



Social comparison processes in the experience of personal relative deprivation

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Abstract

Drawing on social comparison and equity theories, we investigated the role that perceived similarity of a comparison target plays in how resentful people feel about their relative financial status. In Study 1, participants tended to choose a comparison target who was better off, and they selected a target they perceived to be more similar than dissimilar along dimensions that surrounded their financial outcomes. In Study 1, perceived relative disadvantage was positively associated with resentment regardless of the perceived similarity of the comparison target. The results of Studies 2 to 5b clarified these findings by showing that being both similar and dissimilar to a target can cause resentment depending on the context. Using hypothetical and real social comparisons, we found that people are more dissatisfied with their financial outcomes when their comparative targets have the same background qualifications (i.e., are similar) but are financially better off (Studies 2, 3b, 4, and 5b). However, we also found that when the comparative financial contexts were similar (i.e., equal affluence), participants were more dissatisfied when their target for comparison had lower qualifications (i.e., was dissimilar; Studies 2, 3a, 4, and 5a). In all cases, perceptions of unfairness mediated the effects of social comparison on financial dissatisfaction. Taken together, these studies address some of the ambiguities around what it means to be similar to a target in the context of social comparisons of affluence, and they underscore the importance of perceived unfairness in the link between social comparison and resentment with one's financial status.

KEYWORDS

equity, organizational justice, perceived similarity, perceived unfairness, personal relative deprivation, social comparison

Social scientists have long observed that how satisfied people are with their "lot in life" is largely determined by relative (e.g., what they have compared with what others around them have) rather than absolute standards of affluence (e.g., Crosby, 1976; Davis, 1959; Duesenberry, 1949; Runciman, 1966; Stouffer, Suchman, DeVinney, Star, & Williams, 1949). In a systematic review of these effects, Smith, Pettigrew, Pippin, and Bialosiewicz (2012) emphasized the importance of *personal relative deprivation*, which they characterized

as a process beginning with an appraisal of one's relative disadvantage leading to perceptions of unfairness that, in turn, give rise to feelings of anger, resentment, and dissatisfaction. Personal relative deprivation is associated with a variety of social outcomes, attitudes, and behaviors (Crosby, 1976; Mark & Folger, 1984; Walker & Smith, 2002). Indeed, since Smith et al.'s review, there has been burgeoning interest in the consequences of feeling relatively deprived, with experimental and correlational research finding that people higher

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in personal relative deprivation tend to, for example, have greater problem gambling tendencies (Callan, Shead, & Olson, 2015; Mishra & Meadows, 2018), prefer smaller-sooner over larger-later rewards (Mishra & Novakowski, 2016; Tabri, Shead, & Wohl, 2017), be more materialistic (Kim, Callan, Gheorghiu & Matthews, 2017; Zhang, Tian, Lei, Yu, & Liu, 2015), have worse mental and physical health (Beshai, Mishra, Mishra, & Carleton, 2017; Callan, Kim, & Matthews, 2015), be more interpersonally hostile (Greitemeyer & Sagioglou, 2017), and be less willing to act for the benefit of others (Callan, Kim, Gheorghiu, & Matthews, 2017; Zhang, Liu, & Tian, 2016).

Although there has been a resurgence of interest in the various consequences of feeling relatively deprived, much less recent research has examined the *antecedents* of personal relative deprivation, particularly in terms of the social comparison processes involved. To experience the sense of unfairness and resentment that characterizes personal relative deprivation, a person must make a comparison and decide that she does not have what she “should” have (Crosby, 1976). Festinger’s (1954) social comparison theory emphasizes the importance to this process of the perceived similarity between oneself and the comparison target, presumably because comparing with similar others provides the most relevant and diagnostic information for selfevaluation. Several studies have supported the idea that people prefer to compare with others who are similar on attributes or dimensions that *surround* the dimension under evaluation, even if those surrounding dimensions are seemingly irrelevant (for reviews, see Suls & Wheeler, 2017; Wood, 1989). For example, Miller (1982) found that participants chose to compare their performance on a logical reasoning test with others who were similar in physical attractiveness. Similarly, Suls, Gaes, and Gastorf (1979) found that participants tended to choose same-sex targets for comparison when evaluating their performance on a mental ability test.

To date most research examining the role of similarity in the selection of comparison targets has involved asking participants to complete measures of intellectual ability in laboratory contexts (for further examples, see Wheeler, Koestner, & Driver, 1982; Zanna, Goethals, & Hill, 1975). But does “similarity” matter to people when it comes to their social comparisons of actual financial circumstances? The motivation of the current research was to explore several issues related to the role of perceived similarity in the experience of personal relative deprivation. Specifically, our goals were (1) to test whether people tend to make social comparisons of affluence with targets they perceive to be similar along surrounding dimensions, (2) to determine whether people tend to select targets for comparison who are financially better-off or worse-off, (3) to examine the effect of perceived similarity on the experience of personal relative deprivation, (4) test the mediating role of perceived unfairness in the effect of adverse social comparisons on resentment, and (5) to address some of the ambiguities around what it means to be “similar” or “dissimilar” to a comparison target.

To address our first three goals, In Study 1 we asked participants to think of an individual whose material and financial circumstances they usually compare with their own, and to rate their perceived similarity to the comparison individual. To the extent that people select similar versus dissimilar others in their social comparisons of affluence, we

expected participants to rate their comparative target as more similar than dissimilar. The extant social comparison literature also suggests that, for a given evaluative dimension, people often select (at least slightly) better performing targets for comparison, presumably to self-improve, but they may also make downward social comparisons, presumably to self-enhance (see Collins, 2000; Suls, Martin, & Wheeler, 2002; Suls & Wheeler, 2017; Wood, 1989, for discussions of the factors that determine comparison direction). Again, this work has typically involved comparisons of intellectual abilities or task performance as the evaluative dimensions and not comparisons of affluence. However, research investigating social comparison direction in workplace contexts suggests the possibility that people might make more upward than downward social comparisons of their financial outcomes (e.g., Brown, Ferris, Heller, & Keeping, 2007; Buunk, Zurriaga, Gonzalez-Roma, & Subirats, 2003; Michinov, 2005). For example, Brown et al. found that participants self-reported comparing themselves more frequently with co-workers who were better-off than coworkers who were worse-off. These studies, however, used measures that included items assessing comparisons along the surrounding dimensions (e.g., quality of supervision, working conditions) along with comparisons of financial status (e.g., salary), so whether people tend to make upward comparisons specifically of their financial outcomes is unclear. Similarly, Boyce, Brown, and Moore (2010) found that the effect of relative income on life satisfaction was better accounted for by a regression model in which upward comparisons were weighted more heavily than downward ones, but this work did not directly test whether people actually make such comparisons. Thus, in Study 1, we asked participants to rate the degree to which their target for comparison was better-off financially than themselves (dimension under evaluation) separately from their rating of target similarity (surrounding dimensions).

Separately gauging the perceived similarity and the comparative financial status of a target individual also allowed us to test whether personal relative deprivation arises most strongly when people are disadvantaged relative to similar than dissimilar others. That is, based on Festinger’s (1954) similarity hypothesis, we explored whether the positive relationship between perceived relative disadvantage and resentment with one’s relative financial status would be stronger among individuals who compare with others whom they perceive to be more similar than dissimilar in terms of their surrounding dimensions.

