The Gap Between Us: Income Inequality Reduces Face-to-Face Social Capital

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Abstract

Guided by correlational work suggesting that income inequality is associated with deleterious societal outcomes (e.g., reduced trust, increased violence), in the present investigation we tested the hypothesis that increased inequality between individuals will reduce social capital—defined in terms of affiliative intent and social warmth—within face-to-face interactions. In two experiments (total $N = 469$), we examined the effects of income inequality and social power on several key indices of social capital using a semi-structured interaction between participant and confederate. In both studies, the two individuals were randomly assigned to a low- or high-power role and compensated either mildly or extremely unequally. Overall, we demonstrated that greater inequality produced more negative emotional responses, reduced desire to affiliate with one's partner, harsher evaluations of one's partner, and lower observer ratings of behavioral warmth. Our results help to illuminate the proximal, psychological processes through which income inequality worsens societal well-being.

Keywords: income inequality, social capital, social power, social perception, affiliation

Income inequality has skyrocketed in the past 40 years in the United States and become a defining feature of the country's social organization (e.g., Atkinson, Piketty, & Saez, 2011). Understanding the psychological effects of inequality has become a major focus in the social sciences (Kawachi & Kennedy, 2002). Epidemiological, health, and laboratory data are revealing that income inequality is associated with societal problems, including higher rates of mental illness and imprisonment, as well as poorer educational performance and life expectancy (Wilkinson & Pickett, 2009).

A number of scholars have posited causal relationships between inequality and negative societal outcomes, arguing that inequality[1] changes how individuals think, feel, and behave in ways that produce these outcomes (e.g., Kawachi & Kennedy, 2002; Payne, Brown-Iannuzzi, & Hannay, 2017; Wilkinson & Pickett, 2017). Evidence concerning how inequality produces such effects, though, is scarce. One prominent hypothesis is that the poorer health and well-being seen in unequal societies are the result of breakdowns in social capital (Wilkinson & Pickett, 2009). Social capital refers to factors that contribute to the effective functioning of social groups and interpersonal relationships, including trust, affiliative intent, and warmth felt and expressed toward others (e.g., Adler & Kwon, 2002; Putnam, 2001). Causal evidence linking inequality to diminished social capital is, however, lacking. Accordingly, we conducted two experiments aimed at testing the overriding hypothesis that income inequality reduces social capital.

The Social Correlates of Income Inequality

Various strands of correlational evidence for this hypothesis exist. For example, studies suggest that inequality covaries with the belief that others cannot be trusted (Elgar & Aitken, 2011; Kawachi, Kennedy, Lochner, & Prothrow-Stith, 1997; Neville, 2012), as well as increased endorsement of stereotypes pertaining to warmth and competence (Durante et al., 2013). That

perceptions related to trustworthiness, warmth, and competence have been linked to inequality is noteworthy, as these dimensions are considered core aspects of social cognition and damage social capital in myriad ways (Cuddy, Fiske, & Glick, 2007; Fiske, Cuddy, & Glick, 2007; Fiske, Cuddy, Glick, & Xu, 2002; Leach, Ellemers, & Barreto, 2007).

Inequality-related reduced trust and increased stereotyping likely erode social capital at the level of routine, face-to-face interactions, leading individuals to behave less warmly and prosocially. Consistent with this, residents of more unequal compared to equal states are, on average, lower in self-reported agreeableness (de Vries, Gosling, & Potter, 2011)—a personality trait marked by inclinations toward friendship and behaviors aimed at facilitating amiable interactions (Funder & Sneed, 1993).

More broadly, such negative beliefs and behaviors coalesce in a reduced desire to affiliate with others. For example, in more unequal societies and neighborhoods, membership in social groups and perceptions of social support are lower (Alesina & La Ferrara, 2000; Mackenbach et al., 2017). These correlates of income inequality are critical, as reduced trust and affiliation are presupposed to be proximal mechanisms driving inequality's pernicious influences upon societal health and well-being (e.g., Wilkinson & Pickett, 2009; 2017). In this vein, it is perhaps unsurprising that those residing in more unequal societies suffer reductions in well-being (Oishi, Kesebir, & Diener; 2011).

