this

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<sup>1</sup> Although see Klein (1997) for empirical evidence indicating that even in the presence of objective information, people choose and prefer comparative information.

out empirically (Gordon 1966, Radloff, 1966).

Later elaborations of this account more clearly articulated an attributional component of this self-assessment theory. Notably, Goethals & Darley (1977) argued that people compare specifically to others who are similar on “characteristics related to and predictive of performance” in a given domain (Suls & Wheeler, 2000, Chapter 1, p. 7-8), rather than simply others who have performed similarly in the given domain of comparison. Doing this allows the comparer to more clearly understand whether their performance is above or below par—as they should be able to perform similarly to others who have the same capabilities. For example, it would be more informative for a 32 year old man to compare his weight-lifting abilities to that of another 32 year old man than to a 12-year old child, even if his weightlifting performance is closer to that of the 12 year old.

Further developments of the self-assessment account of social comparisons come from Suls' et al. (2002) and Wheeler's et al. (1997) proxy model of social comparisons. Here, people are interested in assessing their future performance in a domain. As the authors put it, when people try to answer the question “Can I do X?”, they search for others who are similar and assess those people’s performance in the relevant domain, in order to predict how they might do (before actually spending time trying to do X themselves, which can be costly and time-consuming).

There is a great deal of empirical support for the self-assessment account of social comparison (Gruder, 1971; Martin et al., 2002; Miller, 1982, 1984; Suls et al., 1978; Wheeler, 1966; Wheeler et al., 1982, 1997; Zanna et al., 1975) and furthermore it is simply eminently reasonable that people would compare themselves to similar others to assess their own abilities. To understand how good they are at algebra, both sixth graders and their teachers compare those



students' algebraic performance to that of other sixth graders, not that of Fields medalists or racoons. The main point for our purposes is the self-assessment account of social comparison posits that people choose their comparison target in service of essentially a functional goal—to evaluate themselves.

### *Self-enhancement*

Another major perspective on social comparison maintains that social comparisons are determined by emotional needs and the urge to protect self-esteem. Essentially, people compare to others who will make them feel better about themselves.

This approach gained steam in the 1980s, although had origins earlier (Suls & Wheeler, 2000, Chapter 1). Thornton & Arrowood (1966) were among the first to make a distinction between self-evaluation and self-enhancement as motivating factors in social comparison. Hakmiller (1966) provided some of the early empirical evidence that when people feel their egos threatened, they tend to engage in downward comparisons. The landmark paper in this area, however, is Wills' (1981) integrative review which marshalled a great deal of evidence in support of the claim that people engage in downward comparison when they feel threatened as a way of making themselves feel better. Empirical research after the publication of this paper seemed to support the idea that people often engage in downward comparisons to make themselves feel better when their self-esteem or feelings were at stake (Wood et al., 1985). However, a recent meta-analysis of 145 studies on social comparisons over the last 60 years finds no evidence that people are more likely to engage in downward comparisons when they are threatened (Gerber et al., 2018).

There is however some evidence that when people feel threatened they avoid making any social comparisons, in order to avoid the negative reactions that might result (Smith & Insko,

1987). Similarly, Wood et al. (1994) show that those with low self-esteem avoid making social comparisons altogether after they have performed poorly, as a way of protecting their egos and avoiding embarrassment.

Regardless of the ultimate empirical validity of the claims that fall within the purview of the self-enhancement perspective of social comparisons, the point for our purposes is that this is another major account of the factors that drive social comparisons and it too is functional.

### *Aspiration, coping, and self-improvement*

The final major factor that has been put forward as a determinant of social comparison processes I will label aspiration, coping, and self-improvement.

Wood (1989) was one of the first to lay out a case for this third goal, self-improvement, as a process driving social comparison. The claim here is that people compare themselves to others not just to know where they stand or to feel better about themselves, but to motivate themselves to achieve more or gather information about how to achieve more. For example, she cites research that young children recognize that they should compare themselves with others to figure out how to successfully complete a task (Feldman & Ruble, 1977).

Similarly, social comparisons may occur as a result of wanting to affiliate and assimilate with others who have achieved a success that we also desire. An example here is that dieters will compare themselves to and even post pictures of others who are thin or have achieved their weight loss goals, as inspiration to accomplish their own weight loss goals (Collins, 1996). Cancer patients have also been found to compare themselves with other cancer patients who are doing well or who have beat cancer as a source of inspiration and hope, as Taylor & Lobel (1989) point out, a finding that has been replicated in other medical contexts as well (Affleck & Tennen, 1991; Blalock et al., 1989). More broadly, Taylor & Lobel (1989) argue that groups that

are facing “threat” (e.g. cancer patients facing the threat of their physical demise) engage in upward and downward comparisons to serve different needs. Upward comparisons serve to allow these threatened individuals to feel affiliated with those who are better off as well as provide information about how they might arrive at a better lot, while downward comparisons help them feel better about how they are doing.

Again, for our purposes, the point is that this final major account of social comparison also posits that social comparison is in service of a goal—coping, hope provision and self-improvement.

### **Cognitive Accounts of Social Comparison**

The fact that the primary accounts of social comparison processes are functional is not to say that psychologists have never thought about the cognitive (rather than motivational) aspects of social comparison.

As Suls & Wheeler (2000) point out, even in the early medical literature on the social comparisons that are made by breast cancer patients, some scholars took note of “an active, cognitive nature to social comparison” (p. 11). For example, Wood et al. (1985) had patients verbally describe who they tend to compare themselves to when thinking about their diagnoses, and found that “at times, then, social comparison may not be particularly ‘social’ at all, in that one’s comparisons may not necessarily involve actual comparisons with another real human being” (p. 1182), but rather social comparisons are made to targets who are a sort of cognitive construction. However, they do not elaborate a deeper cognitive account of social comparisons beyond this.

Other social cognitive perspectives on social comparison emphasize the automatic and uncontrolled nature of social comparisons. Several scholars propose that mere act of making a

social comparison is spontaneous and outside of conscious control (Crusius et al., 2022; Gilbert et al., 1995; Mussweiler et al., 2004a). For example, in one study, Gilbert et al. (1995) show that when people are distracted (and thus more likely to rely on automatic processes), they are more likely to make social comparisons, even when those comparisons are completely non-informative (because, by experimental design, the target's performance is completely determined by external circumstance). Some further argue that comparisons are more computationally efficient than objective assessments, and this helps explain the ubiquity of social comparisons (Corcoran & Mussweiler, 2010; Mussweiler & Epstude, 2009). These authors contend that, because the mind is a “cognitive miser”, it often leads people to choose comparison targets that are the easiest to retrieve—which in most cases consists of others with whom one has frequent contact or to whom one compares themselves regularly, like friends or family members (Corcoran & Mussweiler, 2009; Mussweiler & Rüter, 2003).

The most notable and well-developed cognitive model of social comparison processes is Thomas Mussweiler's Selective Accessibility Model (SAM) (Crusius et al., 2022; Mussweiler, 2003; Mussweiler et al., 2004b; Mussweiler & Strack, 2000). This model begins by positing that social comparisons are often thrust upon us by circumstance. For example, if one is giving a talk in a symposium, it is natural and almost inevitable that we would compare our speaking abilities with those of the other speakers. Once this happens, the theory then asserts that we form an initial hypothesis about whether this comparison target is similar or dissimilar to us, and hence whether we should “assimilate” to or “contrast” away from them. Factors that increase the chance of contrast include whether the comparison target is extreme or belongs to an out-group, whereas factors that increase the chance of assimilation include whether the comparison target is

more moderate or “belongs to the same category as the self”<sup>2</sup> (Crusius et al., 2022, p. 9). Then, because of our mind’s tendency to search for confirmatory evidence of a hypothesis (Klayman & Ha, 1987; Nickerson, 1998), we tend to bring to mind self-knowledge which is consistent with the initial hypothesis (e.g. if our initial reaction is to contrast away from Speaker A at the symposium who is a very skilled speaker, our biased search will lead us to bring to mind instances of our own poor speaking abilities). This biased search will more often than not lead us to confirm our initial gut hypothesis. Of course, it is possible that we would overturn our initial hypothesis in favor of its alternative, if the confirmatory search is unfruitful or if even this biased search nevertheless comes up with an overwhelming amount of disconfirmatory evidence.

This is a reasonable theory and I do not dispute that it correctly describes mental processes that play out in social comparison. However, it says little about how the comparison target is mentally constructed or chosen in the first place. In the Selective Accessibility Model, the comparison target is already there—thrust upon us by the situation. My cognitive account of social comparison specifically offers a richer explanation of which comparison targets come to mind and how they are constructed in the mind, especially when there is ambiguity or openness as to whom the comparison target might or should be.

### **My Account of Social Comparison**

My account of social comparison asserts that cognitive availability (Schwarz & Vaughn, 2002; Tversky & Kahneman, 1973, 1974) often plays a critical role in determining the targets that come to mind when making social comparisons and also borrows from Kahneman &

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<sup>2</sup> The theory, in my view, is a bit circular in explaining what prompts people’s initial tendency to contrast or assimilate—as it essentially says that we contrast away from those who are different and assimilate towards those who are similar.

Miller's (1986) Norm Theory in explaining how these exemplars which are brought to mind are combined to form a comparison target. First, I will describe Norm Theory, and then I will explain how it applies here. Then I will explain the additional role of availability and several other prominent cognitive biases in my account of social comparisons.

Kahneman & Miller's (1986) Norm Theory is a broad theory of how people represent categories against which they then make comparative judgments or use to gauge whether something is surprising or not. This representation of a category, against which a judgment is made is, is called a "norm." So, to borrow a slightly modified example from their paper, when a person says something to us like "My friend Jessica has a big dog", the mind constructs a mental representation of "dogs" against which we judge the bigness of Jessica's dog. The key insight of their theory is that a given prompt (e.g. "My friend Jessica has a big dog") leads to an in-the-moment construction of a norm which is (1) stimulus-specific and (2) a mental agglomeration of the exemplars which that specific prompt calls to mind.

To better understand the implications of this account, it is best contrasted against a more naïve account of how people may make judgments against norms. Imagine two statements "My friend Jessica has a big dog" and "My friend Max has a big dog," and some background knowledge: Jessica is 23 years old who lives in a studio in New York City; Max is 34, ex-military, and lives on a large plot of land in rural Pennsylvania. A naïve theory of norms might hold we already have a pre-computed mental representation of the norm of "dogs", and when we hear either of these two statements, we judge the bigness of Jessica or Max's big dog against this same precomputed norm of dogs.

Kahneman & Miller's (1986) theory instead argues that upon hearing about Jessica's big dog, the mind makes available (consciously or below conscious awareness) several prompt-

specific exemplars (Schwarz & Vaughn, 2002). For example, we might call to mind images of a large standard poodle in a sweater looking out of place in a “trust fund kid” ’s upper East Side apartment or a golden retriever cooped up in a narrow apartment hallway eager to get outside and go for a walk. Out of these exemplars, we then construct a prompt-specific norm of “dogs” against which we judge Jessica’s big dog, once we see it. In contrast, when we hear about Max’s big dog, imagines of a hefty German Shepard or an intimidating Rottweiler on a chain leash held by a man in camouflage pants might come to mind. Out of these images, a (different) norm is constructed, and against which the bigness of Max’s dog is judged.

I argue that a similar process plays out when people engage in social comparisons. And further, I add that the recruitment of these exemplars is biased by the well documented tendencies to bring to mind easily available (Schwarz & Vaughn, 2002; Tversky & Kahneman, 1973, 1974), as well as feature-positive (Hearst, 1991), representative (Kahneman & Frederick, 2002; Kahneman & Tversky, 1972; Tversky & Kahneman, 1974), and confirmatory instances (Klayman & Ha, 1987; Nickerson, 1998) when evaluating a question or generating instances of a phenomenon. That is, the exemplars that tend to come to mind will be biased towards being reflective of the prompt or question which generated them.

My prediction then is that when people try to judge how they compare to others in important domains of their life, like their wealth or social standing, they will call to mind exemplars who embody the characteristics being evaluated, like wealth or sociability. It is the nature of the question that people are asked or ask themselves (“Who goes to more *parties*, me or others?”, “Who is *richer*, me or others?”) that makes disproportionately available in the mind exemplars who exhibit this trait.

It is then out of these exemplars that they construct a “norm” against which they

compare their own wealth or sociability. More concretely, when people ask themselves the question “Who’s more social me or others?” or “Who’s richer, me or others?” they think of others who are social or rich, not simply “others.” They do not compare themselves to pre-computed norms of the wealth or sociability of “others” or the “average person.”

Other accounts of social comparison have also noted the important influence of exemplars and prototypes. For example, Blanton et al., (1997), Gerrard & Gibbons (2013), Gibbons & Gerrard (1995) are concerned with predicting and intervening on adolescents’ health behavior and they argue that prototypes and social comparison play a critical role. They demonstrate that teenagers whose prototype of a smoker is more positive and who see themselves as more similar to this prototype are more likely to be or become smokers themselves (Gibbons & Gerrard, 1995). And further, teenagers who do start to smoke are subsequently more likely to assimilate to their prototype of a smoker. They point out that while social comparisons are “frequently based in reality and experience” they are also “nevertheless, cognitive constructions ... subject to idiosyncrasies and biases” (Gerrard & Gibbons, 2013, p. 65).

My account goes further and specifically claims that these comparison targets are likely to be systematically biased in an “upward” direction, by virtue of comparison targets being constructed from exemplars—that is, people that embody positive instances of what it would mean to be X in the domain of focus. These need not be those who are literally at the “top of the pack” in a domain (e.g. Jeff Bezos, when thinking about whether one is “rich” relative to others), but simply those who would intuitively be considered a prototypical exemplar of being X in a given domain (e.g. a cardiologist who lives in a 5 bedroom house in a wealthy Virginia suburb is a comparison target who exemplifies a reasonably prototypical instance of “being rich”).

And further, I claim that once people bring to mind (consciously or below conscious



awareness) these exemplary cases out of which they construct their comparison standard, they typically contrast away from that standard, rather than assimilate towards it. Why? The fact that many comparisons bring exemplary targets to mind essentially necessitates that most people will reach the conclusion that they don't measure up. This is because exemplary targets are, by definition, "above average". Imagine someone asks themselves "Who is richer, me or others?" and brings to mind images of people who are quite rich—e.g. doctors, lawyers and the like, people who would at least be in say the 70<sup>th</sup> percentile in terms of wealth. If a representative group of people makes this comparison with no additional sources of bias, then 70 percent of them will come away feeling that they don't measure up to "others." This prediction is also broadly consistent with meta-analytic evidence that contrast is the primary responses to "upward" comparison (Gerber et al., 2018). Note, I put "upward" comparison in quotations here because my claim isn't so much that people consider a rank-order list of potential targets and then select a target who is towards the top of the list, but rather that people actively mentally construct a comparison target in response to open-ended social comparisons and this construction is "someone" who would sit towards the top of a rank-order list of comparison targets.

### **The Better-Than-Average and Worse-Than-Average Effect**

This account may at first seem to be inconsistent with the well documented and oft-replicated better-than-average effect (Alicke, 1985; Alicke et al., 1995; Alicke & Govorun, 2005; Dunning et al., 2004; Sedikides & Strube, 1997; Zell et al., 2020). This is the finding that, on average, people think they are better than average. Famously, most people think that compared to the average person, they are better drivers (Svenson, 1981), leaders (College Board, 1976), and managers (Larwood & Whittaker, 1977). This is a robust finding. The general finding that on average people think they are above average has been replicated in samples of people from the

U.S., Canada, France, Sweden, the Netherlands, Australia, Japan, and China (Kruger, 1999, p. 221, citing Heine & Lehman, 1999; Myers, 1995). Two surveys of over 2,800 Americans, weighted to be representative of U.S. population's demographics, found that 65% percent of respondents believe they are more intelligent than the average person. And further, a meta-analysis of 291 studies, covering 950,000 total participants and almost 40 years of studies, confirms that the better-than-average effect is a large and robust effect ( $d_z = 0.78$ , 95% CI = [0.71, 0.84]), subject to minimal publication bias<sup>3</sup>, and is an effect which is stronger for personality traits than abilities, desirable rather than undesirable traits, and when the comparison is direct rather than indirect<sup>4</sup> (Zell et al., 2020). Assuming that traits or abilities follow a symmetric distribution (e.g. normal distribution, uniform distribution), it is impossible that people on average would be above average. This is then taken as evidence that across a host of domains, people are overconfident about how they stack up compared to others.

This would seem to be at odds with my account which claims that when people compare themselves to others, they often feel inferior. However, there is a fairly easy resolution. In the better-than-average literature, the comparison target is pre-determined. Researchers explicitly tell participants to compare themselves to the “average person” or “average student.” For example, in the study on intelligence cited above, participants were asked to rate their agreement with the question “I am more intelligent than the average person”. Thus, all that is required for the above

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<sup>3</sup> likely because it is so replicable and robust of an effect

<sup>4</sup> A direct comparison is one where only one question is asked and the self and the comparison target are brought to mind for contrast simultaneously (e.g. “Compared to the average person, how smart are you?”). An indirect comparison is one where participants are asked two separate sets of question, one rating themselves and the other rating the comparison target (e.g. “How smart are you?”, “How smart is the average person”); these two separate ratings are then compared by the researcher himself.

average effect to exist is for people to have an uncharitable perception of the average person<sup>5</sup>.

Indeed, in Chapter 3 of this dissertation, I provide evidence that this is the case.

My account, on the other hand, is about the conclusions that people reach when the comparison target is left unspecified and participants may consider a potential wide and undefined population of comparison targets. These are questions like “Who is richer, me or others?”, “Do I go to fewer parties than everyone else?”. It is then, that I claim, people *construct* a comparison target, who is well above average, to which they don’t measure up. Thus, a person may very well view themselves as above average, but still find themselves lacking in comparison to “others” or “everyone else”, who they come to view as more exemplary than themselves. My account does not attempt to make a sweeping claim about whether people are “underconfident” or “overconfident” about themselves in general. Rather, the point is that this conclusion depends on what comparative question people are asked or ask themselves. I show that when people are asked or ask themselves a certain common and reasonable question, with an underspecified comparison target, it is then that they come away with unflattering conclusions about how they stack up to “others.”

### **The worse-than-average effect**

A finding with which my account would seem consistent is the worse-than-average effect (Kruger, 1999; Moore, 2007; Moore & Small, 2007), an effect in the better-than-average literature in which, sometimes, people on average think they are worse than average. For

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<sup>5</sup> Furthermore, note that people’s perception of the “average person” need not actually be an accurate reflection of the statistical average ability of people in a domain. “Average person” may call to mind something like “mediocre person”. And so, for example, if people on average get into 1 car accident in their lifetime, people may nevertheless think of the “average person” as the type of person who’s already gotten into 2 or more accidents in their life—and thus find themselves superior to this mediocre driver.

example, in one study, Cornell undergraduates thought they would be below average at playing chess and juggling (Kruger, 1999. Study 1). And Kruger (1999) also points out that in the original College Board (1976; N=828,516) study often cited as some of the earliest evidence of the better-than-average effect, students also rated themselves as below average in acting, and in artistic and mechanical ability. Various explanations have been offered for this finding. Kruger (1999) posits that, when evaluating their abilities, people tend to start the comparison by anchoring on their own absolute ability, with some subsequent adjustment for the perception of the average person's ability. Indeed, he shows that people's ratings of their comparative ability are more correlated with their own judgments of their absolute skill than their judgments of others' absolute skill in a domain. Thus, when people assess their ability in difficult domains or domains where most people's absolute ability is low (e.g. chess and juggling), they tend to conclude they are below average, whereas when people assess their ability in easy domains or domains where absolute ability is high (e.g. riding a bike, operating a computer mouse), they tend to conclude they are above average. Moore & Small (2007) offer what they claim is a more parsimonious account of this effect, whereby people simply assume others' ability is less extreme (more regressive towards the mean) than their own, especially when people's own ability or performance in a domain is "exceptional (either good or bad)". And thus, for this reason, people conclude they are below average on tasks which are hard and above average on tasks which are easy.

This finding may seem to support my claim in a broad sense, showing that sometimes people view themselves, on average, as worse than others. However, again it needs to be noted that in these studies too the comparison target is well specified, either as the average or typical person or student. Although there may be some latitude in the construction of these targets, this

range is limited. There is little leeway to recruit a particular set of exemplars from an ambiguously specified population, as may often be the case when people think about how they stack up to “others” or “everyone else” in domains like sociability and wealth. Thus, people are primarily reaching unflattering conclusions about how they stack up to others for a different reason. Furthermore, many of the below-average effects are found in fairly esoteric domains like chess and juggling, not the domains I am interested in exploring like wealth and socializing. My account may nevertheless offer an additional factor that plays some role in bringing about below average effects in esoteric domains. Most people cannot juggle, and so while participants in these studies may be asked to compare their juggling ability to the typical or average student, to the extent that there is some leeway in constructing a representation of the typical or average student, they are likely to be biased towards thinking of students who can juggle—i.e. readily available and feature-positive exemplars of jugglers.

## **Overview**

The bulk of this dissertation explores cases where the social comparative processes described above play out in the course of social comparisons that are highly salient and relevant in everyday life. Following this first chapter, the second chapter documents the implications of my account on how people evaluate their social lives and offers empirical evidence of the proposed explanation for why people often feel their social lives don't measure up to those of others'. In the fourth chapter, similarly, I show how people come to similarly pessimistic conclusions when judging how their wealth stacks up to the wealth of others. In the third chapter, I present further evidence of my proposed mechanism and also document how this account adds nuance to the above average effect—showing that while people typically view themselves as above average, they are also generally uninterested in comparing themselves with the “average

person” and instead wish to evaluate themselves against higher standards. The fifth and final chapter of this dissertation summarizes and synthesizes these findings.

The middle three chapters in this dissertation are a hybrid of studies from published papers and “new” unpublished studies. The second chapter is largely based on my publication “Home alone: Why people believe others’ social lives are richer than their own” published in the *Journal of Personality and Social Psychology* in 2017 (Deri, Davidai, and Gilovich, 2017). The third chapter is largely based on my publication “The second pugilist's plight: Why people believe they are above average but are not especially happy about it” in the *Journal of Experimental Psychology: General* in 2019, (Davidai & Deri, 2019). The fourth chapter consists of unpublished studies, which I conducted more recently. In the chapters which are based on published findings, I use the pronouns “we” to reflect the collaborative contributions of my coauthors, In the fourth chapter, I use the pronoun “I”, to reflect my more concentrated individual contribution.

## CHAPTER 2: SOCIAL LIFE SOCIAL COMPARISONS

### INTRODUCTION

A large literature in social psychology suggests that people have no trouble drawing flattering conclusions about themselves. For example, people tend to believe that they are more intelligent (Alicke, 1985), trustworthy (Brown, 2012), creative (Alicke, 1985), moral (Epley & Dunning, 2000), healthy (Hoorens & Harris, 1998), and happy than others (Klar & Giladi, 1999), and that they are better leaders (College Board, 1976-1977), drivers (Svenson, 1981), and speakers of their native language (Kruger, 1999). And to top it off, people also tend to think that their assessments are less biased than those of others (Pronin, Gilovich, & Ross, 2004).

To be sure, people are often plagued by idiosyncratic self-doubts (Braslow, Guerrettaz, Arkin, & Oleson, 2012) and there are circumstances in which people as a whole think they are below average. In non-clinical populations (Sowislo & Orth, 2013), however, such pessimism is most reliably observed in domains that are not terribly self-relevant (Pedregon, Farley, Davis, Wood, & Clark, 2012), in which the behavior of relevant others is not easily observed (Miller & McFarland, 1991), or in which people's own absolute level of skill is low (e.g. juggling, improvisation comedy, and computer programming; Kruger, 1999; Moore & Small, 2007). When it comes to self-relevant, desirable, and highly important domains, people tend to see themselves as above average (Alicke, 1985; Brown, 2012; Dunning, Heath, & Suls, 2004), to be overconfident (Moore, Oesch, & Zietsma, 2007), and to express unrealistic optimism (Weinstein, 1980).

A person's social life is presumably such a domain and so it would seem that people should hold similarly flattering views of their social lives. But do they? Surprisingly, the research literature is thin when it comes to people's assessments of how their social lives compare to

others'. Research on social comparison has touched on matters that reflect on people's social skills—asking participants, for example, how they compare to their peers in terms of friendliness, cooperativeness, sense of humor, and the ability to get along with others (Alicke, 1985; Kruger & Dunning, 1999), their sensitivity to social issues (O'Gorman, 1975; Shelton & Richeson, 2005; Van Boven, 2000), and their beliefs about the norms surrounding prominent social behaviors, such as alcohol consumption (Prentice & Miller, 1993) and romantic relationships (Vorauer & Ratner, 1996). What hasn't been studied extensively are people's perceptions of how rich, vibrant, and satisfying their social lives are compared to their peers.

This gap in the literature is surprising in light of what we know about the importance of social connection for physical and emotional well-being. A wealth of research has shown that social connection is a fundamental psychological need (Baumeister & Leary, 1995), and that the act of socializing is a vital source of emotional stability and satisfaction with life (Myers & Diener, 1995; Schachter, 1959). A rich, supportive social life has been shown to be associated with lower rates of cardiovascular disease (Berkman, Vaccarino, & Seeman, 1993), lower incidence of cancer (Glanz & Lerman, 1992), and greater longevity (House, Landis, & Umberson, 1988; Holt-Lunstad & Smith, 2012; Oishi & Schimmack, 2010). More generally, a sense of belonging and social connection is associated with reduced levels of psychological distress (Lee, Draper, & Lee, 2001) and an increased sense that life is meaningful (Lambert, Stillman, Hicks, Kamble, Baumeister, & Fincham, 2013). Critically, it's not merely a person's objective social circumstances that affect health outcomes, but also their subjective sense of whether they're socially flourishing (Cacioppo & Cacioppo, 2014). Given the substantial consequences that follow from a sense that one is adequately connected to others, it is important to examine how people judge their social lives in relation to those around them.



We therefore examined these most *social* of social comparisons, assessing people's beliefs about the comparative breadth and richness of their social lives and social connections. We argue that despite a pervasive tendency for self-assessments to be self-serving (Alicke, 1985; Dunning, Heath, & Suls, 2004), people tend to think that their social lives are less rich than those of others. That is, when comparing how they stacks up to others socially (e.g., how many social gatherings they attend, how many friends they have, how close they are to the “inner circle,” etc.), people tend to believe that they are worse off than their typical peer.

Key to our prediction is that when assessing their social lives, people do not conduct a representative survey of the social landscape. Instead, they compare themselves to the social standard that is most mentally accessible. That standard, furthermore, tends to be biased because examples of exceptionally socially active others—the jetsetters, socialites, and leaders among one's friends and acquaintances—come to mind much more readily than those who are less socially active. In turn, these exceptionally social others become the benchmark against which people evaluate their own social lives. Because readily available examples have a disproportionate influence on judgment (Davidai & Deri, 2017; Davidai & Gilovich, 2016; Oppenheimer, 2004; Ross & Sicoly, 1979; Tversky & Kahneman, 1973), people end up thinking that their social lives are relatively impoverished. When it comes to these most *social* of social comparisons, people tend to see themselves as outside the party looking in.

We recognize that this prediction might seem odd to readers of the contemporary literature on relative self-assessments because, as we noted earlier, there are powerful psychological tendencies that could be expected to lead people to see their social lives as richer than others'. Most important, people have a tendency to see themselves in a flattering light (Brown, 2012; Snyder, Stephan, & Rosenfield, 1976), a tendency that is especially strong in

domains most relevant to a person's self-image (Pedregon et al, 2012). Given that social status plays an important role in people's lives (Carlsson, Johansson-Stenman, & Martinsson, 2007; Frank, 1985), one might expect people's self-assessments to be *particularly* self-serving when it comes to their social lives.

Although we don't doubt that self-enhancement motives are at play when people judge how their social lives compare to the social lives of others', we believe that in this domain these self-serving motives tend to be trumped by the reliance on highly accessible information, an even stronger and more consistent psychological process. Consistent with our contention, past research has shown that biases in availability lead people to believe that they are more prone to negative emotions than their peers (Jordan et al., 2011) and that they are more at fault for instigating domestic quarrels than their spouses (Ross & Sicoly, 1979) even though such beliefs threaten their positive self-assessments. Similarly, although seeing life as a series of uphill battles can elicit all sorts of negative emotions, people tend to believe that they have encountered more obstacles and headwinds than others have, and fewer benefits and tailwinds, because the former are so much more accessible (Davidai & Gilovich, 2016).

Likewise, we contend that when people evaluate their social lives, a distorted portrait of reality springs to mind, leading them to conclude that they fall short of what others are enjoying. This distorted standard of comparison is disproportionately accessible for two reasons. First, the very act of thinking about one's social life makes salient other people and the broader social world in which one is embedded. When evaluating the social world and one's place in it, the mind necessarily turns outward to other people, leading to assessments that involve both the self and others. After all, it is other people that make up one's social life. In contrast, when people evaluate their skills, opinions, traits, and abilities, their self-knowledge and self-image, it is their

own personal attributes that are especially relevant and thus spring quickly to mind, while others' standing on these dimensions are less noticeable and are therefore largely ignored (Klar & Giladi, 1999; Kruger, 1999; Moore, & Small, 2007). It may be, then, that as activities are more social, others' experiences become more salient, and one's self-assessments become more influenced by those others who are brought to mind. Egocentrism, in other words, is likely to be reduced when assessing one's sociability because the nature of the domain highlights other people and what they might be like.

Second, this external focus on others leaves people open to a potent source of bias—the tendency to overweight easily accessible information (Tversky & Kahnmen, 1973). Those with thriving social lives are more highly visible than their less active peers. Once one's attention is focused outward, it is these people who are most mentally available. The dream vacations and late-night club adventures of the rich and famous dominate media reports (Schor, 1999), our most socially active friends clog our Facebook and Twitter newsfeeds (Chou & Edge, 2012), and the most adventurous of our colleagues are more than eager to tell us about their experiences rafting in the Grand Canyon, hiking in the Himalayas, or going to Burning Man. In contrast, the less socially active among us—from the mildly introverted to the true loners, hermits, and shut-ins—are more likely to be out of sight and out of mind (Feld, 1991). The ready availability of these exemplars leaves an impression that “other people” are taking a bigger bite out of life than we are.

In addition, well-connected and socially active individuals naturally grab people's attention even when they're equally exposed to socially active and less active individuals (Sherif & Sherif, 1964). Beginning from adolescence, popular children are attended to, emulated, and approached more often than their less popular peers (Cillessen & Rose, 2005; Newcomb,

Bukowski, Pattee, 1993; Paluck & Sheperd, 2012). Adults likewise tend to seek out those who are more successful than they are, often in search of cues on how to attain comparable success (Collins, 1996; Harris, Anseel, & Lievens, 2008; Lockwood & Kunda, 1997; Taylor & Lobel, 1989). Such upward comparisons tend to weigh heavily on people's emotional lives as well. For example, one study found that feelings of life satisfaction are more strongly determined by upward comparisons of wealth than downward comparisons (Boyce, Brown, & Moore, 2010). Indeed, Festinger's original conception of social comparison focused heavily on upward social comparison, maintaining that people measure how they stack up against those who are like them, but slightly better off (Festinger, 1954). This selective attention to social individuals can only serve to further fill the mind with unrepresentative comparison targets.

Although one might expect any overarching pessimism about the relative richness of one's social life to be restrained by simply taking a balanced look around, that needn't be the case. Due to the inherent structure of social networks (whereby popular individuals have more social ties than unpopular individuals, and are thus known by more people), the average number of friends a person has is indeed lower than the average number of friends their friends have ("the friendship paradox"; Feld, 1991). Thus, to test directly our availability account, we investigate more than how many friends people think they have relative to others, and examine people's pessimism about elements of their social lives that are not readily accounted for by any quirks in the structure of their friendship networks (e.g. people's judgments about the frequency with which they dine out or visit with their extended families).<sup>6</sup>

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<sup>6</sup> For an investigation of lay perceptions of the "friendship paradox," see Zuckerman & Jost (2001).

## OVERVIEW

In eleven studies ( $N = 3,293$  including three pre-registered), we examine whether people believe that others lead richer social lives than they do themselves. We begin by directly asking Mechanical Turk respondents (Study 1), shoppers at a local mall (Study 2A), college students (Study 2B), and respondents from a large, income-stratified panel survey (Study 2C) whether they believe their social lives are less rich and active than those of others. We find that most people think that others lead richer and more active social lives than they do themselves. We then show that this effect generalizes across different operationalizations, holding when people estimate the objective frequency of their social activities (Study 3A), gauge their proximity to their social group's "inner circle" (Study 3B), and assess the richness of the social elements of their lives, but not the non-social elements (Study 4). We then test our proposed mechanism by examining whether social exemplars are especially accessible (Study 5A), finding that they are, and whether increasing the accessibility of less exceptional comparison targets gives rise to more favorable assessments of respondents' social lives (Study 5B), which it does. Finally, we show that these pessimistic assessments correlate with lower emotional well-being (Study 6A) and are not consistent with people's ideal social lives (Study 6B).

For all studies, we report all conditions run and measures collected. All sample sizes were determined in advance, following a heuristic of including at least 50 participants per condition (Simmons, Nelson, & Simonsohn, 2013), and analyses were conducted only after data collection was complete. For reference, we report a sensitivity analysis for each sample (i.e., the smallest effect size detectable with 80% power, given the sample size).

### **Study 1: The Basic Effect**

People's social lives revolve around who they know and where they go: late-night get-

together with close friends, outings with acquaintances, shared celebrations with family and loved ones, and so on. If, as we predict, people see others' social lives as richer and more vibrant than their own, it should seem to them that others know more people, have more friends, and spend more of their time socializing. Therefore, as a first test of our hypothesis we asked participants in Study 1 how they think they measure up to others in these respects.

## Method

**Participants.** Three hundred and four participants from Amazon's Mechanical Turk platform (150 females;  $M_{\text{age}} = 37.1$ ; 78% White, 10% Black, 6% Asian) completed a survey in exchange for modest payment. This sample size allows us to detect effects as small as  $d = 0.16$  with 80% power.

**Measures and procedure.** Participants were first asked to think about their own social lives and the social lives of people they know. They then answered six questions about how their social lives compared to the social lives of those they had called to mind: "*Who goes to more parties, you or others?*"; "*Who has more friends...?*"; "*Who has a wider social network...?*"; "*Who dines out more...?*"; "*Who is part of a greater number of social circles...?*"; and "*Who sees and interacts with their extended family more often...?*" Responses were made on a 5-point scale, ranging from feeling that one's life is less socially rich than those of others (-2; "*I go to many fewer parties than others,*" "*I dine out much less often than others do,*" etc.) to the feeling that one's life is more socially rich than those of others (+2; "*I go to many more parties than others,*" "*I dine out much more often than others,*" etc.). For all questions, the scale's midpoint (0) corresponded to feeling that one's life is as socially rich as others' ("*I go to about as many parties as others,*" "*I dine out about as much as others do,*" etc.). We averaged participants' responses to these six questions to create a composite measure ( $\alpha = 0.79$ ) of the perceived

relative richness of each participant's social life (with negative scores corresponding to a social life deemed inferior to that of others).

## Results

To test our prediction that participants see their own social lives as significantly less rich than others', we compared participants' responses to the scale midpoint. For each of the six measures, participants indicated that they believe their social lives fall short of those of their friends, acquaintances, and others with whom they are familiar. Participants indicated that they believe they have fewer friends ( $M = -0.90$ ,  $SD = 1.04$ ,  $d = -0.87$ ), narrower social networks ( $M = -0.92$ ,  $SD = 1.11$ ,  $d = -0.83$ ), and are part of fewer social circles ( $M = -0.91$ ,  $SD = 1.11$ ,  $d = -0.82$ ), than their peers, all  $t$ 's  $\leq 14.29$ ,  $p$ 's  $< .001$ , and that they attend fewer parties ( $M = -1.35$ ,  $SD = 0.94$ ,  $d = -1.44$ ), dine out less often ( $M = -0.78$ ,  $SD = 1.21$ ,  $d = -0.64$ ), and have fewer interactions with their extended family ( $M = -0.42$ ,  $SD = 1.25$ ,  $d = -0.34$ ), all  $t$ 's  $\leq -5.85$ ,  $p$ 's  $< .001$ . Overall, participants' mean assessment of their social lives fell significantly below the scale midpoint ( $M = -0.88$ ,  $SD = 0.78$ ,  $d = -1.13$ ),  $t(302) = 19.71$ ,  $p < .001$ , indicating that across several measures of sociality, they generally view their own social lives as deficient in comparison to the social lives of others.

The distribution of participants' responses shows that this effect was extremely robust (see Figure 1). For example, when asked about their party attendance, 248 of 303 respondents (82%) indicated that they go to fewer parties than other people they know, while only 18 respondents (6%) believed that they go to more parties,  $d = 1.45^7$ ,  $\chi^2(1) = 198.87$ ,  $p < .001$ . Similarly, when asked about their social circles, 201 of 302 (67%) respondents indicated that

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<sup>7</sup> All effect sizes are converted to Cohen's  $d$  for ease of comparison (Borenstein, Hedges, Higgins, & Rothstein, 2009; Cohen, 1988; Rosenthal, 1994; Ruscio, 2008).

they were part of fewer social circle than others, while only 35 (12%) thought they were part of a greater number of social circles,  $d = 0.96$ ,  $\chi^2(1) = 116.76$ ,  $p < .001$ .

We asked participants to compare their social lives with those of “others” because that is how people often discuss their social activities (“I don’t seem to have as many friends as other people,” “I’m just not as social as others,” etc.). But to ensure that our results are not limited to this particular phrasing, we ran a direct replication of Study 1 ( $N = 151$ ) in which participants were asked to compare themselves to the “average person of your age and sex.” The mean aggregate response across the six questions was significantly below the scale’s midpoint ( $M = -0.73$ ,  $SD = 0.83$ ,  $d = 0.88$ ),  $t(150) = -10.82$ ,  $p < .001$ , and nearly indistinguishable from Study 1’s results. Furthermore, participants’ responses on each of the six individual questions were also significantly below the midpoint,  $t$ ’s  $\leq 4.91$ ,  $p$ ’s  $< .001$ , indicating that our results were not due to the phrasing of the questions in Study 1.



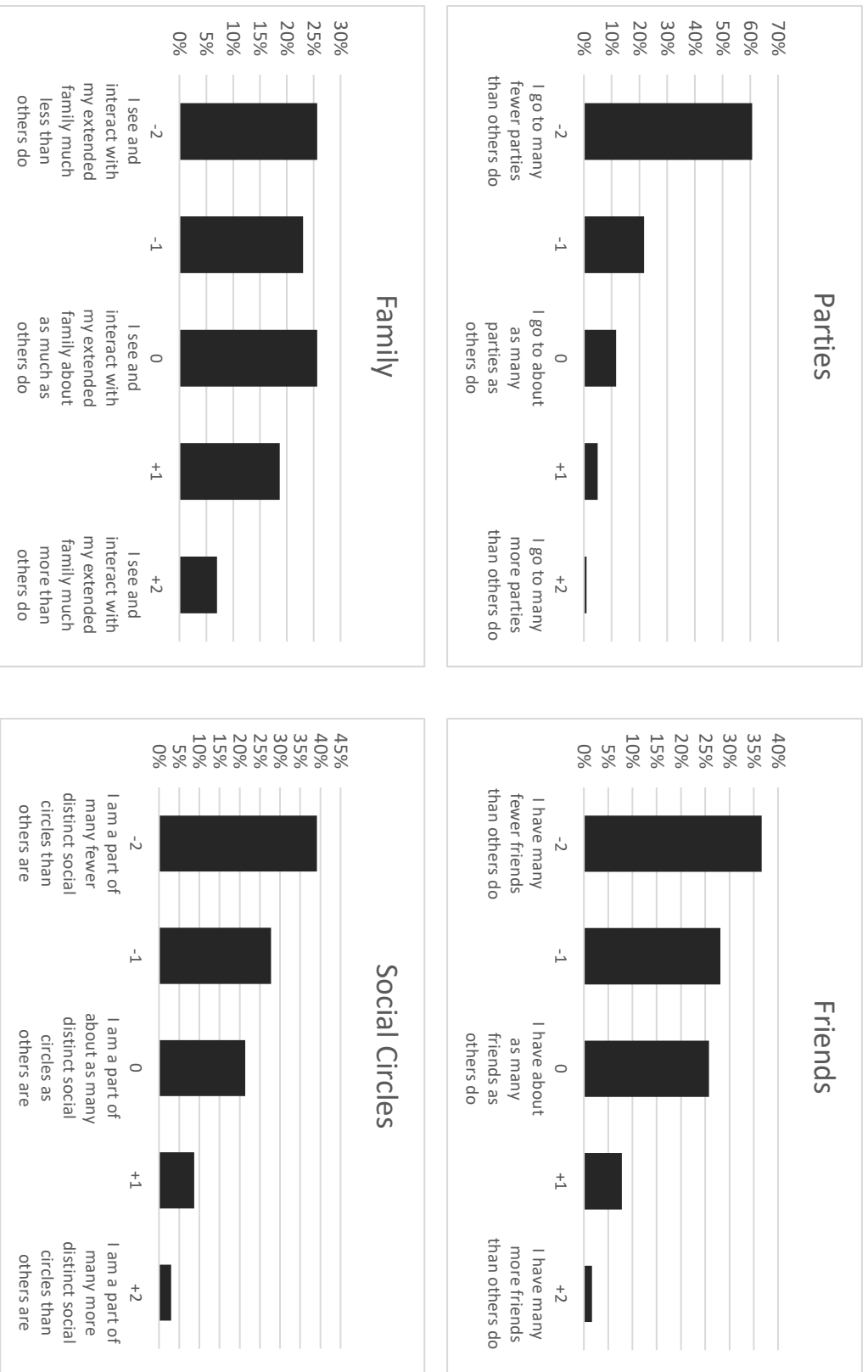


Figure 1. Distribution of participants' responses to each question in Study 1.