Drawing on equity theory (Adams, 1965; Austin, McGinn, & Susmilch, 1980; Crosby & Gonzalez-Intal, 1984), in our remaining studies we addressed some of the ambiguities around what it means to be “similar” or “dissimilar” to a comparison target in the context of social comparisons of affluence. Equity theory posits that people determine the fairness of their outcomes by comparing the ratio between their outcomes (e.g., income, possessions) and inputs (e.g., qualifications, skills) with the corresponding ratios of referent others. By this formulation, one could feel dissatisfied with their own salary if, for example, a coworker has the same salary as them but is less qualified or if a coworker has a higher salary than them but holds the same qualifications (i.e., “dissimilar” or “similar,” respectively, along the surrounding dimension of qualifications). Thus, whether one feels resentful about being financially worse off compared to

a referent other might depend on the particular ways in which the target is similar or not similar.

Using hypothetical (Studies 2–3b) and real (Studies 4–5b) social comparison situations, we examined the potential interactive effect of similarity and perceived relative disadvantage on resentment and dissatisfaction by manipulating both the evaluative (i.e., affluence) and surrounding (i.e., qualifications) comparative dimensions. As Crosby (1976) noted, “by definition, the sense of injustice is a part of relative deprivation” (p. 91). Feather (2015) similarly noted that “resentment ... is assumed to occur when another person’s positive outcome is perceived to be undeserved and when the self’s negative outcome is perceived to be undeserved” (p. 12). But recently researchers have often neglected to directly assess the role that perceptions of justice and fairness play in the experience of personal relative deprivation. Motivated by the observation that societal income inequality has been rising in the industrial world over the last few decades (Piketty & Saez, 2014; Solt, 2016), researchers have also primarily focused their efforts on the negative consequences of income inequality for the individual (e.g., Buttrick & Oishi, 2017; Callan, Ellard, Shead, & Hodgins, 2008; Canale et al., 2017; Greitemeyer & Sagioglou, 2017; Payne, Brownlannuzzi, & Hannay, 2017; Smith & Hou, 2014). As noted above, however, equity theory suggests that people may feel resentful even if their comparative target is just as well off financially as them (i.e., under conditions of income *equality*) insofar as they perceive that they are getting less than they deserve given their relative “inputs.” What potentially matters for the experience of personal relative deprivation, then, is the *perceived unfairness* of one’s relative standing rather than the equality of outcomes per se. Thus, in Studies 3a to 5b we assessed participants’ sense of unfairness along with resentment and dissatisfaction to test the mediating role that perceived unfairness plays in the effect of adverse social comparisons on resentment.

1 | SAMPLING

We recruited participants through Amazon’s Mechanical Turk for all studies. Across studies, the minimum required sample sizes were fixed ahead of data collection; however, the final sample sizes were not completely predetermined due to slight over-recruitment and the removal of some participants (e.g., for failing attention check questions; see below). Sensitivity power analyses showed that our samples had at least 80% power to detect “medium” effect sizes (e.g., $d = 0.55$ for the between-subjects t -tests in Studies 3a and 3b and $dz = 0.32$ for the within-subjects t -tests in Studies 5a and 5b; two-tailed, $\alpha = 0.05$). We report all measures, manipulations, and exclusions in these studies.

2 | STUDY 1

2.1 | Method

2.1.1 | Participants

For Study 1, we recruited 413 participants (63% male; $M_{\text{age}} = 33.65$, $SD_{\text{age}} = 10.26$) to complete an online survey. An additional 202

participants were not included in analyses due to duplicate IP addresses ($n = 18$), failing a basic attention check item (“Attention check, please select the ‘strongly disagree option’”; $n = 29$), or not following the instructions ($n = 155$; see below).

2.1.2 | Procedure and measures

Social comparison

In an online survey, we first asked participants to think of one individual with whom they usually compare themselves in terms of their financial circumstances, as follows:

At one time or another, most of us compare our material and financial situation with that of other people. We’d like you to think of one individual who you might usually compare yourself with in terms of your current material and financial circumstances.

Who is the first person that comes to mind? This individual can be anyone you like.

We asked participants to enter the initials of the person they identified (e.g., WS) in a text box.

Perceived similarity

On the next page of the survey, we asked participants to “think about how dissimilar or similar you are to this individual in terms of any dimensions, characteristics, or attributes other than your current material and financial situation.” They rated how dissimilar-to-similar they considered this individual to be to themselves (“In your own view, how dissimilar or similar are you to this individual?”) using an 11-point slider scale ($-5 = \textit{Extremely dissimilar to me}$, $+5 = \textit{Extremely similar to me}$). The target’s initials were “piped” into the slider scale (e.g., “WS is:”) using Qualtrics online survey software.

Similarity dimensions

On the subsequent page of the survey, participants then indicated using a text box what characteristics came to mind for them when they determined their rating of how dissimilar-to-similar they were to the individual they identified: “What dimensions, characteristics, or attributes of [initials] came to mind for you when you were determining your rating of how dissimilar to similar s/he is to you?”, where [initials] were the initials of the comparison target entered by the participant in the first part of the survey.

Comparison direction

On a new page, using a slider scale, participants rated the degree to which the individual they identified earlier in the survey was better off or worse off than them in terms of their current material and financial situation ($-5 = \textit{Extremely worse off than me financially}$, $+5 = \textit{Extremely better off than me financially}$). The target’s initials were again “piped” into the slider scale (e.g., “WS is:”).

TABLE 1 Descriptive statistics and intercorrelations for measures used in Study 1

Measures	M (SD)	1.	2.	3.	4.	5.
1. Perceived similarity	1.62 (2.46)	–				
2. Target is better off	1.81 (2.07)	–0.001	–			
3. Income (\$)	53,900 (39,312)	0.11*	–0.18**	–		
4. Afford to spend (\$)	28,362 (269,279)	0.07	–0.25**	0.43**	–	
5. PRD	3.38 (0.96)	–0.05	0.58**	–0.16**	–0.25**	–

Note. PRD = Personal Relative Deprivation. * $p < 0.05$; ** $p < 0.01$.

Personal Relative Deprivation Scale (PRDS)

We used a modified version of Callan, Shead and Olson's (2011) 5-item PRDS to measure how deprived participants felt compared to the individual they identified earlier in the survey. The PRDS has acceptable test-retest and internal reliability (Callan et al., 2015), and has been shown to be associated with theoretically relevant antecedents and consequences of higher personal relative deprivation, such as greater social comparison proclivity (Callan, Kim, & Matthews, 2015) and increased delay discounting (Callan et al., 2011). For this study, we programmed the items to be specifically about participants' comparative target rather than "other people" in general as for the original scale (e.g., "I feel deprived when I think about what I have compared to what [initials] has"). The five items were averaged to form a composite measure ($\alpha = 0.73$), with higher scores indicating greater personal relative deprivation.