In addition to being primarily correlational in nature, the growing literature on the social costs of income inequality has focused on neighborhoods, counties, states, and nations. Very little work has examined how inequality influences social capital between individuals in face-to-face interactions. In the present investigation, we examined the extent to which inequality

influences fundamental facets of social capital—affiliative attitudes and behavior, perceptions of others, and emotional responses—specifically within the context of face-to-face interactions.

Does Inequality *Cause* Declines in Social Capital?

Although very few experiments have directly examined the causal impact of income inequality on social interactions, some indirect evidence for inequality's causal role in impoverishing social capital exists. In one study, the authors manipulated perceptions of the extent of income inequality in participants' home states and found that perceiving high inequality led to reduced generosity, albeit only among high-income respondents (Côté, House, & Willer, 2015). In other work, groups of participants playing public goods games under conditions where people received unequal allocations each round displayed reduced coordination and less interconnectedness among players compared to those receiving equal allocations (Tavoni, Dannenberg, Kallis, & Loschel, 2011), particularly when participants' wealth was visible to other players (Nishi, Shirado, Rand, & Christakis, 2015).

In the present investigation, we extended these studies involving economic games played with anonymous others by testing whether income inequality reduces social capital in the context of face-to-face interactions. Drawing upon recent analyses of social cognition and emotion (e.g., Fiske et al., 2007; Keltner & Haidt, 1999), and in line with the social correlates of inequality described above, we operationalized social capital in terms of: (1) affiliative desire; (2) the distribution of positive and negative emotion (e.g., gratitude vs. anger); (3) perceptions of others' warmth, competence, and trustworthiness; and (4) trust-building interpersonal behaviors (e.g., warm smiles, affirmative utterances). Across indices, we expected income inequality to reduce face-to-face social capital.

The Present Research

Across two experiments, participants from nationwide and university samples had a semi-structured interaction with a confederate that simulated a common workplace encounter between a boss and a subordinate. We manipulated level of income inequality between the participant and confederate and obtained both self-report and behavioral measures of social capital. Experiment 1 used an online instant message chat platform to examine inequality's effects on the self-reported desire to affiliate with one's interaction partner. Experiment 2 used an online video chat platform in which we also gathered new self-report measures (e.g., self-reported emotions) and behavioral outcomes (e.g., observer ratings of warmth). Across experiments, we tested the following hypotheses:

Hypothesis 1: Greater inequality decreases positive emotion (e.g., joy, gratitude).

Hypothesis 2: Greater inequality reduces the desire to affiliate with one's partner.

Hypothesis 3: Greater inequality increases negative evaluations of one's partner along fundamental dimensions of social perception (e.g., competence).

Hypothesis 4: Greater inequality reduces behaviorally-expressed interpersonal warmth.

Inequality entails differences in resources and, by implication, differences in social power, which are rooted in resources and control (Fiske, 1993; Keltner, Gruenfeld, & Anderson, 2003). This raises the question of whether the effects of inequality are reducible to power, a question we were able to examine within our experiments through the incorporation of a manipulation of role power.

Experiment 1

Method

Participants. A total of 199 participants (90 female, 109 male) participated via Amazon's Mechanical Turk in exchange for $5 plus a variable bonus payment (see Procedure

below). Eight were excluded from all analyses: three due to technical errors which prevented them from completing the interaction with the confederate, and five due to failing attention checks (described below). Participants were randomly assigned to one of four conditions in a 2 (power: low vs. high) × 2 (inequality: low vs. high) between-subjects design. Participants were run individually but were led to believe that the confederate with whom they interacted during the study was another participant.