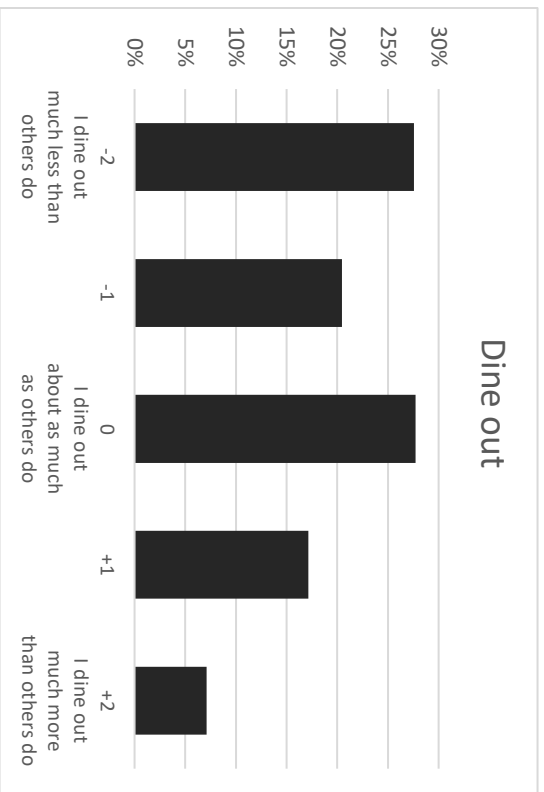
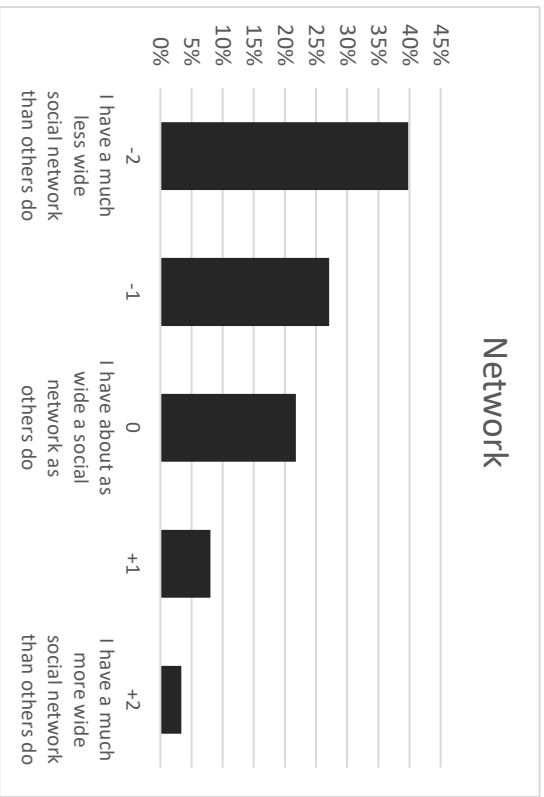


Figure 1. (Continued).

## **Studies 2A-2C: Demographic Consistency**

Study 1 provides initial evidence that, despite an undeniably strong tendency to self-enhance, people see their social lives as worse off than those of others.

One concern about these findings, of course, is the role that the subject sample may have played. Indeed, there is evidence that Amazon Mechanical Turk users are less extroverted than the general population (Buhrmester, Kwang, & Gosling, 2011), which could explain why we found such a pronounced tendency for our participants to think that their social lives were relatively impoverished. We therefore sought to replicate our results in the next three studies with several different subject populations. In Study 2A, we surveyed people in a small Northeastern city going about their day at a local shopping mall. In Study 2B, we surveyed individuals in an especially social phase of their lives—college students. Given that college students tend to be more extraverted than the rest of the population (McCrae, et al., 2000), examining how they believe their social lives compare to others around them should serve as a more stringent test of our hypothesis. In Study 2C, we surveyed over 1000 participants from a large, income-stratified panel, sampling respondents from each of the five income quintiles (as reported by the U.S. Census Bureau). Subjects in all three studies were asked to make judgments about their social lives using the same or very similar questions as in Study 1.

## **Method**

### **Participants.**

*Study 2A.* 50 shoppers at a local mall (29 females,  $M_{\text{age}} = 36.43$ ; 62% White, 10% Black; 10% Latino) completed a short survey. This sample size allows us to detect effects of size  $d = 0.40$  with 80% power.

*Study 2B.* 99 Cornell University students (44 females,  $M_{\text{age}} = 20.14$ ; ethnicity not

collected) completed a short survey at various locations on campus (dining hall, library). This sample size allows us to detect effects of size  $d = 0.29$  with 80% power.

**Study 2C.** 1,111 subjects (577 females,  $M_{\text{age}} = 49.28$ ; 86% White, 8% Black, 3% Asian), representing each of the five income quintiles ( $N \sim 200$  in each), completed a survey as part of an unrelated study for which they were specifically recruited to represent a broad range of socio-economic status. Data was collected using an online survey agency (TurkPrime's Prime Panels platform: <http://www.turkprime.com/LaunchedSurvey/PrimePanels>) that commissions large-scale stratified samples by recruiting participants from a wide array of sources on the web. This large sample size allows us to detect effects of size  $d = 0.07$  with 80% power.

**Measures and procedures.** As in Study 1, participants in Studies 2A-2C were asked to evaluate how their social lives compared to the social lives of familiar others. In all three studies, participants responded to the six questions from Study 1, concerning parties, friends, social networks, dining out, social circles, and visits with extended family. The question concerning extended family was excluded in Study 2B because of the pragmatic constraints on these participants' (students) ability to visit with extended family at this point in their lives. In addition, we included three new questions designed to examine people's *failures* to socialize in Study 2A ("Who eats lunch alone more often, you or others?") and Study 2B ("Who eats dinner alone more often, you or others?" and "Who stays home/in their room by themselves more often, you or others?"). Retrospectively, because these questions are more likely to bring to mind unsocial individuals (e.g., people who always stay home on Friday nights), they may not have activated the mechanism that we argue accounts for our effect—the tendency to bring to mind and compare to especially social others when thinking about how one stacks with regard to positive instances of social activities.

In each study, a composite measure of perceived relative standing was computed by averaging together the responses to all items. For complete transparency, we included all items (i.e., including the items about *failures* to socialize) in these three composites rather than choosing which items belonged in and which didn't ( $\alpha$ 's = 0.71, 0.54, and 0.82 for Studies 2A-2C, respectively). The pattern and significance of the results reported below is identical regardless of whether or not these new measures are included in the analyses.

Study 2A also included three exploratory measures. The first asked participants to judge their own social life from another person's perspective, on a 5-point scale that ranged from the outside observer concluding that the respondent's social life is "much less eventful" (-2) to "much more eventful" (+2) than those of others. The other two questions were about participants' satisfaction with their social lives: One asked participants how satisfied they were with their social life relative to others—on a 5-point scale that ranged from "much less satisfied" (-2) to "much more satisfied" (+2) than others; the other asked participants whether they were satisfied, unsatisfied, or neither satisfied nor unsatisfied with their social life in an absolute sense.

## Results

Across the three studies, participants demonstrated a pronounced tendency to view their own social lives more negatively than the social lives of others. As can be seen in Table 1, the composite social life assessments were all significantly below zero: Study 2A ( $M = -0.33$ ,  $SD = 0.79$ ,  $d = -0.42$ ),  $t(49) = -2.93$ ,  $p = .005$ ; Study 2B ( $M = -0.22$ ,  $SD = 0.58$ ,  $d = -0.38$ ),  $t(98) = -3.82$ ,  $p < .001$ ; Study 2C ( $M = -0.67$ ,  $SD = 0.87$ ,  $d = -0.77$ ),  $t(1110) = -25.83$ ,  $p < .001$ . Furthermore, for 17 of the 20 questions across these three studies, a greater number of participants chose a response below the scale's midpoint than above it ( $p = 0.003$ , by simple

binomial test,  $d = 0.96$ ). The three items not in the predicted direction were those that asked about *failures* to socialize. Not surprisingly, due to numerous differences between the different samples, the results were stronger in some studies than others. Yet, despite the variability across the different studies, the overall pattern of results reveals an overwhelmingly consistent trend towards social pessimism.

**Demographic Breakdown.** Given the large, income-stratified sample surveyed in Study 2C, we were able to examine the strength of our findings across major demographic variables. As can be seen in Table 2, regardless of participants' gender, age, income, education, or politics, there was a strong and significant tendency to view one's own social life as less rich than the social lives of others.

Study	Item	N	M	SD	d	t	p	Composite	Response Distribution		
									(-)	(+)	(0)
2A: <i>Mall</i>	Who goes to more parties, you or others?	50	-1.22	1.04	-1.17	-8.33	<0.001		38	2	10
	Who has more friends, you or others?	50	-0.32	1.27	-0.25	-1.78	0.081		19	11	20
	Who has a wider social network, you or others?	50	-0.32	1.46	-0.22	-1.55	0.128	<i>M</i> = -0.33, <i>SD</i> = 0.79,	26	15	9
	Who dines out more, you or others?	50	-0.24	1.17	-0.21	-1.45	0.153	<i>d</i> = -0.24, <i>f</i> = -2.93, <i>p</i> = 0.005	18	10	22
	Who is part of a greater number of distinct social circles, you or others?	50	-0.34	1.35	-0.25	-1.78	0.081		23	15	12
	Who sees and interacts with their extended family more often, you or others?	50	-0.04	1.51	-0.03	-0.19	0.852		19	18	13
	Who eats lunch alone more, you or others?	50	+0.2	1.28	0.16	+1.11	0.274		12	16	22
	Who goes to more parties, you or other people?	99	-1.07	1.10	-0.97	-9.69	<0.001		75	10	14
	Who has more friends, you or other people?	99	-0.07	0.86	-0.08	-0.82	0.415	<i>M</i> = -0.22, <i>SD</i> = 0.58,	24	19	56
	Who has a wider social network, you or other people?	99	-0.19	1.08	-0.18	-1.87	0.065	<i>d</i> = -0.38, <i>f</i> = -3.82, <i>p</i> < 0.001	41	28	30
2B: <i>College</i>	Who dines out more, you or other people?	99	-0.27	1.23	-0.22	-2.25	0.027		44	26	29
	Who is part of a greater number of social circles, you or other people?	99	-0.23	1.11	-0.21	-2.13	0.036		40	27	32
	Who eats dinner alone more often, you or other people?	99	+0.07	1.34	0.05	+0.52	0.601		35	40	24
2C: <i>Income-Stratified Online Panel</i>	Who stays home/in their room by themselves more often, you or other people?	99	+0.22	1.13	0.19	+1.96	0.053		23	38	38
	Who goes to more parties, you or others?	1108	-1.26	1.05	-1.20	-40.09	<0.001		859	78	171
	Who has more friends, you or others?	1107	-0.69	1.14	-0.61	-20.06	<0.002	<i>M</i> = -0.67, <i>SD</i> = 0.87,	592	139	376
	Who has a wider social network, you or others?	1109	-0.68	1.19	-0.57	-19.03	<0.003	<i>d</i> = -0.77, <i>f</i> = -25.83, <i>p</i> < 0.001	623	172	314
	Who dines out more, you or others?	1107	-0.50	1.29	-0.39	-12.98	<0.004		560	250	297
	Who is part of a greater number of distinct social circles, you or others?	1105	-0.74	1.19	-0.62	-20.83	<0.005		642	155	308
	Who sees and interacts with their extended family more often, you or others?	1109	-0.17	1.27	-0.13	-4.44	<0.006		399	305	405

*Table 1. Summary of results from Studies 2A-2C. For all questions, negative responses correspond to feeling that one is less social than others, positive responses correspond to feeling that one is more social than others, and responses at midpoint (0) indicate neither.*

*Note.* “Distribution of responses” columns show number of responses below (-), above (+), and at midpoint (0).

Demographic Level	N	Parties		Friends		Networks		Dine Out		Social Circles		Family		Composite									
		M	SD	d	M	SD	d	M	SD	d	M	SD	d	M	SD	d							
<i>Gender</i>	<i>Female</i>	577	-1.4	1.0	-1.4	-0.8	1.1	-0.8	-0.7	1.2	-0.6	-0.6	1.3	-0.5	-0.8	1.2	-0.7	-0.1	1.3	-0.1	-0.7	0.8	-0.9
	<i>Male</i>	532	<b>-1.2</b>	1.1	-1.1	<b>-0.5</b>	1.2	-0.5	<b>-0.6</b>	1.2	-0.5	<b>-0.4</b>	1.3	-0.3	<b>-0.7</b>	1.2	-0.6	<b>-0.2</b>	1.3	-0.2	<b>-0.6</b>	0.9	-0.7
<i>Income</i>	\$20,000 or less	214	-1.5	0.9	-1.8	-1.0	1.2	-0.9	-1.0	1.1	-0.9	-1.1	1.2	-1.0	-1.0	1.2	-0.9	<b>-0.4</b>	1.3	-0.3	-1.0	0.7	-1.4
	\$20,000-39,000	213	-1.3	0.8	-1.9	-1.0	1.0	-1.0	-1.0	1.1	-0.9	-0.8	1.2	-0.7	-1.1	1.1	-1.0	<b>-0.5</b>	1.3	-0.4	-1.0	0.7	-1.4
	\$40,000-69,000	229	-1.3	0.9	-1.4	-0.6	1.0	-0.6	-0.8	1.1	-0.7	-0.7	1.1	-0.6	-0.8	1.1	-0.7	<b>-0.2</b>	1.2	-0.2	-0.7	0.8	-0.9
	\$70,000-99,000	157	-1.1	1.1	-0.9	-0.4	1.2	-0.4	-0.5	1.2	-0.4	-0.3	1.2	-0.3	-0.6	1.2	-0.5	0.1	1.3	0.0	<b>-0.5</b>	0.9	-0.5
	\$100,000 or more	298	<b>-0.9</b>	1.2	-0.7	<b>-0.4</b>	1.2	-0.3	<b>-0.3</b>	1.3	-0.2	<b>0.2</b>	1.3	0.2	<b>-0.3</b>	1.2	-0.3	<b>0.2</b>	1.2	0.1	<b>-0.3</b>	0.9	-0.3
<i>Age</i>	<19	18	-1.1	1.1	-1.0	-0.6	1.1	-0.5	-0.8	1.2	-0.7	-0.7	1.2	-0.6	-0.2	1.3	-0.1	-0.2	1.5	-0.1	-0.6	0.7	-0.8
	20-29	115	<b>-0.9</b>	1.3	-0.7	-0.6	1.3	-0.4	-0.3	1.3	-0.2	-0.2	1.3	-0.1	-0.3	1.3	-0.3	0.1	1.3	0.1	<b>-0.4</b>	1.0	-0.4
	30-39	196	<b>-0.9</b>	1.3	-0.7	-0.4	1.3	-0.3	-0.3	1.3	-0.2	-0.2	1.2	-0.1	-0.4	1.3	-0.3	0.1	1.2	0.0	<b>-0.3</b>	1.0	-0.3
	40-49	200	-1.2	1.0	-1.2	-0.7	1.1	-0.6	-0.6	1.2	-0.5	-0.3	1.3	-0.2	-0.7	1.1	-0.6	<b>-0.2</b>	1.2	-0.2	-0.6	0.8	-0.8
	50-59	256	-1.3	0.9	-1.7	-0.9	1.1	-0.8	-0.9	1.2	-0.8	-0.7	1.3	-0.5	-0.9	1.1	-0.8	<b>-0.3</b>	1.3	-0.2	-0.9	0.8	-1.1
	60-69	227	-1.5	0.8	-1.8	-0.9	1.0	-0.9	-1.0	1.0	-1.0	-0.9	1.1	-0.8	-1.1	1.0	-1.1	<b>-0.3</b>	1.3	-0.2	-1.0	0.8	-1.3
	70-79	91	-1.3	0.8	-2.0	-0.6	1.0	-0.6	-0.8	1.1	-0.8	-0.4	1.4	-0.3	-0.9	1.2	-0.8	-0.2	1.3	-0.1	-0.7	0.8	-1.0
	80-89	6	-1.8	0.4	-4.5	-1.5	0.6	-2.7	-1.5	0.8	-1.8	-1.2	1.2	-1.0	-1.5	0.6	-2.7	-0.7	1.2	-0.6	-1.4	0.6	-2.4
	<i>Education</i>	High School or Less	247	-1.4	1.0	-1.4	-1.0	1.1	-0.9	-0.9	1.2	-0.8	-0.8	1.2	-0.7	-1.0	1.1	-0.9	<b>-0.3</b>	1.3	-0.3	-0.9	0.8
Some College		269	-1.5	0.9	-1.7	-0.9	1.0	-0.9	-0.9	1.1	-0.8	-0.7	1.2	-0.6	-0.8	1.1	-0.7	<b>-0.2</b>	1.2	-0.2	-0.9	0.7	-1.2
2 Year Degree		118	-1.3	0.8	-1.9	-0.8	1.0	-0.8	-0.9	1.0	-0.9	-0.8	1.1	-0.7	-1.0	1.0	-1.0	<b>-0.4</b>	1.2	-0.4	-0.9	0.7	-1.2
<i>Political Orientation</i>	4 Year Degree	292	<b>1.1</b>	1.1	-1.0	<b>0.5</b>	1.2	-0.4	<b>0.5</b>	1.2	-0.4	<b>0.3</b>	1.4	-0.2	<b>-0.6</b>	1.2	-0.5	0.0	1.3	0.0	<b>-0.5</b>	0.9	-0.5
	Professional Degree	158	-0.9	1.2	-0.8	-0.3	1.1	-0.2	-0.3	1.3	-0.2	0.1	1.3	0.0	-0.4	1.2	-0.3	0.1	1.3	0.0	<b>-0.3</b>	0.9	-0.3
<i>Political Orientation</i>	Doctorate	25	-0.5	1.4	-0.3	0.0	1.3	0.0	-0.2	1.5	-0.1	0.3	1.4	0.2	-0.1	1.3	-0.1	0.2	1.4	0.2	0.0	1.1	0.0
	Conservative	435	-1.4	0.9	-1.5	-0.8	1.1	-0.7	-0.7	1.2	-0.6	-0.5	1.3	-0.4	-0.8	1.1	-0.7	-0.1	1.3	0.0	-0.7	0.8	-0.8
	Liberal	390	-1.1	1.2	-1.0	-0.6	1.2	-0.5	<b>0.6</b>	1.2	-0.5	<b>0.4</b>	1.3	-0.3	<b>-0.7</b>	1.3	-0.5	-0.1	1.3	-0.1	<b>-0.6</b>	0.9	-0.6
<i>Political Orientation</i>	Neither or Moderate	285	-1.3	1.0	-1.3	-0.7	1.1	-0.7	-0.8	1.2	-0.6	-0.7	1.2	-0.6	-0.8	1.2	-0.6	<b>-0.4</b>	1.2	-0.4	<b>-0.8</b>	0.8	-0.9

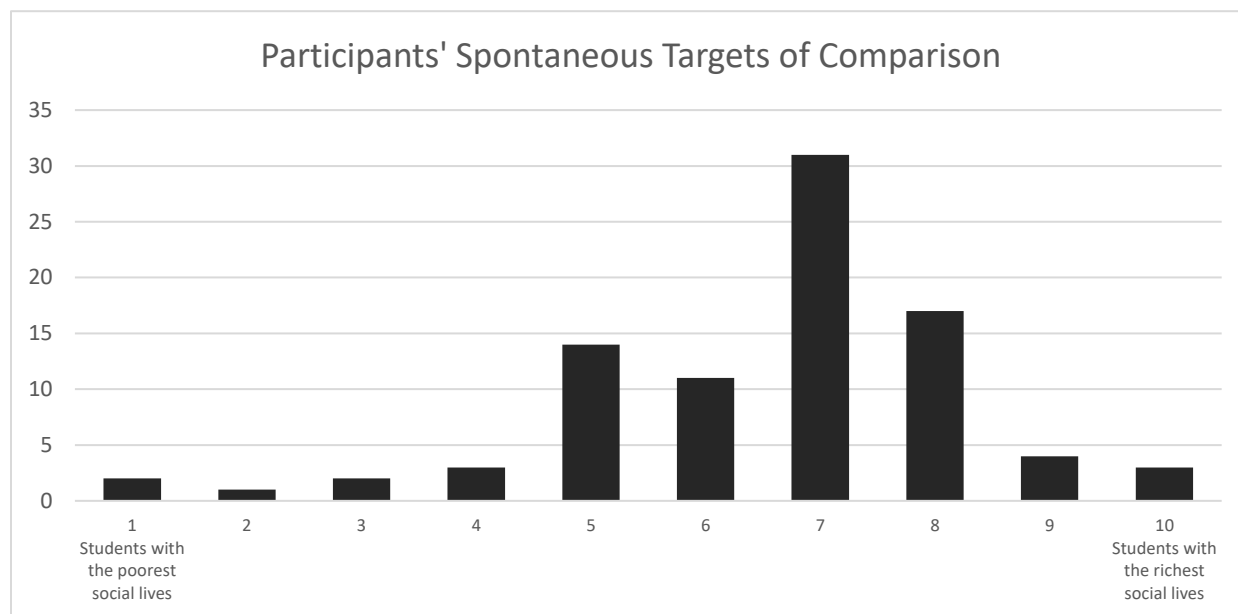
*Table 2. Results from Study 2C, broken down by demographic categories. For all questions, negative responses correspond to feeling that one is less social than others, positive responses correspond to feeling that one is more social than others, and responses at midpoint (0) indicate neither. All bolded means are significantly different from zero,  $p < .05$ .*



## Additional Measures and Results

We argue that people see their social lives as relatively lacking because others who are especially social are especially salient. As an initial assessment of this idea, we also asked participants in Study 2B who came to mind when they were assessing their social lives. Specifically, after making their comparison judgments, these participants were presented with an image of a ten-rung ladder, with the top rung signifying other people with the richest social lives and the bottom rung signifying those with the poorest social lives. They were then asked to indicate where the specific individuals(s) they had brought to mind (i.e., those to whom they compared themselves) stand on this ladder. In addition, we asked participants whether they compared themselves to “one specific person,” “a few specific people,” or a “non-specific blend of people,” as well as to describe in a few words who they were comparing themselves to and the nature of their relationship. As predicted, participants’ most accessible standards of comparison were highly social others: They reported comparing themselves to people significantly above the midpoint of the 10-rung sociability ladder ( $M = 6.89$ ,  $SD = 1.73$ ,  $d = 0.80$ ),  $t(87) = 7.50$ ,  $p < .001$  (Figure 2). Whereas 66 (75%) of the participants spontaneously compared their social lives to those of friends and acquaintances above the middle of the sociability ladder, only 13 (15%) compared themselves to people below the middle of the ladder,  $d = 0.90$ ,  $\chi^2(1) = 35.56$ ,  $p < .001$ . By comparing themselves to such a high standard, participants set themselves up for unflattering assessments of their social lives.

Analyses of participants’ responses to the more purely descriptive questions in Study 2B revealed that most students compared themselves to either a few specific comparison targets ( $N=24$ , 28%) or an abstract blend of people ( $N=62$ , 71%).



*Figure 2.* Distribution of participants' ratings of the social lives of the comparison standards they brought to mind when rating their own lives, from comparison standards with the poorest social lives (1) to those with the richest social lives (10; Study 2B).

Finally, we examined participants' responses to the ad hoc questions asked at the end of Study 2A. Here, participants were less self-critical than elsewhere, although due the smaller sample size and thus lower power of this study, the interpretation of the non-significant results are inconclusive. First, respondents did not think an outsider observer would view their social life as significantly more (or less) eventful than the social lives of the respondents' peers ( $M = -0.16$ ,  $SD = 1.34$ ,  $d = -0.12$ ),  $t(48) = -0.85$ ,  $p = 0.400$ . Nor did respondents think they were significantly more (or less) satisfied with their social life than others are with theirs, ( $M = 0.29$ ,  $SD = 1.31$ ,  $d = 0.22$ ),  $t(48) = 1.53$ ,  $p = 0.133$ . Finally, when thinking about their social life in an absolute sense, rather than comparing it to the social lives of others', respondents reported being

significantly more satisfied than unsatisfied with their social lives, ( $M = 0.38$ ,  $SD = 0.78$ ,  $d = 0.22$ ),  $t(44) = 3.26$ ,  $p = 0.002$ .

### **Studies 3A and 3B: Methodological Robustness**

Our results reveal a consistent tendency for people to think that others lead more vibrant social lives than they do. But could these findings be limited to the method we used to examine people's beliefs about their social lives? In particular, two methodological distinctions highlighted by the literature on comparative self-assessments merit consideration. One line of research has shown that biases in comparative judgments are more likely to be observed in direct comparisons (i.e., whereby participants make a single judgment, directly comparing their own traits, skills, or abilities with those of others) than indirect comparisons (i.e., whereby participants make two absolute judgments—one of themselves and one of others—which are then compared by the researchers; Chambers & Windschitl, 2004; Helweg-Larsen & Shepperd, 2001). Another line of research has shown that, regardless of whether comparisons are direct or indirect, subjective verbal comparisons can be misleading when the underlying trait or behavior is uncommon or rare (Harris & Hahn, 2011). In these cases, biases are better detected by asking participants to make objective numerical estimates both for themselves and for others. Therefore, in Studies 3A and 3B, we examined whether the pessimistic assessments observed in our first 4 studies would surface on other, quite different measures that are not subject to these potential problems.

#### **Study 3A: Indirect Comparisons**

Instead of asking participants to directly compare the richness of their own social lives with the richness of others', we conducted a pre-registered ([https://aspredicted.org/blind.php?x=COB\\_LVW; #4179](https://aspredicted.org/blind.php?x=COB_LVW; #4179)) study in which we asked participants

to provide separate numerical estimates of how frequently they and other people engage in various social activities. We predicted that even when not directly comparing their own social lives with those of others, participants would see their social lives as relatively deficient. That is, we predicted that participants would estimate that they socialize less often than others do.

## Method

**Participants.** Three hundred participants from Amazon’s Mechanical Turk completed a survey (129 females;  $M_{\text{age}} = 33.40$ ; 77% White, 10% Asian, 7% Black) in exchange for a modest payment. This sample size allows us to detect effects of size  $d = 0.16$  with 80% power.

**Measures and procedure.** Participants were prompted, in a counterbalanced order, to “think about your own social life” and to “think about the social lives of others that you know.” They were then asked to make six specific, quantitative estimates of their own lives (e.g., “*In a given month, how many parties would you say you go to?*”) and six matching estimates of other people’s lives (e.g., “*In a given month, how many parties would you say any one of them typically goes to?*”) on the same dimensions of social life assessed in Studies 1, 2A, 2B, and 2C. The other questions were as follows: “*How many friends would you say you [any one of them] typically has?*”; “*How wide would you say your [any one of their] social networks typically is?*”; “*In a given week, how often would you say you [any one of them] typically dines out?*”; “*How many distinct social circles would you say you [any one of them] is typically part of?*”; “*In a given year, how many times would you say you [any one of them] typically sees and interacts with members of their extended family?*” For each question, participants selected a numerical quantity from a drop-down menu, the options for which varied slightly by question: parties per month: (0, 1, 2, 3, 4, 5, 6, 7, 8, 9+), number of friends: (0, 1, 2, 3, 4, 5, 6, 7, 8+), dining out per week: (0, 1, 2, 3, 4, 5, 6, 7+), number of distinct social circles: (0, 1, 2, 3, 4, 5, 6, 7, 8+), family

interactions per year: (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15+), social network size: (0 people, 1-4, 5-9, 10-19, 20-39, 40-59, 60-100, 101-200, 201-300, 301-500, 501-1000, 1000+). Because the number of responses options varied between questions (e.g. 0-9 for parties, 0-8 for friends), responses to each of the six question were transformed to an equal-sized range (0-15, corresponding to the largest number of responses options, which occurred in the question about family interactions) by dividing each response by the maximum possible value for that question (e.g., 9 for the parties question) and then multiplying that value by 15 (as specified in the pre-registration). We then averaged participants' responses for the six questions to create two composites: self-estimates ( $\alpha = 0.70$ ) and other-estimates ( $\alpha = 0.62$ ).

## Results

Even when using a more indirect measure of participants' assessments of their own and others' social lives, we again found strong evidence that people believe their social lives are relatively impoverished. Participants estimated they went to fewer parties ( $M = 0.95$  v.  $1.88$ ,  $d = 0.66$ ),  $t(299) = -12.04$ , dined out less often ( $M = 1.52$  v.  $2.19$ ,  $d = -0.53$ ),  $t(299) = -8.23$ , saw their extended family less often ( $M = 5.58$  v.  $6.41$ ,  $d = -0.17$ ),  $t(299) = -3.09$ , had fewer friends ( $M = 3.90$  v.  $5.13$ ,  $d = -0.54$ ),  $t(299) = -8.17$ , were part of fewer social circles ( $M = 2.24$  v.  $2.96$ ,  $d = -0.50$ ),  $t(299) = -8.17$ , and belonged to smaller social networks ( $M = 3.96$  v.  $4.57$ ,  $d = -0.25$ ),  $t(299) = -6.13$ , than other people,  $p$ 's  $\leq .002$ . Overall, the composite measures revealed that participants thought their social lives were less rich ( $M = 4.56$ ,  $SD = 2.27$ ) than others' social lives ( $M = 5.94$ ,  $SD = 2.00$ ),  $d = -0.65$ ,  $t(299) = -11.49$ ,  $p < .001$ .

The study design also allowed us to compare participants' perceptions of their and others' social lives in a between-subject analysis. When we compared the self-estimates of participants who were first asked about their own lives to the other-estimates of participants who were first

asked about others' lives, we again found that participants judged their own social lives to be significantly less rich and active ( $M = 4.38$ ,  $SD = 2.29$ ) than others' ( $M = 5.68$ ,  $SD = 1.91$ ),  $d = -0.62$ ,  $t(298) = -5.34$ ,  $p < .001$ . Thus, even when using indirect measures of participants' beliefs about their own and their peers' social lives, we find that people view themselves as less social than others.

### **Studies 3B: Social Circle Judgments**

In Study 3B we examined participants' assessments of their social lives in yet another way. Specifically, we asked participants to reflect on how close they and other people were to the "inner circle" of their social milieu. We predicted that because participants would be more likely to bring to mind especially social others who are most popular and have the most influence among their peers, they would judge themselves as farther from the center than their friends and acquaintances.

#### **Method**

**Participants.** One hundred and nine students at Cornell University (64 females  $M_{\text{age}} = 19.17$ ; 65% White, 17% Asian, 6% Black) completed a survey in exchange for extra credit. This sample size allows us to detect (within-subjects') effects of size  $d = 0.27$  with 80% power.

**Measures and procedure.** Participants first read the following description about the cliques and inner circles that often constitute an important part of social life:

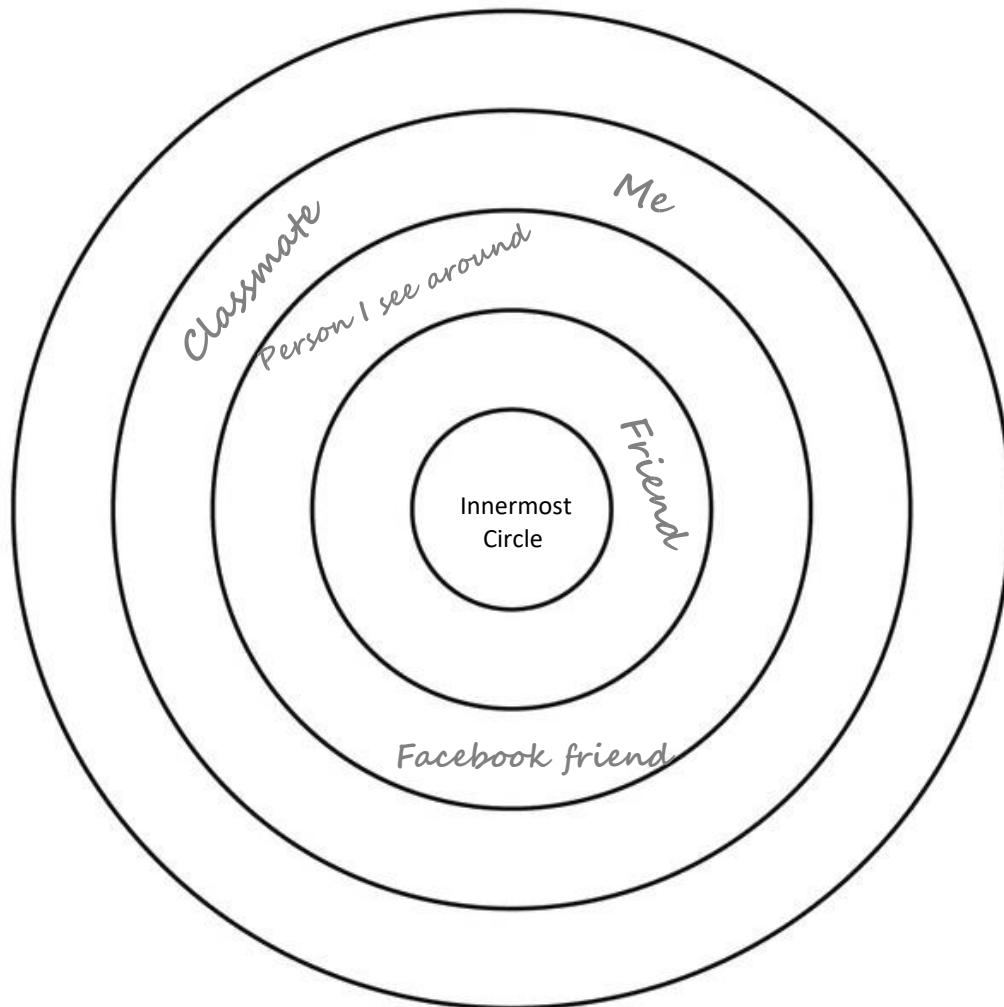
*Social groups have a tendency to organize themselves into 'cliques' and 'social circles'. People in these groups often vary in how close they are to the 'center' of the group. What exactly is meant by the 'center' isn't always clear, but people can often agree that some people are closer to that center than others. For example, those who are closer to the group's center are often connected to more people in the group, influence the social*

*events in the group, affect the group's norms and what the group 'is like', and so on.*

Participants were then presented with a picture depicting 5 concentric circles (see Figure 3), representing all their peers at school, such that:

*The innermost circle represents the students who are in the so-called "inner circle" or the "in-crowd", the 2nd innermost circle represents the students who are close to the "in-crowd" but aren't part of it, the 3rd inner most circle represents the students who are somewhat farther removed from the "in-crowd" and so forth.*

Participants were then asked to think of several specific peers and to place each one into one of the 5 concentric social circles. Specifically, they were asked about the following people: an acquaintance they see around campus, a Facebook friend, a close friend of theirs, and a student in "a class you are currently taking" who they recognize but do not know. Participants then indicated the circle into which they thought they themselves belong.



*Figure 3.* Diagram used in Study 3B to assess how close participants felt to the “inner” circle, with an example of one participant’s responses.

## Results

We predicted that participants would see themselves as farther removed from “the inner circle” than their peers. To test this prediction, we compared the average circle in which participants placed themselves to the average social circle in which they placed the four target



peers—acquaintance, Facebook friend, close friend, and a student in one of their classes (with lower numbers corresponding to circles nearer to the center). As predicted, participants saw themselves as relative outsiders. Specially, they saw themselves as farther away from the “inner circle” ( $M = 3.04$ ,  $SD = 0.85$ ) than their campus acquaintances ( $M = 2.65$ ,  $SD = 1.08$ ),  $d = 0.38$ ,  $t(106) = 3.49$ ,  $p = .001$ , Facebook friends ( $M = 2.66$ ,  $SD = 1.23$ ),  $d = 0.34$ ,  $t(106) = 2.51$ ,  $p = .013$ , and close friends ( $M = 2.70$ ,  $SD = 0.88$ ),  $d = 0.40$ ,  $t(108) = 5.16$ ,  $p < .001$ . The one exception was participants’ assessments of a typical classmate ( $M = 3.11$ ,  $SD = 1.12$ ), whom they saw as equally distant from the inner circle,  $d = -0.07$ ,  $t(108) = -0.56$ ,  $p = .580$ . Thus, even when using a more indirect measure involving a different facet of social connection, we find that people think that they aren’t as much in the thick of the social action as the other people around them.

#### **Study 4: Demonstrating the Effect is Specific to Comparisons in the Social Domain**

We have argued that, in contrast to the self-enhancement so often found in comparative judgments in non-social domains, people believe that they lag behind their peers when it comes to their social lives. We have further argued that this is due to the tendency of social judgments to bring to mind others—and particularly social others—when making comparative judgments. To examine whether our findings are indeed specific to people’s assessments of their social lives, we asked participants in Study 4 to assess where they stand relative to their peers on various elements of their social lives and on a matched set of non-social aspects of life, which have no readily accessible exemplars. We expected them to believe that they lagged behind their peers when it comes to aspects of their social lives, but not comparable aspects of their non-social lives for which there are no strong exemplars.

## Method

**Stimuli.** We began by creating a set of non-social questions matched to the six social questions from Study 1. The matching was based on two critical criteria: that each question tap something minimally relevant to people’s social lives and that each question be as close linguistically as possible to its matched social item. For example, we matched the social question about party attendance (“*Who goes to more parties, you or others?*”) to a non-social question that involves some social interaction yet is not a crucial component of most people’s social lives (“*Who goes to the grocery store more often, you or others?*”). The remaining matched items were as follows: “*Who has a wider social network, you or others?*” vs. “*Who has a wider vocabulary, you or others?*”; “*Who has more friends, you or others?*” vs. “*Who has more neighbors, you or others?*”; “*Who dines out more, you or others?*” vs. “*Who cooks more, you or others?*”; “*Who is part of a greater number of distinct social circles, you or others?*” vs. “*Who receives more junk mail promotions, you or others?*”; and “*Who sees and interacts with their extended family more often, you or others?*” vs. “*Who sees and interacts with strangers (e.g. retail clerks, bus drivers, etc.) more, you or others?*”<sup>8</sup>

Next, as a preliminary test of our hypothesis that other people are more likely to come to mind when evaluating one’s social life than when evaluating non-social aspects of one’s life, we asked 40 participants from Mechanical Turk whether each of the 12 social and non-social items

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<sup>8</sup> We recruited 99 Mechanical Turk participants to examine whether the six social items are, in fact, more central to people’s social lives than the matched, non-social items. Participants indicated on a 5-points scale the extent to which each of the 12 items taps into “something that characterizes a vibrant, active, and rich social life” (1-This question does not at all tap into a component of a thriving social life (one that is: vibrant, active, and rich); 5-This question absolutely taps into a component of a thriving social life (one that is: vibrant, active, and rich)). As anticipated, each of the six social life items were judged more central to social life than the equivalent non-social item (all  $p$ ’s < .001), a result that holds when comparing a composite of the 6 social items ( $\alpha = 0.73$ ,  $M = 3.91$ ,  $SD = 0.71$ ) to a composite of the 6 non-social items ( $\alpha = 0.79$ ,  $M = 2.23$ ,  $SD = 0.80$ ,  $d = 2.22$ ),  $t(98) = 15.61$ ,  $p < .001$ .

would lead them to look “‘inside’ into their own traits, abilities and behaviors” or “‘outside’ to other people’s traits, abilities, and behaviors”. Participants made these assessments on a 5-point Likert scale anchored at -2 (“I focused mostly on the “outside” view”) and +2 (“I focused mostly on the “inside” view”). In line with our expectations, participants indicated that they took the “outside view” significantly more often for the six social items than the six matched non-social items ( $M = -0.06$  v.  $0.47$ ,  $d = -0.76$ ),  $t(39) = -4.60$ ,  $p < .001$ . That is, consistent with our hypothesis, other people were more likely to come to mind when evaluating one’s social life than when evaluating similar, non-social aspects of one’s life. We now turned to the main goal of Study 4—examining whether people’s pessimistic self-assessments are unique to judgments of their social lives.

**Participants.** Three hundred and one participants from Amazon’s Mechanical Turk (137 females,  $M_{\text{age}} = 37.44$ ; 77% White, 9% Asian, 7% Black) participated in a pre-registered survey ([https://aspredicted.org/blind.php?x=XMW\\_FXT; #3311](https://aspredicted.org/blind.php?x=XMW_FXT; #3311)) in exchange for modest payment. This sample size allows us to detect effects of size  $d = 0.16$  with 80% power.