Finally, participants indicated their annual household income given eight categories (*less than \$15,000*, *\$15,001–\$25,000*, *\$25,001–\$35,000*, *\$35,001–\$50,000*, *\$50,001–\$75,000*, *\$75,001–\$100,000*, *\$100,001–\$150,000*, and *greater than \$150,000*), their current access to money using an open-ended text box ("how much money in dollars do you have access to that you could use or spend in whatever way you pleased?"), and their age and gender.¹

2.2 | Results

2.2.1 | Content analysis of responses for similarity dimensions

A content analysis revealed that participants considered personal-ity (29%; e.g., "we're both introverted, soft-spoken"), jobs/career (21%; "we work in the same office"), age (22%; "we are around the same age"), and interests (22%; "our interests overlap a lot") as the most frequently mentioned surrounding dimensions for selection of comparison individuals. Participants often mentioned several comparison dimensions at once (e.g., "Our age, appearance, background, education, work, personal interests"), and the dimensions ranged broadly from hair color to religious beliefs. Although we specifically instructed participants not to make comparisons based on their current material and financial circumstances, a substantial number

of participants ($N = 155$, 27%) mentioned income, material possessions, or financial situation as one of their comparison dimensions. Given our focus on the *surrounding dimensions* for comparison, these participants were not included in subsequent analyses, but analyses including these participants resulted in the same conclusions.

2.2.2 | Perceived similarity and comparison direction

A one sample t -test revealed that participants on average chose individuals who were similar to themselves ($M = 1.62$, $SD = 2.46$, compared against the scale mid-point of 0), $t(412) = 13.36$, $p < 0.001$. Overall, a large majority of participants compared themselves with an individual whom they perceived to be like themselves (79% of the participants responded above the scale mid-point of 0). Likewise, a one sample t -test revealed that participants on average rated their chosen target as financially better off than themselves ($M = 1.81$, $SD = 2.07$, compared against the scale mid-point of 0), $t(412) = 17.73$, $p < 0.001$. Most participants compared themselves with an individual whom they perceived to be better off financially than themselves (74% responded above the scale mid-point).

2.2.3 | Perceived similarity as a moderator of the relation between comparison direction and PRD

Descriptive statistics and zero-order correlations among the measures are shown in Table 1.

We regressed personal relative deprivation onto social comparison direction (standardized), perceived similarity (standardized), and their cross-product interaction term. To control for participants' absolute wealth and access to money, we included annual household income and current access to money to spend as predictors. Here and throughout, we coded annual household income responses using the category mid-points, with the value for the open-ended highest category being the median-based Pareto curve estimator described by Parker and Fenwick (1983; see Matthews, Gheorghiu, & Callan, 2016). The measures of household income and access to money to spend were log transformed to improve normality and then standardized.

The moderated regression analysis revealed that access to money to spend, $b = -0.11$, $SE_b = 0.043$, $t(407) = -2.41$, $p = 0.016$, but not household income, $b = -0.01$, $SE_b = 0.043$, $p = 0.84$, accounted for unique variability in personal relative deprivation. More importantly, social

¹ Although we did not originally plan to do so, two reviewers asked that we test for gender effects. Exploratory analyses revealed no statistically significant main or interaction effects involving participant gender for any of our dependent measures across our studies.

comparison direction significantly predicted personal relative deprivation, $b = 0.54$, $SE_b = 0.041$, $t(407) = 13.19$, $p < 0.001$, such that perceiving a target as better off financially was associated with higher personal relative deprivation (cf. Kim et al., 2017). Neither the main effect of perceived similarity, $b = -0.05$, $SE_b = 0.039$, $t(407) = 1.21$, $p = 0.23$, nor the perceived similarity \times comparison direction interaction, $b = 0.04$, $SE_b = 0.034$, $t(407) = 1.22$, $p = 0.22$, achieved statistical significance.

3 | STUDY 2

In Study 1, participants on average identified a social comparison target whom they perceived as more similar than dissimilar. This finding is broadly consistent with previous social comparison research in other contexts (Suls & Wheeler, 2017), and underscores the importance people place on relatively local rather than general comparisons (Zell & Alicke, 2010). We also found that participants tended to select comparison targets who were financially better off, and this perceived relative disadvantaged correlated positively with personal relative deprivation.

Contrary to our expectations, perceived similarity of the target to the self did not significantly modulate the relationship between perceived relative disadvantage and personal relative deprivation. Although perceived similarity may, in fact, have little to do with the link between perceived relative disadvantage and resentment, it is notable that a large majority of our participants identified a target whom they perceived to be similar, at least compared against the mid-point of the scale. This range restriction may have dampened the potential for perceived similarity to moderate the effects of comparison direction, because we had relatively few participants identify a target who was dissimilar.

Another issue with Study 1 is the ambiguity around what it means to be “similar” or “dissimilar” to a comparison target on attributes that surround the dimension under evaluation (Goethals & Darley, 1977; Wood, 1989). Based on Festinger’s (1954) similarity hypothesis, we assumed that people would be less concerned about a highly dissimilar target being financially better off, but as we noted above there are likely situations where comparisons with dissimilar others may nonetheless cause resentment. For example, learning that a co-worker has a higher—or even the same—salary as you but is less qualified (e.g., less skilled, not as experienced) may invoke resentment. On the other hand, a person might feel sanguine about their relative financial disadvantage if their comparative target is more highly qualified. In both of these examples, the comparative target is “dissimilar” (worse or better qualified), but dissimilar in ways that make the perceiver feel more or less resentful.

What these examples highlight is the importance of perceived equity or merit, rather than “similarity” per se, in people’s appraisals of the appropriateness of their outcomes. Thus, although Study 1 revealed important evidence that people typically make upward comparisons of affluence and compare with similar others, the potential moderating role of “similarity” in the link between relative disadvantage and resentment is not so straightforward, because comparisons with similar and dissimilar others can both lead to resentment if one’s outcomes-to-inputs ratio does not match the corresponding outcomes-to-inputs ratio of one’s comparative target.

In Study 2, we examined whether the effect of perceived relative disadvantage on satisfaction with one’s financial outcomes depends on the relative qualifications (i.e., “inputs”) of the comparative target. To do so, we adopted an experimental approach where we factorially varied cues within a hypothetical workplace scenario such that the targets for comparison were worse, similarly, or better qualified (cf. Olson, 1986) and financially worse-off, similar to, or better-off (cf. van den Bos, van Veldhuizen, & Au, 2015) than the participants. For each of these 9 comparison scenarios, we assessed the degree to which participants believed they would be dissatisfied with their outcome compared to the target’s outcome.

3.1 | Method

3.1.1 | Participants

We recruited 88 participants (61 males; $M_{\text{age}} = 30.89$, $SD_{\text{age}} = 7.41$) to complete an online study. An additional 13 participants were excluded due to duplicate IP addresses ($n = 3$) or incorrectly answering one of two attention check items ($n = 10$; “Based on the scenario we provided, what is your position in the company?” and “Based on the scenario we provided, what degree did you earn?”).