Our target sample size was determined using an a priori power analysis which assumed a small to medium effect size (characteristic of most social psychological findings). Specifically, with an assumed *f* of 0.17, our between-subjects design with four cells could achieve 80% power to detect our hypothesized main effect of inequality with as few as 157 participants. Given this was our first attempt at facilitating a live interaction with MTurk participants, we aimed for 200 participants, thereby allowing room for exclusions due to technical difficulties.

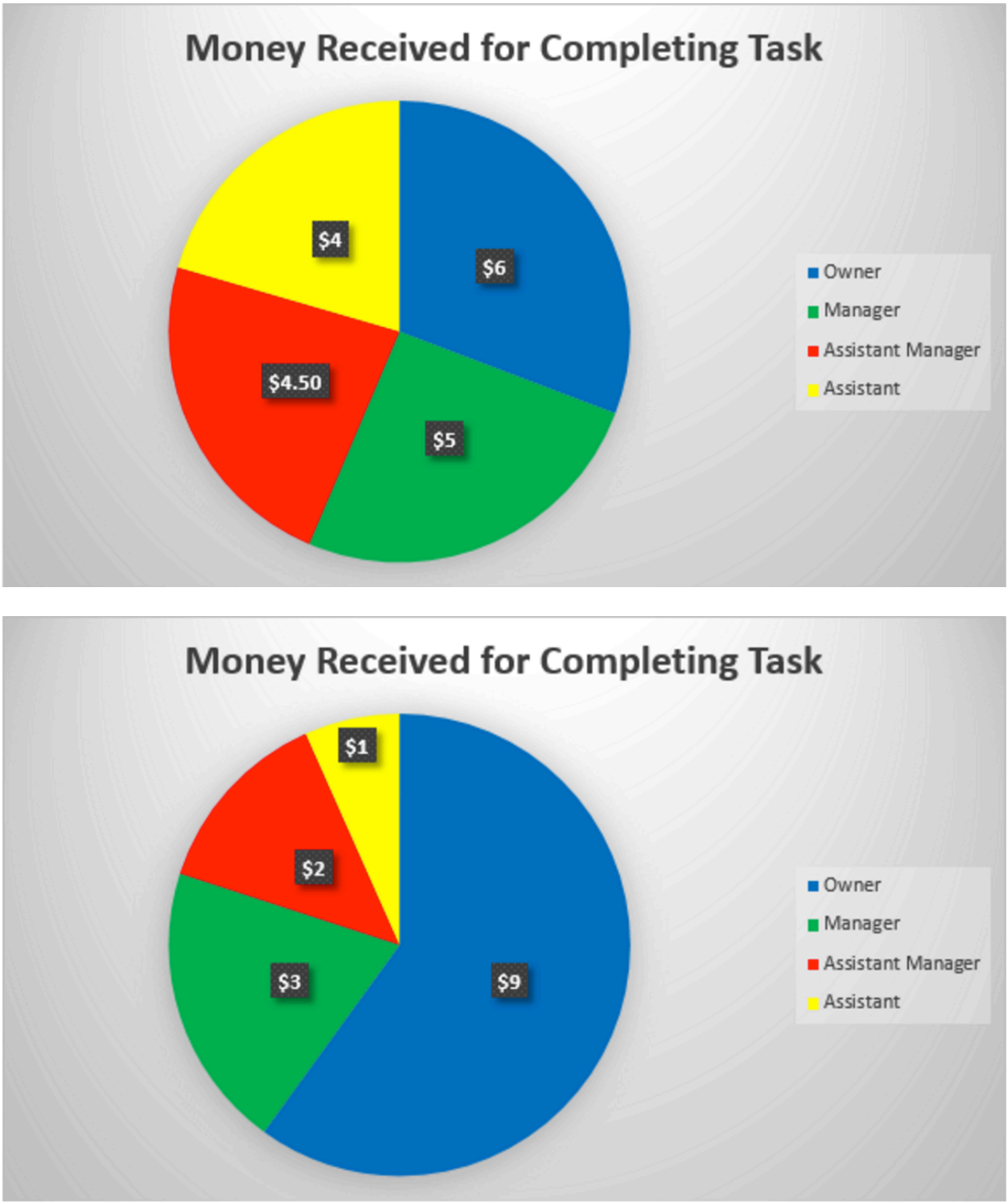
Procedure. Both studies reported herewith were approved by the Committee for Protection of Human Subjects at the University of California, Berkeley. Participants accessed Experiment 1 via a Qualtrics survey link on the MTurk page. The study was conducted entirely online and all interactions took place using a free, anonymous video chat platform hosted by Gruveo (www.gruveo.com), which allows for instant message chat between two individuals. The video chat window was embedded into the Qualtrics survey, so participants could remain in the same browser window for the entire study.