**Procedure.** Participants were presented with the six social items from Studies 1-2 and six matched, non-social items as described above. The order of all 12 questions was randomized for each participant. For each item, they were asked to indicate on a 5-point scale whether they were more or less likely than others to engage in the activity in question (e.g., -2/+2—*I go to many fewer/more parties than others, I go to the grocery store much less/more often than others*). For all questions, the scale’s midpoint (0) corresponded to the belief that one engages in the activity in question as frequently as others (*I go to about as many parties as others, I go to the grocery store about as often as others do*, etc.). Participants’ responses to the six social ( $\alpha = 0.80$ ) and non-social ( $\alpha = 0.31$ ) measures were aggregated to create composite measures of relative

standing when it comes to social and non-social life.<sup>9</sup>

## Results

We first examined participants' responses to the six social items. Once again, we found that participants thought their social lives lag significantly behind their peers'. All six means were below the scale midpoints (all  $p$ 's < 0.001) as was the mean of their composite,  $M = -0.80$ ,  $SD = 0.80$ ,  $d = -1.00$ ,  $t(300) = -19.17$ ,  $p < .001$ .

As predicted, participants' pessimism was specific to their assessments of their social lives: They did not believe that they lag behind their peers when it comes to the matched non-social dimensions of life (composite  $M = 0.08$ ,  $SD = 0.50$ ), and the composite of the six social items differed significantly from the composite of the six, matched non-social items,  $t(300) = -19.17$ ,  $p < .001$ ,  $d = -1.29$ . Furthermore, participants' self-evaluations on five of the six social items were significantly more pessimistic than their corresponding evaluation on the matched, non-social items: parties vs. groceries ( $M = -1.27$  vs.  $0.19$ ,  $d = -1.40$ ),  $t(298) = -17.28$ ,  $p < .001$ ; friends vs. neighbors ( $M = -0.84$  vs.  $-0.06$ ,  $d = -0.80$ ),  $t(298) = -10.67$ ,  $p < .001$ ; network vs. vocabulary ( $M = -0.85$  vs.  $0.75$ ,  $d = -1.60$ ),  $t(298) = -19.78$ ,  $p < .001$ , dining out vs. cooking ( $M = -0.50$  vs.  $0.18$ ,  $d = -0.53$ ),  $t(299) = -5.98$ ,  $p < .001$ ; social circles vs. junk mail ( $M = -0.82$  vs.  $-0.17$ ,  $d = -0.63$ ),  $t(299) = -8.10$ ,  $p < .001$ . The remaining item—about the frequency of participants' interactions with their extended family vs. strangers—was also directionally consistent with our prediction, although not significantly so ( $M = -0.51$  vs.  $-0.42$ ,  $d = -0.08$ ),  $t(295) = -1.03$ ,  $p = .303$ .

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<sup>9</sup> Given that the non-social items were constructed to emulate the social items, rather than cohere as their own category of events in substantive terms, the lower inter-item reliability of the non-social composite was to be anticipated.

Finally, a post-hoc comparison of participants' responses on the non-social items to the scale's midpoint (0) revealed the standard, egocentric bias that is the staple of the self-enhancement literature (Kruger, 1999): Participants believed that they more often engaged in the non-social activities than other people in their lives, ( $M = +0.08$ ,  $SD = 0.50$ ,  $d = 0.16$ ),  $t(300) = 2.74$ ,  $p = .007$ . Thus, only when evaluating non-social aspects of their lives did people believe themselves to be more active than others, indicating that the observed pessimism about how one compares to others may be limited to assessments of one's social life. Note, of course, that the social items (e.g., number of friends) tended to be more socially desirable than the non-social items (e.g., number of neighbors). Given that people tend to self-enhance more on desirable traits and skills than on less-desirable ones (Alicke, 1985), participants were certainly more motivated to see themselves as better than others on the social items than the non-social ones. Even more notable then is the fact that participants were nevertheless still pessimistic about how they compare to others in this highly desirable domain.

**Studies 5A and 5B: Evidence that Self-Critical Comparisons in the Social Domain are Caused by Bringing to Mind Exemplars**

We maintain that because people tend to call to mind social exemplars when assessing their own social lives, they tend to see themselves as relatively cloistered. We obtained initial support for this claim in Study 2B by finding that participants tended to bring to mind especially social targets of comparison when evaluating where they stood relative to others. But participants in that study rated the popularity and sociality of their comparison targets only after they had rated their own social lives (which they took to be relatively dull). The latter may have tainted the former. That is, participants who had just indicated that their own social lives were relatively impoverished might have subsequently justified their responses by saying that they were

comparing themselves to unusually social people. In Studies 5A and 5B, we further examined our proposed mechanism. First, in Study 5A we eliminated participants' need to justify their assessments by asking them to think about their social lives (but not rate them), and then sequentially list any targets of comparison who come to mind. We predicted that social others would come to mind more readily than non-social others, and that this tendency would be attenuated as participants progressively brought to mind additional comparison targets. In Study 5B, we experimentally manipulated the type of comparison targets participants brought to mind before evaluating their own social lives. We predicted that participants would make pessimistic assessments of their social lives only when thinking about social others—and not when experimentally prompted to think about other, less social others.

### **Study 5A: Highly Social Comparison Targets Come to Mind First**

#### **Method**

**Participants.** Four hundred and seven participants from Amazon's Mechanical Turk completed a survey (184 females;  $M_{\text{age}} = 36.04$ ; 81% White, 7% Asian, 7% Black) in exchange for a modest payment. This sample size allows us to detect (within-subjects') effects of size  $d = 0.14$  with 80% power.

**Measures and procedure.** Participants were first instructed to reflect on their social lives and how they compared to the social lives of others—but they did not provide any explicit ratings of how they compared with others. They were then asked to list the name or initials of the first person who came to their mind when making these comparisons, the second person who came to mind, the third person, and so on. This was repeated eight times, such that participants listed eight comparison targets that had come to mind when thinking about their social lives. Finally, participants were asked to rate how social they thought each of these eight people was

on a 9-point scale ( $1 = \text{Not at all social}$ ,  $5 = \text{Somewhat social}$ ,  $9 = \text{Very social}$ ).

## Results

We predicted that the order in which participants' standards of comparison came to mind would be correlated with their sociability. Indeed, as shown in Figure 4, the sociability of the comparison targets differed significantly depending on the order in which they came to mind,  $d = 0.29$ ,  $F(7, 378) = 6.19$ ,  $p < .001$ . The most social comparison targets came to mind first. As participants brought to mind additional targets of comparison, they tended to be less and less socially active. A trend analysis (Maxwell & Delaney, 2004) established that this negative linear relationship between order of recall and sociability was significant,  $d = -0.38$ ,  $t(384) = -6.01$ ,  $p < .001$ . The targets of comparison who are the most cognitively available—and therefore have a disproportionate impact on people's sense of their own sociability—tend to be people who are especially socially active.

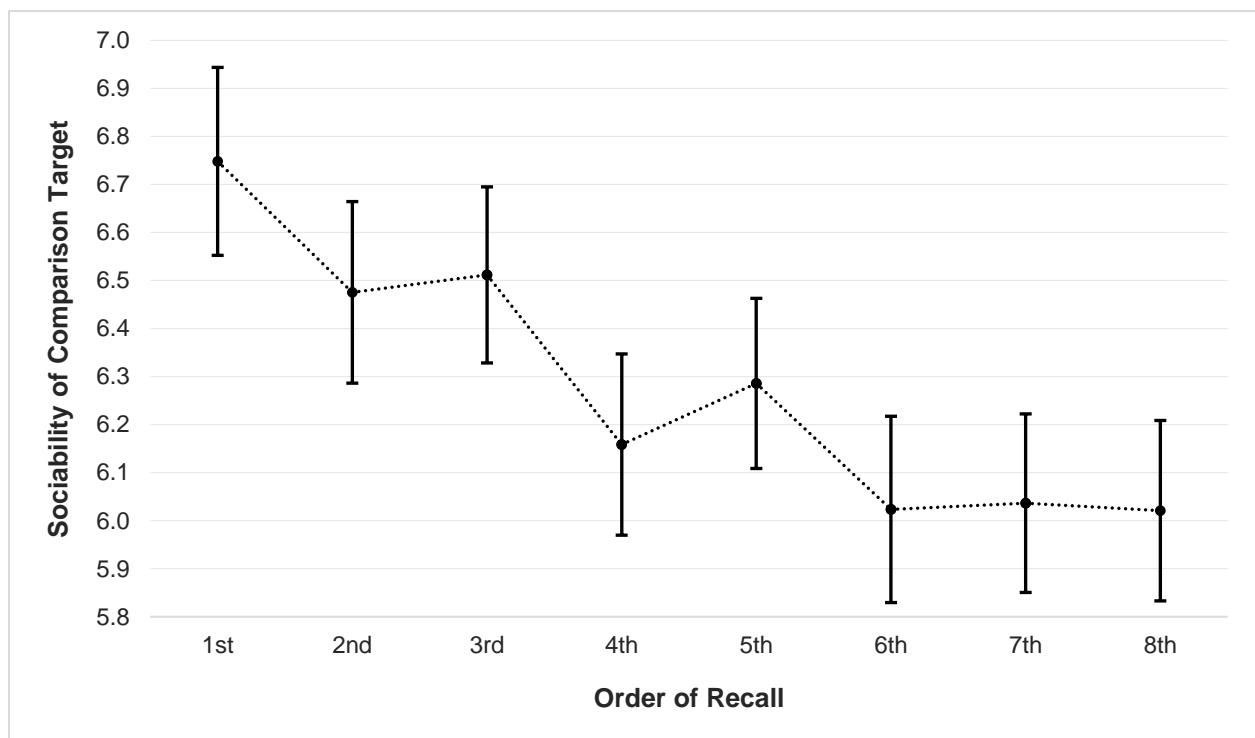


Figure 4. Point estimates and 95% Confidence Intervals for the sociability ratings of each

comparison target participants brought to mind, by the order in which they came to mind (Study 5A).

### **Study 5B: Manipulating the Comparison Target**

The results of Study 5A indicate that when assessing how our social lives compare with the lives of others, highly-social comparison targets come to mind earlier and more easily than less-social targets, suggesting that availability plays a role in people's pessimistic assessments of their social lives. We sought more direct evidence of this link in Study 5B, where we examined the causal influence of comparison standards on people's evaluations of their social lives. We did so by manipulating the type of person participants brought to mind when making their assessments. Some participants were asked to compare themselves to those who lead particularly vibrant social lives and others were asked to compare themselves to those who lead particularly impoverished social lives. We predicted that participants would judge their social lives as lacking only when thinking about particularly social others.

Critically, we also included a control condition in which participants were free to compare themselves to whomever naturally sprang to mind when evaluating their social lives (for a similar approach, see Griffin, Dunning, & Ross, 1990). Because people with the most active social lives tend to be the most salient, we predicted that the evaluations of control participants would be similar to those made by participants explicitly asked to focus on how they compared to especially sociable others. In contrast, we predicted their assessments would differ from those of participants explicitly asked to focus on how they compared to others with relatively dull lives—an instruction we expected to move participants away from their natural (high) standard of comparison.



## Method

**Participants.** One hundred and fifty-eight participants from Amazon's Mechanical Turk completed a survey (74 females;  $M_{\text{age}} = 34.92$ ; 77% White, 8% Asian, 8% Black) in exchange for a modest payment. This sample size allows us to detect effects of size of  $d = 0.50$  with 80% power.

**Measures and procedure.** Participants were randomly assigned to one of three conditions: a socially rich others condition, a socially impoverished others condition, or a control condition. In the socially rich others condition, participants were asked to compare themselves to people they know "*who have rich social lives [...] who might be extroverted and charismatic, and who often can be found in a crowded bar or a wild concert [...] people that seem like they are constantly socializing, or off on some adventure with other people.*" In the socially impoverished others condition, participants were asked to compare themselves to people they know who "*have poor social lives [...] who might be withdrawn and shy, or at any rate are unlikely to be found in a crowded bar or wild concert [...] people that seem like they mostly end up staying-in at home and keeping to themselves.*" In the control condition, participants were simply asked to compare themselves to other people they know, with no further instruction about whom.

Participants then answered six questions that asked them to rate, on a 5-point scale, how their social lives compare to those of the other people they were asked to consider (or, in the control condition, that they considered spontaneously). The questions were the same six used in Study 1, differing only in that they reminded participants that their judgment should be made relative to the specified targets: "*Who goes to more parties, you or these others?*"; "*Who has more friends, you or these others?*"; "*Who has a wider social network, you or these others?*";

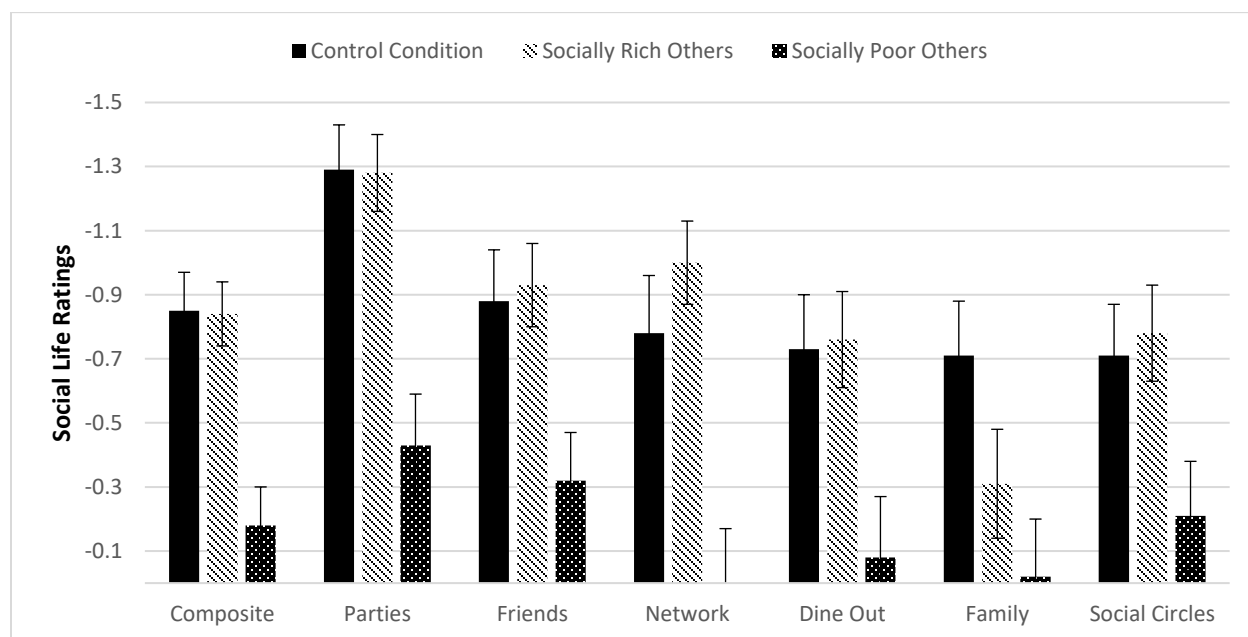
“Who dines out more, you or these others?”; “Who is part of a greater number of social circles, you or these others?”; “Who sees and interacts with their extended family more often, you or these others?” As before, the scales for each question were anchored at -2 (*much less social than the others*) and +2 (*much more social than the others*), with a midpoint at 0 (*equally social as the others*). Participants’ responses to the six questions were averaged to create a composite measure of participants’ assessments of the relative richness of their social lives ( $\alpha = 0.84$ ). Finally, using the ladder measure from Study 2B as a manipulation check, participants reported how vibrant and rich the social lives of the people they had brought to mind as comparison standards were.

## Results

**Manipulation check.** A comparison of how participants rated the social lives of those they had brought to mind in the three different conditions revealed that our manipulation was successful,  $d = 1.25$ ,  $F(2, 144) = 28.34$ ,  $p < .001$ . Participants in the socially rich others condition thought of friends and acquaintances with significantly more vibrant social lives ( $M = 7.02$ ,  $SD = 2.47$ ) than those in the control condition ( $M = 5.83$ ,  $SD = 1.99$ ) and the socially impoverished others condition ( $M = 3.64$ ,  $SD = 2.34$ ), with the latter two conditions also differing significantly from each other, all  $t$ 's  $\geq 2.57$ , and  $p$ 's  $\leq .011$ .

**Perceptions of relative sociability.** Looking across all conditions at the composite measure of relative sociability ( $M = -0.62$ ,  $SD = 0.88$ ), participants tended to view their own social lives as less active and full than those of others,  $d = -0.70$ ,  $t(157) = -8.85$ ,  $p < .001$ . However, as can be seen in Figure 5, this pattern differed significantly between conditions,  $d = 0.77$ ,  $F(2, 155) = 11.52$ ,  $p < .001$ . Only participants in the control ( $M = -0.85$ ,  $SD = 0.85$ ,  $d = -1.00$ ),  $t(50) = -7.17$ ,  $p < .001$ , and socially rich others conditions ( $M = -0.84$ ,  $SD = 0.74$ ,  $d = -1.12$ ),  $t(53) = -8.31$ ,  $p < .001$ , saw their social lives as significantly poorer than the social lives of

others. There was no such effect in the socially impoverished others condition ( $M = -0.18$ ,  $SD = 0.89$ ,  $d = -0.20$ ),  $t(52) = -1.44$ ,  $p = .155$ . Thus, both when explicitly asked to think of exceptionally sociable others and when free to compare themselves to whomever came to mind spontaneously, participants thought that their social lives were relatively impoverished. In contrast, only when explicitly asked to think of unsocial and inactive others were participants able to see their social lives, on average, as they really were—not especially rich or poor.



*Figure 5.* Mean social comparison score for each question, by condition (Study 5B).

Negative scores correspond to the feeling that one's social life lags behind the social lives of others'.

Examining this pattern in more detail, we compared participants' evaluations of their social lives in the control and socially rich others condition to each other. Participants' judgments in these two conditions were almost identical,  $d = 0.01$ ,  $t(155) = 0.04$ ,  $p = .965$ . These data provide especially clear support for our thesis that people judge their social lives to be

relatively impoverished because they spontaneously compare their own social lives to those of people who are social: Those who were free to compare themselves to whomever came to mind assessed themselves no differently than those asked to compare themselves to people with especially active social lives. In marked contrast, participants in the control condition rated their social lives as significantly more impoverished than did participants in the socially poor others condition,  $d = 0.77$ ,  $t(155) = 4.15$ ,  $p < .001$ . Overall, these data indicate that instructing participants to compare themselves to particularly social people has essentially the same effect as leaving participants to their own devices. It is only when participants are explicitly reminded of unsocial people and asked to compare themselves to such targets that their assessments are not pessimistic.

### **Studies 6A and 6B: Well-Being and People's Ideal Social Lives**

We have shown that people consider their social lives to be less rich than those around them, but does it matter? We address this question in the next two studies. In Study 6A, we examine whether people's pessimistic assessments of their social lives bears any relation to well-being—an outcome of clear importance. In Study 6B, we examine whether people's ideal social lives—the lives they would want to lead, given the opportunity—are indeed more active, rich, and engaged than the lives they are currently living.

#### **Study 6A: Life Satisfaction**

We examined the influence of people's pessimistic perceptions of their social lives on their wellbeing in two ways. First, we examined the relationship between people's perceptions of the relative richness of their social lives and their overall life satisfaction. We predicted that the more people tend to be pessimistic in their assessments of their social lives (relative to others'), the less satisfied they would be with life overall. Second, using the same method as in Study 5B,

we examined whether manipulating the standard of comparison participants bring to mind when assessing their social lives influences their overall life satisfaction. Thus, we randomly assigned participants to evaluate their social life in comparison to either especially social others, especially unsocial others, or to whomever came to mind spontaneously. We predicted that increasing the availability of *unsocial* standards of comparison would increase participants' life satisfaction.

## Method

**Participants.** One hundred and fifty-four participants from Amazon's Mechanical Turk (80 females;  $M_{\text{age}} = 33.42$ ; 72% White, 10% Asian, 9% Latino) completed a survey in exchange for modest payment. This sample size allows us to detect effects of size  $d = 0.50$  with 80% power.

**Measures and procedure.** The study's design was nearly identical to that of Study 5B, with the addition of a measure of well-being. Participants were randomly assigned to one of three conditions, asking them to compare themselves to socially rich others, socially impoverished others, or to whomever came to mind spontaneously (control condition). All participants then answered the same six questions used in Study 1 about how they measured up to these others with regard to parties, friends, networks, dining out, social circles, and interactions with their extended family ( $\alpha = 0.90$ ). We then assessed overall well-being using the 5-item Satisfaction with Life Scale ("*In most ways my life is close to my ideal*"; "*The conditions of my life are excellent*"; "*I am satisfied with life*"; "*So far I have gotten the important things I want in life*"; "*If I could live my life over, I would change almost nothing*";  $\alpha = 0.93$ ) (Diener, Emmons, Larren, & Griffin, 1985). Finally, participants rated the sociability of their comparison targets using the same ladder measure from Study 5B.

## Results

An examination of responses to the manipulation check established that participants' targets of comparison differed as predicted between conditions,  $d = 0.61$ ,  $F(2, 149) = 6.87$ ,  $p = .001$ . The mean sociability rating of comparison targets in the socially poor others condition ( $M = 3.98$ ,  $SD = 2.30$ ) differed significantly from the mean sociability rating in both the socially rich others condition ( $M = 5.48$ ,  $SD = 2.56$ ) and the control condition ( $M = 5.25$ ,  $SD = 2.09$ ),  $t$ 's  $\geq 2.86$ ,  $p$ 's  $\leq .005$ . The latter two conditions did not differ significantly from one another,  $d = 0.06$ ,  $t(149) = -0.52$ ,  $p = .603$ .

Replicating Study 5B, we found that participants' judgments of their own lives were significantly influenced by their standards of comparison,  $d = 1.01$ ,  $F(2, 150) = 19.01$ ,  $p < .001$ . Again, participants who were instructed to compare themselves to especially social others ( $M = -1.09$ ,  $SD = 0.92$ ),  $d = -1.18$ ,  $t(52) = -8.60$ ,  $p < .001$ , and those who were given the opportunity to compare themselves to whomever came to mind spontaneously ( $M = -0.71$ ,  $SD = 0.79$ ),  $d = -0.90$ ,  $t(47) = -6.22$ ,  $p < .001$ , thought that their social lives were significantly worse than others' social lives. However, participants who were asked to bring to mind especially unsocial others did not perceive their social lives as relatively impoverished ( $M = +0.08$ ,  $SD = 1.20$ ),  $d = 0.07$ ,  $t(51) = 0.49$ ,  $p = .630$ . Participants' ratings in the control condition differed significantly from those in the socially impoverished others condition,  $d = -0.46$ ,  $t(150) = 4.00$ ,  $p < .001$ , but only marginally from those in the socially rich others condition,  $d = 0.22$ ,  $t(150) = -1.92$ ,  $p = .057$ .

We next examined the relationship between participants' relative assessments of their social lives and their overall life satisfaction. As predicted, across conditions, we found a significant positive association between life satisfaction and participants' assessments of their social lives. The more participants believed their social lives were deficient, the less satisfied

they were with life overall,  $r(151) = 0.37, p < .001$ .

Finally, we assessed the causal influence of comparison targets on well-being by examining how life satisfaction ratings differed between conditions. We found that participants' life satisfaction ratings differed across the three conditions,  $d = 0.39, F(2, 148) = 2.79, p = .065$ , albeit marginally so. A contrast comparing life satisfaction ratings in the socially rich others ( $M = 4.04, SD = 1.73$ ) and control conditions ( $M = 4.30, SD = 1.71$ ) to the socially poor others condition ( $M = 4.80, SD = 1.54$ ), showed that those directed to think of less social comparison targets were significantly more satisfied with life,  $d = 0.45, t(148) = 2.21, p = .028$ .

Further analysis established the mediating role of participants' assessments of their social lives on their overall life satisfaction. Participants instructed to compare themselves to targets who were unsocial (socially poor others condition) made significantly different assessments of their social lives than those who either spontaneously or by instruction compared themselves to more socially active targets (socially rich others and control conditions),  $b = 1.00, SE = 0.17, t(149) = 5.89, p < .001$ . When both comparison-target condition (socially poor others v. socially rich others and control conditions) and participants' assessments of their social lives were simultaneously entered into a linear regression model predicting life satisfaction, comparison target condition was no longer a significant predictor of life satisfaction,  $b = 0.08, SE = 0.30, t(148) = 0.27, p = .790$ , but self-assessments of social lives were  $b = 0.55, SE = 0.13, t(148) = 4.26, p < .001$ . A Preacher and Hayes (2008) bootstrapping procedure (with 10,000 iterations) showed that the indirect effect through perceived social richness was significant, 95% CI = [0.254, 0.992], indicating that participants' assessments of their social lives mediated the relationship between targets of comparison and life satisfaction.

### Study 6B: Ideal Social Lives

Beyond establishing that people's pessimistic perceptions of their social lives are related to their well-being, we wanted to examine whether people see their social lives as truly deficient, not just worse off than other people they know. Although people might feel that their social lives compare unfavorably with the social lives of others, they may be perfectly content with that fact. Some may consider efforts to lead a rich social life physically and emotionally depleting; others may see the activities that comprise such a life as superficial. To examine this possibility, participants in Study 6B were asked to make two evaluations: how their social lives compare to others' and how they would *like* their social lives to compare to others'. If people are bothered by the sense that their social lives lag behind others', their desired standing should be significantly higher than their perceived standing. Given that people's most enduring regrets in life involve their failures to live up to their ideal selves (Davidai & Gilovich, 2017), a large discrepancy between people's actual and desired social lives would constitute evidence that people are unhappy with how their social lives compare with those of others.

#### Method

**Participants.** Three hundred participants from Amazon's Mechanical Turk (137 females,  $M_{\text{age}} = 37.44$ ; 74% White, 11% Asian, 9% Black) completed a pre-registered ([https://aspredicted.org/blind.php?x=CBR\\_NLT; #3224](https://aspredicted.org/blind.php?x=CBR_NLT; #3224)) survey in exchange for modest payment. This sample size allows us to detect effects of size  $d = 0.16$  with 80% power.

**Measures and procedure.** Participants compared their social lives to the social lives of others they know by answering the same six questions from Study 1. Participants then answered the same six questions with respect to their desired social life—by indicating what their social life would look like if they had “*the exact social life that you would most want to have*” (e.g., *In*



*your ideal social life: Who goes to more parties, you or others?*, etc.) Participants' responses were aggregated to create a composite of their actual ( $\alpha = 0.81$ ) and desired ( $\alpha = 0.82$ ) social lives.

## Results

As before, participants thought their social lives lag behind others': for the individual items, all  $p$ 's  $< .001$ ; for the composite:  $M = -0.79$ ,  $SD = 0.84$ ,  $d = -0.94$ ,  $t(299) = -16.27$ ,  $p < .001$ . More important, participants' assessments of their social life differed significantly from the life they would like to lead. Participants' desired social life was much richer (composite:  $M = 0.24$ ,  $SD = 0.81$ ) than the life they currently believe they have,  $d = -1.25$ ,  $t(299) = -20.82$ ,  $p < .001$ . This was also true for each of the individual items: parties ( $M = -0.17$  vs.  $-1.25$ ,  $d = -0.96$ ), friends ( $M = 0.26$  vs.  $-0.87$ ,  $d = -1.05$ ), network ( $M = 0.26$  vs.  $-0.89$ ,  $d = -0.99$ ), dining out ( $M = 0.48$  vs.  $-0.48$ ,  $d = -0.84$ ), social circles ( $M = 0.24$  vs.  $-0.75$ ,  $d = -0.86$ ), and family ( $M = 0.39$  vs.  $-0.50$ ,  $d = -0.72$ ),  $t$ 's  $> 12.00$ ,  $p$ 's  $< .001$ . Thus, people not only tend to see their lives as lagging behind the social lives of others', but they also wish that this were not the case.

It is important to note, furthermore, that this gap between people's actual and desired social lives was not the result of their setting unrealistic, oversized expectations for their desired social lives. Although the responses options ranged from  $-2$  to  $+2$ , the mean rating for each of the six items was closer to 0 than any other scale point (where zero meant the respondent would simply like to go as many parties as others, have as many friends, etc.). Indeed, for each of the six items, both the median and modal responses were 0 – a desired social life that is simply on par with the social lives of others.

## Discussion

In the six decades since Leon Festinger's (1954) theory of social comparison was

published, researchers have examined the cognitive (Dunning, Meyerowitz, & Holzberg, 1989; Klar & Giladi, 1999; Kruger, 1999) and emotional (Buunk, Collins, Taylor, Van Yperen, & Dakof, 1990; Lyubomirsky & Ross, 1997) processes involved in social comparison, including when people compare themselves to others around them, why they do so, and what the consequences are (for a review, see Suls & Wheeler, 2000). To the extent that previous work has touched on people's assessments of their social lives, it has focused on assessments of general social traits (e.g. whether people believe they are friendlier or more polite than others) rather than specific social habits or achievements (i.e., whether people believe they attend more parties and have larger social circles than others). We sought to extend prior research by examining how people evaluate the breadth and richness of their social lives in comparison to those of their friends, acquaintances, and peers. That is, we examined the most *social* of social comparisons.

In eleven studies, we found that people believe their social lives are relatively impoverished. Across various populations and using both direct and indirect measures of comparison, we found that people tend to believe that others attend more parties, dine out more frequently, have a greater number of friends, enjoy more interactions with their extended family, occupy wider social networks, possess larger social circles, and are closer to the “inner circle” than they are themselves.

### **The peculiar nature of the most social of social comparisons**

These results can seem surprising in light of the wealth of research indicating that people hold overly-positive views of themselves (Alicke, 1985; Dunning, Heath, & Suls, 2004; Taylor & Brown, 1988; Weinstein, 1980). Why should people's assessments of their social lives be an exception? As we discussed in the introduction, the answer, we believe, is two-fold. First, when evaluating one's social life—for example, whether one goes to more parties than others—the

mind naturally turns to other people and their lives. Rather than focusing inward, assessments of one's social life spontaneously direct one's attention outwards—to the social lives of others. In contrast, when evaluating non-social aspects of one's life—for example, whether one goes grocery shopping more than others—the mind more naturally turns inward (“how often do I shop?”). Thus, whereas people largely ignore others when evaluating their standing on non-social dimensions (Klar & Giladi, 1999; Kruger, 1999; Moore, & Small, 2007), they are more attuned to what others are like when evaluating their social lives. Indeed, as was shown in Study 4, participants reported both taking other people more into consideration and feeling relatively deficient when evaluating their social lives than when evaluating their standing on non-social dimensions.

This external focus that comes with evaluating the richness of one's social life makes people vulnerable to an influential source of bias—the tendency to overweight mentally available information (Tversky & Kahnmen, 1973). Because people are disproportionately exposed—in both their daily lives and through social media—to sociable others, they naturally think of such people and their habits when reflecting on their own social lives. Indeed, we have provided evidence that people's pessimistic assessments of their social lives are due, at least in part, to the availability of social exemplars. Socially active others are more likely to spring to mind spontaneously as “social benchmarks” (Study 2B). Indeed, even when free to compare themselves to whomever they wish, people tend to bring to mind the same social exemplars as those who are explicitly instructed to think of particularly social others (Studies 5B and 6A). Only when we explicitly instructed participants to compare themselves to others with dull social lives did this pessimism disappear. It thus appears that because extroverts and socialites spring to mind more readily than introverts and recluses, people compare themselves to a tough

benchmark and conclude that their social lives are sub-par.

### **Social media and social life assessments**

Today, of course, access to exemplars comes not just from direct encounters, but through social media exposure. And as many have noted, the information people receive about others' lives through social media platforms like Facebook is anything but a representative sample of their day-to-day and moment-to-moment experience (Newman, Lauterbach, Munson, Resnick, & Morris, 2011). People tend not to post photos of themselves reading, eating dinner in front of the television, or watching *Love Actually* for the twelfth time. Instead, we see our Facebook friends in large group photos, at parties, on vacation, at concerts and so on, and so it is easy to come away with feelings of social inadequacy. Indeed, research has shown that frequent use of social media is associated with feelings of loneliness and dissatisfaction with one's life (Kross et al., 2013; Steers, Wickham, & Acitelli, 2014). And some evidence suggests that this relationship might be causal, as one study reported by a think tank found that those randomly assigned to quit Facebook for a week subsequently felt less lonely and more satisfied with their social lives (Happiness Research Institute, 2015). Another large-scale randomized control trial, in which over 1,500 users were paid to deactivate Facebook (or not) for four weeks, found that those who deactivated their accounts (1) spent less time online, (2) spent more time socializing with family and friends, and (3) saw significant improvements in subjective well-being (Allcott, Braghieri, Eichmeyer, Gentzkow, 2020).

But note that the informational asymmetries that can feed a sense of social inadequacy are not limited to social media. By their very nature, socially active people tend to be more salient than their less socially active counterparts. Anyone studying alone in a dormitory is likely to be aware of rowdier classmates partying down the hall or on another floor; those same

partiers, however, are unlikely to think much about those studying behind closed doors. Both groups, those spending an evening alone and those out partying, are therefore likely to underestimate the prevalence of the former and overestimate the prevalence of the latter. In addition, direct experience and social media can come together to feed a sense of social inadequacy as people may be especially likely to consult social media when they are feeling lonely (Amichai-Hamburger, & Ben-Artzi, 2003; Joinson, 2008; Skues, Williams, Wise, 2012).

### **Global assessments of social life**

We have implicitly defined a rich social life as one in which people have many friends, are part of numerous social networks, attend lots of social functions, and are closer to the “inner circle.” Other definitions are certainly possible. Although attending parties, enjoying friendships, creating social ties, and accumulating a wealth of experiences can be central to social life, they are not the only way to have a rich and fulfilling social life. When it comes to global assessments of one’s social life, for example, the quality of one’s experiences can be as important as their quantity. Nevertheless, there is reason to believe that people think of their social lives as sub-par even when left to define for themselves what it means to have a rich social life. When we asked 359 Mechanical Turk users to rate on a continuous sliding scale how their social lives compare to the social lives of others they know—with the definition of social life, unspecified (-10, “*I have a less rich social life than them,*” to +10, “*I have a more rich social life than them,*”)—the average response ( $M = -2.83$ ,  $SD = 4.06$ ) was significantly below the scale midpoint (“About equal”),  $d = 0.70$ ,  $t(358) = -13.21$ ,  $p < .001$ . Seventy-one percent of the responses were below the midpoint, and only 28% were above,  $d = 0.51$ ,  $\chi^2(1) = 65.57$ ,  $p < .001$ . Thus, even when left to define for themselves what it means to have a rich social life, people tend to think that they fall short. This is especially striking given the evidence that self-serving judgments are especially common when

people are free to define the ability or trait in question in a self-serving manner (Dunning, Meyerowitz, & Holzberg, 1989). There is still much to explore about how people's assessments of the quality and quantity of their social experiences contribute to their overall assessments of their social lives—and how those assessments in turn relate to their general well-being.

### **Potential Interventions**

Although it simply cannot be that people in general have poorer social lives than people in general, our studies indicate that such a summary of their own lives is compelling to the majority of individuals. An important question, then, is how this illusion might be dispelled. We were able to dispel this illusion in Studies 5B and 6A by having participants compare themselves to others with especially dull social lives—a rather heavy-handed manipulation that would not seem to offer much promise as a practical, sustained, real-world intervention. While decreasing the availability of unusually sociable exemplars may prove to be impractical, a more promising approach might be to focus on reducing the perceived relevance of such exemplars to the self, or instilling doubts about whether such exemplars are, in fact, as social as they appear. Focusing on important differences between oneself and the unusually-social others that come to mind, for example, may remove the sting of an otherwise painful comparison. Moreover, recasting these sorts of especially *social* social comparisons in a way that implicates people's core values may shift the focus from those who have a more active social life to those who has a more meaningful social life. Although it might be hard to overcome the illusion that others are coasting through life accumulating more social experiences, it might be easier for people to see themselves as having more profound and meaningful experiences. People may believe that others have visited more countries, made more social connections, or “seized more moments,” but nonetheless conclude that their own travels were more fulfilling, their own friendships deeper and more

enduring, and their own seized moments more profound.

### **Cultural Variation**

Moreover, what it means to have a rich social life may be culturally specific. We have explored a type of rich social life (e.g., having a lot of friends, going to a lot of parties, and having a greater number of social experiences) that is perhaps highly WEIRD (Western, educated, industrial, rich, and democratic) (Kim, & Markus, 1999). Cultures which are more interdependent, and are more likely to focus on maintaining harmonious relations and encourage more modest social displays of emotion (Markus & Kitayama, 1991; Tsai et al., 2016), might have a different take on what it means to lead a rich social life. In such cultures, for example, having strong intimate bonds may be seen as the apex of a rich social life, and those most devoted to a smaller circle of close relationships may be the benchmark for comparison. And because the depth of others' relationships may not be as salient as their number, people in more interdependent cultures might hold less self-critical views about how they measure up to others socially.

Of course, a greater focus on social relations in these cultures might well mean the opposite. It may be that such a focus leads members of these cultures to think of others and their social lives even more, making the social lives of others even more mentally salient and social self-assessments even more self-critical.

### **Conclusion**

Comparison is often described as the “thief of joy.” We find evidence consistent with that adage in these studies. As we have shown, people tend to believe that others are living fuller lives than they are themselves—attending more parties, enjoying the company of more friends, and checking off one exhilarating experience after the other. However, as we have also shown,

this belief is an illusion, although one that is not easily dispelled. We'd be better off if it were.



## CHAPTER 3: ABOVE-AVERAGE COMPARISON TARGETS

### INTRODUCTION

When people compare themselves to the average person, they sometimes come off as self-aggrandizing, overconfident, and unduly optimistic. Whether it's about health, intellect or morality, a consistent finding across decades of research on social comparisons is that people believe they are superior to the average person (Alicke, 1985, Brown, 2012, Epley & Dunning, 2000, Dunning et al., 2004, Hoorens & Harris, 1998, Klar & Giladi, 1999, Pronin, Gilovich, & Ross, 2004). And these beliefs appear sincere, as people are even willing to place money on them (Williams & Gilovich, 2008).

Yet, how often do people compare themselves to the average person? Everyday experience is riddled by myriad instances of self-doubt, underconfidence and pessimism when thinking about oneself in relation to others (Hermann, Leonardelli, & Arkin, 2002; Norem & Cantor, 1986; Showers & Ruben, 1990; Watson & Friend, 1969). Given the pervasiveness of the above-average effect, if comparisons to the average were the norm, such reactions would be surprising.

We argue that although people often believe they are above average, these are not the comparisons that typically come to mind when people measure themselves against others.<sup>10</sup>

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<sup>10</sup> It can be argued that there is an implicit assumption in the better-than-average effect literature that people commonly compare themselves to the average person. First, it is unclear why researchers would use the average as a standard of social comparison unless it was at least partially assumed that people find a comparison to the average person meaningful. Second, the common interpretation of the better-than-average effect as a sign of self-enhancement (e.g., Dunning, Heath, & Suls, 2004) suggests that many researchers consider the average as a relevant benchmark against which every deviation is either self-enhancing or self-diminishing. Finally, this assumption is sometimes explicitly stated; for example, in one of the most highly-cited chapters about the better-than-average effect, the authors write: "*The better-than-average effect is a particular type of social comparison, one in which people compare their characteristics or behaviors against a norm or a standard, which is usually the average standing of their peers*" (Alicke & Govorun, 2005; emphasis added). While the average is seen as one of several benchmarks to which people compare themselves, researchers commonly treat it as a meaningful comparison

Instead, we contend that people more often compare themselves to domain-relevant exemplars—who, by virtue of being exemplars, are often high performers. For example, when people think about how good their painting ability is, they compare themselves to those who can paint, not simply the average person. And this happens because such exemplary comparison targets are simply more cognitively salient and mentally accessible when a person focuses on a given domain like painting. As a result, people commonly come away feeling inadequate compared to others.

### **Theoretical Contribution**

This chapter casts new light on the better-than-average effect (Alicke, 1985; Zell et al., 2020) and offers a novel mechanism for the processes that govern who people compare themselves to when engaging in social comparisons.

As reviewed in Chapter 1 (General Introduction), previous theories of social comparison tend to be functional. They posit that the selection of social comparison targets is in service of some goal. These goals commonly fall into one of three categories: self-evaluation (Festinger, 1954; Goethals & Darley, 1977), self-enhancement (Thornton & Arrowood, 1966; Wills, 1981), or aspiration, coping, and self-improvement (Wood, 1989). The only major cognitive account of social comparison meanwhile offers an explanation of why people assimilate towards or contrast away from comparison targets once they are called to mind (Crusius et al., 2022; Mussweiler, 2003; Mussweiler et al., 2004b), but it does not offer much of an explanation of how those comparison targets come to mind in the first place or how those comparison targets are mentally constructed.

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standard. This ubiquity of the average as a standard of comparison, we believe, emphasizes the need for a systematic examination of whether people make such comparisons unprompted.