3.1.2 | Procedure and measures

Participants first reported their age and gender. Next, for a “workplace context” study, we asked participants to respond to a simulated workplace scenario as though they were really experiencing the event described. Participants read:

Imagine that you are a Senior Sales Executive with a competitive salary at a large management consultancy firm. You earned your Master’s degree in Economics. Soon after completing your master’s degree, you received an offer for your current position. You have been working in the company for the last 3 years. You plan to stay with company [sic] for a while, and you have developed a good working relationship with the clients you have brought to the firm since you started.

Next, participants were reminded of their current qualifications (i.e., position, degree, and the number of years of experience) before reading:

One day, you received an email from someone in Human Resources that, after opening it, you realized wasn’t meant for you. In the email was a list of salaries for many of the employees at your company. You couldn’t help to notice that the salaries for several of your departmental co-workers were listed in the email.

One at a time, we then provided participants with descriptions of nine different coworkers who were listed in the email. We varied the

comparative salary and background qualifications of the co-workers in a fully within 3 (qualifications: lower, similar, higher) \times 3 (salary: worse, similar, better) design. The lower qualifications condition involved a person who just started working for the company as a Junior Sales Executive, had an undergraduate degree in Economics, and had a smaller client base. The higher qualifications condition involved a person who had worked for the company for 6 years, was a Chief Sales Executive, held a PhD in Economics, and had an extensive client base. The qualifications were matched in the similar qualifications condition (senior sales executive, master's degree, working for 3 years). We varied comparative salary by telling participants that the target individuals made \$10,000 more, \$10,000 less, or had the same salary as them.

All descriptions were gender-matched to the participants' self-reported gender, such that female participants were presented with all female co-workers and male participants with all male co-workers. For example, for the condition where the co-worker who was better qualified yet had a lower salary, self-identified female participants read: "Jennifer is your co-worker who has been working for the company for 6 years. She has a PhD in Economics and was recently promoted to Chief Sales Executive. She has developed an extensive client base for the company. In the email, you noticed that Jennifer makes \$10,000 less than you per year."

Participants rated the extent to which they felt dissatisfied-to-satisfied with their salary compared to each of the target coworker's salaries ($-4 = \text{Extremely dissatisfied}$ to $+4 = \text{Extremely satisfied}$) immediately after each description. To be consistent with Study 1, these ratings were rescaled so that higher values indicate higher levels of dissatisfaction. Participants completed nine questions in total, one for each of the comparison targets, which were presented in a random order across participants.

3.2 | Results

A 3 (qualifications: lower, similar, higher) \times 3 (comparative salary: worse, similar, better) fully within-subjects ANOVA revealed significant main effects of comparative salary, $F(1.72, 149.95) = 175.34$, $p < 0.001$, $\eta_p^2 = 0.67$, and qualifications of the comparative targets, $F(1.38, 120.20) = 184.74$, $p < 0.001$, $\eta_p^2 = 0.68$, on perceived dissatisfaction (degrees of freedom were Greenhouse-Geisser corrected). There was also a significant qualifications \times comparative salary interaction, $F(2.77, 240.68) = 33.28$, $p < 0.001$, $\eta_p^2 = 0.28$. As shown in Figure 1, the effect of comparative salary on participants' dissatisfaction was weaker when the target was better qualified, $F(1.54, 133.80) = 28.86$, $p < .001$, $\eta_p^2 = 0.25$, than similarly qualified, $F(1.93, 167.93) = 143.61$, $p < 0.001$, $\eta_p^2 = 0.62$, or had lower qualifications, $F(1.93, 168.03) = 135.50$, $p < 0.001$, $\eta_p^2 = 0.61$, than the participants. Of note, when qualifications were equal, participants were more dissatisfied when the target's salary was higher ($M = 1.90$, $SD = 1.32$) than the participant's than when it was the same as the participant's ($M = -1.11$, $SD = 1.42$), $t(87) = 14.62$, $p < 0.001$, $d_z = 1.56$. When the salaries were equal, participants were more dissatisfied when the target had lower qualifications ($M = 1.89$, $SD = 1.81$) than the same qualifications ($M = -1.11$, $SD = 1.42$), $t(87) = 13.09$, $p < 0.001$, $d_z = 1.40$. When qualifications were the same, participants reported more dissatisfaction when the target had the same salary ($M = -1.11$, $SD = 1.42$) vs. a worse salary ($M = -1.63$, $SD = 1.52$), $t(87) = 2.29$, $p = 0.024$, $d_z = 0.24$. When the salaries were equal, there was no significant differences in dissatisfaction between the similar ($M = -1.11$, $SD = 1.42$) and higher ($M = -1.42$, $SD = 1.84$) target qualifications conditions, $t(87) = 1.44$, $p = 0.154$, $d_z = 0.15$.

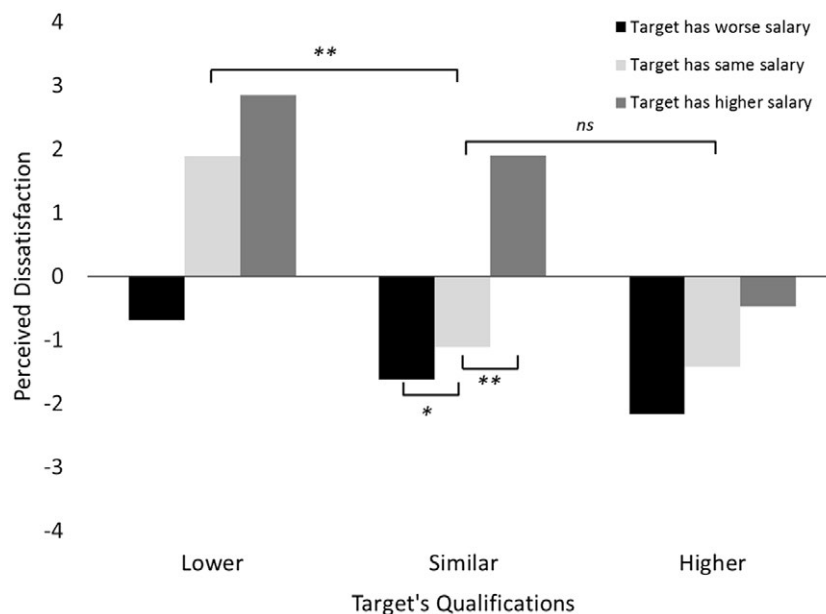


FIGURE 1 Participants' mean perceived dissatisfaction after making upward, lateral, and downward comparisons with targets who were either better, similarly or worse qualified than the participant in Study 2. *ns* = not statistically significant. * $p < 0.05$; ** $p < 0.01$

4 | STUDIES 3A AND 3B

In Study 2, the effect of comparative financial status on participants' dissatisfaction depended on the qualifications of the comparative targets. In Studies 3a and 3b, we examined in more detail the mediating role that perceived unfairness plays in the effect of comparative financial status on resentment. Using between-subjects designs, Studies 3a and 3b examined the role of perceived unfairness in two of the comparative contexts from Study 2: when the self and other had the same salary (income equality) but the target had lower or worse qualifications (Study 3a), and when the self and other had the same qualifications but the target had a higher salary (income inequality) (Study 3b). We expected that the reason why both income equality and income inequality might produce personal relative deprivation is because both of these contexts may be perceived as unfair given the surrounding attributes or "inputs" of the comparative targets (i.e., their qualifications).