Participants were told the study would involve role-playing an interaction between two individuals running an art gallery, and they would take part in an online instant message chat with another participant (actually a confederate). After verifying that eligibility criteria were met

(e.g., that participants were using Google Chrome or Mozilla Firefox as their web browsers), participants were disconnected from the experimenter.

Participants then completed demographic items, after which they were given information that constituted our manipulations. They were told that they would be randomly assigned to one of four roles: Assistant, Assistant Manager, Manager, or Owner. In reality, participants were assigned to play either the Assistant (*low-power condition*) or Owner (*high-power condition*). They also received information about the 'wage' they would be paid, which constituted our manipulation of income inequality. In the *low-inequality condition*, participants were told that the Assistant would earn $4 whereas the Owner would earn $6. In the *high-inequality condition*, they were told that the Assistant would earn $1 whereas the owner would earn $9. This information was presented in text and in a pie chart to help participants visualize the extent to which payments were unequal (see Fig. 1). Participants were actually paid these bonus payments upon study completion.

Fig. 1. Pie charts presented to participants in the low inequality (top) and high inequality (bottom) conditions in both experiments to explain payment structure. All participants were assigned to either the Owner (highest income) or Assistant (lowest income) roles.



Participants were then given the role-play instructions (adapted from Chen, Langner, & Mendoza-Denton, 2009). They were told that they and their partner would view five paintings, discuss each one via instant message, and select one to feature in their gallery. Participants were led to believe that their partner was of the same gender as themselves by using gender-matched pronouns in the instructions (given that the chat took place via instant message and the participant and confederate could not see each other, the two were not necessarily gender-matched in reality). After receiving additional instructions designed to reinforce the power manipulation (e.g., the Owner would be evaluating the Assistant for a possible promotion) and to ensure that the technical aspects of the study were working properly, participants were connected with the confederate and completed the task. Confederates, who were naive to participants' inequality condition, adhered to a set of guidelines for each power-based role (e.g., waiting for the participant to initiate discussion and voicing tentative responses when playing the Assistant, always initiating discussion and stating opinions confidently when playing the Owner).

After selecting a painting, the discussion was ended, and participants were reminded of how much they and their partner earned for completing the task. They then completed attention-check items that asked them in a multiple-choice format what roles they and their partner were assigned to, as well as how much each person earned. Finally, they completed our key dependent measures, and then were debriefed and thanked.

Measures.

Desire for affiliation. Participants completed a five-item scale assessing their desire to affiliate with their partner (e.g., "I would like to get to know my partner better," van Kleef et al., 2008). Participants responded to each item using a 1 (*strongly disagree*) to 7 (*strongly agree*) Likert scale ($M = 4.29$, $SD = 1.28$, $\alpha = 0.94$).

Trait ratings. Participants indicated the extent to which the confederate possessed a series of six personality traits indicative of warmth (e.g., caring) and six indicative of competence (e.g., capable; Yzerbyt, Kervyn, & Judd, 2008). Responses to each set of six items were made on a 1 (*not at all*) to 7 (*a whole lot*) scale, and then were summed and averaged to form warmth ($\alpha = 0.86$) and competence ($\alpha = 0.91$) indices ($M = 5.39$, $SD = 1.25$).