Thus, whereas previous work has examined the *motivational* determinants of who people compare themselves to or the cognitive determinants of how people react once they have a target in mind, we propose a novel and distinctly *cognitive* account of why certain above-average comparisons tend to come to mind in the first place. We argue that people do not regularly measure themselves against the average person because that specific standard of comparison rarely comes to mind. Instead, we argue that people are most likely to compare themselves to the most cognitively salient exemplars or a standard which is a mental agglomeration of such exemplars (Kahneman & Miller, 1986, Tversky & Kahneman, 1973). As a consequence, people's benchmarks of comparison are disproportionately influenced by the availability of high-ranking comparison standards. Because it is easier to bring to mind people who exhibit a given trait or ability than people who lack that very same trait or ability (e.g., Hearst, 1991; Snyder & Swann, 1978), people tend to compare themselves to others who are high on a given domain of comparison. For example, when people evaluate their social lives, social others—whose social lives are significantly richer than the average person's—come more quickly to mind and subsequently serve as an standard of comparison (Deri, Davidai, & Gilovich, 2017). Similarly, exemplars or stereotypes of high-ranking others have a disproportionate influence on self-evaluations (Dannals & Miller, 2017; Davidai, Deri, & Gilovich, 2021). Rather than think of the average person, people are likely to resort to the most cognitively accessible standards of comparison—positive exemplars of others who instantiate what it means to be X (e.g. rich, social) and are thus above average.

This account also casts the classic above-average literature in a new light (Alicke, 1985; Alicke & Govorun, 2005; Zell et al., 2020). It does not call into question the finding, but rather what it seems to imply about people's self-views. Taken at face value, the above average effect

would seem to suggest that people have a generally highly inflated sense of how they stack up to others. Our findings cast doubt on this possibility, as they show that while, yes, people do think they are above average, they tend not to compare to such a standard, and instead tend to compare themselves to targets that who above average.

In addition to the cognitive mechanism that determines why people bring to mind exemplary comparison targets, there is another reason to question the implication that people's tendency to regard themselves as above average implies that they are ubiquitously self-satisfied. This is because, as we posit and provide evidence for, people are unlikely to have more than a tepid regard for the average person. Rather, perceptions of the *average* are more likely to be akin to people's feelings towards concepts like *ordinary*, *mediocre*, or *unexceptional* (for a related discussion, see Alicke et al., 1995, and Klar & Giladi, 1997). One's conclusion that he or she is better than a mediocre comparison standard does not imply an inflated self-view. Seeing oneself as better at swimming than a person floundering in the shallow section of a pool does not imply we think we are like Michael Phelps.

### **Relation to The Worse-than-Average Effect**

Of course, people do sometimes believe that they are worse than average and such occasions are important for understanding self-evaluations. For example, people believe they are worse than others on especially difficult tasks (Kruger, 1999), tasks in which they are aware of their own—but not others'—lack of expertise (Moore & Kim, 2003), or tasks at which they are exceptionally bad (Moore & Small, 2007). Similarly, people believe they are worse than average when they focus on the difficulties that they—but not others—face (Blanton, Axsom, McClive, & Price, 2001; Windschitl, Kruger, & Simms, 2003), or when evaluating their likelihood of experiencing especially rare or unique events (Chambers, Windschitl, & Suls, 2003; Kruger &

Burrus, 2004).

Because instances in which people believe they are below average are entirely consistent with the subjective experience of inadequacy and self-doubt, we focus on domains in which people typically believe they are better than average. While it is not surprising that people who perceive their juggling skills as below average would also experience insecurity about their lack of abilities (Kruger, 1999), it is surprising that people would experience insecurity regarding their intelligence while also believing that they are significantly smarter than the average person (Alicke, 1985). And the fact that people are often insecure about their intelligence, their personal relationships, and their professional skills—all domains in which above average effects have been documented (Alicke, 1985; Baker & Emery, 1993; Larwood & Whittaker, 1977)—suggests a discrepancy between everyday experience and research on the better-than-average effect.

## **OVERVIEW**

The 12 studies ( $N = 2,474$ ) in this section document the fact that people do not typically compare themselves to the “average” person and instead measure themselves up to comparison targets who are above average in a given domain, and this occurs at least in part because such exemplary comparison targets are more cognitively available. We start by establishing the fact that, across a host of domains, people’s typical standard of comparison is not an “average” person (Studies 1A-1B, Study 2). Next, we show that this cannot simply be explained by motivational factors previously identified in the social comparison literature, such as comparison targets being aspirational (Study 2), reflecting possibly inflated self-views (Studies 3A-3C), nor people’s inclination to give socially desirable answers (Study 4C-4D). Instead, we show people often pick comparison targets who exemplify a domain (Studies 4A-4D, Study 5). For example, when assessing their artistic ability, people compare to artistic people, not simply “people”. Such

comparison targets literally come to mind first (Study 5). Even in undesirable domains (e.g. rudeness), people's minds turn to exemplars (Study 4C), i.e. a prototypical rude person. Finally, we show that this natural tendency to compare to exemplary others can lead people to feel worse about their own abilities (Study 5).

For all studies that follow we report all conditions run and measures collected. We followed the heuristic of including at least 50 participants per condition, as suggested by Simmons, Nelson, & Simonsohn (2013) to have adequate power to detect at least medium size effects. Sample sizes were always determined in advance, and analyses were conducted only after data collection was complete. In addition, we report a sensitivity analysis for each sample (i.e., the smallest effect size detectable with 80% power, given the sample size).

### **Studies 1A-1C: Who do people compare themselves to?**

Studies 1A-1C establish our basic effect—people measure themselves against comparison targets who are well above average.

#### **Study 1A**

##### **Method**

**Participants.** One hundred fifty U.S. residents recruited from Amazon's Mechanical Turk platform (81 females,  $M_{\text{age}} = 36.41$ ) completed this study in exchange for monetary compensation. This sample size allows us to detect within-subject effects as small as  $d = 0.23$  with 80% power.

**Materials and Procedure.** This study examined people's perceptions of the average person and their perceptions of other people to whom they typically compare themselves. To assess perceptions of the average American, we asked participants to think about how two traits (rationality and responsibility) are distributed in the population. Specifically, participants were

instructed to think about the entire population of the United States and how people differ in terms of their rationality (how rational versus irrational they are) and their responsibility (how responsible versus irresponsible they are). Participants were then presented with seven levels for each trait and indicated the percentage of the population that they believe falls within each level. For example, when thinking about rationality, participants indicated the percentage of Americans who are *extremely rational*, the percentage of Americans who are *more rational than irrational*, the percentage of Americans who are *somewhat more rational than irrational*, the percentage of American who are *about as rational as irrational*, and so forth all the way to the percentage of Americans who are *extremely irrational*. To do this, participants adjusted seven sliding scales (one for each of the aforementioned labels) such that the total sum across the scales was equal to 100%.

Next, participants indicated their benchmark of comparison for each trait: “When you think about how rational/irrational (responsible/irresponsible) you are, what is the “standard” to which you compare yourself? That is, what type of person/people do you typically compare yourself to on this trait?” Participants were presented with seven levels of comparison for each trait that corresponded to the seven levels on the trait distribution measure (e.g., 7=*I compare myself to extremely rational people*, 6=*I compare myself to people who are much more rational than irrational*, 5=*I compare myself to people who are somewhat more rational than irrational*, 4=*I compare myself to people who are about as rational (responsible) as irrational (irresponsible)*, etc. all the way to 1=*I compare myself to people who are extremely irrational (irresponsible)*).

## Results

***Perceptions of the average American.*** As a measure of their perceptions of the average

American, we calculated from each participant's trait distribution responses a weighted average of rationality and a weighted average of responsibility. To do so, we multiplied the perceived proportion of the population participants assigned to each of the given trait levels (i.e., % *extremely irrational*, % *more irrational than rational*, ..., % *extremely rational*) by the corresponding value of that trait level (i.e., 1, 2, ..., 7), and then summed the resultant products into a weighted average. This weighted average could therefore range from 1 (the participant believed that 100% of Americans are extremely irrational/irresponsible) to 7 (the participant believed that 100% of Americans are extremely rational/responsible).

Overall, participants had a somewhat tepid view of the average American's levels of rationality and responsibility. A one-sample t-test comparing the calculated weighted averages to the scale's midpoint (4) revealed that the average American is seen as only slightly more rational than irrational ( $M = 4.34$ ,  $SD = 0.95$ ),  $t(149) = 4.38$ ,  $p < .001$ , and only slightly more responsible than irresponsible ( $M = 4.42$ ,  $SD = 0.93$ ),  $t(149) = 5.51$ ,  $p < .001$ .<sup>11</sup>

**Typical standards of comparison.** We next examined participants' comparison benchmarks—the standards they measure themselves against when evaluating their own level of rationality and responsibility. Participants held themselves to relatively high standards of comparison on both traits, measuring themselves against people who are significantly more rational than irrational ( $M = 5.46$ ,  $SD = 1.35$ ) as well as with people who are significantly more responsible than irresponsible ( $M = 5.48$ ,  $SD = 1.33$ ),  $t_s > 13.00$ ,  $p_s < .001$  (as compared to the scale's midpoint).

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<sup>11</sup> We also computed participants' perceived *median* trait level for each trait. Perceptions of the median American's rationality ( $M = 4.33$ ) and responsibility ( $M = 4.48$ ) were very similar to perceptions of the average American's level on these traits ( $M_{\text{rationality}} = 4.34$ ,  $M_{\text{responsibility}} = 4.42$ ),  $t's < 1.62$ ,  $p_s > .10$ . Using perceptions of the median instead of the average American does not change the significance of any of the results.



Most important, participants' standards of comparison were much higher than their perceptions of the average American. When it came to evaluating their own level of rationality, participants measured themselves against a standard ( $M = 5.46$ ) that is significantly higher than their views of the average American ( $M = 4.32$ ),  $t(146) = 8.47$ ,  $p < .001$ . Similarly, participants' standard for evaluating their level of responsibility ( $M = 5.48$ ) was significantly higher than their views of the average American's level of responsibility ( $M = 4.42$ ),  $t(146) = 8.08$ ,  $p < .001$ . Thus, participants seem to measure themselves against standards much higher than the average American.

### **Study 1B**

Study 1B extends the findings of Study 1A in several ways. First, because they made both judgments, participants in Study 1A may have been motivated to inflate their typical comparison standards relative to their perceptions of the average. Thus, in Study 1B we examined whether our findings hold in a between-subjects design, wherein some participants report how they view the average person and others report who they typically compare themselves to. Second, in Study 1B we explicitly asked participants how they view the average American rather than inferring this view from a weighted perceived distribution. Third, rather than asking participants who they typically "compared themselves to" (which may have led some respondents to think of others who are similar or "comparable" to themselves), in Study 1B we asked participants who they typically *measure* themselves against. Finally, to examine the robustness of our findings, we asked participants about two new traits: politeness and intelligence.

### **Method**

***Participants.*** Two hundred two U.S. residents recruited from Amazon's Mechanical

Turk platform (82 females,  $M_{\text{age}} = 36.84$ ) completed this study in exchange for monetary compensation. This sample size allows detection of between-subject effects as small as  $d = 0.40$  with 80% power.

**Materials and Procedure.** Participants were randomly assigned to make one of two judgments. In the *standard of comparison* condition, they reported their typical standard when evaluating their own politeness or intelligence:

*Think about the standard you typically hold yourself to when it comes to evaluating how polite (intelligent) you are. When you think about how polite/impolite (intelligent/unintelligent) you are, what is the “standard” against which you measure yourself? That is, what type of person/people do you typically measure yourself against on this trait?*

As in Study 1A, participants were presented with seven levels of each trait and indicated which level best represents their typical standard of comparison (e.g., 7=*I measure myself against people who are extremely polite*, 6=*I measure myself against people who are much more polite than impolite*, 5=*I measure myself against people who are somewhat more polite than impolite*, etc.).

In the *perceptions of the average American* condition, participants were asked about the average American’s levels of politeness and intelligence:

*Think about how the average American rates in terms of how polite (intelligent) he/she is. How polite/impolite (intelligent/unintelligent) is the average American? That is, where does the average American fall on this trait?*

Participants indicated their responses on a 7-point scale (e.g., 7=*the average American is extremely polite*, 6=*the average American is much more polite than impolite*, 5=*the average*

*American is somewhat more polite than impolite, etc.)*

## **Results**

***Perceptions of the average American.*** As shown in Figure 6, participants held a lukewarm view of the average American, both in terms of politeness and in terms of intelligence. Compared to the scales' midpoint (4), participants believed that the average American is about as intelligent as they are unintelligent ( $M = 4.09$ ,  $SD = 1.07$ ),  $t(100) = 0.84$ ,  $p = .400$ , and only slightly more polite than impolite ( $M = 4.23$ ,  $SD = 1.15$ ),  $t(100) = 1.99$ ,  $p = .049$ .

***Typical standards of comparison.*** In contrast, participants held themselves to relatively high standards on both traits—measuring themselves against people who are significantly more intelligent than unintelligent, ( $M = 5.46$ ,  $SD = 1.29$ ),  $t(100) = 11.32$ ,  $p < .001$ , and significantly more polite than impolite, ( $M = 5.13$ ,  $SD = 1.49$ ),  $t(100) = 7.59$ ,  $p < .001$ . Most important, participants' personal standards for intelligence ( $M = 5.46$ ) and politeness ( $M = 5.13$ ) were higher than their perceptions of the average American's intelligence ( $M = 4.09$ ) and politeness ( $M = 4.32$ ),  $ts > 4.80$ ,  $ps < .001$ . Thus, participants held themselves to a standard that was much higher than their judgments of the average person.

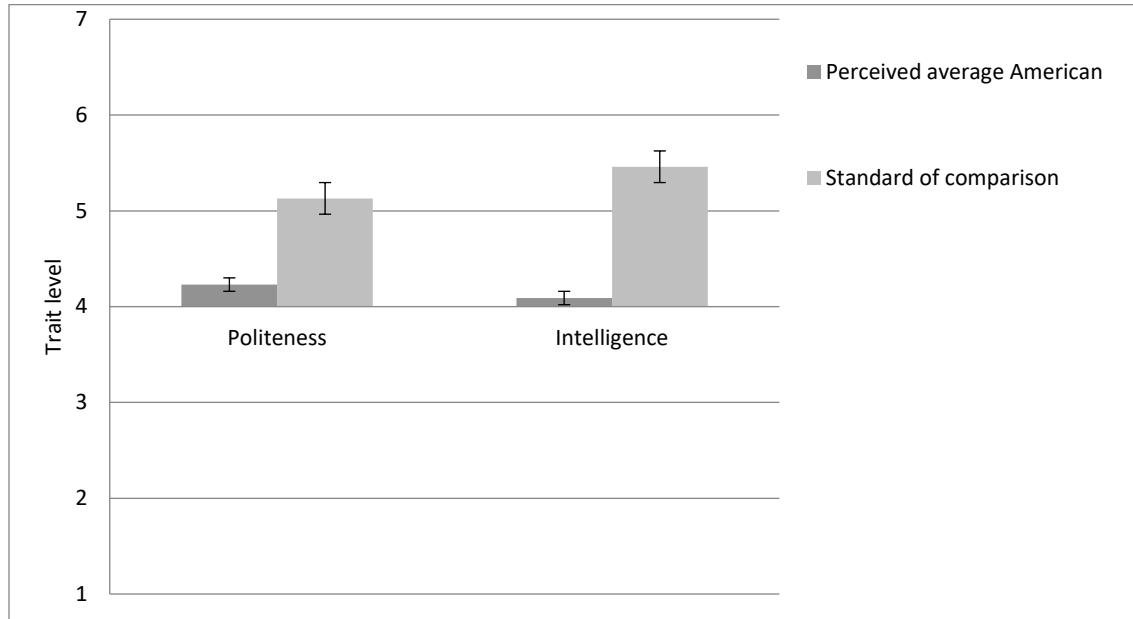


Figure 6. Perceived level of politeness and intelligence of the average American, and participants' standard of comparison. (Study 1B)

### Study 1C: Lowest standards of comparison

In Study 1C, we examined the extent to which people disregard the average as a comparison standard, by asking participants to evaluate a range of benchmarks. Specifically, we asked participants about their *typical* standard of comparison as well as their *lowest* standard of comparison (below which comparisons would be uninformative). A failure to include the average person in this range would constitute further evidence that people do not pay much mind to the average when evaluating how they measure up to others.

#### Method

**Participants.** One hundred fifty-one U.S. residents recruited from Amazon's Mechanical Turk platform (84 females,  $M_{\text{age}} = 35.25$ ) completed this study in exchange for monetary compensation. This sample size allows detection of between-subject effects as small as  $d = 0.57$ ,

and one-sample effects as small as  $d = 0.40$ , with 80% power.

**Materials and Procedure.** Participants were randomly assigned to one of three conditions in which they either evaluated themselves (*self-perception* condition), their typical standards of comparison (*typical standard* condition), or their lowest relevant standard of comparison (*low standard* condition). In all conditions, participants made judgments about six traits, which were presented in random order: *friendliness, responsibility, intelligence, rationality, politeness, and honesty.*

In the *self-perception* condition, participants estimated their relative standing on each trait: *Below is a list of traits. For each one, please indicate where you stand on this trait relative to the American population. For example, if the trait was “generosity” and you have reason to suspect that you are less generous than most Americans, you might state that you are in the 30th percentile. This means that you think you are more generous than only 30% of the population. On the other hand, if you think that you are more generous than most Americans, you might indicate that you are in the 85th percentile. This means that you think that you are more generous than 85% of the population.*

In the *typical standard* condition, participants indicated the standard of comparison they would typically consider for each trait:

*Below is a list of traits. For each one, think about your typical standard of comparison on this trait. Who do you usually measure yourself against on each trait? For example, if the trait was “generosity” and your typical standard of comparison is people that are very generous, you might state that your typical standard is people in the 85th percentile. This means that you never measure yourself against people that are higher than the 85th percentile of the population because they are too generous to be a relevant standard of*

*comparison. On the other hand, if your standard of comparison is people that are a little bit stingy, you might state that your typical standard is people in the 30th percentile. This means that you never measure yourself against people that are higher than the 30th percentile of the population, which is your typical standard.*

Finally, in the *lowest standard* condition, participants indicated the lowest relevant standard of comparison they would consider for each trait:

*Below is a list of traits. For each one, think about your **lowest relevant standard** on this trait. What is the lowest acceptable standard against which you would measure yourself on each trait? For example, if the trait was "generosity" and your lowest standard of comparison is people that are a little bit stingy, you might state that your lowest relevant standard is people in the 30th percentile. This means that you never measure yourself against people that are lower than the 30th percentile of the population because they are not generous enough to be a relevant standard of comparison. On the other hand, if your lowest standard of comparison is people that are very generous, you might state that your lowest relevant standard is people in the 85th percentile. This means that you never measure yourself against people that are lower than the 85th percentile of the population, which is your lowest relevant standard.*

## **Results**

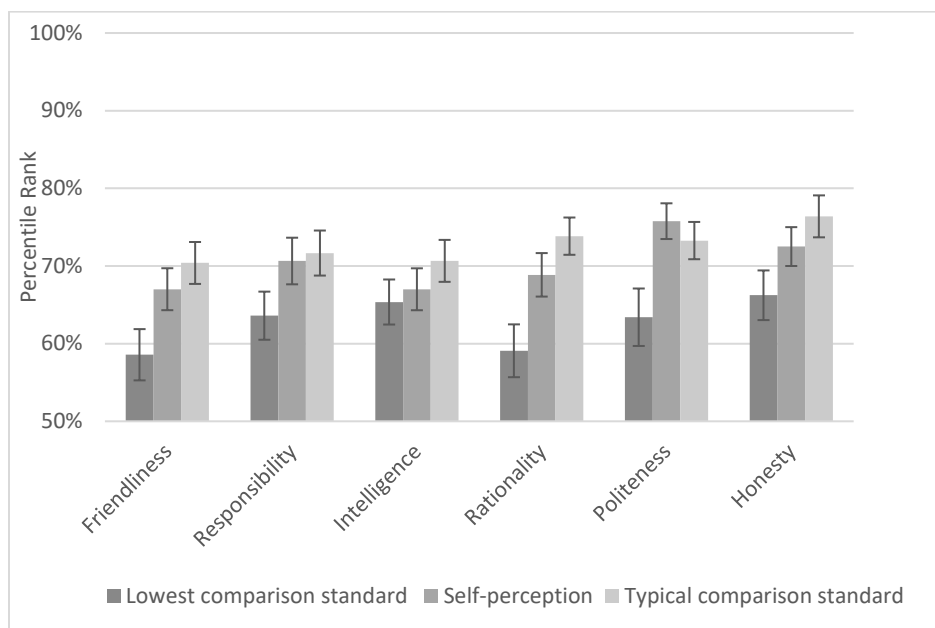
***Standards of comparison.*** Participants' typical standards of comparison for all six traits were significantly above the 50th percentile ( $M_{\text{friendliness}} = 70.39$ ,  $M_{\text{responsibility}} = 71.67$ ,  $M_{\text{intelligence}} = 70.67$ ,  $M_{\text{rationality}} = 73.84$ ,  $M_{\text{politeness}} = 73.27$ ,  $M_{\text{honesty}} = 76.39$ ),  $t_s > 7.39$ ,  $p_s < .001$  (Figure 7).

More important, participants' *lowest* acceptable standards for all six traits were also significantly higher than the 50<sup>th</sup> percentile ( $M_{\text{friendliness}} = 58.57$ ,  $M_{\text{responsibility}} = 63.64$ ,  $M_{\text{intelligence}} = 65.36$ ,

$M_{\text{rationality}} = 59.09$ ,  $M_{\text{politeness}} = 63.43$ ,  $M_{\text{honesty}} = 66.23$ ),  $t_s > 2.50$ ,  $p_s < .015$ . Thus, participants did not seem to consider the average American as a benchmark for comparison even when thinking about their most uninspiring standards of comparison.

***Self-perceptions.*** We next examined self-perceptions. Replicating past research, participants believed they were more honest ( $M = 72.51$ ,  $SD = 18.43$ ), polite ( $M = 75.77$ ,  $SD = 16.71$ ), intelligent ( $M = 67.02$ ,  $SD = 19.96$ ), rational ( $M = 68.87$ ,  $SD = 20.69$ ), responsible ( $M = 70.64$ ,  $SD = 22.03$ ), and friendly ( $M = 67.02$ ,  $SD = 19.29$ ) than the average American,  $t_s > 6.20$ ,  $p < .0001$ .

***Standards of comparison vs. self-perceptions.*** When we combined the six traits into a single composite, we found that participants rated themselves ( $\alpha = 0.81$ ;  $M = 70.31$ ,  $SD = 14.02$ ) significantly higher than their lowest acceptable standard of comparison ( $\alpha = 0.89$ ;  $M = 62.72$ ,  $SD = 18.11$ ),  $t(148) = 2.51$ ,  $p = .01$ , but not differently than their typical standards ( $\alpha = 0.78$ ;  $M = 72.71$ ,  $SD = 13.00$ ),  $t(148) = 0.81$ ,  $p = .419$ . Thus, participants saw themselves as much better than the average American but as no better than their own self-set high standards of comparison.



*Figure 7.* Participants’ self-perceptions, their lowest acceptable standard of comparison, and their typical standard for comparison. (Study 1C)

### **Studies 2: Aspiration vs. Accuracy**

Although participants in Studies 1A-1C reported measuring themselves against standards of comparison that were well above average, it is possible that they interpreted these questions as asking about who they look up to and aspire to be like. In Study 2, we aimed to rule out the possibility that this accounts for our results.

To do so, we explicitly differentiated between a social comparison target who is an ‘aspiration benchmark’ (i.e., a comparison target who is someone participants aspire to be like when evaluating a trait of theirs, like intelligence) and a comparison target who is an ‘accuracy benchmark’ (i.e., a comparison target who they typically measure themselves against in order to get a sense of how, for example, intelligent/unintelligent they are). We predicted both comparison targets would still be significantly higher than participants’ perceptions of the



average person, indicating that it is not only when comparing aspirationally that people compare themselves to above average others.

## Method

**Participants.** One hundred U.S. residents recruited from Amazon’s Mechanical Turk platform (41 females,  $M_{\text{age}} = 34.63$ ) completed a pre-registered study ([http://aspredicted.org/blind.php?x=mx434p; #9798](http://aspredicted.org/blind.php?x=mx434p;#9798)) in exchange for monetary compensation. One participant who did not complete all three dependent variables was excluded from analysis. The sample size in this study allows detection of within-subject effects as small as  $d = 0.28$  with 80% power.

**Materials and Procedure.** Participants reported two standards against which they measure themselves—one for when accurate self-evaluation is their primary concern, and one for when aspiration is their primary concern—and then rated their perceptions of the average American.

When reporting their comparison standards for accuracy, participants were told:

*People often evaluate themselves by comparing their abilities to others around them.*

*When making such comparisons, people bring to mind others who serve as an “accuracy benchmark”—that is, people who they can measure themselves against in order to get an accurate sense of their own ability level. Think about how you would go about accurately assessing how intelligent you are relative to other people.*

Participants responded on a scale similar to the one used in Study 1B (7=I measure myself against people who are extremely intelligent, 6=I measure myself against people who are much more intelligent than unintelligent, 5=I measure myself against people who are somewhat more intelligent than unintelligent, etc.)

Similarly, when reporting their aspiration standards, participants were told:

*People often evaluate themselves by comparing their abilities to others around them. When making such comparisons, people often bring to mind others who serve as an “aspiration benchmark”—that is, people who they aspire to be like. Think about who you aspire to be like in terms of intelligence. When you think about how intelligent/unintelligent you are, who do you aspire to be like? When it comes to intelligence, what type of person/people do you aspire to be like?*

They then answered with a scale rating (7=*I aspire to be like people who are extremely intelligent*, 6=*I aspire to be like people who are much more intelligent than unintelligent*, 5=*I aspire to be like people who are somewhat more intelligent than unintelligent*, etc.).

Finally, participants rated the average American’s level of intelligence (7=*the average American is extremely intelligent*, 6=*the average American is much more intelligent than unintelligent*, 5=*the average American is somewhat more intelligent than unintelligent*, etc.). The order of the two comparison questions was counterbalanced.

## **Results**

***Accuracy standards of comparison.*** When trying to assess their own abilities, participants measured themselves against people who are significantly more intelligent than unintelligent, ( $M = 5.48$ ,  $SD = 1.09$ ),  $t(98) = 13.54$ ,  $p < .001$ , and this standard for accurate self-evaluation was significantly higher than their perceptions of the average American’s intelligence ( $M = 3.99$ ,  $SD = 1.08$ ),  $t(98) = 9.57$ ,  $p < .001$ . Thus, even when trying to accurately evaluate their intelligence, participants did not seem to perceive the average American as a relevant benchmark.

***Aspiration standards.*** As can be seen in Figure 8, participants clearly had high

intelligence aspirations, looking up to others who are much more intelligent than unintelligent, ( $M = 6.19$ ,  $SD = 0.84$ ),  $t(98) = 25.93$ ,  $p < .001$  and, not surprisingly, much more intelligent than their perceptions of the average American ( $M = 3.99$ ),  $t(98) = 15.99$ ,  $p < .001$ . Thus, participants did not perceive the average American's level of intelligence as particularly inspiring.

***Accuracy standards vs. aspiration standards.*** Although participants who wanted an accurate assessment of their intelligence measured themselves against relatively intelligent others ( $M = 5.48$ ) they aspired for even higher levels of intelligence ( $M = 6.19$ ),  $t(98) = 6.63$ ,  $p < .001$ . An identical pattern of results was revealed in a between-participant analysis comparing the “accuracy benchmark” of participants who first made their accuracy ratings to the “aspiration benchmark” of participants who first made their aspiration ratings. Although participants measured themselves against relatively intelligent others ( $M = 5.42$ ,  $SD = 1.11$ ), their aspiration standards were even higher ( $M = 6.16$ ,  $SD = 0.87$ ),  $t(97) = 4.00$ ,  $p < .001$ .

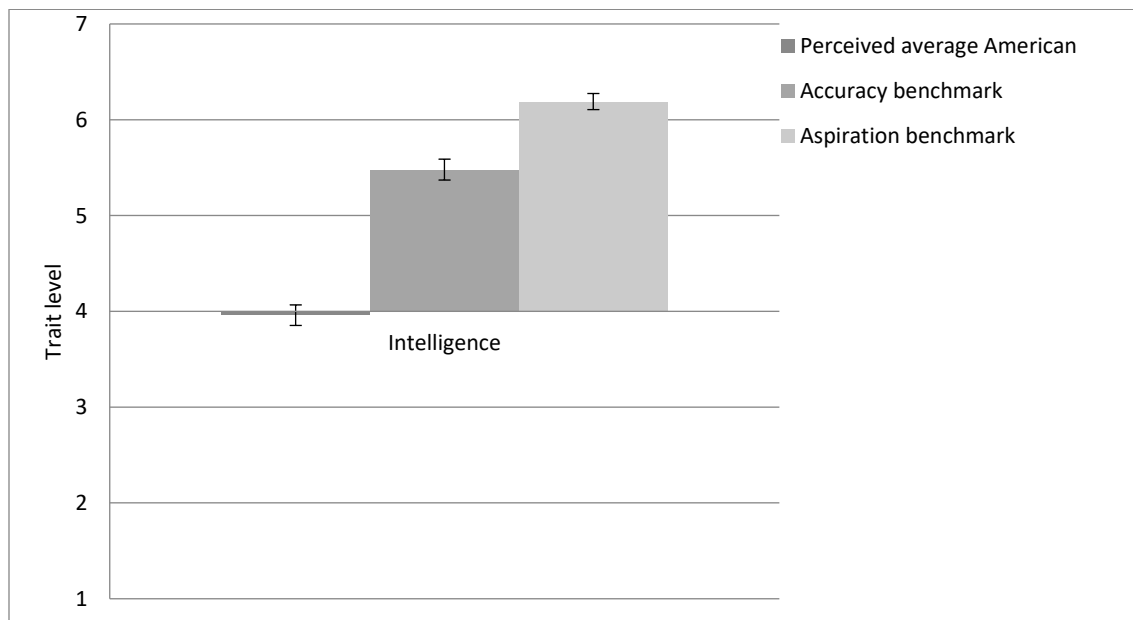


Figure 8. Perceived level of intelligence of the average American (“perceived average

American”), their standard of comparison for accurately evaluating their own intelligence (“accuracy benchmark”) and their aspiration level in terms of intelligence (“aspiration benchmark”). (Study 2).

### **Studies 3A-3C: Accessibility vs. Inflated Self-Perceptions**

The studies so far suggest that people compare themselves to others who are well above average. We claim that this is at least partially due to the ease with which these high standards of comparison pop into mind. Nevertheless, one might argue that these results are entirely explained by people’s tendency to self-enhance (e.g. Sedikides & Strube, 1997). By rejecting the average as a standard of comparison, participants may be expressing confidence in their own abilities or restating their belief that they are above average. For example, when someone reports that she measures herself against highly intelligent others, she may simply be indicating that her standards should match her own (perceived) high stature (see Studies 4C-4D, where we provide evidence marshalling against a related concern that social desirability drives our results). In Studies 3A-3C, we gather evidence to rule out the possibility that self-enhancement entirely explains our results.

To do this, we examine the key prediction of such an account—that inflated self-perceptions are the sole determinant of who people compare themselves to. If the standards people hold themselves to merely reflect their own inflated self-perceptions, then they should fluctuate with those perceptions: the higher people rate themselves, the higher their standards of comparison should be. Likewise, when people *lack* confidence in their traits, skills, or abilities, we should observe low comparison standards. That is, if comparison standards merely reflect self-perceptions, these standards should be high when self-perceptions are high but low when

self-perceptions are low.

While we do not doubt that self-perceptions may play a role in who people compare themselves to, our argument is that they cannot fully account for the results we have seen thus far. Rather, we claim that the cognitive accessibility is also critical in people's tendency to compare themselves to above average others. We predict that here, even when low self-perceptions would motivate people to lower their standards of comparison, the forces of accessibility will win out and people will measure themselves against others who are higher than average on the evaluated trait or ability.

To test this, in Studies 3A and 3B we manipulated self-perceptions prior to eliciting participants' standards of comparison, either by having them recall a time of inadequacy (Study 3A) or by directly manipulating their objective performance level (Study 3B). In Study 3C, rather than manipulating self-perceptions, we examined who participants measure themselves against in domains for which they chronically lack self-confidence. We predicted that despite the downward shift in self-evaluations, the accessibility of high domain-specific comparison standards would lead participants to focus on higher-than-average comparison benchmarks, even when lacking self-confidence.

### **Study 3A**

#### **Method**

*Participants.* One hundred U.S. residents recruited from Amazon's Mechanical Turk platform (53 females,  $M_{\text{age}} = 34.64$ ) completed this study in exchange for monetary compensation. This sample size allows detection of between-subject effects as small as  $d = 0.57$  with 80% power.

*Materials and Procedure.* We manipulated participants' confidence in how responsible

they are. Participants were randomly assigned to describe an event in which they've acted in a responsible or an irresponsible manner: "think about a recent time when you behaved in a responsible [irresponsible] manner. This could be a time when you acted responsibly [irresponsibly] at work, a time when you felt that you managed your finances in a responsible [irresponsible] manner, or any other event when you acted in a way that—looking back—seems very responsible [irresponsible]." They then rated themselves in terms of responsibility: "To what extent do you consider yourself a responsible or irresponsible person?" (7=*I am extremely responsible*, 6=*I am much more responsible than irresponsible*, 5=*I am somewhat more responsible than irresponsible*, 4=*I am equally responsible and irresponsible*, 3=*I am somewhat more irresponsible than responsible*, 2=*I am much more irresponsible than responsible*, and 1=*I am extremely irresponsible*).

Next, to measure their views of the average American's responsibility, participants estimated the distribution of the trait responsibility in the population, using the same measure from Study 1A (e.g., the percentage of Americans who are *extremely responsible*, the percentage of Americans who are *much more responsible than irresponsible*, etc.). Finally, participants rated their own standard of comparison for evaluating how responsible/irresponsible they are (e.g., 7=*I compare myself to extremely responsible people*, 6=*I compare myself to people who are much more responsible than irresponsible*, etc.)

## Results

***Self-perceptions.*** As expected, participants who wrote about a time they acted responsibly rated themselves as significantly more responsible ( $M = 5.98$ ,  $SD = 1.17$ ) than those who wrote about a time they acted irresponsibly ( $M = 5.43$ ,  $SD = 1.00$ ),  $t(98) = 2.48$ ,  $p = .015$ .

***Perceptions of the average American.*** We next examined participants' perceptions of

the average American. As in Study 1A, we calculated from each participant's trait distribution a weighted average of responsibility by multiplying each trait level with the perceived percentage of the population that lies within that level. A one-sample t-test revealed that participants had a relatively tepid view of the average American's level of responsibility, ( $M = 4.50$ ,  $SD = 0.7$ ),  $t(99) = 6.46$ ,  $p < .001$ , as compared to the scale's midpoint (4). The manipulation did not affect perceptions of the average American ( $M_{\text{responsible}} = 4.53$ ,  $SD = 0.79$ ;  $M_{\text{irresponsible}} = 4.46$ ,  $SD = 0.76$ ),  $t(98) = 0.452$ ,  $p = .653$ .

***Standard of comparison.*** Finally, we examined whether doubting their own levels of responsibility influenced to whom participants compared themselves. As predicted, participants held themselves to a relatively high standard of comparison, measuring themselves against people who are significantly more responsible than irresponsible ( $M = 5.70$ ,  $SD = 1.40$ ),  $t(99) > 12.11$ ,  $p < .001$ , and significantly more responsible than the average American ( $M = 4.50$ ,  $SD = 0.70$ ),  $t(99) = 7.95$ ,  $p < .001$ . Participants' standards of comparison, however, were not influenced by the self-perception manipulation. Participants held themselves to an equally high standard of responsibility regardless of whether they were first asked to write about a time they'd acted responsibly ( $M = 5.80$ ,  $SD = 1.32$ ) or irresponsibly ( $M = 5.59$ ,  $SD = 1.50$ ),  $t(98) = 0.743$ ,  $p = .459$ . Most important, regardless of whether their self-confidence was undermined or not, participants' standards of comparison were significantly higher than their perceptions of the average,  $ts > 4.80$ ,  $ps < .0001$ . Thus, even when led to doubt their own abilities, participants did not consider the average person a relevant standard of comparison.

### **Study 3B**

In Study 3B, we manipulated self-perceptions by having participants complete an easy or a difficult version of a trivia quiz and then examining who they chose to compare themselves to.

This improves on Study 3A in three ways. First, it allows for a much stronger manipulation of self-perceptions—by modifying actual performance rather than simply altering participants’ recollections. Second, by having participants make an explicit choice about which comparison target they would like to receive information about, it allows us to collect actual comparison targets rather than just self-reports. Finally, it allows us to verify the accuracy of participants’ self-perceptions (by scoring participants quizzes).

We expected that relative to an easy quiz, participants completing a difficult trivia quiz would doubt their own competence. However, we predicted that regardless of which quiz they completed, participants would measure themselves against comparison standards that are significantly higher than average.

## **Method**

***Participants.*** One hundred four U.S. residents recruited from Amazon’s Mechanical Turk platform (62 females,  $M_{\text{age}} = 36.28$ ; 78% White, 7% Latino, 6% Black) completed this study in exchange for monetary compensation. This sample size allows detection of between-subject effects as small as  $d = 0.55$  with 80% power.

***Materials and Procedure.*** Participants completed a trivia quiz which consisted of 10 general knowledge questions. They were told that in addition to learning their own scores, they could also see two other quiz-takers’ scores in order “to get a sense of how you compare to other Mechanical Turk users” and “evaluate how well/poorly you did.” Participants were further told that to maintain others’ anonymity, they will choose people by the percentile of their scores (e.g., choose to see the result of a quiz-taker who scored in the 30<sup>th</sup> percentile, 50<sup>th</sup> percentile, 70<sup>th</sup> percentile, etc.) Participants then indicated the percentiles of two other quiz-takers against whom they’d like to compare their scores. These two percentiles were averaged to create a measure of



participants' *pre-quiz standard of comparison*.

Next, participants were randomly assigned to answer either 10 easy multiple-choice questions (e.g., *Which state in the U.S. is the Grand Canyon located in? Who directed the movie Jurassic Park?*) or 10 difficult multiple-choice questions (e.g., *Which state in the U.S. is Congaree National Park located in? Who directed the movie The Shawshank Redemption?*). Upon completion, participants estimated how many of the 10 questions they had answered correctly and indicated their overall confidence in their performance (*1=Not confident at all; 4=Somewhat confident; 7=Very confident*).

After indicating their confidence but before seeing their own scores, participants were again asked who they wished to compare themselves to. They were told that since they had now completed the quiz, they could change whose scores they would like to see. Participants then selected two quiz-takers (in terms of score percentiles) against whom they would like to evaluate their own scores. These two percentiles were averaged to create a measure of participants' *post-quiz standard of comparison*.

Finally, participants indicated which percentile they believed their own score fell into.

## Results

**Manipulation check.** Compared to participants who completed the easy quiz, participants who completed the difficult quiz (1) believed that they answered fewer questions correctly ( $M = 2.92$  vs.  $M = 6.33$ ), (2) actually answered fewer questions correctly ( $M = 3.87$  vs.  $M = 7.42$ ), (3) were less confident in their performance ( $M = 2.29$  vs.  $M = 4.54$ ), and (4) predicted that their scores would fall into a lower percentile ( $M = 34.02$  vs.  $M = 60.21$ ),  $t_s > 5.50$ ,  $p_s < .001$ . Furthermore, participants in the difficult quiz condition believed that their score would be below the average ( $M = 34.02$ ,  $SD = 24.30$ ),  $t(51) = 4.74$ ,  $p < .001$ , and those in the easy quiz condition

believed their score would be above the average ( $M = 60.21$ ,  $SD = 23.54$ ),  $t(51) = 3.13$ ,  $p = .003$ . Thus, we successfully manipulated both participants' actual and perceived performance.<sup>12</sup>

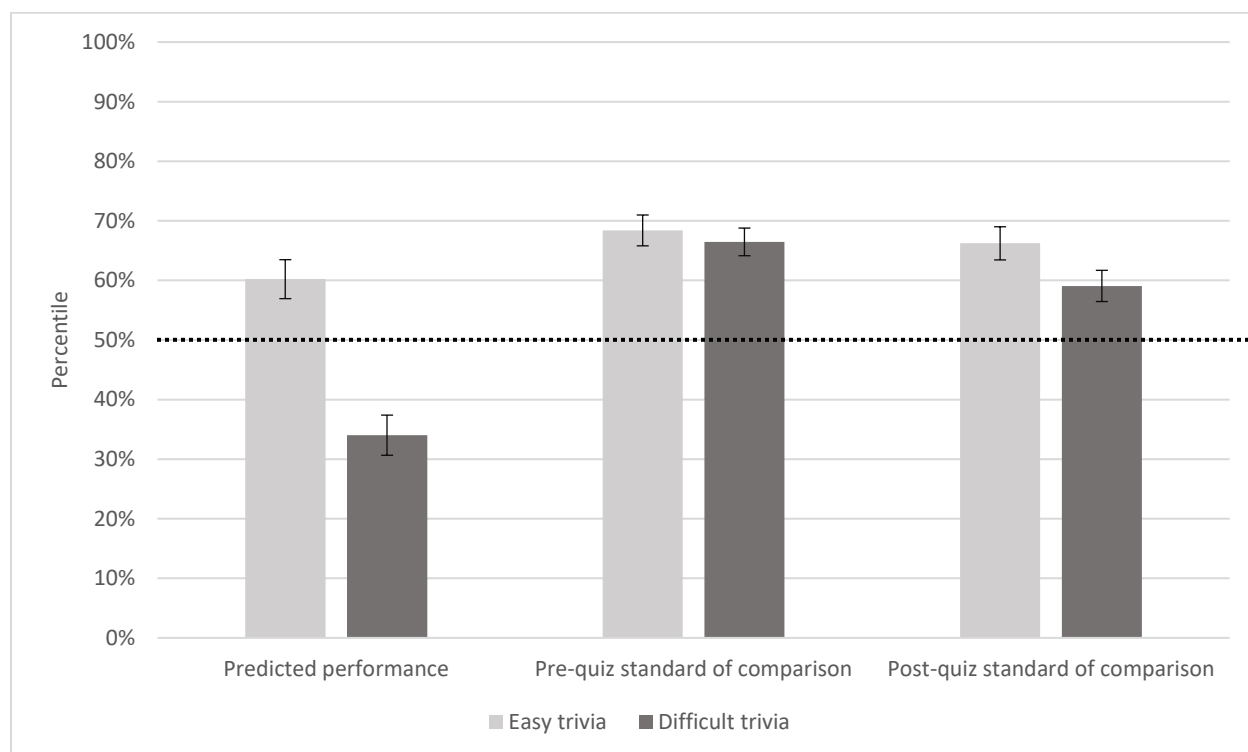
*Pre-quiz standard of comparison.* Before taking the quiz, participants assigned to the easy ( $M = 68.39$ ,  $SD = 18.69$ ) and difficult ( $M = 66.46$ ,  $SD = 16.72$ ) versions of the trivia game chose equally high standards of comparison,  $t(103) = 0.555$ ,  $p = .580$ . More important, standards of comparison in both conditions were significantly higher than the 50<sup>th</sup> percentile,  $ts > 7.00$ ,  $ps < .001$  (Figure 9).