4.1 | Method

4.1.1 | Participants

Participants were recruited to complete an online survey (Study 3a: $N = 105$, 64 males, $M_{\text{age}} = 37.41$, $SD_{\text{age}} = 12.37$; Study 3b: $N = 107$; 70 males; $M_{\text{age}} = 36.29$, $SD_{\text{age}} = 11.34$). In Study 3a, an additional eight participants were excluded due to duplicate IP addresses ($n = 3$) or failing one or both attention check items ($n = 5$; per Study 2). In Study 3b, an additional two participants were excluded for failing one or both attention check items, which were the same as for Study 2.

4.1.2 | Procedure and measures

The procedures for both Study 3a and 3b were similar to Study 2. The key difference was that we presented participants with only one of two targets for comparison (Michael or Sara for male or female participants, respectively). Specifically, in Study 3a, we fixed the comparative salary between conditions (i.e., the target earned the same salary as the participant) but varied between-subjects whether the target held the same or worse qualifications than the participant. In Study 3b, we fixed the target's qualifications between conditions (i.e., the target had the same qualifications as the participant) but varied between-subjects whether the target received the same or a higher salary than the participant.

Perceived unfairness and income satisfaction

Participants responded to the same measures across Studies 3a and 3b. Using two items, participants rated the degree to which they believed their comparative financial situation was less than they deserved: "I think it's unfair how much [Michael or Sara] makes per year compared to what I make" and "When I think about my salary compared to [Michael or Sara]'s salary, I feel like I am getting less than I deserve." Both items were rated

on a 6-point scale (1 = *Strongly disagree* to 6 = *Strongly agree*) and averaged to form a composite measure of perceived unfairness (r s between items for Studies 3a and 3b = 0.97 and 0.84, respectively, p s < 0.001).

Dissatisfaction

We used two items to measure salary dissatisfaction: "I feel dissatisfied with my salary compared to [Michael or Sara]'s salary" and "I feel resentful when I think about my salary compared to [Michael or Sara]'s salary" (1 = *Strongly disagree*, 6 = *Strongly agree*). Ratings were averaged to form a composite measure of dissatisfaction (r s between items for Studies 3a and 3b = 0.91 and 0.92, respectively, p s < 0.001).

4.2 | Results and discussion

4.2.1 | Study 3a

As shown in Table 2, participants who compared themselves with a "co-worker" with worse qualifications but who received an equal salary rated their current salary as being more unfair and felt more dissatisfied than those who compared themselves to a coworker with the same salary and qualifications.

Perceived unfairness and dissatisfaction were highly correlated ($r = 0.96$, $p < 0.001$). According to Smith et al.'s (2012) model (cf. Feather, 2015), the experience of PRD stems from a process whereby a person makes an adverse social comparison, believes themselves to be unfairly disadvantaged, and consequently feels resentful. We therefore tested the indirect effect of comparative qualifications on dissatisfaction through perceived unfairness using the quasi-Bayesian Monte Carlo method (5,000 simulations) with the "mediation" package (Tingley, Yamamoto, Hirose, Keele, & Imai, 2014; see Imai, Keele, & Tingley, 2010) in R (R Core Team, 2014). As shown in Figure 2 (upper panel), perceived unfairness significantly mediated the effect of comparative qualifications on dissatisfaction (indirect effect = 3.48, 95% Monte Carlo confidence interval [CI]: 2.94, 4.05; $p < 0.001$). Although this mediation pattern is consistent with Smith et al.'s model and past research (Callan et al., 2008), the results should be viewed with caution given the high correlation between perceived unfairness and resentment.

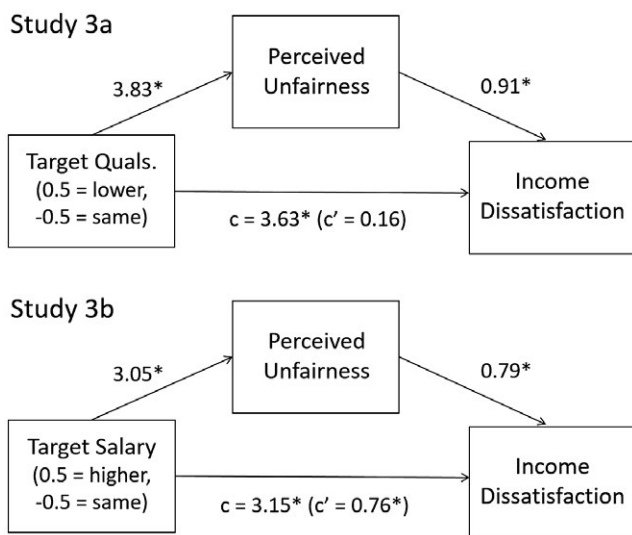
4.2.2 | Study 3b

As shown in Table 2, participants who compared themselves with a "co-worker" with similar qualifications but a higher salary rated their salary as more unfair and felt more dissatisfied than those who compared themselves to a coworker holding similar qualifications and receiving the same salary. Like Study 3a, perceived unfairness and dissatisfaction were highly correlated ($r = 0.94$, $p < 0.001$). As shown in Figure 2 (lower panel), perceived unfairness significantly mediated the effect of comparative salary on dissatisfaction (indirect effect = 1.20, 95% CI: 0.97, 1.45, $p < 0.001$).

TABLE 2 Effects of social comparisons on mean perceived unfairness and dissatisfaction for Studies 3a, 3b, 5a, and 5b

	Social comparison context			t_{df} [d or dz]
	Similar wealth/target worse qualifications	Similar wealth/similar qualifications	Target better off/similar qualifications	
Study 3a				
Unfair	6.21 (0.73)	2.39 (1.40)	-	$t_{78.79} = 17.64^{**}$ [3.43]
Dissatisfaction	5.98 (0.80)	2.36 (1.45)	-	$t_{81.10} = 15.88^{**}$ [3.09]
Study 3b				
Unfair	-	2.47 (1.21)	5.52 (0.94)	$t_{103.50} = 14.67^{**}$ [2.82]
Dissatisfaction	-	2.26 (1.14)	5.42 (0.97)	$t_{104.87} = 15.49^{**}$ [2.99]
Study 5a				
Unfair	3.75 (1.58)	2.79 (1.45)	-	$t_{79} = 4.89^{**}$ [0.55]
Dissatisfaction	3.49 (1.68)	2.93 (1.56)	-	$t_{79} = 2.64^*$ [0.30]
Study 5b				
Unfair	-	2.99 (1.23)	3.78 (1.39)	$t_{80} = 5.47^{**}$ [0.61]
Dissatisfaction	-	2.94 (1.43)	4.14 (1.41)	$t_{80} = 6.65^{**}$ [0.74]

Note. Standard deviations are shown in parentheses. Effect sizes are shown in brackets. Degrees of freedom for Studies 3a and 3b are Welch corrected. * $p < 0.01$; ** $p < 0.001$.