Interpersonal trust. Lastly, participants completed a 5-item scale assessing the extent to which they felt that they could trust their partner (e.g., "I would trust my partner completely"; adapted from Larzelere & Huston, 1980). Responses were given on a 1 (*strongly disagree*) to 7 (*strongly agree*) Likert scale ($M = 4.47$, $SD = 1.19$, $\alpha = 0.84$).

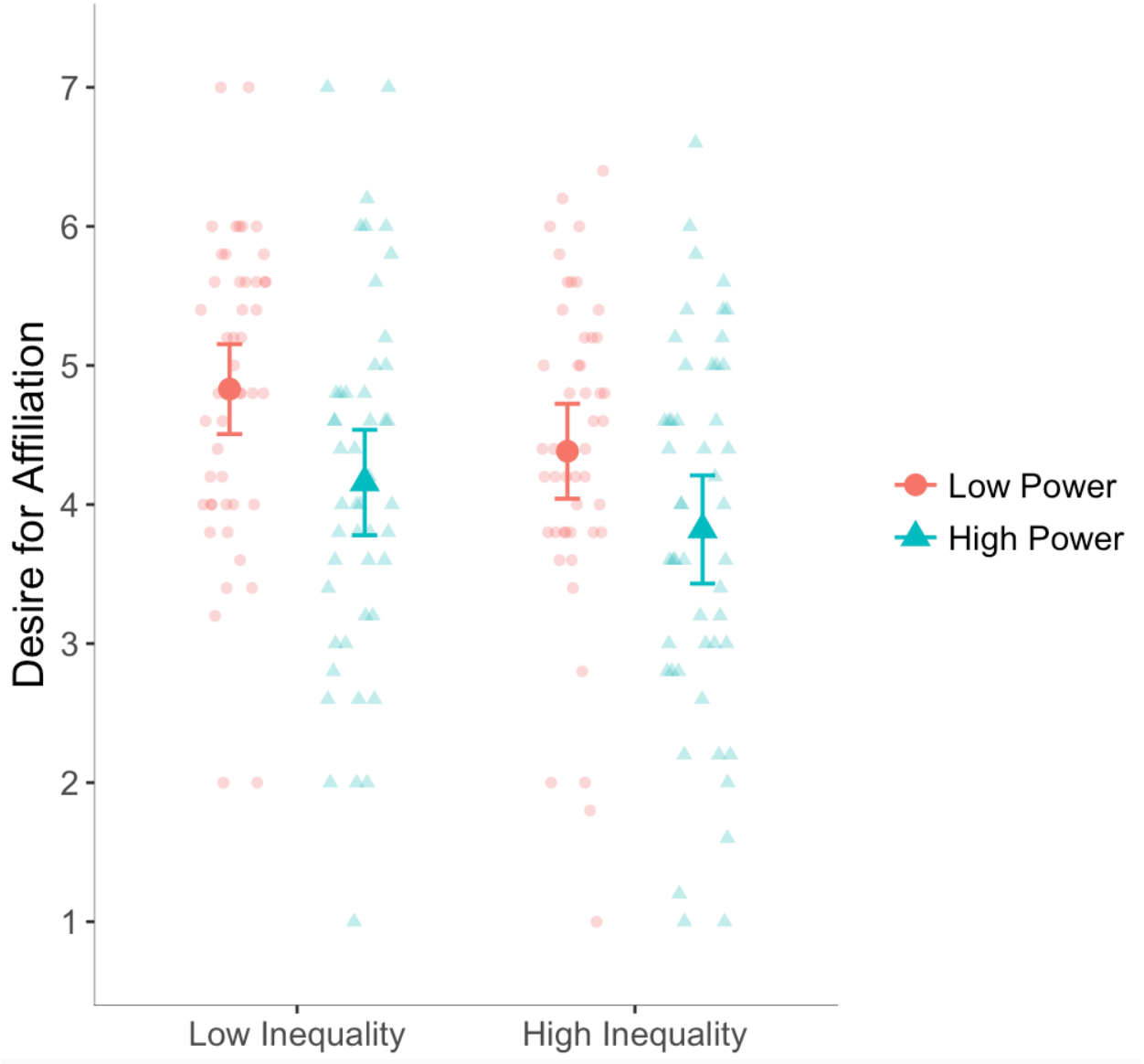
Results

We analyzed each dependent measure using a 2 (power) × 2 (inequality) analysis of variance (ANOVA).