*Post-quiz standard of comparison.* Next, we examined the critical test of our hypothesis: participants' standards of comparison *after* having completed the trivia quiz (i.e., when their self-perceptions were inflated or deflated). As might be expected, participants who completed the difficult trivia quiz dropped their standards to an extent and wished to measure themselves against users from a slightly lower percentile ( $M = 59.08$ ,  $SD = 18.91$ ) than participants who completed the easy trivia quiz ( $M = 66.22$ ,  $SD = 20.05$ ), although this difference was not significant,  $t(102) = 1.87$ ,  $p < .064$ . More important, both participants who took the easy quiz and participants who took the difficult quiz measured themselves against standards that were significantly higher than the 50<sup>th</sup> percentile  $ts > 3.45$ ,  $ps < .005$ . Thus, regardless of their own performance, participants held themselves to above-average standards of comparisons. Moreover, because participants were told that they would only see other quiz-takers' final scores but not their trivia responses, this desire to see better-performers' scores cannot be explained by mere curiosity about the correct answers. Despite their poor performance on the difficult trivia

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<sup>12</sup> Since the study was completed online, one may be concerned about participants consulting with online resources to answer the trivia questions (e.g., Google). However, the fact that participants' performance differed by condition assuages this concern.

quiz—and the resultant belief that their own performance was below average—participants still measured themselves against a standard significantly higher than the average quiz-taker. This suggests people’s social comparisons do not simply fluctuate with their self-views. While self-views appear to have some effect on comparison target selection, this study demonstrates that people compare themselves to above average others even when they view themselves as below average.



*Figure 9.* Participants’ predicted performance and their chosen targets of comparison before and after taking an easy or a difficult trivia quiz (Study 3B).

### Study 3C

Both when recalling a time of personal inadequacy (Study 3A) and when performing

poorly (Study 3B), participants still measured themselves against above average comparison targets. However, one might argue that while the manipulations in Studies 3A and 3B temporarily influenced self-perceptions, they were not strong enough to put a meaningful dent in participants' typically inflated self-views. Thus, in Study 3C, we examined who participants brought to mind when evaluating themselves in domains for which they chronically lack self-confidence. We predicted that regardless of their positive or negative chronic self-perceptions, the mental availability of high-performers would lead participants to measure themselves against above-average standards of comparison.

## Method

**Participants.** One hundred U.S. residents recruited from Amazon's Mechanical Turk platform (54 females,  $M_{\text{age}} = 35.25$ ; 81% White, 3% Latino, 8% Black, 6% Asian/Asian-American) completed a pre-registered study (<http://aspredicted.org/blind.php?x=um4xr8>; #9797) in exchange for monetary compensation. Three participants who did not complete all the dependent variables were excluded from analyses. The sample size in this study allows detection of within-subject effects as small as  $d = 0.28$  with 80% power.

**Materials and Procedure.** Participants were asked who they thought about when evaluating their knowledge about various topics:

*Below is a list of various knowledge domains. Think about who you compare yourself to when evaluating how much you know or do not know about each domain. When you try to evaluate how much you know about each domain, who comes to mind? For each domain, please write down the name or initials of the first person that comes to mind when you try to evaluate how much you know about the domain.*

They were randomly presented with two relatively easy knowledge domains, on which

they were likely to have chronically high self-regard (*the English language and using the Internet*), and two relatively difficult knowledge domains, on which they were likely to have chronically low self-regard (*fixing a car's engine and computer programming*). For each domain, participants typed the name or initials of the first person that came to mind when they evaluated their own knowledge.

Next, participants indicated, for each person they wrote about, how knowledgeable that person is about the specific domain for which they were brought to mind (1=*they are much less knowledgeable than the average person*, 2=*they are moderately less knowledgeable than the average person*, 3=*they are slightly less knowledgeable than the average person*, 4=*they are as knowledgeable as the average person*, and so forth all the way to 7=*they are much more knowledgeable than the average person*).

Finally, participants indicated, for each of the four domains, their own level of knowledge relative to the average person (1=*I am much more knowledgeable than the average person*, 2=*I am moderately more knowledgeable than the average person*, 3=*I am slightly more knowledgeable than the average person*, etc).<sup>13</sup>

## Results

**Self-perceptions.** Participants perceived themselves as better than average on seemingly easy domains but worse than average on seemingly difficult domains. They believed they were more knowledgeable than the average person about the English language (M = 5.33, SD = 1.06) and using the Internet (M = 5.57, SD = 1.16),  $t_s > 12.50$ ,  $p_s < .001$ , but less knowledgeable than the average person about fixing a car's engine (M = 2.96, SD = 1.59),  $t(96) = 6.43$ ,  $p < .001$ .

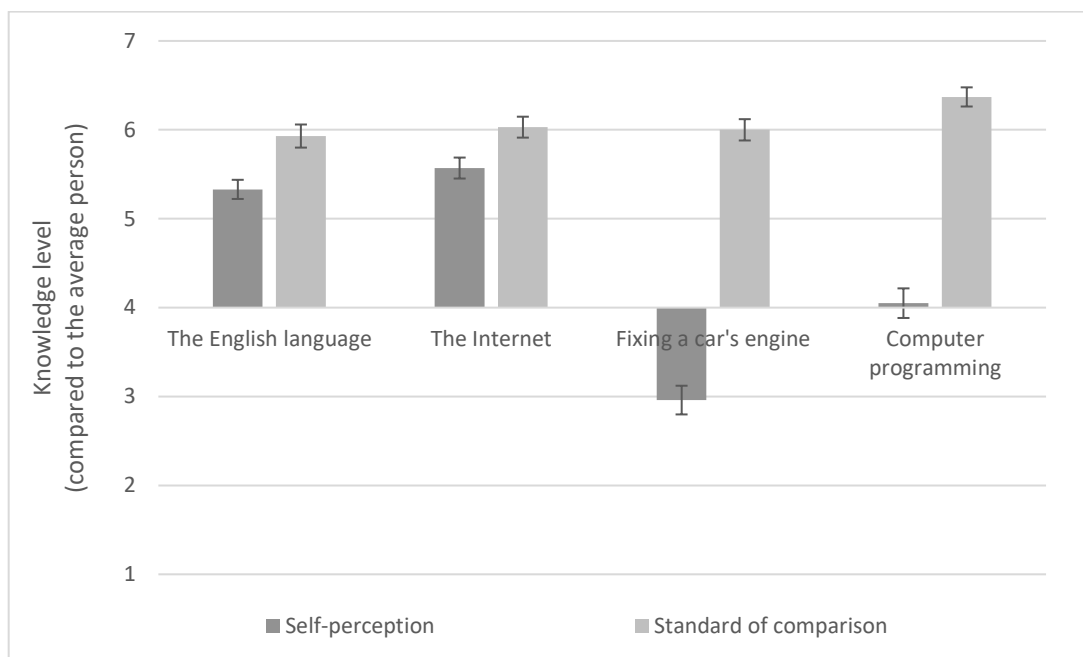
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<sup>13</sup> For ease of interpretation, we reverse-scored participants' responses such that higher numbers correspond to a higher-than-average knowledge level.

Surprisingly, participants believed they were as knowledgeable (or unknowledgeable) about computer programming as the average person ( $M = 4.02$ ,  $SD = 1.64$ ),  $t(96) = 0.12$ ,  $p = .905$ .

Although participants did not perceive themselves as below-average in terms of computer programming, the results still allowed us to test whether comparisons to above-average standards reflect participants' self-perceptions (supporting an inflated self-confidence account) or whether comparisons to above-average others occur independent of self-perceptions (supporting a mental availability account).

***Standards of comparison.*** We predicted that, regardless of participants' perceptions of their own abilities, they would bring to mind others who are significantly more knowledgeable than the average person. Indeed, in all four domains participants compared themselves to targets who were significantly more knowledgeable than the average. The first people that came to mind when evaluating their knowledge of the English Language ( $M = 5.93$ ,  $SD = 1.28$ ), the Internet ( $M = 6.03$ ,  $SD = 1.16$ ), a car's engine ( $M = 6.00$ ,  $SD = 1.18$ ), and computer programming ( $M = 6.37$ ,  $SD = 1.06$ ) were all perceived as significantly more knowledgeable than the average person,  $t_s > 14.80$ ,  $p_s < .0001$ . Finally, the 2 (rating: self-perception vs. standard of comparison) x 4 (domain of knowledge: the English language, using the Internet, fixing a car's engine, computer programming) interaction was significant,  $F(3, 288) = 64.82$ ,  $p < .001$ . Whereas chronic self-perceptions differed by domain, the tendency to think about high standards of comparison remained uniformly high (Figure 10).



*Figure 10.* Participants' ratings of their own knowledge and the knowledge of the first person to come to mind when thinking about two easy (*the English language* and *the Internet*) and two difficult (*fixing a car's engine* and *computer programming*) knowledge domains. (Study 3C).

#### **Studies 4A-4D: A mental accessibility account of social comparisons**

The previous studies marshal against the possibility that people compare to above average comparison targets simply because they are making aspirational comparisons (Study 2) as well as the possibility that these above average comparison targets simply reflect their own inflated self-views (Studies 3A-3C).

So why do people not seem to give much heed to the average person as a typical (Studies 1A-1B) or even *low* (Study 1C) standard of comparison? We maintain that the lack of consideration for “the average” is due to a basic function of the mind—the tendency to overweight easily accessible information in judgments. We argue that exceptional, outstanding, and memorable exemplars spring readily to mind (Dannals & Miller, 2017; Deri, Davidai, &

Gilovich, 2017; Tversky & Kahneman, 1973), and thus will have undue influence when people make social comparisons.

In Studies 4A-4D we gather evidence for this cognitive accessibility account of social comparisons. In Studies 4A and 4B, we do this by demonstrating that making a social comparison increases the accessibility of above-average exemplars and that, further, this is specific to the domain in which the comparison is occurring—indicating that it is the act of making a given social comparison that is specifically causing these above average exemplars to come to mind. In Studies 4C and 4D, we demonstrate that even in undesirable domains (e.g. rudeness) people compare themselves to above average comparison targets (i.e. others who are more rude than average)—thus demonstrating that the forces of accessibility outweigh those of social-desirability, when determining who people compare themselves to.

#### **Study 4A**

We asked participants in this study to list the comparison standards that came to mind when evaluating their own standing on one of two domains—artistic or analytical abilities. Participants then rated these standards of comparison in the domain for which they had been brought to mind, as well the other non-focal domain. We predicted that comparison standards would be exemplary in the domain for which these targets had been brought to mind, but not in the non-focal domain. For example, we predicted that when evaluating their analytic abilities, participants would bring to mind people who are especially high on their analytic skills, but not their artistic skills. Conversely, we predicted that when evaluating their artistic skills, participants would think about highly artistic—but not necessarily analytic—others. Rather than bringing to mind the “average” person, the act of self-evaluation increases the mental availability of comparison standards who are uniquely high on the evaluated—but not on other—traits. This



provides evidence that the mere act of social comparison recruits an exemplary, above average, set of comparison targets.

## Method

**Participants.** Four hundred one U.S. residents recruited from Amazon's Mechanical Turk platform (222 females,  $M_{\text{age}} = 36.76$ ; 78% White, 5.5% Latino, 7% Black, 6.5% Asian) completed this study in exchange for monetary compensation. This sample size allows detection of between-subject effects as small as  $d = 0.28$  with 80% power.

**Materials and procedure.** Participants were randomly assigned to one of two conditions. In the *artistic abilities* condition, participants wrote the names or initials of the first three people who came to mind when evaluating their own artistic ability: "think about who you compare yourself to when evaluating your artistic abilities. When you try to evaluate how artistic you are, who comes to mind?" In the *analytic abilities* condition, participants responded to a similar question pertaining to their analytic abilities: "think about who you compare yourself to when evaluating your analytic abilities. When you try to evaluate how analytical you are, who comes to mind?"

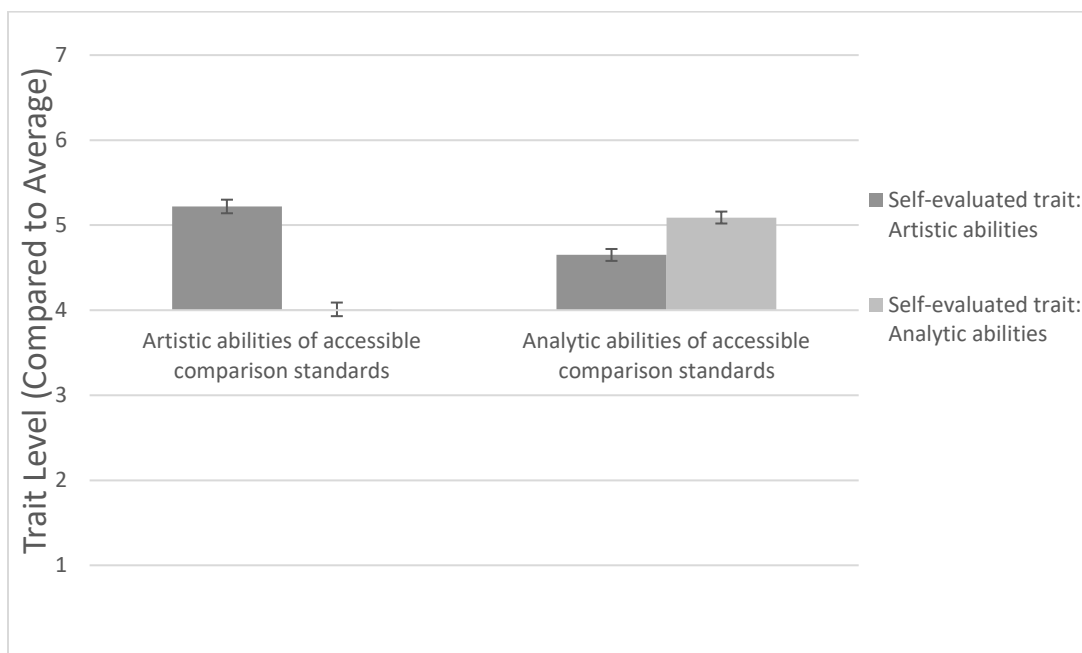
Next, participants rated each of the three people they had thought about in terms of their artistic ability *and* their analytic ability ( $1 = \text{Extremely less artistic/analytical than the average American}$ ,  $2 = \text{Much less artistic/analytical than the average American}$ ,  $3 = \text{Somewhat less artistic/analytical than the average American}$ ,  $4 = \text{As artistic/analytical as the average American}$ , and so forth all the way to  $7 = \text{Extremely more artistic/analytical than the average American}$ ). In both conditions, participants first rated their comparison standards on the focal, self-evaluated trait and then rated them on the non-focal, non-evaluated trait (e.g., participants in the *artistic abilities* condition first rated each comparison target in terms of their artistic ability and then in

terms of their analytical ability).

## Results

As before, participants held themselves to standards significantly higher than the average. When evaluating their artistic abilities, participants thought about people who are significantly more artistic than the average American ( $M = 5.22$ ,  $SD = 1.09$ ),  $t(203) = 15.97$ ,  $p < .0001$ . Similarly, when evaluating their analytic abilities, participants brought to mind people who are significantly more analytical than the average American ( $M = 5.09$ ,  $SD = 0.99$ ),  $t(196) = 15.76$ ,  $p < .0001$ . Thus, merely thinking about how one compares to others in terms of artistic and analytic abilities was enough to bring to mind standards of comparison who are above average in artistic and analytic abilities.

We next examined whether self-evaluation uniquely increased the availability of others who are high on the focal, self-evaluated trait. As predicted, when evaluating themselves on a given trait, participants thought about social benchmarks who were uniquely high on the self-evaluated trait but not on the other non-focal trait (Figure 11). Participants were more likely to think of highly artistic others when evaluating their own artistic abilities ( $M = 5.22$ ,  $SD = 1.09$ ) than when evaluating their analytical abilities ( $M = 4.01$ ,  $SD = 1.12$ ),  $t(399) = 10.97$ ,  $p < .0001$ . In contrast, they were more likely to bring to mind highly analytical others when evaluating their analytical abilities ( $M = 5.09$ ,  $SD = 0.99$ ) than when evaluating their artistic abilities ( $M = 4.65$ ,  $SD = 1.01$ ),  $t(399) = 4.40$ ,  $p < .0001$ . The 2 (self-evaluated trait: artistic vs. analytic) x 2 (comparison target's trait: artistic vs. analytic) interaction was significant,  $F(1,399) = 151.48$ ,  $p < .0001$ .



*Figure 11.* Participants' rating of their standards of comparison in terms of analytic and artistic abilities, as a function of the self-evaluated trait (Study 4A).

### Study 4B

Study 4B was identical to Study 4A, but with a different pair of traits: politeness and extraversion.

#### Method

**Participants.** Four hundred fourteen U.S. residents recruited from Amazon's Mechanical Turk platform (245 females,  $M_{\text{age}} = 36.99$ ; 79% White, 4% Latino, 7% Black, 6% Asian) completed this study in exchange for monetary compensation. This sample size allows detection of between-subject effects as small as  $d = 0.28$  with 80% power.

**Materials and procedure.** Participants were randomly assigned to one of two conditions: the *extraversion* condition or the *politeness* condition. In the *extraversion* condition, participants listed three individuals who came to mind when evaluating how extraverted they are relative to

other people. In the *politeness* condition, they listed three individuals who come to mind when evaluating how polite they are relative to other people. Participants in both conditions then indicated how extroverted and how polite each of these three individuals are in comparison to the average American ( $1=Extremely\ less\ extraverted/polite\ than\ the\ average\ American$ ,  $2=Much\ less\ extraverted/polite\ than\ the\ average\ American$ ,  $3=Somewhat\ less\ extraverted/polite\ than\ the\ average\ American$ ,  $4=As\ extraverted/polite\ as\ the\ average\ American$ , and so forth all the way to  $7=Extremely\ more\ extraverted/polite\ than\ the\ average\ American$ ).

## Results

Participants' mentally available standards of comparison were again significantly higher than the average. When evaluating their levels of extraversion, participants thought about others who are significantly more extraverted than the average American ( $M = 4.62$ ,  $SD = 0.97$ ),  $t(203) = 9.12$ ,  $p < .001$ . Similarly, when evaluating their levels of politeness, they thought about people who are significantly more polite than the average American ( $M = 5.03$ ,  $SD = 0.96$ ),  $t(209) = 15.51$ ,  $p < .001$ .

We again found that self-evaluation increased the accessibility of others who were uniquely high on the self-evaluated—but not on other—traits. Participants were more likely to think of highly extraverted others when evaluating their own extraversion ( $M = 4.62$ ,  $SD = 0.97$ ) than when evaluating their own politeness ( $M = 4.29$ ,  $SD = 1.01$ ),  $t(412) = 3.38$ ,  $p < .001$ . And they were marginally more likely to bring to mind highly polite others when evaluating their own politeness ( $M = 5.03$ ,  $SD = 0.96$ ) than when evaluating their own extraversion ( $M = 4.86$ ,  $SD = 1.01$ ),  $t(412) = 1.76$ ,  $p = .079$ . Most important, the  $2$  (self-evaluated trait: extraversion vs. politeness)  $\times$   $2$  (comparison target's trait: extraversion vs. politeness) interaction was significant,  $F(1,412) = 14.46$ ,  $p < .001$ , indicating that self-evaluation increased the accessibility of

comparison benchmarks that were uniquely high on the focal, self-evaluated trait but not on another, unrelated trait.

One might object that these results are guaranteed by the regression to the mean effect. For example, given that swimming and basketball skills are not perfectly correlated, if we take a set of people who are above average in their swimming abilities, it is mathematically guaranteed that they will not be equally above average in their basketball skills. Thus, one could argue that this fact should guarantee the effects we observe here. Given that artistic and analytic abilities aren't perfectly correlated, a set of people who are above average in artistic ability are guaranteed not to be equally above average in analytical abilities. However, the difference here is that we are examining people's perceptions of their comparison targets. Just as the average person thinks they are above average despite this being a mathematical impossibility, it of course possible that people would rate and regard their comparison targets as equally above average in two non-perfectly-correlated domains. In fact, if people were simply artificially inflating their comparison targets or claiming to hold themselves to high standards due to some desirability bias (e.g. to make themselves look like they have high standards or are in a high-achieving milieu), then it is likely that they would rate their comparison targets as above average across the board. If this is how people were generating their comparison targets, it seems unlikely that they would have the mental wherewithal to adjust for the regression to the main effect. Nevertheless, it is possible that these results are due to a simple regression effect. Thus, the following studies provide additional evidence for the cognitive accessibility account, using different methods.

#### **Studies 4C: Accessibility Account of Exemplary Targets in Undesirable Domains**

In Study 4C, we examined who participants measure themselves against in negative,

undesirable domains (e.g. rudeness). This study aims to lend further credence to the mental accessibility account of people's above average social comparisons and marshal further evidence against competing accounts. Three competing accounts of why people compare themselves to above average comparisons targets—an aspirational account (explored in Study 2), an inflated self-perception account (explored in Studies 3A-3C), and a social desirability account—all suggest that in undesirable domains people should compare themselves to others who are “below average” (e.g. less rude than average). An aspirational account of social comparison would suggest that people compare themselves to others who are below average on undesirable traits (i.e., people who are less rude than the average person) because they themselves aspire to be below average on undesirable traits. Likewise, an inflated self-perception account would also suggest that people would report comparing themselves to targets who are below average on undesirable traits (e.g. people who are less rude than average), as it would be self-enhancing to claim that one holds themselves to these high standards or considers oneself to be in the company of such exceptional people. A social desirability account, wherein people report social comparisons targets that are the most socially desirable (i.e. reflect best on oneself), also suggests that people would compare to below average targets in undesirable domains—because measuring oneself up against such high standards or considering oneself in the company of these exceptional people is socially desirable. In contrast to these accounts, a cognitive accessibility account makes the opposite prediction—that people will compare to exemplars who are above average in terms of undesirable traits.

One might object and argue that the prediction of the latter two accounts (self-enhancement and social desirability) is that people would seek to compare against above average others in negative domains (e.g. people who are above average in rudeness), because this would

make it easier for them reach flattering conclusions about themselves. It is both socially desirable and self-enhancing to view oneself as less rude than average, and it is easier to reach this conclusion if one compares against others who are ruder than average. This is possible, but it would be inconsistent with the totality of the evidence. If the sole determinant of comparison target selection were the target which made positive conclusions about the self most likely, then we should expect a “flip” between desirable traits (e.g. intelligence, politeness) and undesirable traits (e.g. rudeness, self-centeredness), such that in desirable domains people compare themselves against below average others (less intelligent, less polite than average) and in undesirable domains people compare themselves against above average others (ruder, more self-centered)—as these are the targets that would make desirable and self-enhancing conclusions most likely.

Only a cognitive accessibility account of social comparison suggests that people will compare themselves to “above average” comparison targets in both desirable *and* undesirable domains. If comparison standards are influenced by cognitive accessibility, then people should bring to mind above average comparison targets in both desirable and undesirable domains, because in both cases it is easier to bring to mind someone who exhibits a trait than someone who lacks it (Hearst, 1991; Snyder & Swann, 1978). That is, the most mentally accessible comparison standards in undesirable domains (as well as desirable domains) would be others who are higher-than-average on the given trait (e.g. others who are *more* rude than the average person). Thus, we predicted that even when considering undesirable traits, the most cognitively salient comparison standards would be people who are higher than average on those traits.

## **Method**

*Participants.* One hundred U.S. residents recruited from Amazon’s Mechanical Turk

platform (60 females,  $M_{\text{age}} = 39.01$ , 81% White, 5% Latino, 6% Black, 6% Asian) completed a pre-registered study (<https://aspredicted.org/blind.php?x=aj984w; #10029>) in exchange for monetary compensation. Consistent with our pre-registration, we excluded from the analyses one participant who did not complete all three dependent variables. The sample size in this study allows detection of within-subject effects as small as  $d = 0.28$  with 80% power.

**Materials and Procedure.** Participants were presented with three undesirable traits (rudeness, shallowness, and self-centeredness) and wrote down the name or initials of the first person they thought about when evaluating their own standing on each trait (e.g., *Who is the first person that comes to mind when you try to evaluate whether you are a rude person?*). Next, participants indicated for each person they wrote about how he/she stands on the specific trait for which they had been brought to mind as a comparison target (e.g., *“Think about how [PERSON’S NAME] rates in terms of their rudeness. How rude is this person (if at all)?”*). Responses were given on a 7-point scale (e.g., *1=they are much less rude than the average person, 2=they are moderately less rude than the average person, 3=they are slightly less rude than the average person, 4=they are as rude as the average person, and so forth all the way to 7=they are much more rude than the average person*). Finally, participants indicated their own standing relative to the average person for each of the three traits (e.g. *1=I am much more rude than the average person, 2=I am moderately more rude than the average person, 3=I am slightly more rude than the average person, etc.*)<sup>14</sup>

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<sup>14</sup> Due to oversight, this scale was in the opposite direction from the pre-registration. For ease of interpretation and consistency with the other reported studies, we reverse-scored responses such that higher numbers correspond to having “more” of the trait: being more rude, more self-centered, or more shallow than the average person.



## Results

***Self-perceptions.*** Consistent with the literature, participants believed they were less rude ( $M = 2.46$ ,  $SD = 1.39$ ), less self-centered ( $M = 3.18$ ,  $SD = 1.43$ ), and less shallow ( $M = 2.82$ ,  $SD = 1.44$ ) than the average person,  $t_s > 5.69$ ,  $p_s < .001$ .

***Standards of comparison.*** We predicted that despite it being undesirable, participants would think about others who are high on these traits. Rather than thinking about desirable comparison standards, participants would bring to mind *feature-positive* others—others who exhibit the presence of the evaluated trait (Hearst, 1991). Indeed, participants brought to mind a ruder than average comparison standard when evaluating whether they are rude ( $M = 5.53$ ,  $SD = 1.70$ ),  $t(98) = 8.94$ ,  $p < .001$ , a more self-centered than average comparison standard when evaluating whether they are self-centered ( $M = 5.86$ ,  $SD = 1.60$ ),  $t(98) = 11.58$ ,  $p < .001$ , and a shallower than average comparison standard when evaluating whether they are shallow ( $M = 5.55$ ,  $SD = 1.61$ ),  $t(98) = 9.54$ ,  $p < .001$ . Thus, participants who evaluated how they stand on undesirable traits didn't measure themselves against below average targets (i.e. comparison targets who exhibit low levels of negative traits), but rather standards who exemplify these undesirable traits—supporting our claim that comparison standards are often determined by cognitive accessibility, rather than aspiration, self-enhancement or social desirability.

## Study 4D

In Study 4D, we replicate and demonstrate the robustness of the results in Study 4C. Perhaps, in Study 4C (and other studies), the act of asking for a comparison target in a given domain implies to participants (Grice, 1975) that they should report a comparison target who exhibits the focal trait. To rule out this explanation and to provide further evidence against the claim that people are simply answering in a socially desirable way (i.e. saying they have high

standards because this would make them seem motivated, etc), in this study we explicitly told participants to bring to mind comparison standards at any trait level they desire. If conversational and desirability norms led participants to report high comparison standards, then acknowledging such a possible pressure and very explicitly giving participants the freedom and go-ahead to report low comparisons standards just as easily as high ones should eliminate or at least substantively diminish this expectation of an “appropriate” or desirable response and reduce the prevalence of high comparison standards. If, however, our findings are due to cognitive accessibility, participants should continue to report high comparison standards even when a conversational or desirability norm to report such targets has been eliminated. Thus, we predicted that even in the absence or lowered presence of a conversational or desirability norm, participants would be more likely to think of others who are higher than average on any given trait.

## **Method**

***Participants.*** Two hundred one U.S. residents recruited from Amazon’s Mechanical Turk platform (122 females,  $M_{\text{age}} = 35.42$ , 76% White, 6% Latino, 6% Black, 9% Asian) completed a pre-registered study (<http://aspredicted.org/blind.php?x=cp7s37>; #14320) in exchange for monetary compensation. Consistent with our pre-registration, three participants who failed an attention check were excluded from analyses. The sample size in this study allows detection of within-subject effects as small as  $d = 0.20$  with 80% power.

***Materials and Procedure.*** Participants were randomly assigned to one of two conditions. The *direct replication* condition was identical to Study 4C, where participants had to report who came to mind when evaluating themselves on three negative traits (rudeness, shallowness, and self-centeredness). In the *experimental* condition, participants read the same instructions, but

were explicitly told to bring to mind, for each trait, any person they wish from any level of the trait:

*Who is the first person that comes to mind when you try to evaluate whether you are a [TRAIT] person? This could be a person at any level of [TRAIT] – someone who is particularly high in [TRAIT], someone who is particularly low in [TRAIT], or anywhere in between – so feel free to write down the name or initials of the first person that comes to mind*

Using the same measures as in Study 4C, participants in both conditions rated each of the comparison targets they thought about on the specific trait for which they had been brought to mind.

## **Results**

Replicating Study 4C, participants in the *direct replication* condition again brought to mind comparison standards who were exceptionally high—not low—on each trait. They thought about a ruder than average comparison standard when evaluating whether they were rude ( $M = 5.59$ ,  $SD = 1.62$ ),  $t(101) = 9.91$ ,  $p < .0001$ , a more self-centered than average comparison standard when evaluating whether they were self-centered ( $M = 5.34$ ,  $SD = 1.81$ ),  $t(101) = 7.49$ ,  $p < .0001$ , and a shallower than average comparison standard when evaluating whether they were shallow ( $M = 5.33$ ,  $SD = 1.86$ ),  $t(101) = 7.23$ ,  $p < .0001$ .

We next examined participants' responses in the *experimental* condition. Although they were explicitly told to bring to mind comparison standards of any trait level (thus reducing any conversational norm or desirability norms), participants still thought of others who were significantly higher than the average person. This was true when participants evaluated whether

they were rude ( $M = 5.43$ ,  $SD = 1.62$ ),  $t(98) = 7.32$ ,  $p < .0001$ , when they evaluated whether they were self-centered ( $M = 5.69$ ,  $SD = 1.72$ ),  $t(98) = 9.77$ ,  $p < .0001$ , and when they evaluated whether they were shallow ( $M = 5.38$ ,  $SD = 1.71$ ),  $t(98) = 8.04$ ,  $p < .0001$ . Thus, even when diminishing any possible pressure to give an “appropriate” or desirable response, participants were more likely to think about targets who exhibited an evaluated trait than targets who lacked it.

Finally, we compared participants’ comparison standards in the two conditions. If conversational and desirability norms account for our results, participants should bring to mind higher standards in the *direction replication* condition than in the *experimental* condition, where these norms were absent or diminished. In contrast, if cognitive accessibility largely accounts for the tendency to compare oneself to high standards, then we would not expect much or even any difference between conditions. Indeed, we found no difference at all in the comparison standards that participants brought to mind in the two conditions. There was no significant difference between conditions in the ratings of comparison standards for any of the three traits evaluated: rudeness,  $t(200) = 0.61$ ,  $p = 0.543$ , self-centeredness,  $t(200) = 1.34$ ,  $p = 0.169$ , and shallowness,  $t(200) = 0.20$ ,  $p = 0.842$ . It seems that accessibility is the dominant force.

### Study 5

The goal of Study 5 was twofold. First, it was designed to further test whether accessibility is a mechanism driving people to compare themselves to above average comparison targets. Second, it aimed to examine the consequences of comparing oneself to above average comparison targets.

To this end, we asked participants to bring to mind, sequentially, several people they measure themselves against when evaluating their standing on a desirable trait—being physically

active. Then, we randomly assigned participants to compare themselves to either the first person or the last person they brought to mind. Consistent with our accessibility account, we predicted that comparison targets who are especially physically active would come to mind earlier than less physically active comparison targets. And we predicted, as a consequence, people would feel worse about their own levels of physical activity when measuring themselves against the first person that came to mind than when measuring themselves against the last person that came to mind.

## Method

**Participants.** Four hundred seven U.S. residents recruited from Amazon's Mechanical Turk platform (264 females,  $M_{\text{age}} = 36.31$ ) completed this study in exchange for monetary compensation. We excluded from the analyses 49 participants who did not write down names/initials for all 7 comparison targets and 3 participants who failed an attention check, leaving a final sample of 355 participants. This sample size allows detection of between-subject effects as small as  $d = 0.30$  with 80% power.

**Materials and Procedure.** Participants were asked who they brought to mind when evaluating whether they are physically active people. Specifically, they were asked to write the names or initials of seven people they thought about when evaluating their own physical activity starting with "*the first person that comes to mind when you try to evaluate whether you are a physically active person,*" continuing on to "*the second person that comes to mind when you try to evaluate whether you are a physically active person*", and so forth all the way to "*the seventh person that comes to mind*".

Following this, participants completed two measures in a counterbalanced order. On one measure, they rated each of the seven people they thought about in terms of physical activity:

*“Compared to the average person, how physically active would you say each of the people you just brought mind are?”* On the other measure, participants were randomly assigned to compare their own physical activity level against either the first person or the seventh person they thought about: *“When you think about how you compare to [NAME OF 1<sup>ST</sup> PERSON/NAME OF 7<sup>TH</sup> PERSON] in terms of being physically active, how does this make you feel?”* (1=It makes me feel very bad about the amount of physical activity I do, 2=It makes me feel bad about the amount of physical activity I do, 3=It makes me feel about as good as bad about the amount of physical activity I do, 4=It makes me feel good about the amount of physical activity I do, 5=It makes me feel very good about the amount of physical activity I do).

## **Results**

We predicted that the order in which participants' standards of comparison came to mind would be correlated with those targets' level of physical activity. Indeed, the physical activity level of the comparison targets differed significantly depending on the order in which they came to mind,  $F(6, 349) = 13.18, p < .0001$ , (Figure 12). Thus, the first comparison target participants thought about was rated as significantly more physically active ( $M = 3.96, SD = 1.21$ ) than the seventh comparison target they thought about ( $M = 3.32, SD = 1.21$ ),  $t(354) = 7.48, p < .0001$ .

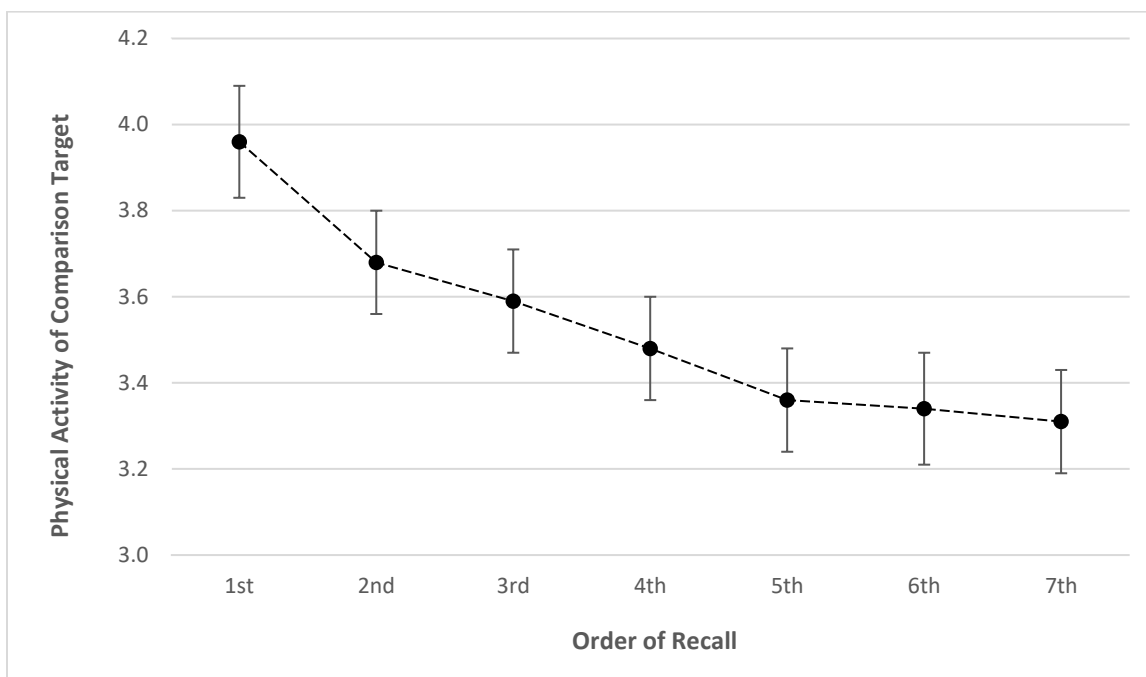


Figure 12. Point estimates and 95% confidence intervals for the physical activity ratings of each comparison target participants brought to mind, by the order in which they came to mind (Study 5).

We next examined how measuring oneself against the comparison standards that most readily came to mind influenced people's assessments of their own physical activity. As predicted, participants who were assigned to compare themselves to the first person they thought about felt significantly worse about their physical activity ( $M = 2.49$ ,  $SD = 1.14$ ) than participants who were assigned to compare themselves to the seventh person they thought about ( $M = 2.96$ ,  $SD = 1.14$ ),  $t(353) = 3.91$ ,  $p = .0001$ . Whereas comparing themselves to their seventh most accessible comparison standard left participants feeling neither good nor bad about their own physical activity (as compared to the scale midpoint),  $t(180) = 2.96$ ,  $p = 0.458$ , comparing themselves to their most accessible standard of comparison left participants feeling significantly more bad than good,  $t(173) = 5.91$ ,  $p < .0001$ . Thus, the targets of comparison who are the most

cognitively accessible tend to be the ones who are the most above average and it is comparisons to these targets that leave people feeling the most inadequate about themselves.

### **Discussion**

Although people often believe they are above average (Alicke, 1985; Zell et al., 2020), our findings suggest that people do not often compare themselves to the average person. In the studies presented here, participants measured themselves against standards that were significantly higher than average (Studies 1A and 1B), whom they did not consider even as a *low* benchmark of comparison (Study 1C). We have further shown that this disregard for the average person does not simply stem from participants' aspiration levels (Studies 2) or their desire to respond in a manner deemed "appropriate" due to conversational norms (Study 4D). Instead, we have shown that the tendency to measure oneself against higher-than-average others stems, at least partially, from the heightened mental availability of such targets, and that this heightened availability is unique to the trait being evaluated (Studies 4A-4B). Nor is such a tendency due to self enhancement, as people measure themselves against above average others even when reflecting on instances of poor performance (Study 3A), when they believe that they are objectively below average (Study 3B), and when they evaluate themselves in domains where they chronically underperform (Study 3C). This tendency is also unlikely to be due to social desirability, as even when thinking about how they measure up to others on undesirable traits (e.g. rudeness), people compare themselves to others who are above average (e.g. ruder than average). Finally, measuring oneself against these readily available and above-average comparison standards negatively influences people's perceptions of themselves (Study 5).

### **Theoretical Impact**

These findings offer new insight into two literatures in the area of social comparison: (1)



the literature on the better-than-average effect and (2) research that aims to explain the processes that determine who people compare themselves to.

Dating back to Festinger (1954), theories of social comparison have primarily focused on the *motivational* components of this process (see the “Major Accounts of Social Comparison” section in Chapter 1: General Introduction). The current findings do not contradict this established body of research but complement them by adding a *cognitive* mechanism that influences such processes. Whereas the social comparison literature makes several predictions regarding when people will be motivated to make upward or downward comparisons, our work supplements this literature by demonstrating a cognitive factor that biases people to conduct upward comparisons. Just as cognitive mechanisms influence whether people look for similarities or differences between themselves and their comparison standards (Mussweiler, 2001; Mussweiler, Ruter, & Epstude, 2004), we show that cognitive processes influence who those standards are likely to be. And, just as motivational forces can override people’s cognitive tendencies to look for similarities or differences between themselves and others (e.g., Mussweiler, 2003), the increased accessibility of high comparison standards does not preclude motivational influences occasionally overriding the effects we observed. Future research could examine the interplay of between these cognitive and motivational mechanisms in social comparison processes.