**FIGURE 2** Mediation models for Studies 3a and 3b. Values depict unstandardized regression coefficients. * $p < 0.05$

5 | STUDY 4

Across Studies 2, 3a, and 3b, we found consistent evidence that whether people feel dissatisfied with their financial outcomes depends on the background or surrounding attributes of the referent others, and this dissatisfaction correlates highly with perceived unfairness. One major limitation of these studies, however, is the hypothetical nature of the workplace scenario we used. Although these studies shed light on how norms of equity underpin personal relative deprivation, it was unclear whether we would observe similar patterns when people were asked to make real social comparisons of their actual financial circumstances. To this end, we

aimed to conceptually replicate our findings from Studies 2 to 3b by adapting our procedure from Study 1. Specifically, in Study 4, we asked participants to think of actual comparative targets that varied in terms of their relative financial circumstances (better off, similarly off, or worse off) and their background qualifications (lower, similar, higher).

5.1 | Method

5.1.1 | Participants

Participants were recruited to complete an online survey ($N = 116$; 63 males; $M_{age} = 35.11$, $SD_{age} = 10.15$; $M_{income} = \$48,027$, $SD_{income} = \$31,464$; 60% at least college graduation). An additional two participants were excluded due to duplicate IP addresses.

5.1.2 | Procedure and measures

Using a fully within-subjects 3 (qualifications) \times 3 (financial situation) design, we asked participants to think of nine comparison targets across varying levels of the target's qualifications (lower, similar, higher) and comparative financial situation (worse off, similar, better off). Participants identified and responded to their chosen comparative targets one at a time, with presentation order randomized for each participant. For example, in the similar qualifications/financially better off condition, participants read:

In this question, we'd like you to think of one individual that you know who is similar to you in many respects (e.g., roughly the same educational or vocational qualifications, years of experience, skill set,

motivation) and who is better off financially than you are. Who is the first person that comes to mind?

Like Study 1, participants were given a text box to provide the initials of their comparison target for each condition, and these initials were piped through to the items participants used to rate their perceived unfairness and dissatisfaction: "How unfair or fair do you believe your financial situation is compared to [initials]'s financial situation?" ($-4 = \textit{Extremely unfair}$ to $+4 = \textit{Extremely fair}$) and "How dissatisfied or satisfied are you with your financial situation compared to [initials]'s financial situation?" ($-4 = \textit{Extremely dissatisfied}$ to $+4 = \textit{Extremely satisfied}$). Responses were rescaled so that higher values indicate higher perceived unfairness and higher dissatisfaction.

Lastly, participants reported their annual income as per Study 1, their highest level of educational attainment given four categories (*did not finish high school, high school graduation, college graduation, postgraduate degree*; Kraus, Adler, & Chen, 2013), and their age and gender.

5.2 | Results

5.2.1 | Perceived unfairness

A 3 (qualifications: lower, similar, higher) \times 3 (comparative financial situation: worse off, similar, better off) fully within-subjects ANOVA revealed significant main effects of comparative financial situation, $F(1.94, 223.27) = 9.47, p < 0.001, \eta_p^2 = 0.08$, and qualifications of the comparative targets, $F(1.94, 223.01) = 7.91, p < 0.001, \eta_p^2 = 0.06$, on perceived unfairness. There was also a significant qualifications \times comparative financial situation interaction, $F(3.37, 387.17) = 19.54, p < 0.001, \eta_p^2 = 0.15$. As shown in Figure 3, the effect of comparative affluence on perceived unfairness was weaker

when the target was better qualified, $F(1.84, 211.48) = 2.70, p = 0.07, \eta_p^2 = 0.02$, than similarly qualified, $F(1.98, 227.27) = 16.48, p < 0.001, \eta_p^2 = 0.13$, or had lower qualifications, $F(1.95, 224.02) = 25.17, p < 0.001, \eta_p^2 = 0.18$, than the participants. Consistent with our Study 3 results, when qualifications were similar, participants perceived more unfairness when their chosen target was financially better off ($M = -0.06, SD = 1.88$) than when they had similar financial circumstances ($M = -1.21, SD = 1.84$), $t(115) = 5.32, p < 0.001, dz = 0.49$. When comparative affluence was equal, participants perceived more unfairness when their chosen target had lower qualifications ($M = 0.17, SD = 1.93$) than the same qualifications ($M = -1.21, SD = 1.84$), $t(115) = 6.06, p < 0.001, dz = 0.56$. When qualifications were similar, participants perceived more unfairness when their chosen target had a worse ($M = -0.33, SD = 1.75$) vs. the same financial situation ($M = -1.21, SD = 1.84$), $t(115) = 4.45, p < 0.001, dz = 0.41$. When the salaries were equal, participants perceived more unfairness when their target was better ($M = -0.55, SD = 1.69$) vs. similarly qualified ($M = -1.21, SD = 1.84$), $t(115) = 3.48, p = 0.001, dz = 0.32$.

5.2.2 | Dissatisfaction

A 3 (qualifications: lower, similar, higher) \times 3 (comparative financial situation: worse off, similar, better off) fully within-subjects ANOVA revealed significant main effects of comparative financial situation, $F(1.92, 220.85) = 76.80, p < 0.001, \eta_p^2 = 0.40$, and qualifications of the comparative targets, $F(1.96, 224.80) = 3.21, p = 0.043, \eta_p^2 = 0.027$, on dissatisfaction (see Figure 4).

There was also a significant qualifications \times comparative financial situation interaction, $F(3.78, 434.49) = 7.55, p < 0.001, \eta_p^2 = 0.062$. As shown in Figure 4, the effect of comparative salary on dissatisfaction was weaker when the target was better qualified,

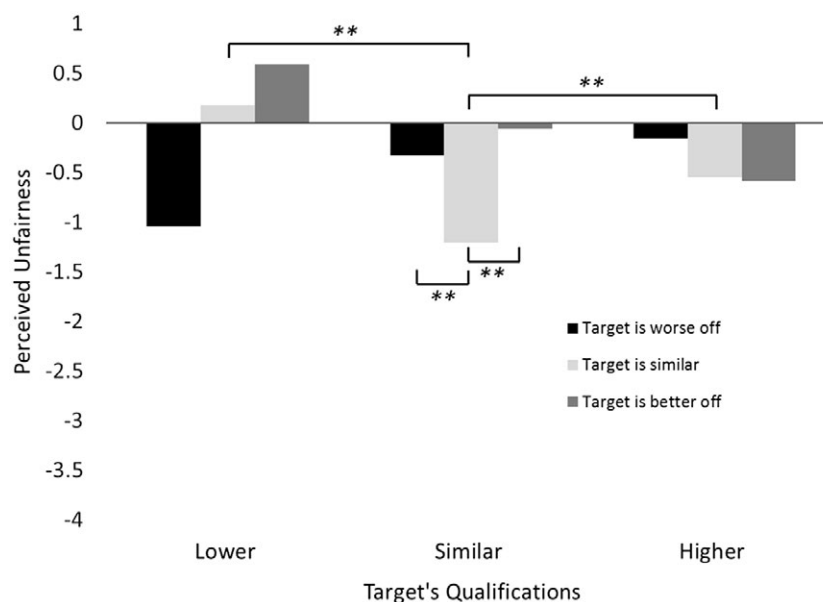


FIGURE 3 Participants' mean perceived unfairness after making upward, lateral, and downward comparisons with targets who were either better, similarly or worse qualified than the participant in Study 4. ns = not statistically significant. * $p < 0.05$; ** $p < 0.01$