These findings also offer a new perspective on research on the better-than-average effect (for a review, see “The Better-Than-Average and Worse-Than-Average Effect” section in Chapter 1: General Introduction). How can our findings be reconciled with the large body of research suggesting that people consider themselves more intelligent, polite, honest, responsible, and friendly than average? While we have no doubt that people do at times hold overly positive

and unrealistically inflated self-perceptions, this only tells one side of the story. The tendency to rate oneself as above average can be considered as evidence of self-enhancement only if the average is seen as a personally meaningful standard of comparison. Just as the belief that one is more honest than Bernie Madoff would not constitute evidence of self-enhancement, the belief that one is more intelligent, polite, honest, responsible, or friendly than the average person does not constitute a strong form of self-enhancement unless one finds the average person to be a meaningful standard of comparison. As we have shown, people believe they are above average and, *at the same time*, hold themselves to above average standards. By judging themselves against these standards, it is unlikely that people would emerge with especially high self-regard.

These findings also offer insight into the seeming contradiction that we live in a society that has been characterized as both overly self-confident and optimistic (e.g. Twenge, 2014; Twenge & Campbell, 2009) and unduly anxious and full of doubt (Denizet-Lewis, 2017; Eagan et al. 2017). Although self-perceptions are often inflated relative to the average person, people most likely hold themselves to even higher standards of comparison. By simultaneously perceiving themselves *and their standards of comparison* as above average, many people suffer the same plight as William James' pugilist, who despite having a high opinion of himself nonetheless feels "shamed to death because he is only the second pugilist [...] in the world" (James, 1890, p. 186).

There are, of course, situations in which people *do* compare themselves to the average person. Although college students may typically obsess about their classmates' superior grades or better job prospects, they do, at times, wonder how they are performing relative to the average. And, although homeowners may be especially sensitive to "keeping up with the Joneses", they do look up how their home value compares to the average house in their area.

Notice, however, that the forces that typically suppress the average from coming to mind likely play a lesser role in such instances. Evaluating one's performance on a concrete task involves a much smaller and more specific comparison group (e.g., how am I doing *compared to my classmates?* how much is my home worth *compared to equivalent homes in the neighborhood?*) than evaluating general skills or traits (e.g., how smart am I? how attractive is my home?). As a consequence, the average member of the specified local group may become more cognitively salient and more likely to come to mind as a standard of comparison. Just as self-evaluations tend to become less extreme as the trait or ability being evaluated becomes more concrete (Dunning, Meyerowitz, & Holzberg, 1989), people may also bring to mind less extreme comparison standards.

### **Consequence of High Comparison Standards**

What might be some of the consequences of measuring oneself against these high standards? High comparison standards need not be detrimental to well-being (Collins, 1996; Taylor & Lobel, 1989; Wood, 1989), yet they often are. For example, nurses who frequently engage in upward comparisons are more likely to feel like they're failing to reach their career goals (Buunk, Zurriaga, Gonzalez-Roma, Subirats, 2003), people who compare themselves to more attractive individuals tend to feel dissatisfied with their own bodies (Myers & Crowther, 2009), consumers who compare their possessions with others' superior purchases feel envious and less satisfied with their own purchases (Carter & Gilovich, 2010; Crusius & Mussweiler, 2012), workers who compare themselves against better compensated colleagues feel less satisfied with their own wages (Morewedge, Zhu, & Buechel, 2018; Solnick & Hemenway, 1998), and students who learn about their peers' superior performance are more likely to distrust them (Dunn, Ruedy, & Schweitzer, 2012), feel worse about their own performance

(Lyubomirsky & Ross, 1997), and quit their studies (Rogers & Feller, 2016), especially when their comparison standards seem unattainable (Lockwood & Kunda, 1997). Indeed, in our own research, in Study 5, we have found that people felt significantly worse about their physical ability when they compared themselves to the first standard that came to mind, who were on average above average.

One consequential domain where such dynamics may play it out is when people think about their finances. We predict (and in Chapter 4, provide evidence) that especially wealthy individuals are more likely to come to mind when people evaluate their own economic standing. Interviews of society's richest members find that even they end up feeling "like [they are] somewhat in the middle" financially (Sherman, 2017). Among all people, this tendency may be exacerbated by the media's tendency to focus on the lives of the rich and famous, which in addition to increasing the salience of exemplars, has also arguably caused many to increase their own standard of living despite their inability to live up to such standards (Schor, 1997; Frank, 1985, 2016). Assuming that most people may not be able reach the bar exemplified by these high standards of comparison, holding oneself to such standards may lead to deep financial and personal dissatisfaction (Payne, 2017).

Of course, comparing oneself to above-average others may not be entirely negative, as it can also motivate learning, growth, and achievement. Upward comparisons may serve a functional role by providing people with information about how to improve and the motivation to do so (Taylor & Lobel, 1989). Cancer patients gain useful information about coping by comparing themselves to other patients with fewer physical symptoms (Wood, Taylor, & Lichtman, 1985), recent immigrants maintain a hopeful perspective by comparing themselves to others who have successfully immigrated and have integrated into their host country (Lockwood,

Shaughnessy, Fortune, & Tong, 2012), and high school students often compare themselves to others in their class who motivate them to do better (Blanton, Buunk, Gibbons, & Kuyper, 1999; Huguet, Dumas, Monteil, & Genestoux, 2001; see also Wheeler, 1966). Indeed, the fact that participants in Study 2 differentiated between who they typically measure themselves against and who they aspire to be like suggests that certain comparison standards may be especially likely to motivate people to do better. Yet, as noted above, such high aspirations and standards can at times be detrimental to well-being (Davidai & Gilovich, 2017).

## **Conclusion**

Our work was inspired by two seemingly opposing observations: that people hold self-aggrandizing perceptions of themselves and that, at the same time, people are plagued by self-doubt and self-criticism. Building on our previous work on the cognitive underpinnings of social comparison processes (Davidai, Deri, & Gilovich, 2021; Deri, Davidai, & Gilovich, 2017), we argue that these opposing observations can be made sense of by a mental accessibility of comparison standards. People do indeed judge themselves as better than average. But that does not lead people to have unlimited self-regard. This is because the average person is not the typical target that comes to mind as a standard of comparison. Rather, the most cognitively accessible standards of comparison, to which people do compare themselves, are above average. Like Jay Leno looking up to David Letterman, Brian Wilson looking up to the Beatles, and William James' second pugilist looking up to the world's top pugilist, people may think they are better than the average Joe or Jane, but it's the Joneses they are trying to keep up with.

## CHAPTER 4: FINANCIAL SOCIAL COMPARISONS

### INTRODUCTION

The goal of this chapter is to examine the ubiquity of the mind's tendency to construct exemplary comparison targets when making social comparisons, which then leads people to feel like they are not measuring up to others. This is done by examining whether an effect similar to the one in Chapter 2 (which concerned people's comparisons of their social lives), exists in another important domain that is the target of many everyday social comparisons—income and wealth.

### Importance of Financial Social Comparisons

It goes without saying that income and wealth matter. According to an annual “Stress Survey” (N=1,134-3,068) run by the American Psychological Association, the most commonly listed source of significant stress in the lives of a representative sample of Americans (each year from 2007-2014) was money, closely followed by work. 60-74% of respondents identified money as a significant source of stress each year (American Psychological Association, 2021). From 2019-2021, the same survey (N=3,035-3,617), again identified money, tied with work, as the most commonly listed source of stress for Americans.

Many financial concerns are a matter of making ends meet (e.g. “If my car breaks down, do I have enough money to still cover rent this month?”). However, perhaps just as many financial woes are about how one is doing relative to others<sup>15</sup>. For example, even when holding

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<sup>15</sup> See Frank (1985) for an entire book discussing this topic. The book however is lighter on providing empirical evidence of its (very reasonable) claims. The studies cited here (e.g. Solnick & Hemenway, 1998), which the authors explicitly state were inspired by Frank's (1985) book, provide more concrete empirical support for those claims.

purchasing power constant, 56% of respondents in one survey stated they would rather earn \$50,000, if it meant others earn \$25,000, than \$100,000, if it meant that others earn \$200,000<sup>16</sup> (Solnick & Hemenway, 1998). Similarly, in another survey, about half (48%) of the respondents stated that they would rather earn \$200,000 if it meant others were making \$100,000, rather than \$400,000 if it meant others were earning \$800,000 (Solnick & Hemenway, 2005).

People care about their relative financial standing presumably because it is an important determinant of their satisfaction with their income as well as their overall happiness. Indeed, previous research provides evidence of a meaningful link between relative income and various measures of satisfaction with one's income, as well as overall satisfaction.

In one study, Clark & Oswald (1996) leveraged demographic, income, and job satisfaction ratings from a survey of a random panel of British Households (British Household Panel Study, N=10,000 individual, N=5,500 households) to examine the relationship between relative income and job satisfaction. The authors imputed relative income by dividing participants' actual income by what their income was predicted to be from purely demographic factors (e.g. age, sex, occupation, education, region). Those doing better than their demographics would suggest were recorded as having higher relative income than others, and vice versa. The authors found a stronger correlation between respondents' relative income and job satisfaction, than between absolute income and job satisfaction, a relationship which also held after implementing various controls.

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<sup>16</sup> The exact proportion choosing the relatively higher income rather than the absolutely higher income varied depending on the framing of the question (e.g. decreased to 38% when the higher relative income was framed as a "loss" from the higher absolute reference point, in the first survey). But, in either case, the point is that making more than others rather than simply making more is a hard decision and a meaningful tradeoff for just about everyone, and a substantial portion of people (38-56%) would rather earn less but make more than others, rather than earn more but make less than others. When it comes to income, how one compares to others clearly matters.

In an experimental study examining the same question, Card et al. (2012) randomly assigned University of California employees to a treatment in which they were informed that the salaries of all their colleagues were available on a website created by the *Sacramento Bee*<sup>17</sup> (80% of those in this treatment group visited the website, in contrast to an estimated 25% in the control group who had heard about and used the new website). Relative to the UC employees who were not informed of the website, those who were informed and earned below the median were significantly more likely to report lower job satisfaction and intentions to look for another job. There was no such effect of the treatment on those who earned above the median salary.

More broadly, both Hagerty (2000) and Oishi et al., (2011) examined the relationship between income inequality and people's general reported level of happiness. Hagerty (2000; Study 2) examined the relationship between national happiness and income inequality across 8 different countries, including the U.S., U.K. France, Germany, and Japan, and found that over a 25 year period, greater inequality was associated with less happiness, even after controlling for absolute income. Oishi et al., (2011), meanwhile examined the relationship between national happiness and income inequality in the U.S., from 1972 to 2008, using General Social Survey data. They also found that less inequality was associated with higher levels of happiness. To the extent that greater income inequality is associated with deflating financial comparisons for most citizens, this constitutes evidence that feelings of relative financial standing may have a general effect on happiness (of course, one should be careful generalizing from country or aggregate levels trends to within-person effects).

Thus, if there are distortions in the ways people reach conclusions about their relative

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<sup>17</sup> This salary information was available because all University of California employees are employees of the state, and thus their salary information must be made publicly available.



financial standing as well as those conclusions themselves, they are worth documenting and exploring further.

### **Previous Research**

Although the studies discussed above show that people care about their relative income and that their relative financial standing influences their satisfaction with their job and perhaps their overall happiness, none of that research addresses (1) who people tend to compare themselves to financially, (2) the conclusions they reach when they do so, nor (3) why they reach those conclusions.

Some studies have examined people's perceptions of the distribution of wealth (Norton & Ariely, 2011) and degree of economic mobility (Davidai & Gilovich, 2015) in the U.S., finding notable distortions in both cases. People believe there is less inequality and more mobility than there actually is. Others studies, however, have found that people can make fairly accurate estimates of the income distribution in the U.S., when the estimates are elicited using more intuitive question framings (Chambers et al., 2014)—i.e. asking participants to estimate the percentage of the population that earns a certain income (rather than percent of wealth owned by each quintile, as in the Norton & Ariely (2011) study). However, none of these studies examine who individual people compare themselves to financially, nor how they personally feel they measure up to those comparison targets.

Some studies from the field of economics provide at least a partial answer to that question, by examining how accurately people can estimate their relative position in the income distribution, given specific pre-defined reference groups. In particular, Hvidberg et al's (2020) work is notable here. They first conduct a survey, collecting a probability sample of 10,089 respondents born in Denmark between 1969-1973 (making them 45-50 years old at the time of

the survey). In the survey, participants were given several pre-defined reference groups to compare themselves to: people born in the same year, people born in the same year and of the same gender, people born in the same year and who live in the same municipality, people born in the same year who have a similar level of education, people born in the same year and who work in the same sector, people who they went to school with (the year they turned 15), people in their same physical workplace, and people who live on the same road or in the same apartment. After reporting their own income, participants were made to watch a 2 minute video explaining the nature of percentiles and an income distribution (e.g. those in the 5<sup>th</sup> percentile make more than the bottom 5% of others, and less than the top 95% of others, etc). They were then asked to estimate the income of those in the 5<sup>th</sup>, 50<sup>th</sup>, and 95<sup>th</sup> percentile for each of the reference groups listed above. Then, for each reference group, they were asked to estimate their own precise position (percentile) within this reference group. These survey results were then linked to official government administrative data on respondent's full income histories and relative placement in the income distribution. Overall, the authors find what they call a "center bias," such that people think they are closer to the middle of their reference groups than they are—that is, people who are above the median in terms of income, think they are closer to the median (poorer) than they are, and people who are below the median think they are closer to the median (richer) than they are. Overall, despite some bias, and perhaps ultimately unsurprisingly, the authors find that people are able to somewhat accurately place themselves financially within various concrete reference groups (e.g. those born in the same year and who live in the same municipality).

A few other studies in the economics literature also aim to assess the accuracy of people's ability to place their income within a national or regional distribution. For example, as Hvidberg et al., (2020) point out, and in contrast to their own findings, a study by Karadja et al.,

(2017) finds that over 85% of a sample of 1,242 Swedish survey respondents underestimate their relative rank in Sweden's income distribution, as do 55% of the 1,100 respondents to a survey run by Cruces et al. (2013) which asked respondents from Argentina to estimate their relative income (this is compared to 30% of the sample in the same survey, who overestimate their relative position, and 15% who correctly estimate their position).

As well-done as these studies are, they are not able to directly answer the psychological questions at the heart of this dissertation and the focus of this chapter on financial social comparisons. These questions are: (1) how do people *generally* think they stack up to others financially, (2) who do people *actually choose to* compare themselves to financially, (3) what *causes* certain comparison targets to come to mind over others, and (4) what are the *effects* of bringing to mind and making comparisons to these particular comparison targets? Furthermore, I explore a wider range of financial outcomes than simply income, including savings, debt, quality of housing, etc.

It also unlikely, I believe, that when people think about their wealth and income on a daily basis, they bring to mind a precise comparison group (e.g. people in their municipality, born in the same year as them), against which they rigorously evaluate the percentile in which they and others fall. Rather, it seems more likely that they ask a more vague question of how they feel they are doing compared to “everyone else” or “others they know”, and make a more intuitive assessment, across a host of financial outcomes (e.g. savings, debt, housing, etc).

## **Prediction**

In short, I expect the same dynamics to play out here, in the economic realm, as I observed in the domain of social life (Chapter 2). When people think about how their wealth and income compares to those of others, they are likely to ask themselves questions like “Who’s

richer, me or others?” With a loosely defined comparison target, exemplars of others who are rich or doing well-financially are likely come to mind. Out of these exemplars, I expect a comparison target to be constructed, one that is above average in income and wealth. Then, when comparing to this target, most people will reach the conclusion that others are doing better.

## **Overview**

I examine these predictions in the three studies in this chapter. In Study 1 (N=303), I provide evidence that people tend to think they are worse off financially than others across a host of financial domains. In this study, I also show that people are more likely to bring to mind and more interested in comparing themselves to others are who are substantially richer rather than substantially poorer than themselves. I replicate these findings in Study 2 (N=1,000), in a more representative sample of respondents which closely reflects the income distribution of the U.S. population. Finally, in Study 3 (N=400), I provide evidence for my proposed mechanism, wherein open-ended financial comparisons bring to mind feature-positive exemplars of targets who exemplify wealth, thus leading people to draw contrasts between themselves and the exemplars. Specifically, I show that the results from Studies 1 and 2 can be reversed when respondents are asked to make financial comparisons that bring to mind targets who are poor (by asking questions about how they compare to others in terms of negative financial outcomes, like debt).

## **Study 1**

This study aimed to examine whether people (1) typically conclude they don't measure up to others when making comparisons of income and wealth, and (2) tend to bring to mind and compare to others who are particularly well off.

## Method

### *Participants.*

After initially targeting a sample of 300 participants on the Prolific research platform, 303 participants completed a survey, which was expected to take five minutes, in exchange for \$0.80 (\$9.60/hour). This sample size allows me to detect within-subjects effects as small as  $d = 0.21$  with 95% power, and within-subjects effects of size  $d = 0.16$  with 80% power.

Demographically, my sample was 91% female<sup>18</sup>, with a mean age of 24.4, and was 78% White, 6% Hispanic, and 3% Asian. In terms of income and wealth, the median household income of my sample was \$55,000 (IQR = \$15,000-\$75,000, min = \$5,000, max = greater than \$500,000), and the median net worth of my sample was \$68,000 (IQR = \$38,000-\$113,000, min = less than \$0, max = \$1.5 million).

### *Materials and procedure.*

Participants were asked a series of questions that can be grouped as follows.

1. Subjective financial comparisons
2. Objective income information
3. Satisfaction with income
4. Open-ended financial social comparisons
5. Frequency of financial comparisons
6. Normative financial comparisons
7. Subjective financial rankings
8. Financial comparison curiosity

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<sup>18</sup> See end of the Results section for a discussion of the sample's demographic imbalances.

## 9. Demographics

The ordering of the groups above corresponds to the order in which participants received these questions.

The **subjective financial comparison questions** were designed to test my claim that, when people are given free rein to compare themselves to a wide range of others in the financial domain, they will think of feature positive-exemplars, against which most people will rate themselves as inferior. This set contained 7 questions, 6 of which were expected to bring to mind exemplars of wealthy people and 1 of which was expected to bring to mind exemplars of people who are struggling financially (this dichotomy is further explored in Study 3). Participants were told to think of themselves and “other people you know” when answering these questions. The questions were presented to participants in a randomized order and were phrased as follows: *Who is richer, you or others?*; *Who has more in savings, you or others?*; *Who has a more valuable stock portfolio, you or others?*; *Who has a higher income, you or others?*; *Who lives in a more expensive house/apartment, you or others?*; *Who has a more expensive car, you or others?*; *Who has more debt, you or others?* Participants responded on a 5-point scale, where they could indicate whether they felt better off, worse off, or about as well off as others financially, e.g. for the “Who is richer you or others?”, the responses options were: *I am much richer than others*, *I am somewhat richer than others*, *I am about as rich as others*, *I am somewhat less rich than others*, *I am much less rich than others*, and scored +2, +1, 0, -1, -2. The order in which these 7 questions were presented was randomized. Further, the order of the 5 responses options for each question was constant within participants but randomly reversed for half the participants (i.e. half the participants saw the responses to all 7 questions in in one order, and the other half of participants saw those same responses options in the reverse order).

The **frequency of financial comparison questions** aimed to test the exemplar mechanism, as did the **satisfaction with income** questions, their accompanying **probes**, and the **financial comparison curiosity questions**. Specifically, these questions probed whether people were more likely to compare to “upward” exemplars than downward exemplars.

The frequency of financial social comparison questions were: *How often do you think about how your wealth compares to the wealth of the richest people you know personally?* and *How often do you think about how your wealth compares to the wealth of the poorest people you know personally?* (response options for both: *Never, Rarely, Occasionally, Somewhat often, Very frequently*, scored as 1, 2, 3, 4, 5, respectively).

The satisfaction with income questions started with the following question: *How satisfied are you with your income?* (response options: *not at all satisfied, slightly satisfied, somewhat satisfied, satisfied, very satisfied*, scored as 1, 2, 3, 4, 5, respectively). Participants were then probed about the comparison target that had come to mind, by answering the next question: *When you answered the previous question, about how satisfied you are with your income, did any specific person, people, or “type” of people come to mind as a source of comparison?* (response options: *Yes, No*). And, only if they responded “Yes” to that question, they were asked: *How do the people/person who came to mind compare to you, in terms of wealth?* (response options: *They are substantially richer than me, They are somewhat richer than me, They are about as rich/poor as me, They are somewhat poorer than me, They are substantially poorer than me*, scored as +2, +1, 0, -1, -2, respectively).

The financial social comparison curiosity questions likewise aimed to gauge the direction in which people’s mind wandered when given free rein to learn others’ income. These questions were: *Think about the people you regularly encounter and with whom you associate. This might*

*include some set of your friends, coworkers, neighbors, and so on. Imagine you could find out the yearly salary of one, and only one, person in this group. Which person would you pick? and Think about the people who come from similar circumstances as you, who had similar opportunities in life, and have similar natural talents as you do. Perhaps these are people who you went to high school with or who grew up in the same neighborhood as you. Imagine you could find out the yearly salary of one, and only one, person in this group. Which person would you pick? (response options for both: The person with the lowest yearly salary, The person closest to the middle of the pack, in terms of yearly salary, The person with the highest yearly salary, scored as -1, 0, +1, respectively).*

The **subjective financial ranking questions** were designed to assess participants' perceptions of their wealth, using an alternative paradigm to elicit ratings. These questions asked participants to compare themselves to slightly more specific comparison targets, to an extent limiting the distance their mind could wander when thinking of comparison targets, while still leaving some room for open-ended mental construction of exemplary comparison targets. To answer these questions, participants were presented with a ladder with ten rungs (a modified version of Adler et al.'s (2000) subjective social status scale), and told

*Think of the ladder below as representing the levels of wealth and income that exist in the United States. At the top of the ladder are the people who earn the most money and have the most amount of wealth—those who have high paying jobs and substantial wealth in savings, real estate or other financial assets. At the bottom are the people who earn the least amount of money and have the least amount of wealth—those who have the lowest paying jobs or no jobs at all and no wealth in savings, real estate or other financial assets. The higher up you are on this ladder, the closer you are to people at the very top*



*and the lower you are, the closer you are to the bottom.*

They were then asked to rank themselves as well as 5 other comparison targets on this ladder (rankings went from 1 to 10, with higher numbers indicating higher income and wealth). Specifically, they were asked to rank: (1) themselves, (2) their friends, (3) their neighbors, (4) people who live in the same city as them, (5) people in their “*line of work, who are at a similar career stage, and have similar experience and skills*” as them, and (6) people who “*come from similar circumstances*” and “*had similar opportunities in life, and ... similar natural talents*” as they did.

The **open-ended questions financial comparison questions** were designed to assess who participants (1) tended to compare themselves to, (2) why they believe they chose these targets, and (3) what reaction they tend to have when they compare to the target(s) they listed. Specifically, they were asked to type out an answer to the following three questions: *In general, who are the people in your life or who is the person in your life that you tend to compare yourself to when assessing your personal wealth and income?; Why do you compare yourself or your financial situation to this person (or these people)?; And what reaction, if any, do you tend to have when you make that comparison?*

Participants were also asked to provide **objective income information**. Specifically, participants were asked to report their total yearly household income (before taxes) from \$0 to \$500,000 (using a dropdown menu, incremented in tens of thousands of dollars (e.g. \$60-69K, \$70-79K, etc) in the lower end and middle end of the range, and ultimately increasing to increment sizes of \$100,000 in the very upper end of the income range). Participants were also asked how many people were in their household. Finally, participants were asked what the combined net worth of all the members of their household was, from “less than \$0” to “\$20-49

million” (using a drop down menu, incremented in the tens of thousands of dollars in the lower end of the wealth range, and ultimately increasing to increment sizes of millions of dollars in the very upper end of the wealth range).

Participants were also asked **normative financial comparisons questions**. These exploratory questions were designed to gauge who participants thought they and others *should* compare themselves to. This was done in a three condition mixed between and within subjects design, with a self condition, an others-general condition, and an others-specific condition. All participants were assigned to the self-condition, and one of the two others-condition. The self and whichever “others condition” participants were assigned were presented in a random order (i.e. self followed by others, or others followed by self). Participants were randomly assigned to only one of the two others condition. In the others-general condition participants were asked who a randomly selected person in the U.S. *should* compare him/herself to. Specifically, this was phrased as who participants thought it would be “most appropriate and personally beneficial” for this person compare themselves to. In the others-specific condition, participants were asked this same question 4 different times, once each for a person who makes \$30K a year, once for a person who makes \$70K a year, once for a person who makes \$140K a year, and once for a person who makes \$500K a year. In the self condition, participants were also asked the same question, but for themselves, i.e. who they *should* compare themselves to.

Finally, participants were asked a series of demographic questions, recording their sex, age, education, current country of residence, longest country of residence, and ethnic identity.

## **Results**

The results are divided into three sections: (1) evidence of the hypothesized effects, (2) evidence relevant to the proposed mechanism, and (3) evidence from the exploratory questions.

*Evidence of the Hypothesized Effect.*

As predicted, both participants' subjective financial comparisons with "others" and their subjective financial rankings demonstrated that, on average, they thought they did not measure up to others. With regard to subjective financial comparisons, participants thought they were significantly less rich ( $M = -0.7$ ,  $SD = 1.1$ ),  $t(302) = -11.3$ ,  $p < 0.001$ ,  $d = -0.7$ , had less in savings ( $M = -0.5$ ,  $SD = 1.2$ ),  $t(302) = -7.6$ ,  $p < 0.001$ ,  $d = -0.4$ , had a less valuable stock portfolio ( $M = -1.2$ ,  $SD = 1.1$ ),  $t(302) = -19.9$ ,  $p < 0.001$ ,  $d = -1.1$ , had a lower income ( $M = -0.7$ ,  $SD = 1.0$ ),  $t(302) = -12.5$ ,  $p < 0.001$ ,  $d = -0.7$ , a less expensive house or apartment ( $M = -0.2$ ,  $SD = 1.0$ ),  $t(302) = -3.4$ ,  $p < 0.001$ ,  $d = -0.2$ , and a less expensive car than others ( $M = -0.6$ ,  $SD = 1.1$ ),  $t(302) = -10.0$ ,  $p < 0.001$ ,  $d = -0.6$ . This can be seen in Figure 13. The only domain in which they thought they were doing better than others was with regard to debt, where participants thought they had significantly less debt than others ( $M = 0.6$ ,  $SD = 1.3$ ),  $t(302) = 8.3$ ,  $p < 0.001$ ,  $d = 0.5$ . Here, I expected, a positive exemplar of someone in debt would be brought to mind by this question, and thus participants would draw a contrast between themselves and this exemplar who was struggling financially (see Study 3, for a full study exploring this). A composite measure combining all such ratings was also significant ( $M = -0.7$ ,  $SD = 0.7$ ),  $t(302) = 16.5$ ,  $p < 0.001$ ,  $d = -1.0$ .

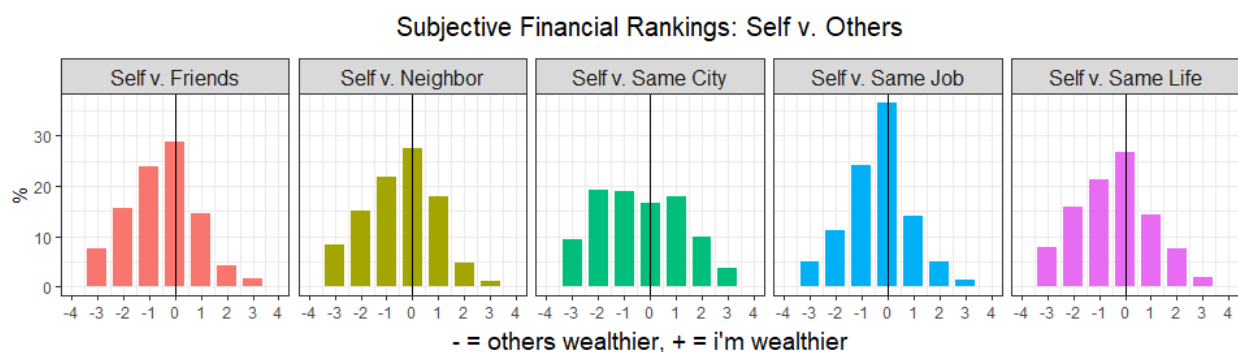


*Figure 13.* Distribution of responses for the 7 financial social comparison questions. Negative responses indicate feeling that one is financially worse off than others, while positive responses indicate feeling that one is better off than others.

Likewise, when people ranked themselves and others on the financial ladder, they indicated that they thought they lagged behind others. Of the ten rungs they could place themselves on, participants put themselves between the 4<sup>th</sup> and 5<sup>th</sup> rung on average ( $M = 4.8$ ,  $SD = 1.5$ ). This was significantly below where they put their friends ( $M = 5.3$ ,  $SD = 1.4$ ),  $t(302) = -0.5$ ,  $p < 0.001$ ,  $d = -0.4$ , neighbors ( $M = 5.6$ ,  $SD = 1.7$ ),  $t(302) = -0.8$ ,  $p < 0.001$ ,  $d = -0.5$ , those living in the same city ( $M = 5.8$ ,  $SD = 2.0$ ),  $t(302) = -1.0$ ,  $p < 0.001$ ,  $d = -0.5$ , those at a similar stage in their career ( $M = 5.1$ ,  $SD = 1.4$ ),  $t(302) = -0.3$ ,  $p < 0.001$ ,  $d = -0.2$ , and those who had had a similar life as them ( $M = 5.4$ ,  $SD = 1.6$ ),  $t(302) = -0.7$ ,  $p < 0.001$ ,  $d = -0.4$ .

For each comparison target, I then subtracted this rating from their self rating. Thus, negative scores indicate that one feels that the comparison target (e.g. a friend) is doing better

than them financially, and positive scores indicate that one feels the comparison target is doing worse than them financially. The distribution of these responses is shown in Figure 14, where we can see that for each comparison target the distribution is skewed such that there are more responses below zero than above, indicating that more people felt they were doing worse than others rather than better than others.



*Figure 14.* Distribution of difference scores for differences between self-ratings and other ratings, for each of the comparison targets in the ladder rating exercise. Responses below zero (black line) indicate participants felt they were worse off financially than the specified comparison target.

### ***Evidence Relevant to the Proposed Mechanism.***

In line with my expectations, participants ended up making financial social comparisons with others who they felt were doing better than themselves. Participants reported comparing themselves to the richest people they know ( $M = 3.3$ ,  $SD = 0.9$ ) much more frequently than the poorest people they know ( $M = 2.8$ ,  $SD = 0.9$ ),  $t(302) = 6.9$ ,  $p < 0.001$ ,  $d = 0.4$ . See Figure 15.

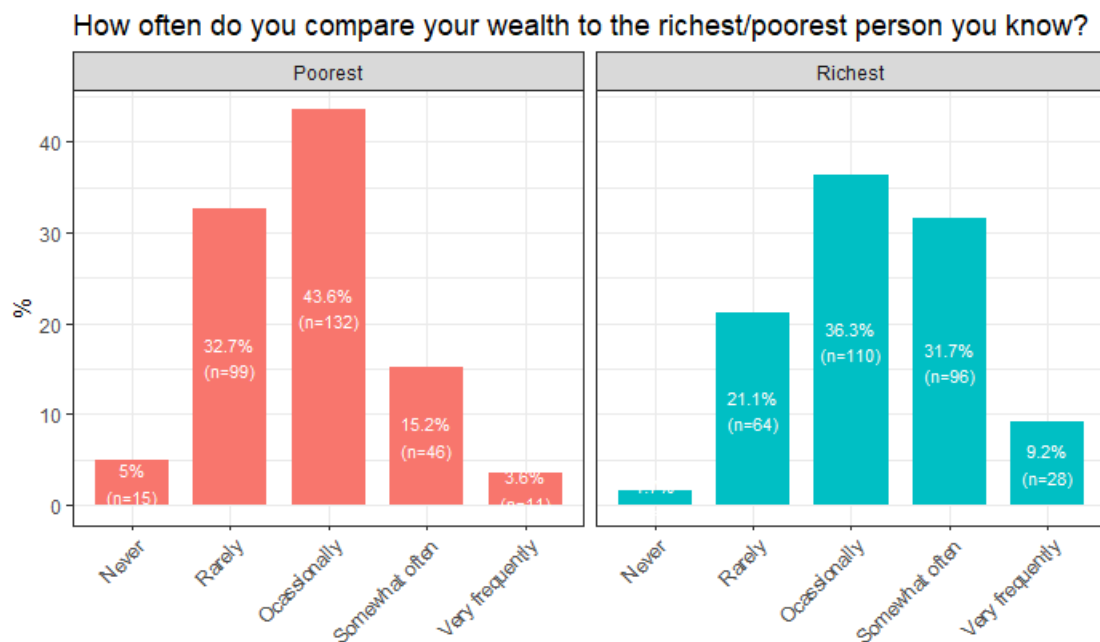


Figure 15. Distribution of frequency of comparison with poorest (red) and richest (blue) associates in Study 1

Most participants were not highly satisfied with their income, with 27% [95% CI = 23%-33%] of the sample reporting they were *not at all* satisfied with their income, 27% [95% CI = 23%-33%] reporting they were *slightly* satisfied, 26% [95% CI = 21%-31%] reporting they were *somewhat* satisfied, 16% [95% CI = 12%-21%] reporting they were *satisfied*, and only 3% [95% CI = 1%-6%] reporting they were *very satisfied*. Among all the respondents, 66% [95% CI = 61%-71%] reported comparing themselves with someone when gauging their satisfaction with their income. This group of comparers were much more likely to compare themselves to those who were richer than themselves (somewhat richer = 38%, substantially richer = 44%) than those who were poorer than themselves (somewhat poorer = 8%, substantially poorer = 2%),  $t(200) = 16.1$ ,  $p < 0.001$ ,  $d = 1.1$ .

Similarly, participants reported being much more curious about knowing the top income among the people with whom they associate ( $M = +0.5$ ,  $SD = 0.7$ ),  $t(302) = 11.8$ ,  $p < 0.001$ ,  $d = 0.7$ , and among people who came from similar circumstances as they did ( $M = +0.4$ ,  $SD = 0.7$ ),  $t(302) = 11.0$ ,  $p < 0.001$ ,  $d = 1.1$ .

The open-ended financial comparison questions were not rigorously analyzed, but a cursory analysis revealed that people tended to compare to others who were either doing better than they were or were in similar situations as they. Explicitly, they stated the reasons they tended to choose these targets was because these people were similar to them or because they were aspiring to be like these people (of course, these were only the reasons that they chose these comparison targets of which they were consciously aware). And finally, the overwhelming reaction of participants to these comparisons was negative—that is, they described feeling worse about themselves.

***Evidence from the Exploratory Questions.***

For each of the normative financial comparison questions, I examined whether, on average, respondents thought the focal person (self, others in general, others making \$30K, others making \$70K, others making \$140K, others making \$500K) should compare themselves to comparison targets who were richer, poorer, or about as rich or poor as themselves. Here, I found that participants, on average, believed that they themselves ( $M = +0.2$ ,  $SD = 0.9$ ),  $t(302) = 4.4$ ,  $p < 0.001$ ,  $d = 0.3$ , others in general ( $M = +0.3$ ,  $SD = 0.8$ ),  $t(302) = 4.6$ ,  $p < 0.001$ ,  $d = 0.4$ , and others making \$30K ( $M = +0.2$ ,  $SD = 1.0$ ),  $t(302) = 2.3$ ,  $p = 0.025$ ,  $d = 0.2$ , should compare themselves with others who are at least somewhat wealthier. This pattern began to change after income increased to \$70K where participants were as likely to suggest that these people should compare themselves with targets who were poorer than themselves as they were to suggest that

these people compare themselves with targets who were richer than themselves, ( $M = 0.0$ ,  $SD = 0.9$ ),  $t(302) = 0.3$ ,  $p = 0.786$ ,  $d = 0.0$ . Further, participants thought that those making \$140K ( $M = -0.3$ ,  $SD = 1.1$ ),  $t(302) = -3.0$ ,  $p = 0.002$ ,  $d = -0.3$ , and \$500K ( $M = -0.7$ ,  $SD = 1.4$ ),  $t(302) = -6.2$ ,  $p < 0.001$ ,  $d = -0.5$ , should compare themselves with people who were somewhat or substantially poorer than themselves. Although not relevant to the main focus of this chapter, these results suggest that normatively people believe that as income rises people should think more about how their income compares to those less financially fortunate, especially when a person's incomes rise to levels that are objectively in the upper end of the income distribution.

**Sampling Issues.** Finally, as readers may have noticed, my sample skews heavily female (over 90% of the sample was female) and young (the median age in the sample was 22). The most likely cause of this is a [viral video](#) on TikTok where user @sarah.\_frank, who has over 50,000 followers, introduced her audience to the Prolific survey platform, which she described as a “side hustle” that will let her followers earn a little extra money (@sarah.\_frank, 2021). The video was posted on July 23, 2021, three days before I launched this study. The video has over 4 million views, over 750,000 comments, and over 21,000 reshares. The creator of this video is a young female content creator, who likely has a similarly young, female audience. Shortly after this incident, Prolific acknowledged that they had seen a recent influx of 30,000 new users, who skewed heavily young and female (Charalambides, 2021). This sampling artifact on Prolific was first noticed by researchers sharing information on the social media platform Twitter, in August of 2021 (@hannah\_schacter, 2021; Letzter, 2021; @SebastianDeri, 2021)<sup>19</sup>.

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<sup>19</sup> There was a news article (cited) covering this TikTok-induced viral influx to Prolific in *The Verge*, an online tech news website, on September 24, 2021. However, I believe I was the first to publicly bring this issue to the research community's attention, in a tweet (cited) on August 6, 2021, asking if other researchers had been finding skewed samples on Prolific (“Analyzing  $N=300$  Prolific study. Very generic title & description. Survey questions mostly



The fact that the sample consisted of largely young women, means that the income distribution in my sample was also skewed. Given that my proposed mechanism is that people will bring to mind feature-positive exemplars when answering these questions, and that this should be true across income levels, it is important to examine this effect’s robustness across a wide range of the income distribution. The next study aims to do just that.

## Study 2

This study was designed to assess the replicability of the findings from Study 1, in a more representative sample of the U.S. population in terms of sex, age, and income.

### Method

#### *Sampling.*

Prolific was used to recruit participants in this study, but I used the platform’s participant filtration tools to implement my own quota-sampling method to recruit a sample that was representative of the U.S. in terms of income, sex, and (roughly) age. This can be done because Prolific allows researchers to restrict their samples by (among other demographics): nationality, sex, age, and household income. With this in mind, I looked up the distribution of sex, age, and household income in the United States (data sources were U.S. Census Bureau reports and data sets: Rodgers, 2019; Shrider et al., 2021; US Census Bureau, 2019). I then created a series of surveys targeting different demographic buckets, such that when these surveys were aggregated,

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*about social comparisons & money 91% of respondents are female, 7% are male. Don't think I've miscoded anything, and no unusual survey restrictions. How does that happen?"). The mystery was solved on August 12, 2021, when Dr. Hannah Schacter (@hannah\_schacter) posted a reply (cited) to my tweet, stating “This may be far-fetched, but given the timing, virality of the video, and the user's follower demographics... [link to @sarah.\_frank's viral TikTok video].” I note all this because it highlights how Twitter has become a vital part of the academic research community—not just as a tool that has been used disseminate and discuss research, but one integrally involved in the research process itself. The news coverage and Prolific response are downstream of the original Twitter discussion.*

the demographic distribution would roughly match that of the U.S. population. To do that, I made the following demographic distinctions—**sex**: 2 buckets, men, and women; **age**: 2 buckets, above and below the median age ( $\leq 37$  years old,  $\geq 38$  years old), **income**: 5 buckets, one for each post-tax<sup>20</sup> income quintile: \$0-\$29,999, \$30,000-\$49,000, \$50,000-\$79,000, \$80,000-\$150,000, \$150,000+. I then created 20 separate surveys, one for each of these unique sex X age X income combinations. For example, one survey was restricted to U.S. citizens who were women, below the median age ( $\leq 37$ ) and in the bottom post-tax income quintile (\$0-\$29,999); another was then restricted to U.S. citizens who were women, above the median age ( $\geq 38$ ), in the bottom post-tax income quintile (\$0-\$29,999k). And so on. With a targeted total sample size of 1,000, I recruited 50 participants into each of these buckets ( $50 \times 20 = 1,000$ ).

*Further sampling details.* Age was only restricted to two buckets—above and below the median age in the U.S. Ideally, I would have had done more granular targeting (e.g. 2 sex

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<sup>20</sup> When discussing household income, the convention in the U.S. is to talk about pre-tax income. However, Prolific is a British survey company, and thus while it allows researcher to target American participants by income, the targeting is done on post-tax income. I wanted my final sample to be representative of the U.S. population in terms of pre-tax income. Thus, after obtaining the distribution of pre-tax household income in the U.S., I calculated the post-tax income for each income decile. Specifically, I adjusted for federal but not state income taxes. This was simpler, as the marginal federal tax rates are the same for all Americans, while state income varies by state and there is no way to know the distribution of participants by state, before collecting the survey (although a post-hoc analysis does reveal my sample to be surprisingly representative of the U.S. in terms of state population distribution). Second, and more importantly, it seemed likely to me that when Americans reported their post-tax U.S. income to Prolific, they gave a heuristic approximation, rather than actually looking back on their exact tax returns. Because federal taxes are higher than state taxes, I assumed adjusting only for federal taxes would get me pretty close to the heuristic approximation participants likely used. Finally, it must also be noted that, when targeting on post-tax income, Prolific only allows so much granularity. Specifically, Prolific groups participants' post-tax household income into the following buckets: \$20,000-\$29,999; \$30,000-\$39,999, etc. Grouped by quintile and adjusted for federal taxes, the post-tax U.S. household income distribution is: \$0-26K, \$27-47K, \$48-\$73K, \$74K-\$116K, \$117K+. Thus, to approximate this distribution, on Prolific, I targeted the following five income groupings: \$0-\$29,999, \$30,000-\$49,000, \$50,000-\$79,000, \$80,000-\$150,000, \$150,000+. At the end of the distribution, I deliberately slightly oversampled high earners, because I was more concerned with under-sampling rather than oversampling people in this distribution (as they present the strongest challenge to my hypothesis). Finally, in the actual survey itself (my survey), I asked participants about their pre-tax household income—thus allowing a direct comparison between the pre-tax household income distribution achieved in my sample to the pre-tax household income distribution in the United States.

buckets X 10 age deciles X 10 income deciles). However, given the targeted sample size and platform constraints, the cuts described above are the compromise I struck. I struck this particular compromise because I wanted my most fine-grained demographic cut to be by income, as this is the demographic most meaningfully related to the effect under investigation (whereby people don't feel they measure up to others in terms of income and other financial outcomes). However, these sampling procedures still ensure that over half the sample is above the median age, half the sample consists of men, and furthermore, only a maximum of 25% of the sample consists of young women (the oversampled population in Study 1, who comprised approximately 80-90% of that sample).

Finally, a more sophisticated sampling strategy would have taken into account the marginal distributions of each of the 20 unique sex X age X income buckets. For example, by design, 5% of my sample consisted of men, above the median age, who make over \$116K a year in post-tax income, and another 5% of my sample consisted of women, below the median age, who make over \$116K a year in post-tax income. However, in the actual U.S. population, the proportion of people in these groups is likely unequal—the proportion of young women making over \$116K a year after taxes is likely lower than 5%, and the proportion of older men making over \$116K a year after taxes is likely higher than 5%. Thus, my sample is representative along the 3 demographic cuts specified, but not necessarily their margins.

### ***Participants.***

Using the sampling strategy described above, 1,000 participants completed my survey, which was expected to take five minutes, in exchange for \$0.80 (\$9.60/hour). This sample size allows me to detect within-subjects effects as small as  $d = 0.11$  with 95% power, and within-subjects effects of size  $d = 0.09$  with 80% power. Note, the effect size of the primary effect in

Study 1 (composite measure of the subjective financial comparison questions) was  $d = -0.95$ , giving me  $>99.99\%$  power to detect this effect.

The limitations noted above notwithstanding, my sampling strategy worked remarkably well. Specifically, my sample was very similar to the U.S. population in terms of household income (see Table 3), the demographic that was most precisely targeted in the sampling strategy. Here is a comparison of the pre-tax household income deciles in my study's sample and the pre-tax household income deciles of the actual U.S. population (Shrider et al., 2021, Table A-4a).

Population	Income Decile								
	10 <sup>th</sup>	20 <sup>th</sup>	30 <sup>th</sup>	40 <sup>th</sup>	50 <sup>th</sup>	60 <sup>th</sup>	70 <sup>th</sup>	80 <sup>th</sup>	90 <sup>th</sup>
Study	\$18K	\$30K	\$41K	\$51K	\$68K	\$85K	\$110K	\$150K	\$198K
U.S.	\$16K	\$27K	\$40K	\$52K	\$68K	\$85K	\$108K	\$141K	\$201K

*Table 3.* Comparison of the income distributions of the Study 2 sample and the U.S. population.

In terms of wealth, which was not a demographic that was explicitly targeted in the sampling, my sample contained the full range of wealth levels seen in the U.S. population, as per Census Data (Eggleston et al., 2020), although the two distributions vary to an extent. The wealth at the upper end of my sample's distribution (80<sup>th</sup>-90<sup>th</sup> percentile) was very similar to the wealth concentration in the upper end of the U.S. wealth distribution. Meanwhile, the lower end of my sample's distribution (10<sup>th</sup>-40<sup>th</sup> percentile) was a bit wealthier than the U.S. population. Those in the middle to upper range of my sample's distribution (50<sup>th</sup>-75<sup>th</sup> percentile), were somewhat less wealthy than the U.S. population. See Table 4. Note that I could not find wealth information for each decile from U.S. Census data, but I was able to recover wealth data about the median, 25<sup>th</sup>, 75<sup>th</sup>, 10<sup>th</sup>, 90<sup>th</sup> percentiles as well as each quintile (i.e. 20<sup>th</sup>, 40<sup>th</sup>, 60<sup>th</sup>, 80<sup>th</sup>

percentile), which is what is compared below.

Population	Wealth Percentile								
	10 <sup>th</sup>	20 <sup>th</sup>	25 <sup>th</sup>	40 <sup>th</sup>	50 <sup>th</sup>	60 <sup>th</sup>	75 <sup>th</sup>	80 <sup>th</sup>	90 <sup>th</sup>
Study	<\$0K-\$5K	\$38K	\$28K	\$63K	\$88K	\$138K	\$230K	\$550K	\$1.3M
U.S.	-\$6K	\$5K	\$6K	\$35K	\$104K	\$188K	\$428K	\$555K	\$1.2M

*Table 4.* Comparison of the wealth distributions of the Study 2 sample and the U.S. population.

The sex distribution of my sample was (by design) much less skewed than in Study 1 and much more representative of the U.S. population distribution. Specifically, the sex of my sample breaks down as follows: 48.7% female, 49.9% male, and 1.3% non-binary, which closely matches U.S. Population averages: 51.0% female, 49.0% male (US Census Bureau, 2019; *U.S. Census Bureau QuickFacts*, 2021).

The age distribution is also reasonably representative of the age distribution<sup>21</sup> in the U.S. population (US Census Bureau, 2019), with a skew such that my sample still contains more young people (ages 20-39) and fewer old people (ages 60+). However, the skew in the sample is much less dramatic than in Study 1 (where the median age was 22). Here, the median age in my sample (37 years old) is essentially the same as the median age in the U.S. population (38 years old). See Table 5.

Population	Age Range (years)							
	18-20	20-29	30-39	40-49	50-59	60-69	70-79	80+
Study	6%	26%	26%	19%	15%	8%	2%	<1%

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<sup>21</sup> Note, that for both my sample and the U.S. population, I am restricting the analysis to the population of people who are 18 or older (as that was the minimum age eligibility for the study).

U.S.	5%	18%	17%	16%	17%	15%	9%	2%
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*Table 5.* Comparison of the age distribution of the Study 2 sample and the U.S. population.

In terms of race and ethnicity<sup>22</sup>, the participants in my sample identified as 75% White, 8% Asian, 4% Black or African American, 1% Middle Eastern, 1% “Other”, with the remaining 6% identifying as being of multiple ethnicities. 7% of these people also identified as Hispanic (either solely or in addition to another ethnicity). This is somewhat representative of the U.S. population, except that Black or African American and Hispanic people are under-represented. The U.S. racial composition is: 76% White, 6% Asian, 13% Black or African American, with 19% also identifying as Hispanic (*U.S. Census Bureau QuickFacts*, 2021).

### ***Materials and procedure.***

Participants were asked the same questions as in Study 1, with modifications described below.

The **subjective financial comparisons** were identical, but the debt question was

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<sup>22</sup> Note, depending on the Census year, the U.S. Census has divided race and ethnicity into two separate questions (with ethnicity simply being a binary: Hispanic or Latino, Not Hispanic or Latino) (Brown, 2020; Pew Research Center, 2020a; US Census Bureau, 2021). Because race and ethnicity are often closely linked and because there are more ethnic identities than Hispanic/Not Hispanic, I considered race and ethnicity one construct and asked participants one single question, that allowed them to select one single or multiple racial/ethnic identities. The question was phrased as follows: “Which of the following best describe your racial and ethnic identity? You can select as many as apply: White (e.g. European, European American, White Hispanic, Italian); Black (e.g. African American, Caribbean, African, Nigerian); Hispanic or Latino/Latina (e.g. Latin American, Mexican American, Colombian); Asian (e.g. Asian American, Chinese, Korean, Indian, South East Asian); Middle Eastern (e.g. Iranian, Iraqi American, Israeli); Indigenous (e.g. Native American, Aboriginal); Other/I’d rather specify in words (specify below, if you would like to)”. In addition to grouping race and ethnicity together and allowing participants to select multiple options, I also offered participants more granular racial/ethnic identity categories (e.g. Middle Eastern and Asian, and opposed to the singular Asian grouping in the U.S. Census). Race and ethnicity are subjects that should be dealt with thoughtfully, and the style of this question was an attempt to give participants greater freedom to express their racial and ethnicity identities, in a way that was simple and ideally respectful and more closely matched their everyday experience of race and ethnicity in the United States today.

eliminated.

The **subjective financial rankings** were identical to Study 1.

The **objective income information** was modified as follows. Household income was asked about more precisely by: (1) asking respondents specifically about their household income in the last year, as opposed to leaving time period unspecified as in Study 1 and (2) allowing respondents to respond on a sliding scale, which allowed them to report an income from \$0 to \$250,000<sup>23</sup>, to the nearest thousand dollar. Participants were asked what percent of their reported household income they personally accounted for (e.g. as opposed to the percent that came from a parent or spouse in the household). The categories for the net worth responses were slightly modified, allowing users to report a maximum of net worth of \$100 million or more. Finally, participants were also asked to guess the median household income in their zip code.

The **satisfaction with income and satisfaction probes** were largely identical, but the phrasing of the first satisfaction probe was slightly altered to *When you answered the previous question, about how satisfied you are with your income, did any specific people or “type” of person come to mind as a source of comparison?*, where previously it was *“When you answered ... did any specific person, people, or “type” of people come to mind”* (i.e. *person* was eliminated).

The **open-ended financial comparison questions** were eliminated, as they were not essential and cutting them out reduced survey time for participants.

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<sup>23</sup> This upper bounder is somewhere between the 90<sup>th</sup> (\$201,126) and 95<sup>th</sup> percentile (\$273,739) of pre-tax household income in the U.S. This upper bound scale limit (\$250,000) was used because I judged it to be the best compromise between trying to provide as large of an income range as possible, and not creating a scale so wide that the majority of the answer options were not relevant to most people. For example, given that granularity was desired (and thus a linear sliding scale with \$1,000 increments was used), if the upper bound here had been \$500,000 (as it was in Study 1), then approximately half the scale (\$250,000-\$500,000) would not be relevant to 90% of respondents.

The **frequency of financial comparisons questions** were identical to Study 1.

The **normative financial comparisons questions** were identical to Study 1.

The **financial comparison curiosity questions** were eliminated, as they were viewed as marginally informative and largely redundant with the frequency of financial social comparison questions.

The **demographic questions** were identical to Study 1, except that participants were also asked for the state in which they lived and their current zip code.

Finally, the ordering of these question groupings was changed to the following: (1) subjective financial comparisons, (2) subjective financial rankings, (3) satisfaction with income and satisfaction probes, (4) frequency of financial comparisons, (5) objective income information, (6) normative financial comparisons, and (7) demographic questions.

## **Results**

The results are grouped into three sections, as in Study 1: (1) evidence of the hypothesized effects, (2) evidence relevant to the proposed mechanism, and (3) evidence from the exploratory questions.

### ***Evidence of the Hypothesized Effects.***

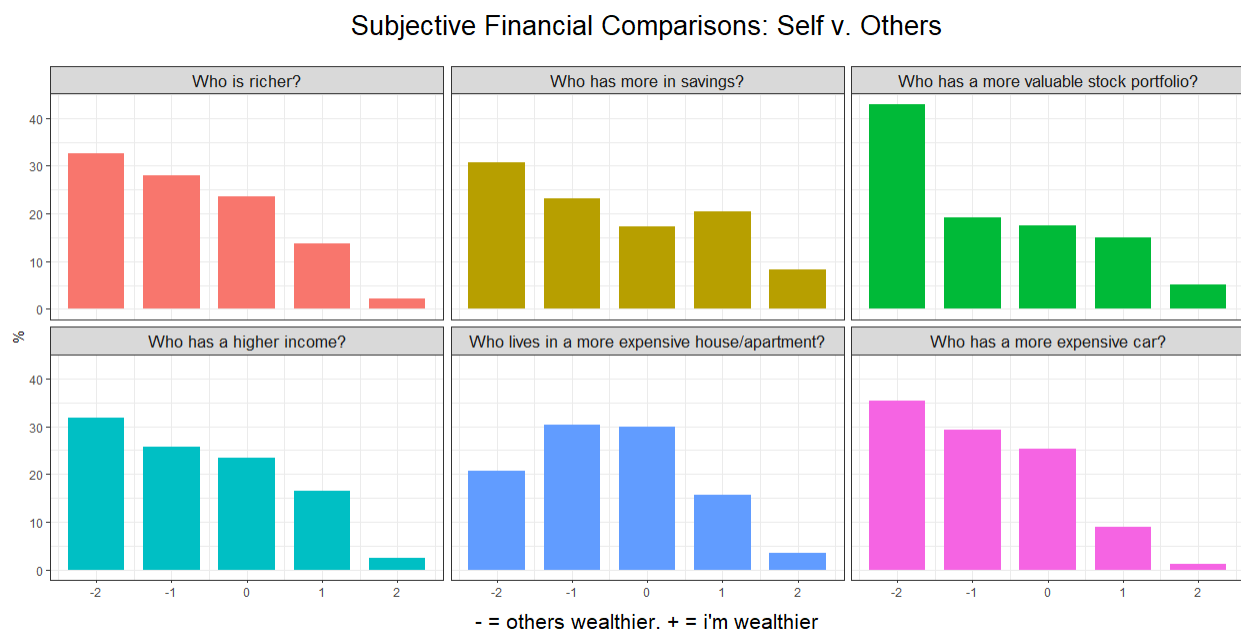
All of the findings from Study 1 were replicated, but with a sample that was more representative of the U.S. in terms of sex, age, and household income.

As before, compared to others, participants thought they were significantly less rich ( $M = -0.8$ ,  $SD = 1.2$ ),  $t(999) = -21.2$ ,  $p < 0.001$ ,  $d = -0.7$ , had less in savings ( $M = -0.5$ ,  $SD = 1.3$ ),  $t(999) = -11.4$ ,  $p < 0.001$ ,  $d = -0.4$ , had a less valuable stock portfolio ( $M = -0.8$ ,  $SD = 1.3$ ),  $t(999) = -19.7$ ,  $p < 0.001$ ,  $d = -0.7$ , had a lower income ( $M = -0.7$ ,  $SD = 1.2$ ),  $t(999) = -18.7$ ,  $p < 0.001$ ,  $d = -0.6$ , a less expensive house or apartment ( $M = -0.5$ ,  $SD = 1.1$ ),  $t(999) = -14.2$ ,  $p < 0.001$ ,  $d = -$



0.5, and a less expensive car than others ( $M = -0.9$ ,  $SD = 1.0$ ),  $t(999) = -27.4$ ,  $p < 0.001$ ,  $d = -0.9$ .

A composite that combined all measures was also significant ( $M = -0.7$ ,  $SD = 0.9$ ),  $t(999) = -23.6$ ,  $p < 0.001$ ,  $d = -0.8$ . This can be seen in Figure 16, where the distribution of responses is such that there were many more participants who felt they were worse off financially than others than there were participants who felt they were better off financially (e.g. the ratio of respondents who felt they were less rich than others to respondents who felt they were richer than others was 4:1).



*Figure 16.* Distribution of responses for the 6 financial social comparison questions in Study 2. Negative responses indicate feeling that one is financially worse off than others, and positive responses indicate feeling that one is financially better off than others.

These results held across different household income levels, as can be seen in Table 6. The composite measure of all financial comparisons is significantly below zero for all deciles from the 0<sup>th</sup> to the 80<sup>th</sup>, indicating that more respondents believe they are worse off than others

financially than believe they are better off than others financially in each of these income deciles. For each individual item (e.g. richness, income, savings, etc), within each decile, it is only at the 90<sup>th</sup> decile that the results ever significantly reverse—such that people feel significantly better off than others. For all deciles below this (0-90<sup>th</sup>), people either felt that they were significantly worse off than others or that there was no significant difference. Likewise, for any item, it is only in the 90<sup>th</sup> percentile where there were a greater number of people who felt they were better off than others financially than there were people who felt there were worse off than others financially. In all other deciles, there were more people who felt they were worse off than others financially than there were people who felt they were better off, or at best the ratio is 1:1 (see the *ratio* column for each item in Table 6). I provide a more extended discussion of the relationship between the effect and income in the Discussion section of this Chapter.

As also can be seen in Table 6, the results hold across sex, age, and ethnicity. Men, women, and non-binary participants, on average, all felt they were worse off than others, in all six financial domains (richness, income, savings, stock holdings, car, and housing). Likewise, people across all age levels from 18 to 80 years old felt they were worse off than others in all six financial domains (the only exceptions were 80 year olds, of whom we only had 3 participants in our sample, and 18-19 year olds' views of their housing). Similarly, White, Asian, Multi-Ethnic, Hispanic, Black and Middle-Eastern people also felt they were worse off than others in all six financial domains (the only exceptions coming from Middle-Eastern people, of whom we only had 9 participants in our sample, with regard to savings and housing, and Black people's views on their housing).

Demographic	Rich			Income			Savings			Stocks			Housing			Car			Composite					
	n	M	d	ratio	M	d	ratio	M	d	ratio	M	d	ratio	M	d	ratio	M	d	ratio	M	d	ratio		
Income Decile	0-10th	100	-1.6**	-2.4	91:1	-1.6**	-2.6	>100:1	-1.3**	-1.2	8:1	-1.5**	-1.6	12:1	-1.1**	-1.1	9:1	-1.6**	-2.0	45:1	-1.4**	-2.3	>100:1	
	11-20th	107	-1.5**	-2.0	48:1	-1.5**	-2.1	>100:1	-1.2**	-1.1	7:1	-1.5**	-1.6	18:1	-1.1**	-1.1	10:1	-1.3**	-1.5	21:1	-1.4**	-2.1	>100:1	
	21-30th	91	-1.2**	-1.4	15:1	-1.1**	-1.2	12:1	-0.9**	-0.7	4:1	-1.3**	-1.2	9:1	-0.9**	-1.0	13:1	-1.2**	-1.4	34:1	-1.1**	-1.7	>91:1	
	31-40th	94	-1.2**	-1.5	26:1	-1.0**	-1.0	8:1	-0.8**	-0.7	4:1	-1.2**	-1.1	9:1	-0.8**	-0.9	7:1	-1.1**	-1.1	12:1	-1.0**	-1.4	56:1	
	41-50th	97	-0.9**	-0.9	10:1	-0.7**	-0.7	4:1	-0.6**	-0.4	2:1	-0.7**	-0.6	3:1	-0.5**	-0.5	4:1	-0.9**	-0.9	9:1	-0.7**	-0.8	15:1	
Sex	51-60th	97	-0.6**	-0.6	5:1	-0.6**	-0.5	3:1	-0.4*	-0.3	2:1	-0.7**	-0.6	4:1	-0.3*	-0.3	2:1	-0.7**	-0.6	4:1	-0.6**	-0.7	9:1	
	61-70th	101	-0.3*	-0.4	2:1	-0.4**	-0.4	2:1	0.1	0.1	1:1	-0.5**	-0.4	2:1	-0.3*	-0.3	3:1	-0.7**	-0.8	6:1	-0.4**	-0.5	6:1	
	71-80th	101	-0.4**	-0.4	2:1	-0.2	-0.2	1:1	-0.1	-0.1	1:1	-0.6**	-0.5	2:1	-0.1	-0.1	1:1	-0.6**	-0.6	4:1	-0.3**	-0.4	7:1	
	81-90th	88	0.0	0.0	1:1	0.1	0.1	1:1	0.1	0.0	1:1	-0.1	-0.1	1:1	0.0	0.0	1:1	-0.4*	-0.4	2:1	-0.1	-0.1	2:1	
	91-100th	98	0.4**	0.4	1:3	0.4*	0.4	1:3	0.6**	0.5	1:3	0.3	0.2	1:2	0.3*	0.3	1:2	-0.3*	-0.3	2:1	0.3*	0.3	1:2	
Age	Male	498	-0.7**	-0.6	3:1	-0.6**	-0.5	3:1	-0.4**	-0.3	2:1	-0.6**	-0.4	2:1	-0.5**	-0.4	3:1	-0.9**	-0.9	7:1	-0.6**	-0.6	8:1	
	Female	486	-0.8**	-0.8	5:1	-0.7**	-0.7	4:1	-0.6**	-0.4	2:1	-0.6**	-0.8	5:1	-0.5**	-0.4	3:1	-0.8**	-0.8	6:1	-0.8**	-0.9	15:1	
	Non-binary	13	-1.3*	-1.2	6:1	-1.6**	-2.1	>13:1	-0.9*	-0.7	3:1	-0.6**	-1.3	10:1	-1.1*	-0.9	4:1	-1.0*	-1.2	>100	-1.2**	-1.7	>13:1	
Race	<=19	27	-0.6*	-0.6	2:1	-0.9**	-0.8	4:1	-0.4	-0.3	1:1	-0.6**	-1	6:1	-0.1	-0.1	1:1	-0.7*	-0.7	4:1	-0.7**	-0.8	>27:1	
	20-29	256	-0.9**	-0.8	5:1	-0.8**	-0.7	4:1	-0.6**	-0.4	2:1	-0.6**	-0.8	4:1	-0.3**	-0.3	2:1	-0.9**	-0.8	6:1	-0.7**	-0.9	13:1	
	30-39	265	-0.6**	-0.5	3:1	-0.6**	-0.5	2:1	-0.3**	-0.2	1:1	-0.6**	-0.4	2:1	-0.5**	-0.4	3:1	-0.9**	-0.8	5:1	-0.6**	-0.6	6:1	
	40-49	188	-0.8**	-0.7	5:1	-0.6**	-0.6	3:1	-0.5**	-0.4	2:1	-0.6**	-0.7	3:1	-0.5**	-0.5	3:1	-0.9**	-0.9	7:1	-0.7**	-0.8	17:1	
	50-59	150	-0.8**	-0.7	4:1	-0.7**	-0.6	3:1	-0.5**	-0.4	2:1	-0.6**	-0.8	4:1	-0.6**	-0.6	4:1	-0.9**	-1	10:1	-0.7**	-0.8	18:1	
	60-69	84	-0.7**	-0.6	3:1	-0.6**	-0.5	3:1	-0.4*	-0.3	2:1	-0.6**	-0.5	2:1	-0.5**	-0.4	2:1	-0.8**	-0.8	10:1	-0.6**	-0.6	5:1	
	70-79	24	-1.0*	-0.8	4:1	-1.0**	-1	6:1	-0.8*	-0.5	2:1	-0.6**	-0.6	3:1	-1.2**	-1.3	19:1	-1.2**	-1.4	19:1	-1.0**	-1	13:1	
	80+	3	-0.7	-1.1	>3:1	-0.7	-1.1	>3:1	-0.3	-0.3	2:1	-0.6**	-1	>3:1	-1	-1	>3:1	-1	-1	>3:1	-0.8	-4	>3:1	
	Income	White	752	-0.7**	-0.6	3:1	-0.7**	-0.6	3:1	-0.5**	-0.3	2:1	-0.6**	-0.6	3:1	-0.5**	-0.5	3:1	-0.9**	-0.9	7:1	-0.7**	-0.7	9:1
		Asian	80	-0.8**	-0.7	4:1	-0.8**	-0.7	4:1	-0.4*	-0.3	2:1	-0.6**	-0.5	2:1	-0.3*	-0.3	2:1	-0.8**	-0.8	5:1	-0.6**	-0.7	12:1
Multi-Ethnic		65	-0.9**	-0.8	6:1	-0.8**	-0.7	4:1	-0.6*	-0.4	2:1	-0.6**	-0.9	6:1	-0.5*	-0.4	3:1	-1.0**	-1.1	15:1	-0.8**	-1	33:1	
Hispanic		43	-1.0**	-1	14:1	-0.9**	-0.8	5:1	-0.5	-0.3	2:1	-0.6**	-0.8	4:1	-0.7**	-0.7	5:1	-0.9**	-0.7	3:1	-0.8**	-1	23:1	
Black		42	-0.8**	-0.7	4:1	-0.6*	-0.4	2:1	-0.7**	-0.6	3:1	-0.6**	-0.8	8:1	-0.3	-0.2	2:1	-0.8**	-0.7	4:1	-0.7**	-0.7	19:1	
Middle-Eastern		9	-1.3*	-1.5	>9:1	-1.3**	-1.9	>9:1	-0.7	-0.5	6:1	-0.6**	-4	>9:1	-0.4	-0.4	2:1	-1.3*	-1.5	>9:1	-1.1**	-2	>9:1	
Other		8	-0.9	-0.6	3:1	-0.8	-0.5	2:1	-1.1	-0.8	7:1	-0.6**	-0.7	3:1	-0.4	-0.2	2:1	-1	-0.8	5:1	-0.9	-0.7	4:1	

Table 6. Results for the subjective financial comparison question in Study 2, broken down by demographic categories. The columns

represent the following: n = sample size, M = mean, d = effect size (Cohen's d), ratio = the ratio of the number of respondents who

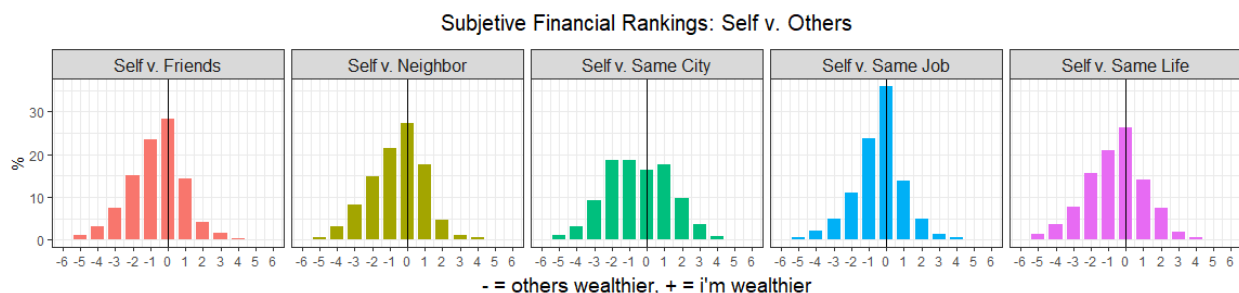
gave a response below the scale midpoint (indicating that they felt financially worse off compared to others) to the number of

respondents who gave a response above the scale midpoint (indicated that they felt financially better off than others). For example, for

those in the 51-60<sup>th</sup> percentile of household income, there were 5 people who felt they were somewhat or substantially less rich than

others, for every one person who felt they somewhat or substantially richer than others. The ratios within the lowest income deciles are quite dramatic. p-value demarcations: ` =  $p < 0.05$ , \* =  $p < 0.01$ , \*\* =  $p < 0.001$ . Significant results in the predicted direction are highlighted in yellow.

We see similar results with the subjective financial rankings. When participants ranked themselves and others, on average, they felt that they were financially worse off than their friends ( $M = -0.7$ ,  $SD = 1.6$ ),  $t(999) = -13.2$ ,  $p < 0.001$ ,  $d = -0.4$ , their neighbors ( $M = -0.6$ ,  $SD = 1.7$ ),  $t(999) = -12.0$ ,  $p < 0.001$ ,  $d = -0.4$ , people who live in the same city as them ( $M = -0.5$ ,  $SD = 1.9$ ),  $t(999) = -8.9$ ,  $p < 0.001$ ,  $d = -0.3$ , people who have a similar job and are in a similar career stage as them ( $M = -0.5$ ,  $SD = 1.6$ ),  $t(999) = -9.1$ ,  $p < 0.001$ ,  $d = -0.3$ , and people who had similar opportunities in life as they did ( $M = -0.6$ ,  $SD = 1.8$ ),  $t(999) = -10.9$ ,  $p < 0.001$ ,  $d = -0.3$ . See Figure 17.



*Figure 17.* Distributions of the difference between self-ratings and other ratings, for each of the comparison targets in the ladder rating exercise. Responses below zero (black line), indicate participants who felt they were worse off financially than the specified comparison target. For each comparison target, there are more ratings below zero than above zero, indicating the participants tended to feel that they were doing worse off financially than each of these comparison targets.

### ***Evidence Relevant to the Proposed Mechanism.***

I contend that when assessing how they measure up to others in terms of wealth, people tend to compare themselves to feature-positive instances of others who are wealthy. I therefore

expected that participants would report making a greater number of comparisons to others who are rich than others who are poor. Indeed, and as in Study 1, participants reported comparing themselves to the richest people they know ( $M = 3.3$ ,  $SD = 1.1$ ) much more frequently than the poorest people they know ( $M = 2.8$ ,  $SD = 1.0$ ),  $t(302) = 7.6$ ,  $p < 0.001$ ,  $d = 0.2$ . This can be seen in Figure 18.

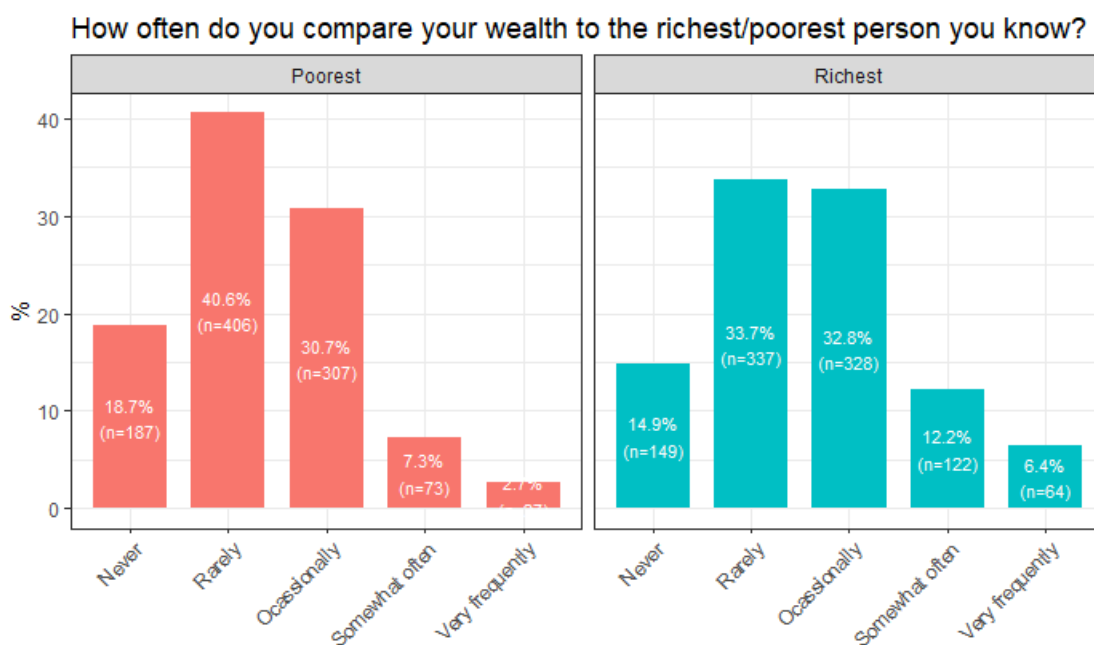


Figure 18. Distributions of the frequency of participants' comparisons with their poorest (red) and richest (blue) associates in Study 2.

Furthermore, this effect largely holds across different levels of household income. As can be seen in Table 7, for 7 out of the 10 income deciles, there was a significant difference such that people in those deciles were more likely to compare to the richest people they know than the poorest people they know. Thus, when thinking about how they stack up to others in terms of

wealth, people across nearly all incomes more often compare themselves to others who are richer (i.e. feature positive exemplars) than others who are poorer. It bears noting that two of the three income deciles in which there was no significant difference between upward and downward comparison targets are at the upper range of the income distribution, where the subjective financial comparison effects also tapered off (e.g. final Composite column, Table 6).

Income Decile	N	M	t	p	d	ratio
0-10th	100	0.3	2.1	0.037	0.2	3:1
11-20th	107	0.4	3.8	<0.001	0.4	4:1
21-30th	91	0.4	3.1	0.003	0.3	2:1
31-40th	94	0.1	0.8	0.422	0.1	1:1
41-50th	97	0.3	2.5	0.015	0.3	3:1
51-60th	97	0.3	3.0	0.003	0.3	2:1
61-70th	101	0.3	2.4	0.017	0.2	2:1
71-80th	101	0.2	1.5	0.132	0.2	2:1
81-90th	88	0.2	1.5	0.134	0.2	2:1
91-100th	98	0.3	2.8	0.007	0.3	2:1

*Table 7.* Results of significance tests comparing the frequency of comparisons to richer and poorer others, across income deciles. Positive means (“M” column), indicate participants made more comparisons to richer rather than poorer others. The mean differences which are significant are highlighted in light yellow. The “ratio” column indicates the ratio of the number of participants who reported comparing themselves more frequently with the richest people they know to the number of participants who reported comparing themselves more frequently with the poorest people they know.

The income satisfaction questions and their accompanying follow-up probes can also be used to assess distortions in the direction of comparisons people tend to conduct. First, as in

Study 1, most participants were not highly satisfied with their income, with 30% [95% CI = 27%, 33%] of the sample reporting they were *not at all* satisfied with their income, 21% [95% CI = 19%, 24%] reporting they were *slightly* satisfied, 24% [95% CI = 21%, 26%] reporting they were *somewhat* satisfied, 21% [95% CI = 18%, 23%] reporting they were *satisfied*, and only 5% [95% CI = 3%, 6%] reporting they were *very satisfied*.

More important, 25% of these respondents [95% CI = 22%, 27%] (N = 246) reported comparing themselves with someone when gauging their satisfaction with their income<sup>24</sup>. And this group of comparers were much more likely to compare themselves to those who were richer (somewhat richer = 40%, substantially richer = 35%) than those who were poorer (somewhat poorer = 8%, substantially poorer = 2%),  $t(245) = 15.2$ ,  $p < 0.001$ ,  $d = 1.0$ .

### ***Evidence from the Exploratory Questions.***

As in Study 1, I also examined responses to the exploratory question regarding who participants thought they should compare themselves to when making financial comparisons and who they thought others should compare themselves to when making these same financial comparisons. The results were largely similar to those from Study 1. Participants believed they

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<sup>24</sup> This is a notably smaller percentage of participants than in Study 1, where 66% [95% CI = 61%-71%] (N=201) of participants reported comparing themselves to someone when assessing their satisfaction with their income. I have no clear explanation for why this is. The only differences between Study 1 and Study 2 are the question ordering and a minor change in the question phrasing. In Study 1, participants were asked if they had compared to any “specific person, people, or “type” of people”, while in Study 2, participants were asked if they had compared to any “specific people or “type” of person”. Perhaps this minor change (eliminating “specific person” and starting with “people”) made the difference. In terms of ordering, in Study 2, the questions preceding the satisfaction questions were the: (1) subjective financial comparison questions, and the (2) subjective financial rankings; in Study 1, the questions preceding the satisfaction questions were the: (1) subjective financial comparison questions, and the (2) objective income information questions. Finally, of course, the sample demographics were different. However, this does not seem to be the culprit, as when I restrict the Study 2 analysis to only women who 22 years or younger (the median age and modal gender in Study 1), still only 34% [95% CI = 25%, 44%] (n=83) of these respondents reported comparing themselves to others when gauging their satisfaction with their income, which is similar to the overall proportion across Study 2.



and those earning a modest to a decent income should compare themselves to others somewhat above them, whereas those making a handsome income should begin to look downwards (presumably to remind themselves of how fortunate they are). Specifically, participants believed that they themselves ( $M = +0.3$ ,  $SD = 0.8$ ),  $t(999) = 11.1$ ,  $p < 0.001$ ,  $d = 0.4$ , others in general ( $M = 0.2$ ,  $SD = 0.7$ ),  $t(999) = 5.6$ ,  $p < 0.001$ ,  $d = 0.3$ , as well as others making \$30K ( $M = 0.3$ ,  $SD = 0.9$ ),  $t(999) = 6.8$ ,  $p < 0.001$ ,  $d = 0.3$ , and \$70K ( $M = 0.2$ ,  $SD = 0.8$ ),  $t(999) = 5.0$ ,  $p < 0.001$ ,  $d = 0.2$ , should compare themselves with others who are at least somewhat wealthier. Only at \$140K did participants not lean in one direction or another ( $M = 0.0$ ,  $SD = 0.9$ ),  $t(999) = -0.5$ ,  $p = 0.596$ ,  $d = 0.0$ . Finally, participants thought those making \$500K or more should compare themselves to others who are somewhat or substantially poorer ( $M = -0.7$ ,  $SD = 1.3$ ),  $t(999) = -3.4$ ,  $p < 0.001$ ,  $d = -0.2$ . Compared to Study 1, in Study 2, the income at which participants shifted from stating that people should compare to richer others to the income at which participants stated that people should compare to poorer others was higher (\$70K to \$140K). This is, perhaps, due the fact that distribution of incomes was higher in Study 2 than in Study 1.

Overall, the results from Study 2 replicate the results from Study 1, this time in a more representative sample of the U.S. in terms of sex, age, and income. Thus, when thinking about how rich they are compared to others—whether in terms of income, savings, or other forms of wealth—people tended to think others were doing better than they. And these effects largely held across income levels. Furthermore, and in line with my contention that this is because people tend to compare to feature positive exemplars of wealthy others, participants report comparing more often to those are who doing better than they financially rather than those who are doing worse financially. And this too was also largely true across all income levels.

### Study 3

The previous two studies demonstrate that when people think about how their wealth and income compares to those of others, they tend to think they are not measuring up. I claim that this is because people mentally construct above-average comparison targets out of the (literally) rich exemplars who come to mind when they ask certain questions about how their wealth compares to the wealth of others. Studies 1 and 2 both provide evidence that people do not compare to rich and poor comparison targets equally. Participants report more frequently comparing themselves to the richest people they know, being more curious about knowing about the wealth of their highest earning associates, and thinking about individuals somewhat or substantially richer than themselves when evaluating their satisfaction with their income. However, these results do not provide direct evidence of my proposed mechanism.

I aim to provide more direct evidence here. To do so, I explore a natural conclusion of my proposed mechanism. If the financial questions that people ask themselves (e.g. “Who is richer, me or others?”) bring to mind feature-positive examples of those who are rich, then if people are asked financial questions which bring to mind examples of those who are poor (e.g. “Who is poorer, me or others?”), they should reach the opposite conclusion—that they are doing better than others financially.

Accordingly, one group of participants in Study 3 was asked to respond to questions that were meant to invoke images of wealthy exemplars, while another group of participants was asked to respond to questions that were meant to invoke images of poor exemplars. My prediction was that the former group would end up feeling poorer relative to others, while the latter group would end up feeling richer. The procedures, sampling strategy, and analyses plans for this study were all pre-registered (<https://aspredicted.org/87n75.pdf>, #96854).

## Method

### *Sampling.*

I aimed to collect a sample of 400 participants, using the sampling strategy described in Study 2. However, because the targeted sample size was smaller, I used somewhat coarser income buckets. Specifically, I made the following demographic distinctions—sex: 2 buckets, men, and women; age: 2 buckets, above and below the median age ( $\leq 37$  years old,  $\geq 38$  years old), income: 2 buckets, above and below the median post-tax yearly U.S. household income ( $\leq \$59,999$ , and  $\geq \$60,000$ ). This resulted in 8 separate surveys, one for each of these unique sex X age X income combinations. As the targeted sample size was 400 total participants, I recruited 50 participants into each of these buckets ( $50 \times 8 = 400$ ).

### *Participants.*

In the end, using the sampling strategy described above, 400 participants completed my survey, which was expected to take three minutes, in exchange for \$0.60 (\$12.00/hour). This sample size allows me to detect within-subjects effects as small as  $d = 0.18$  with 95% power and within-subjects effects as small as  $d = 0.14$  with 80% power. Note that the effect size of the primary effect observed in Study 2 (composite measure of the subjective financial comparison questions) was  $d = -0.8$ , giving me  $>99.99\%$  power to detect such an effect. Because one planned analysis in this study involves comparing two between-subjects conditions, I will also note that this sample allows me to detect between-subjects effects of size as small as  $d = 0.36$  with 95% power, and between-subjects effects as small as  $d = 0.28$  with 80% power.