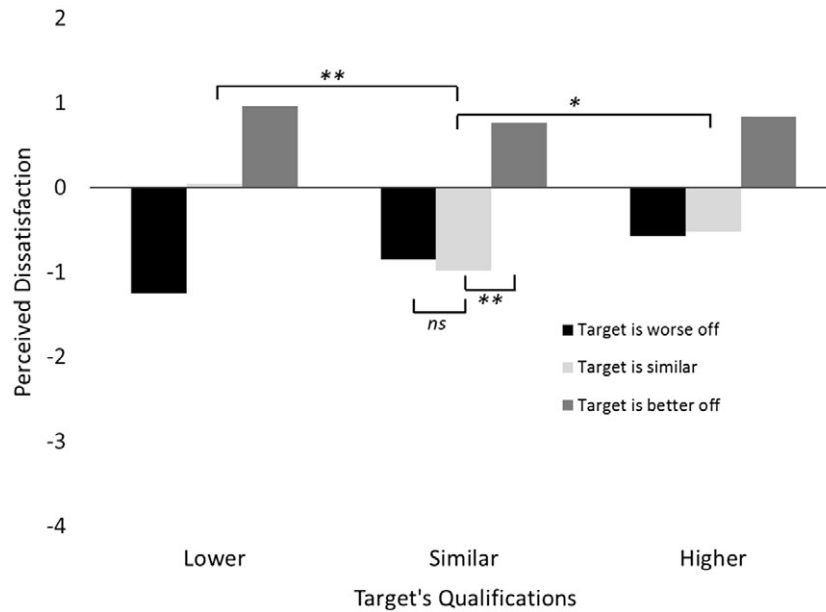


FIGURE 4 Participants' mean perceived dissatisfaction after making upward, lateral, and downward comparisons with targets who were either better, similarly or worse qualified than the participant in Study 4. *ns* = not statistically significant. * $p < 0.05$; ** $p < 0.01$

$F(2, 229.40) = 24.59, p < 0.001, \eta_p^2 = 0.176$, than similarly qualified, $F(1.90, 218.44) = 41.29, p < 0.001, \eta_p^2 = 0.26$, or had lower qualifications, $F(1.99, 229.30) = 48.86, p < 0.001, \eta_p^2 = 0.30$, than the participants. Like the effects for perceived unfairness, when qualifications were similar, participants were more dissatisfied when their chosen target was financially better ($M = 0.76, SD = 1.84$) vs. similarly off ($M = -0.98, SD = 1.90$), $t(115) = 7.66, p < 0.001, dz = 0.71$. When the comparative financial situation was equal, participants reported more dissatisfaction when their chosen target had lower ($M = 0.04, SD = 2.01$) vs. the same qualifications as them ($M = -0.98, SD = 1.90$), $t(115) = 4.63, p < 0.001, dz = 0.43$. When qualifications were similar, there was no significant difference in dissatisfaction when the participant's chosen target was financially similar ($M = -0.98, SD = 1.90$) or worse off ($M = -0.85, SD = 1.79$), $t(115) = 0.69, p = 0.49, dz = 0.06$. When the salaries were equal, participants were more dissatisfied when their target was better ($M = -0.53, SD = 1.96$) vs. similarly qualified ($M = -0.98, SD = 1.90$), $t(115) = 2.38, p = 0.02, dz = 0.22$.

6 | STUDIES 5A AND 5B

In Study 4, the effect of comparative financial status on participants' perceptions of unfairness and dissatisfaction depended on the qualifications of the comparative targets. Apart from a general tendency to report more dissatisfaction when the target was financially better off regardless of qualifications, these results are largely consistent with those of Study 2 using hypothetical comparisons. In Studies 5a and 5b, we again examined the mediating role of perceived unfairness in the comparative contexts we used in Studies 3a and 3b, but in these studies we asked participants to make real rather than hypothetical social comparisons of affluence.

6.1 | Method

6.1.1 | Participants

Participants were recruited to complete an online survey (Study 5a: $N = 80$; 49 males; $M_{age} = 32.40, SD_{age} = 9.58$; $M_{income} = \$50,628, SD_{income} = \$37,480$; 53% at least college graduation; Study 5b: $N = 81$; 44 males; $M_{age} = 32.99, SD_{age} = 10.96$; $M_{income} = \$50,994, SD_{income} = \$37,954$; 57% at least college graduation). For Study 5b, an additional 2 participants were excluded due to duplicate IP addresses.

6.1.2 | Procedure and measures

The procedures for both Studies 5a and 5b were similar to Study 4, except that participants responded to only two types of social comparisons. In Study 5a, we fixed the comparative financial situation between conditions (i.e., the target had similar financial circumstances as the participant) but varied within-subjects whether the self-identified target held the same qualifications or worse qualifications. In Study 5b, we fixed the target's qualifications between conditions (i.e., the target had similar qualifications to the participant) but varied within-subjects whether the target was financially better off or had similar financial circumstances ("...who is just as well off financially as you are").

After reporting the initials for each comparison target, participants completed the same measures of perceived unfairness and dissatisfaction we used in Studies 3a and 3b (i.e., two items for each construct, which were averaged within condition to form composite variables of each; r s between items were greater than 0.50 across conditions and studies). The order of presenting the social comparisons was counterbalanced across participants for each study.

6.2 | Results

6.2.1 | Study 5a

As shown in Table 2, participants reported more unfairness and greater dissatisfaction when they compared their financial situation with a target who was just as well off financially but had lower qualifications than a target who was just as well off financially but had the same qualifications.

Following the approach taken in Study 3a, we tested whether perceived unfairness mediated the effect of the social comparison manipulation on dissatisfaction. Given the nested structure of the data (i.e., the responses to the comparison targets were nested within participants), mediation analyses were performed using hierarchical linear regression with the “lme4” (Bates, Maechler, Bolker, & Walker, 2015) and “mediation” packages in R. As shown in Figure 5 (upper panel), perceived unfairness significantly mediated the effect of comparative qualifications on dissatisfaction (indirect effect = 0.87, 95% CI: 0.51, 1.23; $p < 0.001$).

6.2.2 | Study 5b

As shown in Table 2, participants who compared themselves to an individual with similar qualifications but a better financial situation perceived greater unfairness and felt more dissatisfied than participants who compared themselves to an individual with similar qualifications and similar income. As shown in Figure 5 (lower panel), perceived unfairness significantly mediated the effect of comparative financial situation on dissatisfaction (indirect effect = 0.69, 95% CI: 0.43, 0.96; $p < 0.001$).