Demographically, the sex of my sample breaks down as follows: 48.5% female, 50.0% male, and 1.5% non-binary, which closely matches U.S. Population averages: 51.0% female, 49.0% male (US Census Bureau, 2019; *U.S. Census Bureau QuickFacts*, 2021).

The age distribution in this sample covers a wide range of the age distribution in the U.S. population (US Census Bureau, 2019), however it is skewed such that my sample contains more young people (ages 20-39) and fewer old people (ages 60+). Nevertheless, as in Study 1, the median age of my sample (37.5 years old) is essentially the same as the median age of the U.S. population (38 years old). See Table 8.

Population	Age Range (years)							
	18-20	20-29	30-39	40-49	50-59	60-69	70-79	80+
Study	6%	30%	22%	21%	14%	7%	3%	<1%
U.S.	5%	18%	17%	16%	17%	15%	9%	2%

*Table 8.* Comparison of the age distributions between the Study 3 sample and the U.S. population.

In terms of race and ethnicity, my sample identified as 77% White, 8% Asian, 4% Black or African American, and 8% identified as being of multiple ethnicities. 7% of these people also identified as Hispanic (either solely or in addition to another ethnicity). This is somewhat representative of the U.S. population except that, as in Study 2, Black or African American and Hispanic people are under-represented. The U.S. racial composition is: 76% White, 6% Asian, 13% Black or African American, with 19% also identifying as Hispanic (*U.S. Census Bureau QuickFacts*, 2021).

In terms of income, by design, the median pre-tax yearly household income of participants in the study (\$67K) essentially matched the yearly U.S. median pre-tax household income (\$68K). And, nicely, the distribution of income in the lower half of my sample (10<sup>th</sup>-40<sup>th</sup> percentile) roughly matched the distribution of incomes in the U.S. population. However, the

range of incomes in the upper half of my sample (60<sup>th</sup>-90<sup>th</sup> percentile) was more restricted and lower than in the U.S. population (e.g. the income of those in the 90<sup>th</sup> percentile of my study was \$143K, while it is \$201K in the U.S. population). Thus, my sample has a slightly lower income than the U.S. population. (Again, see Shrider et al., 2021, Table A-4a, for yearly U.S. pre-tax household income information).

Population	Income Decile								
	10 <sup>th</sup>	20 <sup>th</sup>	30 <sup>th</sup>	40 <sup>th</sup>	50 <sup>th</sup>	60 <sup>th</sup>	70 <sup>th</sup>	80 <sup>th</sup>	90 <sup>th</sup>
Study	\$22K	\$31K	\$40K	\$51K	\$67K	\$79K	\$90K	\$105K	\$143K
U.S.	\$16K	\$27K	\$40K	\$52K	\$68K	\$85K	\$108K	\$141K	\$201K

*Table 9.* Comparison of the income distributions between the Study 3 sample and the U.S. population.

In terms of wealth, the range in my sample was slightly more constricted than in the U.S. population, with the lower limits not going as low (e.g. 10<sup>th</sup>-40<sup>th</sup> percentile), and everything from the middle to the upper end of the distribution (i.e. 50<sup>th</sup>-90<sup>th</sup> percentile) being lower than in the U.S. population.

Population	Wealth Percentile								
	10 <sup>th</sup>	20 <sup>th</sup>	25 <sup>th</sup>	40 <sup>th</sup>	50 <sup>th</sup>	60 <sup>th</sup>	75 <sup>th</sup>	80 <sup>th</sup>	90 <sup>th</sup>
Study	<\$0K-\$10K	\$13K	\$38K	\$63K	\$88K	\$113K	\$250K	\$250K	\$550K
U.S.	-\$6K	\$5K	\$6K	\$35K	\$104K	\$188K	\$428K	\$555K	\$1.2M

*Table 10.* Comparison of the wealth distributions between the Study 3 sample and the U.S. population.

***Materials and procedure.***

Participants were randomly assigned to one of two conditions: (1) the Rich Exemplars condition, or (2) the Poor Exemplars condition.

In the Rich Exemplars condition, participants were asked the following 6 questions, which were expected to bring to mind exemplars of comparison targets who are well off financially:

1. Who is richer, you or others?
2. Who has more in savings, you or others?
3. Who has a higher income, you or others?
4. Who lives in a more expensive house/apartment, you or others?
5. Who has a more expensive car, you or others?
6. Who has a more valuable stock portfolio, you or others?

In the Poor Exemplars condition, participants were asked the following 6 comparable questions<sup>25</sup>, which were expected to bring to mind exemplars of comparison targets who are not doing well financially:

1. Who is poorer, you or others?
2. Who has more debt, you or others?
3. Who has a lower income, you or others?

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<sup>25</sup> Note, some of the questions are “direct inverses” of the questions in the Rich Exemplars conditions (e.g. “Who is richer, you or others?” v. “Who is poorer, you or others?”), while some are not as exactly direct inverses (e.g. “Who has a more valuable stock portfolio, you or others” v. “Who receives more financial assistance from the government, you or others?” or “Who has a more expensive car, you or others?” v. “Who has a more beat up car, you or others?”). When creating the questions for the Poor Exemplars condition, there was somewhat of a tradeoff between asking questions that are direct inverses of the question in the Rich Exemplar condition and asking questions that I felt confident would invoke exemplars of others who are poor. This set of questions is an attempt to strike a balance, by asking about as many directly analogous questions as questions that I felt confident would more strongly invoke an exemplar of someone who is poor.

4. Who struggles more to make housing payments (e.g. rent/mortgage), you or others?
5. Who has a more beat up car, you or others?
6. Who receives more financial assistance from the government, you or others?

All questions afforded 5 response options (e.g. for “Who's richer you or others?”: *I am much richer than others; I am somewhat richer than others; I am about as rich as others; I am somewhat less rich than others; I am much less rich than others*, e.g. for “Who's poorer, you or others?”: *I am much poorer than others; I am somewhat poorer than others; I am about as poor as others; I am somewhat less poor than others; I am much less poor than others*). These were then coded with values of -2, -1, 0, +1, +2. In both conditions, the values were coded such that positive values indicated that respondents felt they were doing better than others financially (e.g. for “Who's richer you or others?”: +2=*much richer than others*; +1=*somewhat richer than others*, e.g. for “Who's poorer you or others?”: +2=*much less poor than others*; +1=*somewhat less poor than others*), negative values always indicated that respondent feels they were doing worse than others financially (e.g. for “Who's richer you or others?”: -2=*much less rich than others*; -1=*somewhat less rich than others*, e.g. for “Who's poorer you or others?”: -2=*much poorer than others*; -1=*somewhat poorer than others*), and a value of zero indicated that respondents felt they were doing about as well as others financially.

As in Studies 1 and 2, the order in which these questions was presented was randomized and the order of the 5 responses options for each question was constant within participants but randomly reversed for half the participants (i.e. half the participants saw the response options to all 6 questions in one order, and the other half of participants saw those same responses options in the reverse order).

## Results

As predicted, and just as in Study 1, participants in the Rich Exemplars condition thought that they were doing worse financially than those to whom they compared themselves.

Participants thought they were significantly less rich ( $M = -0.8$ ,  $SD = 1.2$ ),  $t(198) = -10.2$ ,  $p < 0.001$ ,  $d = -0.7$ , had less in savings ( $M = -0.5$ ,  $SD = 1.3$ ),  $t(198) = -5.6$ ,  $p < 0.001$ ,  $d = -0.4$ , a less valuable stock portfolio ( $M = -0.9$ ,  $SD = 1.3$ ),  $t(198) = -9.8$ ,  $p < 0.001$ ,  $d = -0.7$ , a lower income ( $M = -0.8$ ,  $SD = 1.1$ ),  $t(198) = -10.2$ ,  $p < 0.001$ ,  $d = -0.7$ , a less expensive house or apartment ( $M = -0.5$ ,  $SD = 1.0$ ),  $t(198) = -6.9$ ,  $p < 0.001$ ,  $d = -0.5$ , and a less expensive car ( $M = -0.8$ ,  $SD = 1.1$ ),  $t(198) = -11.0$ ,  $p < 0.001$ ,  $d = -0.8$ , than others. And a composite of all of these measures was also significant ( $M_{\text{composite\_rich}} = -0.7$ ,  $SD_{\text{composite\_rich}} = 0.9$ ),  $t(198) = -11.8$ ,  $p < 0.001$ ,  $d = -0.8$ .

Also as predicted, the above tendency ( $M_{\text{composite\_rich}} = -0.7$ ,  $SD_{\text{composite\_rich}} = 0.9$ ) differed significantly from the responses of participants in the Poor Exemplars condition ( $M_{\text{composite\_poor}} = 0.4$ ,  $SD_{\text{composite\_poor}} = 0.8$ ),  $t(392.6) = -13.8$ ,  $p < 0.001$ ,  $d = 0.8$ . Not only did perceptions differ from the Poor Exemplars condition to the Rich Exemplars condition, but in the Poor Exemplars condition, where the questions were designed to bring to mind exemplars of people who are poor, participants thought they were doing significantly better than others financially ( $M_{\text{composite}} = 0.4$ ,  $SD_{\text{composite}} = 0.8$ ),  $t(200) = 7.5$ ,  $p < 0.001$ ,  $d = 0.5$ . This can be seen in Figure 19, where the distribution of participants' responses switches dramatically from being positively-skewed in the Rich Exemplars condition, to being negatively-skewed in the Poor Exemplars condition.





*Figure 19.* Distribution of responses to the 6 financial social comparison questions, in each of the two conditions in Study 3. In both conditions, negative responses reflect the feeling that one is financially worse off than others, whereas positive responses reflect the feeling that one is financially better off than others. Typically comparable questions are overlaid vertically (e.g. “Who is richer, you or others?” sits atop “Who is poorer, you or others?”).

For every single question in the Rich Exemplars condition, a greater number of respondents thought they were worse financially off than the number of respondents who thought they were better off financially. In contrast, for every single question in the Poor Exemplars condition, a greater number of respondents thought they were better off financially than the number of respondents who thought they were worse off financially. In the latter condition, participants thought they had significantly less debt than others ( $M = 0.8$ ,  $SD = 1.2$ ),  $t(200) = 8.6$ ,  $p < 0.001$ ,  $d = 0.6$ , received less assistance from the government ( $M = 1.0$ ,  $SD = 1.1$ ),  $t(200) = 12.4$ ,  $p < 0.001$ ,  $d = 0.9$ , struggled less to afford housing ( $M = 0.5$ ,  $SD = 1.2$ ),  $t(200) = 5.86$ ,  $p <$

0.001,  $d = 0.4$ , were less poor ( $M = 0.2$ ,  $SD = 1.2$ ),  $t(200) = 1.7$ ,  $p = 0.087$ ,  $d = 0.1$ , and drove a less beat up car than others ( $M = 0.1$ ,  $SD = 1.3$ ),  $t(200) = 1.4$ ,  $p = 0.159$ ,  $d = 0.1$ , although the difference in latter two domains was not significant. In terms of income, participants thought they were doing about as well as others ( $M = 0.0$ ,  $SD = 1.3$ ),  $t(200) = 0.0$ ,  $p = 1.000$ ,  $d = 0.0$ , a significant change from the assessments in the Rich Exemplars condition,  $t(394.9) = 6.9$ ,  $p < 0.001$ ,  $d = 0.7$ , but not enough to tip things in the other direction, perhaps because prefixing income with the word “lower” in this question was not enough to bring to mind an exemplar of a true low earner.

## Discussion

According to a YouGov survey from 2019 (N=1,163), only 5% of Americans consider themselves “rich” (Smith, 2019). The more amazing fact is that this percentage hardly varies by income. The number of respondents who consider themselves rich among those who make less than \$20K per year is 2%, and only rises to 9% for those who make between \$90K-\$150K. The portion of respondents who consider themselves rich reaches a maximum at 17%, among those who make \$150K+ per year. I believe this is a powerful testament to the effects documented in this chapter. Certainly, people’s standard of “rich” also changes as they themselves become wealthier (indeed in another part of the report, the YouGov survey results bear this out). However, it seems likely that people’s ubiquitous tendency to bring to mind comparison targets who are exemplary in a domain also plays a role in most people’s tendency to never quite feel “rich.” Indeed, as we saw in Study 2, regardless of income decile, participants reported more frequently comparing themselves to the richest people they know than to the poorest people they know.

In line with my account and the results from Chapter 2 and Chapter 3, the results from

this chapter are another demonstration of this basic tendency of the mind—to bring to mind exemplars when making social comparisons, to create a comparison target out of these exemplars, and then to conclude that one does not measure up to this standard. This is born out not only in the data presented in this chapter, but in the results of surveys that have examined Americans’ perceptions of income and wealth. For example, in a nationally representative survey run by Charles Schwab (N=1,000) respondents on average stated that it takes a net worth of \$2.6 million dollars to be “wealthy” (Schwab, 2020). During the same period, the actual median net worth of Americans was around \$104K-\$122K, and the mean net worth was around \$750K (Bhutta et al., 2020; Eggleston et al., 2020)—in either case, hundreds and hundreds of thousands of dollars below most participants’ standard of comparison.

Furthermore, in the domain of finance, exemplars of wealth and high income should be particularly available, as such people pervade our media ecosystem (Kendall, 2011). Among the top 10 most followed Instagram accounts in 2022 are Kylie Jenner, Kim Kardashian, and Khloe Kardashian (SocialTracker, 2022), who are primarily famous for being rich socialites, and the first two of whom have estimated net worths of \$1.8 billion and \$1 billion, respectively, according to Forbes World’s Billionaires List (Forbes, 2022a; Robehmed, 2019), which itself employs a staff of 92 different reporters focused on putting this list together (Staley, 2022). Time Magazine’s 2021 Man of the Year was the richest person on earth, Elon Musk, who also regularly appears in our news headlines and Twitter feeds (where he is the 6<sup>th</sup> most followed account on Twitter with over 90 million followers) (SocialBlade, 2022). Some of the most popular shows of the last decade include *Entourage*, *Succession*, *Downton Abbey*, *Bridgerton*, *Gossip Girl*, *The Real Housewives of Orange County*, and even *Curb Your Enthusiasm*, all depicting the lives of society’s rich and elite.

Similarly, a large part of our country's political discourse has been dominated by issues related to the outsized influence of the extremely rich. "Every billionaire is a policy failure" emerged as one of the most popular slogans in the 2018 and 2020 U.S. election cycles (Matthews, 2019) and 49% of voters in the 2020 election identified economic inequality as a "very important" issue in determining their vote, just as high as issues like immigration and the economy, and above issues including abortion and climate change (Pew Research Center, 2020b). Influential members of both parties are very rich—from Donald Trump (estimated net worth in 2022: \$3 billion; Forbes, 2022b) to Nancy Pelosi (estimated net worth in 2018: \$115 million; Open Secrets, 2018), to the billionaires like Michael Bloomberg (estimated net worth in 2022: \$82 billion; Forbes, 2022) who regularly appear in the Presidential primaries. These may be extreme examples, but they are not the exception—according to Open Secrets, a non-profit that tracks the wealth and finances of government officials, the median net worth of members of the U.S. Congress was \$1.1 million dollars in 2014 (Tucker, 2015), which would place them around the 90<sup>th</sup> percentile of wealth in the U.S. (Eggleston et al., 2020).

Regardless of how exactly you cut it, it seems clear that wealth pervades our media and political ecosystem. Our culture's focus on wealth may be both a cause and a result of our mind's tendency to access exemplars of wealth when thinking about our own wealth relative to others'.

### **Limitations**

Readers likely noted that in Study 2 the effect tends to taper off as participants' income rises. This is to be expected. First, the fact that participants recruit exemplars when making social comparisons to "others" does not mean that they are always literally comparing themselves to the likes of Jeff Bezos or Elon Musk, however present they may be in media. A Manhattan attorney is a perfectly exemplary representation of someone who is "rich" and, as participants' income

rises, they will recognize that they reasonably fit the prototype of a person who is “rich,” by virtue of, for example, themselves being a Manhattan attorney. The postulated effect is simply that people’s constructed feature-positive representation of others, which is then used as a comparison target, is someone who is meaningfully above-average. Second, my claim is not that this biased comparison target effect is the sole mechanism that determines the outcome of social comparison. It is merely one. I do not intend to argue that people don’t track reality when evaluating how they stack up to others—just that there is a bias towards constructing above-average feature-positive exemplars.

However, one might still ask: if people end up feeling worse off than others financially when thinking about positive instances of wealth (e.g. “Who’s richer, me or everyone else?”) but better off than others when thinking about positive instances of poverty or low economic standing (e.g. “Who’s poorer, me or everyone else?”), which question do they typically ask themselves and how do they then usually end up feeling up their comparative financial standing?

I claim that (1) it depends, but (2) more often than not, in the financial domain, people will ask themselves comparative questions about positive instances of wealth (e.g. “Who richer, me or others?”) and will thus come away feeling worse off than others financially. I make this claim because similar to Mussweiler's (2003) Selective Accessibility Model, which argues that social comparisons are thrust upon us by the situation, I claim that the topics of the comparative questions people ask themselves are often prompted either by (1) situational cues in the environment or (2) habitual patterns of thought. And I hypothesize that there are more situational cues in our environments that prompt us to think about wealth rather than poverty or low economic standing. This is largely because, as I argued above, our informational ecosystem is inundated with images, instances, and discussion of wealth. For example, O’Guinn & Shrum

(1997) show that watching more television is associated with greater awareness and estimation of the prevalence of products and services that would be available to those who live an affluent lifestyle. Thus, for example, if a person habitually sees Lexus commercials on TV, they are more likely to think about positive instances of wealth (e.g. owning a Lexus), thus prompting more comparative questions focused on positive instances of wealth (e.g. “Do most people own nicer cars than I do?”). Indeed, the evidence reviewed at the very beginning of this Discussion—which showed that the vast majority of Americans across all income groups do not consider themselves rich—is consistent with people making many more financial comparisons relating to positive instances of wealth (whereafter they would come away not feeling rich) than positive instance of poverty and low economic status (whereafter they would come away feeling rich or least better off financially than others).

But, one might ask: why is it that our media and political ecosystems tend to focus on wealth and those at the top of the income and wealth distributions rather than poverty and those at the bottom of the income and wealth distributions? For one, wealthy people have an outsized influence on almost every aspect of society (Gilens & Page, 2014). So, it would make sense for the media to focus on those who have a disproportionate influence on the events they cover. Second, it is likely that evolution has selected for the behavior of focusing more of our attention and time on people and groups with high status. Evolutionary accounts of social comparison argue that, due to the social nature of our species, it is important for people to constantly monitor their social status within a group, and pay special attention to others of higher status (Anderson et al., 2015; Henrich & Gil-White, 2001; Price et al., 1994). My argument isn’t that this directly leads to upward comparisons (although it does that too). But rather, the argument is that our media and political ecosystem focuses on high-status and wealthy individuals because these are

the people who evolution has oriented us to follow in a social group. This tendency then makes those type of people disproportionately available, and issues related to our relative standing to them (“Am I rich?”) more mentally salient.

This is similar to the explanations offered for the media’s tendency to focus on “bad news” (Soroka et al., 2019) as being due to an evolutionarily selected tendency to pay more attention to negative (e.g. threatening) information than positive information (Rozin & Royzman, 2001). Of course, a great deal of research would be needed to definitively nail this full hypothesized pathway down.

Whatever the reason, when we ask ourselves questions which focus our attention on the rich (“Who’s richer, me or others?”), we end up feeling that we do not measure up to others.

## CHAPTER 5: GENERAL DISCUSSION

The phrase “Keeping Up With The Joneses” comes from a comic strip written by Arthur “Pop” Momand from around 1913 to 1938, where the focal McGinis family repeatedly attempted and failed to keep up with their neighbors, the Joneses (Markstein, 2010). Interestingly, the Joneses themselves rarely made an appearance in the comic (Holtz, 2012; Wikipedia<sup>26</sup>, 2021). The effects documented in this dissertation are similar (N=7,743, 26 studies). People feel like they are failing to keep with others, yet these others are a distorted construction of the mind more than actual specific people.

As I have shown, in sociability (Chapter 2) and finance (Chapter 4)—two important domains of everyday life—people often conclude that they don’t measure up to others. In Chapter 2 (N=3,293, 11 studies), I showed that people believe they go to fewer parties, have fewer friends, smaller social networks, and belong to fewer social circles than others who come to mind when making these comparisons. And this result holds across sex, age, income, racial and ethnic identity, education level, and political orientation. Likewise, in Chapter 4 (N=1,703, 3 studies), I showed that, when thinking about positive instance of wealth, people feel that compared to others they are poorer, earn less, have less in savings, and have a smaller stock portfolio. This result also held across sex, age, income, and racial and ethnic identity.

Why is this? As I have shown in Chapters 2, 3, and 4, when making such comparisons

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<sup>26</sup> The citation of Wikipedia in this dissertation is an intentional choice to acknowledge its presence and importance in the academic informational ecosystem. Studies comparing the accuracy of Wikipedia to more traditional sources of information (e.g. Encyclopedia Britannica) have repeatedly found Wikipedia articles equally reliable. Other studies examining the objective accuracy of articles on Wikipedia have also found its articles to be highly accurate (Giles, 2005; Kräenbring, et al, 2014, Wikipedia, 2022). It is one of the major successes of the open source movement and the collaborative web. The failure to acknowledge it as a source of information in this dissertation would feel unfair and outmoded. Furthermore, in the two places it is cited in this dissertation, I verified the validity of the citations to which the claims in the referenced Wikipedia article point.



people tend to measure themselves against comparison targets who are well-above average.

Across three chapters, people reported holding themselves to standards that are above average in every domain from intelligence, to rationality, analytic ability, responsibility, friendliness, politeness, extraversion, honesty, artistic ability, physical activity, as well as rudeness, shallowness, self-centered-ness, and of course, sociability and wealth.

Why is this? I have shown that, in addition to the typical reasons people have been shown to engage in upward comparisons (e.g. self-improvement), open-ended social comparisons lead people to call to mind the most cognitively available comparison targets in a domain. And the most available targets tend to be exemplars and feature-positive cases where the target possesses a high level of the focal trait. For example, in Study 5A, in Chapter 2, I showed that when asked to sequentially list the comparison targets that came to mind when conducting social comparisons of one's social life, the first targets that participants brought to mind were the most social, decreasing in socialness as participants continued recalling targets. In Study 5B, in Chapter 2, I showed that people's responses to questions like "Who goes to more parties, you or others?" were almost identical to their responses to those same questions when participants were told the "others" they should consider should be among the most social people they know. Only when people were told to bring to mind instances of highly unsocial people did their feelings of comparative inadequacy begin to abate, suggesting that intuitively people bring to mind and compare to highly social targets. In Studies 4C and 4D, in Chapter 3, I showed that even when comparing to others on undesirable traits like rudeness and shallowness people brought to mind and compared against feature-positive comparison targets. This suggests that people do not compare to or report comparing to exemplary comparison targets simply out of a desire to appear to be holding themselves to high standards or to be in the company of a high-achieving milieu.

And finally, in Study 3, in Chapter 4, I showed that the effect can be reversed in the domain of finance, by the same mechanism, if people ask themselves comparative questions than invoke instances of poverty or low economic standing (e.g. being poor, having a lot of debt) rather than instances of wealth (being rich, having large savings).

In sum, many open-ended comparative questions people ask themselves or are asked, invoke comparison targets who are exemplars in a domain because such people are the most cognitively available. And when they do so, they find themselves comparatively lacking in this domain. When the trait, domain, or behavior is desirable (e.g. sociability and wealth), this leaves people feeling worse off.

### ***Norm Theory and Multiple Exemplars***

One aspect of my account is that, consistent with Kahneman & Miller's (1986) theory of how norms are constructed, people's comparison targets are a cognitive construction, built specifically out of the *several* feature-positive and thus above-average exemplars that come to mind when people ask themselves questions like "How rich am I compared to everyone else?" and "Do others socialize more than I do?" The results reviewed above present ample evidence that people bring to mind and compare to targets who are above average. But it's important to note that there was also evidence that people bring to mind *multiple* above average comparison targets.

In Study 2B, in Chapter 1, after Cornell undergraduates were asked to compare their social lives to those of other Cornell students, they were asked a follow-up question about the "others" to which they had compared themselves. Specifically, they were asked how many "others" had come to mind, on a question that afforded three responses options: "one specific person", "a few specific people", and "a non-specific blend of people I know." The

overwhelming majority of respondents (71%, 95% CI = 61-80%) stated they had compared to a non-specific *blend* of others they know. A remaining 28% [95% CI=19-38%] of participants reported comparing themselves to a few specific people, and only 1% [95% CI=0-7%] of participants stated they compared to only one specific person. In that same study, participants rated these “others” who had come to mind significantly above the midpoint of the scale, indicating that not only were their comparison targets a blend of multiple targets who came to mind, but that this blend was above-average in the focal domain. Similarly, in Study 5A, in Chapter 2, where participants were instructed to list eight comparison targets that had come to mind when evaluating their relative sociability, every single one of the comparison targets that came to mind was above the scale’s midpoint in terms of sociability. Together, these studies provide evidence that, when making open-ended social comparisons, people bring to mind *multiple* comparisons targets *and* that these comparison targets tend to be exemplary in the focal domain.

### **Contributions To The Literature**

So what’s new here? In the social comparison literature, there has long been an awareness of the dominance of upward comparisons. Festinger's (1954) original social comparison theory, after stating that people generally aim to compare to others of similar ability, adds that there is also a “unidirectional drive upward” when comparing one’s abilities to those of others (Hypothesis IV). He attributes this to a cultural value of aiming to do “better and better.” Gerber et al's (2018) meta-analysis of over 60 years of research on social comparison backs up this claim. Across all the studies included in the meta-analysis in which participants were asked to make a social comparison (and in which only upward and downward comparisons were offered), participants chose to make an upward, rather than downward, comparison 76% of the

time. When a lateral comparison choice was also offered (a choice to compare to someone who is of similar standing as oneself), participants still chose to make an upward comparison 46% of the time, compared to 36% of the time when they chose to make a downward comparison, and 19% of the time when they who chose to make a lateral comparison.

The dominance of upward comparison has also been demonstrated in ecologically rich environments. Nosanchuk & Erickson (1985), for example, studied competitive bridge players (N=500) in the midst of a bridge tournament, and found that players of all levels were much more interested in comparing upward than either downward or laterally (the ratio of upward to lateral comparison was 2:1, 8:1, and 9:1 among high, medium, and low ranked players, while the ratio of upward to downward comparisons for all these groups varied from 10:1 to over 100:1). However, for an exception in another study with strong ecological validity, see Wheeler & Miyake's (1992) study in which 94 undergraduates kept a diary of all the social comparison they conducted in a two-week period. Here, the authors found that overall downward comparisons were made somewhat more often (30%) than upward comparisons (45%). Although, in that study the authors also found great variation in comparison direction based on a comparer's mood and their personal relation to the comparison target.

Regardless of its exact frequency, the contribution of the research presented in this dissertation is not to provide further evidence that people tend to engage in "upward" comparisons, nor to demonstrate that they do so often. The contribution here is documenting a novel cognitive reason why people engage in such comparisons.

As I reviewed in Chapter 1, there are several major explanations of how people choose comparison targets. These can be roughly grouped into three categories: (1) self-assessment (e.g. Festinger, 1954; Goethals & Darley, 1977), (2) self-enhancement (e.g. Wills, 1981), and (3) self-

improvement and aspiration (e.g. Wood, 1989). All of these accounts are functional—the selection of comparison targets is in service of some goal (i.e. accurately measuring one’s ability, making oneself feel better, and achieving or feeling that one may achieve a higher standing, respectively). My explanation is not functional. It is the first account of social comparison to tie the forces of cognitive availability (Tversky & Kahneman, 1973, 1974) and social comparison together. Previous cognitive accounts of social comparison merely explain why social comparisons are automatic or cognitively efficient (Corcoran & Mussweiler, 2009; Gilbert et al., 1995; Mussweiler & Epstude, 2009), or take for granted the choice of comparison target and seek to explain why people contrast or assimilate towards these targets once they are in mind (Crusius et al., 2022; Mussweiler, 2003; Mussweiler et al., 2004b). Here I show that *inadvertently* and without any intentional choice, people still make upward comparisons more frequently. This is because the very questions people ask themselves (“Who is more social, me or others?”, “Is everyone else richer than me?”) make exemplars who embody the trait or behavior in question disproportionately available.

### **Consequence of Social Comparison**

What are the consequences of people making upward comparisons, even inadvertently? Two studies in this dissertation provide evidence that this usually leads people to feel worse about themselves. In Study 6A, in Chapter 2, I showed that the more people feel worse off than others socially, the lower their general satisfaction with life. Of course, people’s comparisons also track reality to an extent, so this may be partly accounted for by the fact that people who feel comparatively worse off socially do indeed socialize less, which directly decreases their wellbeing—a well-known finding (Myers & Diener, 1995). However, in Study 6A, in Chapter 2, I also showed that distorted comparisons can directly diminish well-being. That is because

participants who were randomly instructed to conduct social comparisons with highly sociable comparison targets had just as low life satisfaction ratings as those at baseline (who, as I have shown, also compare themselves to well above-average comparison targets)—only those instructed to move away from baseline and compare to highly unsocial comparison targets reported significantly higher satisfaction with their lives. Likewise, in Study 5, in Chapter 3, participants who compared themselves to the first comparison targets that came to mind when evaluating their physical ability felt worse about themselves than participants who compared their physical ability against a comparison target who was not so readily available in mind (and thus, also less exemplary in physical ability). Both of these studies indicate that the mind's tendency to conduct such distorted comparisons can have a direct negative effect on a person's self-view and well-being.

It should be noted that the consequences of social comparison are not always so simple as “upward comparisons make us feel bad, and downward comparisons make us feel good”. For example, Buunk et al. (1990) found that downward comparisons can make cancer patients, who have low self-esteem and feel little control over their situation, feel worse than do upward comparisons.

Tesser's (1988) self-evaluation-maintenance theory offers a broader and nuanced way to think about the consequences of social comparison on one's self-esteem. The underlying premise of the theory is that people have a motivation to maintain a positive view of themselves. Social comparisons can bump these up or down, based on three factors: (1) closeness of the comparison target, (2) relevance of the domain of comparison, and (3) quality of the comparison target's performance. Very simply, the main takeaway is that the closer a person is to us and the better their performance, the more it will affect how we feel about ourselves. And the relevance of the

domain to our identity will in turn determine the valence of our reaction. If someone we are close to performs much better than us in a domain that is highly relevant to our identity, then we will tend to feel worse about ourselves. Imagine for example that you are a very academically oriented student and you get a B- on a test and your friend in the class gets a perfect score. This would make you feel bad about yourself. However, if someone you are close to performs better than you, in a domain that is not highly relevant to your identity, then you will engage in what the authors call “reflection” and feel better about yourself—essentially basking in your comparison target’s glory. For example, having a sibling who is an Olympic athlete would make most people feel great, if their own sense of identity has little to do with athletic prowess (Erber & Tesser, 2013; Tesser & Smith, 1980).

How might that apply here? Two factors—the relevance of domain and the quality of the target’s performance—are relatively straightforward. People typically care about the domains that I studied (sociability and finance) and the targets’ performance was typically perceived as exemplary. However, the remaining dimensions (closeness of comparison target) is a bit ambiguous. The fact that participants did end up feeling worse about themselves and their lives in Study 6A in Chapter 2 and Study 5 in Chapter 3 suggests that people perceive their comparison targets as at least somewhat close or relevant to themselves.

The factor that likely has the largest influence on the self-esteem and well-being, for the effect I’ve documented, is the relevance of the domain in question. If the targets brought to mind are at least somewhat close or relevant to one’s identity, it is only the relevance of the domain that can mitigate any hits to self-esteem. Note further, however, that the effect I documented can also bring to mind targets with poorer than average performance (e.g. Study 4C-4C in Chapter 3, Study 3 in Chapter 4) when the focal domain is negative and undesirable (e.g. “Who has more

debt, you or others?")—thus, in some cases where the domain is relevant (finance), participants may still emerge feeling better about themselves, if the comparative question they ask themselves focuses on an undesirable trait or behavior (e.g. being poor, being rude).

### **Future Directions**

These findings raise new questions. Two notable questions that should be explored in future research on this topic are: (1) how does the specificity of the comparison target influence these results, and (2) when will this phenomenon lead people to unflattering conclusions about their relative standing (e.g. that they are poorer than others) and when will it lead people to flattering conclusions about their relative standing (e.g. that they are richer than others)?

With regard to the first question, I predict that as the specificity of the comparison target increases, the effect diminishes. This is because, the more vaguely defined a comparison target is, the wider the range of potential comparison targets that can be considered, and the more room there is for the forces of availability to bring to mind a biased sample of feature-positive exemplars. Imagine, in the extreme, asking, "Who has a higher income, you or your spouse?" to someone who is married and knows their spouse's income. Here, there is no leeway to construe a target out of the targets that come to mind. There is only one definitive target. However, if one lives in say the San Francisco Bay Area, and is asked "Who has a higher income, you or other people who live around you?", instances of others driving top of the line Tesla model S Plaid and living in five million dollar single-family homes are free to come to mind. There is greater leeway for the documented forces of availability to have their effect.

This is similar to Dunning, Meyerowitz, & Holzberg's (1989) finding that the more ambiguously a trait is defined (e.g. "sophisticated" v. "well-read", "disciplined" v. "punctual"), the more leeway people have in defining that trait and the more likely they are to reach a self-



enhancing conclusion about how they compare to the average person on this trait. The difference here is that rather than the comparison target being fixed and the domain being variable in ambiguity, the domain is fixed and comparison target is variable in ambiguity.

Indeed, there is some evidence that such an effect plays out when reviewing some of the results from the studies in Chapter 4. In Study 2 of that chapter, for example, the range of potential comparison targets for the subjective financial comparison questions (e.g. “Who’s richer you or *others*?”) was broader than the range of potential comparison targets for the subjective financial ranking questions (e.g. after ranking themselves, participants were asked to rank more specific comparison targets like “*people in your line of work, who are at a similar career stage, and have similar experience and skills as you*”). And in this study, the average effect size across the 6 subjective financial comparison questions, where the comparison targets were more open-ended, was  $d = -0.6$ , while the average effect size across the 5 subjective financial rankings questions, where the comparison targets were more narrowly specified, was  $d = -0.3$ . The same pattern also emerges in Study 1 of Chapter 4: the average effect size for the 7 subjective financial comparison questions was  $d = -0.6$ , while the average effect size across the 5 subjective financial rankings questions was  $d = -0.4$ . In both studies, smaller effects were observed when the range of comparison targets was more restricted.

Future research might vary the specificity of the comparison target in questions more systematically—e.g. “Who’s richer, you or others?” v. “Who’s richer, you or others your age?” v. “Who’s richer, you or others your age and education level?” v. “Who’s richer, you or others your age, education level, and who grew up in the same community as your?”—and examine if the effect diminishes accordingly.

Future research also ought to examine the second question mentioned at the beginning of

this section: when is the documented phenomenon likely to lead people to reach unflattering versus flattering conclusions about themselves?

One might think that whether people reach flattering or unflattering conclusions depends on the “domain” in focus (e.g. in Chapter 2, in the domain of sociability, people reached unflattering conclusions, while in Chapter 4, in the domain of finance, people reached unflattering conclusions when thinking about positive instances of wealth, but flattering conclusions when thinking about positive instances of poverty or low economic status). However, the idea of a “domain” is a bit of an artificial construction. For example, does asking oneself “Am I able to push myself to run faster than others?” fall into the domain of athleticism or competitiveness?

It is more clarifying to think about desirable and undesirable traits and behaviors. My prediction is that desirability of a trait or behavior is the primary predictor of whether the effect documented in this dissertation leads people to reach flattering or unflattering conclusions about themselves. The prediction is straightforward: when people think about desirable traits (e.g. sociability, wealth, athleticism), they will feel they are falling behind others, by virtue of bringing to mind targets who are above-average on these desirable traits. And when people think about undesirable traits (e.g. poverty, criminality), then they will feel that they are doing better than others, by virtue of, again, bringing to mind targets who above-average on these undesirable traits.

This prediction could be easily tested in future studies. One simple way to do this would be to compile a list of both desirable and undesirable traits and behaviors (e.g. being rich, being a fast runner, being impatient, being late often). To verify the desirability and undesirability of these traits and behaviors, one set of participants would then be asked to rate the desirability of these

traits and behaviors. Finally, another set of participants would be asked to rate how they compare to a broadly defined set of “others” on these traits. The prediction would be that people feel that they are doing worse than others on desirable traits and behaviors and better than others on undesirable traits and behaviors.

Finally, it may also be true that in some domains (e.g. finance, as predicted in the Discussion section of Chapter 4), there is a greater focus on desirable outcomes (e.g. being rich) than undesirable outcomes (e.g. being poor). In other domains, the opposite may be true. For example, in the domain that might be described as criminality or law-abidingness (notice the more awkward construction when trying to frame this domain in terms of desirable behaviors), there is a more natural focus on undesirable behaviors (e.g. arrest, thefts, prison time) than desirable traits (e.g. following the law, being extremely honest in tax filings). Thus, in the domain of criminality and law-abidingness, the natural focus on undesirable traits and behaviors may lead people to generally feel they are doing better than others.

### ***Methods of Studying Social Comparisons***

A note should also be made about the methods used to study social comparisons across the studies that comprise this dissertation. Wood (1996) outlines the primary methods by which who people compare themselves to has been studied: (1) selection methods (e.g. participants select who they want to compare to from a rank order listed of potential targets, or participants’ gaze is monitored to see who they look at and compare to), (2) narration methods (e.g. open-text free response, self-recorded comparison diaries, narrative interviews), and (3) reaction methods (e.g. rather than looking directly at comparative choices, researchers evaluate how people react to comparisons to different targets). The primary method used to elicit comparison targets in the studies in this dissertation were selection methods, where participants selected or reported the

comparison targets to which they compared, usually on some sort of scale or ladder, allowing them to rank or rate the relative outstandingness of their comparison target.

Although it should also be noted that several studies elicited comparison targets more furtively—for example, in Study 5B, in Chapter 2, comparison targets were inferred by examining the similarity of self-other ratings across conditions which instructed participants to compare to targets at different levels of sociability. This method doesn't neatly fit into Wood's (1996) taxonomy—and may eliminate some of the biases of selection methods of studying social comparison, such as participants' ability to consciously reflect on (and alter, if they like) the comparison target they are reporting.

It may be beneficial in future research to replicate these findings using alternative methods. In particular, narration methods—where participants are asked to speak out loud the questions that come to mind when thinking about their relative financial standing—may be particularly illuminating. For example, Wood et al. (1985) used this method when trying to characterize the social comparisons that cancer patients made. A finding that people spontaneously ask themselves questions like “Is everyone richer than me?” or “Do I go to fewer parties than everyone else?” would lend more ecologically rich evidence to my claim that people often ask themselves questions, which by their very nature, will make more available feature-positive and above-average exemplars.

### ***Social Media and Social Comparison***

Finally, the idea that people compare to readily available exemplars of sociability and wealth brings up the oft touted claim that social media, e.g. Facebook, Instagram, negatively impacts users by exposing them to unrealistic standards that then leads them to feel inadequate relative to the others they are seeing on these sites (Lanier, 2018; Orłowski, 2020). For example,

documents leaked from Facebook's internal research department in 2021 revealed that 32% of Instagram users in the U.S. and 33% of Instagram users in the U.K. stated that their view that they "don't have enough friends" started on Instagram, and 42% of Instagram users in both the U.S. and U.K. stated that their view that they "don't have enough money" started on Instagram, (Wells et al., 2021). These self-reported origins of personal inadequacy should be treated with appropriate skepticism (Kamenetz, 2021; Nisbett & Wilson, 1977). Nevertheless, there is evidence that people selectively post content to social media platforms that presents them in the best light (Newman, Lauterbach, Munson, Resnick, & Morris, 2011). Thus, there is reason to believe that people are comparing to a distorted sample of content when browsing Facebook, Instagram and the like, which is likely to lead to them to less flattering comparative self-evaluations.

Is there a connection between these phenomena and the effects documented here? The studies in this dissertation do not present any direct evidence. But one straightforward prediction is that social media makes particularly social or rich others more available, thus exacerbating the documented bias. Future research on this topic could examine whether there is a causal relationship. For example, participants could be incentivized and then randomly assigned to quit Instagram (e.g. as Allcott et al., 2020 did with Facebook use in their study on the effects of social media on polarization and well-being) and the extent to which participants exhibit the social comparative biases documented in Chapter 2 regarding their social lives could be examined.

However, the effects documented in this dissertation also cast doubt on claims that social media is the primary culprit behind an apparent tendency to compare against unrealistic standards. Specifically, the findings in this dissertation suggest that people's tendency to compare to exemplars of high sociability and wealth is a tendency that precedes social media,

rather than one that is caused by it. Perhaps social media exacerbates this tendency by making exemplars in domains like sociability and wealth even more available. But the original of this phenomenon stems from a more basic tendency of the mind.

### **Conclusion**

Across the 26 studies (N=7,743) in this dissertation, I documented two notable domains of everyday concern—wealth and sociability—in which people don't feel like they are “keeping up with the Joneses.” The novel contribution of this dissertation is to show that this frequently referenced tendency is often inadvertent and automatic, a hidden feature of the very questions we ask ourselves about how we relate to others.

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