7 | GENERAL DISCUSSION

In the present research, we integrated theoretical insights from social comparison and equity theories to test the role that perceived similarity of a comparison target plays in the experience of personal relative deprivation. Study 1 demonstrates that people typically make upward comparisons of affluence, and they compare with referent others whom they perceive to be more similar than dissimilar along dimensions that surround their financial outcomes. In Study 1, however, participants' perceived similarity with their chosen comparison target did not significantly modulate the relationship between perceived relative disadvantage and resentment. The results of Studies 2 to 5b point to one reason why: all else being equal, even comparisons of affluence with *dissimilar* others can cause resentment insofar as the perceiver deems such comparisons as unfair. Specifically, using both hypothetical and real social comparison contexts, we conceptually replicated previous relative deprivation research (e.g., Callan et al., 2008; Kim et al., 2017) by finding that people are generally more dissatisfied with their financial situation when their comparative targets are financially better off than they are (Studies 2, 3b, 4, and 5b). But we also found that when the comparative financial contexts were similar (i.e., under conditions of wealth equality), participants

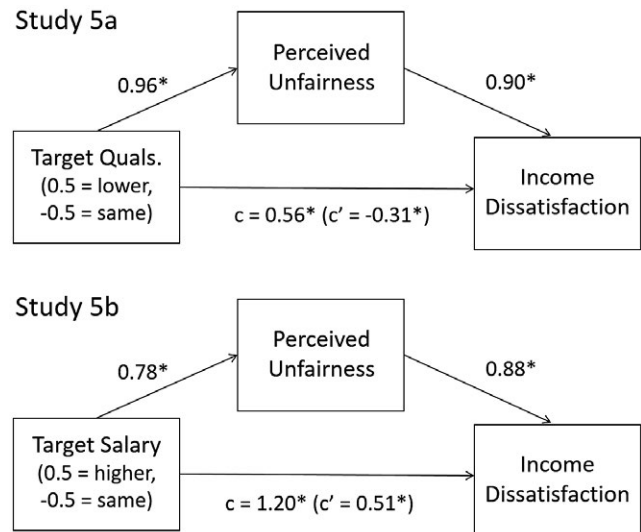


FIGURE 5 Mediation models for Studies 5a and 5b. Values depict unstandardized regression coefficients. * $p < 0.05$

were more dissatisfied when their targets for comparison had lower qualifications (Studies 2, 3a, 4, and 5a). In all of these cases, perceptions of unfairness mediated the effects of social comparison on dissatisfaction (Studies 3a, 3b, 5a, and 5b). Thus, one reason why perceived similarity might not have modulated the relation between perceived comparative disadvantage and resentment in Study 1 is that some participants might have compared with others they perceived to be *dissimilar* in ways that nonetheless elicited resentment (e.g., someone who was equally well off but had worse qualifications; cf. Studies 3a and 5a), hence serving to mitigate any potential interactive effect with generally perceived “similarity.”

Taken together, these findings have significant theoretical and applied implications. Our results support Smith et al.'s (2012; see also Crosby, 1976) model of the relative deprivation experience by highlighting the key role that perceptions of unfairness play in the link between adverse social comparisons and resentment with one's financial outcomes. Recently, there has been a great deal of research interest into the deleterious effects of income inequality for the individual, and our findings confirm that upward social comparisons of one's financial status can affect resentment. These studies, however, also serve to bolster the point that the perception that one is not getting what one deserves relative to others is a key determinant of resentment and dissatisfaction rather than the inequality of outcomes per se, because even comparisons under conditions of “income equality” can lead to resentment if people perceive equal financial outcomes as unfair. Thus, from a distributive justice perspective, comparisons with others who are similarly well off but who are not perceived to merit their equal standing could lead to the same negative outcomes for the individual that have been shown to be associated with resentment stemming from comparisons with referent others who are financially better off (e.g., ill-health, materialism, interpersonal aggression).

From a research methods standpoint, the current studies also contribute to the literature by developing and validating relatively

straightforward, adaptable, and easily administered manipulations of personal relative deprivation. Researchers interested in examining the consequences of personal relative deprivation have largely employed correlational, cross-sectional designs (e.g., Beshai et al., 2017; Callan et al., 2015). The manipulations we developed here could be used in further applied research to provide supporting causal evidence for these and other potential consequences of personal relative deprivation. For example, Callan et al. (2017) found that self-reported personal relative deprivation was negatively associated with prosociality, but causal evidence for this link is lacking. Indeed, personal relative deprivation could lead people to be less generous to others as Callan et al. (2017) proposed, but being generous to others (e.g., by donating money to charity) could also lead to personal relative deprivation insofar as expending resources in this way affects one's relative financial position. Using the manipulations we developed here, future researchers could examine how invidious social comparisons within the workplace, for example, might reduce people's willingness to engage in organizational citizenship behaviors (for a review, see LePine, Erez, & Johnson, 2002), such as whether a person might be less prosocial toward a work colleague (e.g., willingness to cover their shift) in the conditions we found to elicit a sense of unfairness and dissatisfaction.

Limitations of the current studies should also be considered in future research. First, we focused on contexts where equity and equality were particularly relevant to people's experiences of personal relative deprivation (e.g., varying qualifications in the workplace), but these are not the only principles people use to evaluate the fairness or unfairness of the allocations of outcomes. Indeed, in some situations people rely on need rather than equity or equality as a basis for deciding the fairness of outcomes, such as in familial relationships (Deutsch, 1975; Lerner, 1975). The degree to which the results of these studies apply in situations where concerns about the needs of a comparative target are salient remains to be investigated. Second, we relied on samples from Amazon's Mechanical Turk. Although MTurk participants are more demographically diverse than traditional undergraduate psychology student samples, Paolacci and Chandler (2014) noted that they are not representative of the general population and might not always be fully attentive. We limited the latter concern by removing participants who were clearly not attending to the materials. Nonetheless, future research should consider extending our findings using samples that are more representative.

Finally, across studies we asked participants to select and respond to one-off, individual social comparisons. In daily life, however, social comparisons often occur in dynamic, ongoing social relationships with multiple targets at once. Moreover, social norms that limit discussing one's finances with others, or pay secrecy policies in the workplace (Rosenfeld, 2017), may affect how much people can be aware of their relative financial status in the first place. We also focused on upward social comparison contexts that tended to elicit resentment, but not all upward social comparisons necessarily lead to negative affect—sometimes upward comparisons may elicit positive feelings through upward assimilation (i.e., feeling positive because one may improve to become more like their better off target; see

Buunk & Ybema, 1997). Thus, although we found consistent evidence that one-off adverse social comparisons can produce a sense of unfairness and resentment, we know little about how the processes we examined in the current research might play out over repeated encounters with multiple social comparison targets (see Gartrell, 2002).

8 | CONCLUSIONS

The goal of the current research was to examine several issues related to the role of perceived similarity in the experience of personal relative deprivation. We found that people tend to make social comparisons of affluence with targets they perceive to be more similar than dissimilar along dimensions and attributes that surround their financial status, and they typically select targets for comparison who are financially better off. We also addressed some of the ambiguities around what it means to be "similar" or "dissimilar" to a comparison target in the context of making social comparisons of affluence. There is not a straightforward link between perceived similarity of a comparison target and personal relative deprivation, because being both similar and dissimilar to a target (vis-à-vis background qualifications or "inputs") can cause resentment depending on whether the person perceives the comparative context as unfair.

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