Desire for affiliation. We found a significant power effect with participants in the high-power condition ($M = 3.99$, 95% CI = [3.74, 4.24]) reporting less affiliative intent than those in the low-power condition ($M = 4.61$, 95% CI = [4.36, 4.86]), $F(1, 187) = 11.88$, $p = .001$, $\eta^2 = .060$, 90% CI = [.016, .122]. This fits prior work showing that individuals in high-power positions display less prosocial tendencies compared to their lower-power counterparts (e.g., Magee & Smith, 2013).

More importantly, we found a significant inequality effect, such that participants in the high-inequality condition ($M = 4.10$, 95% CI = [3.85, 4.35]) reported less of a desire for affiliation than those in the low-inequality condition (see Fig. 2; $M = 4.49$, 95% CI = [4.24, 4.74]), $F(1, 187) = 4.80$, $p = .030$, $\eta^2 = .025$, 90% CI = [.001, .073]. The power × inequality interaction was not significant, $F(1, 187) = 0.09$, $p > .250$, $\eta^2 = .001$, 90% CI = [0, .017].

Fig. 2. Results from Experiment 1: Desire for affiliation as a function of power and inequality conditions. Higher scores on the y-axis indicate greater desire to affiliate. The small symbols indicate individual scores on our measure of affiliative desire. The large symbols indicate the means for each cell in our 2 × 2 design; error bars represent 95% confidence intervals.



Trait ratings

Warmth. We found a significant power effect, with high-power participants (M = 5.15, 95% CI = [4.93, 5.37]) perceiving their partner to be less warm than did their low-power counterparts (M = 5.63, 95% CI = [5.41, 5.85]), $F(1, 187) = 9.41$, $p = .002$, $\eta^2 = .048$, 90% CI = [.010, .106]. This result complements evidence that individuals in high- relative to low-power positions deliver harsher judgments of others' (e.g., Wiltermuth & Flynn, 2013).

Consistent with our overriding social-capital hypothesis, we also observed an inequality effect—participants in the high-inequality condition (M = 5.25, 95% CI = [5.03, 5.47]) perceived their partner to be less warm than did those in the low-inequality condition (M = 5.53, 95% CI = [5.31, 5.75]). However, this effect was only marginally significant, $F(1, 187) = 3.24$, $p = .073$, $\eta^2 = .017$, 90% CI = [0, .059]. The power × inequality interaction was not significant, $F(1, 187) = 0.16$, $p > .250$, $\eta^2 = .001$, 90% CI = [0, .020].

Competence. We found a significant power effect, with high-power participants (M = 4.90, 95% CI = [4.67, 5.13]) viewing their partner as less competent than did their low-power counterparts (M = 5.89, 95% CI = [5.65, 6.12]), $F(1, 186) = 35.16$, $p < .001$, $\eta^2 = .159$, 90% CI = [.086, .237]. As with the results for partner warmth, this finding fits prior work on power (e.g., Wiltermuth & Flynn, 2013), though the size of this effect was likely exaggerated by the extreme (scripted) submissiveness of the confederate in the high-power condition, fueling perceptions of incompetence.

We did not find a significant inequality effect on perceptions of partner competence, $F(1, 186) = 2.50$, $p = .116$, $\eta^2 = .013$, 90% CI = [0, .053], though the means fell in a direction consistent with our social-capital hypothesis (i.e., high-inequality participants rated their partner

as lower in competence relative to low-inequality participants). The power × inequality interaction was not significant, $F(1, 186) = 0.45$, $p > .250$, $\eta^2 = .002$, 90% CI = [0, .027].

Trust. There were no significant effects of either power, $F(1, 185) = 1.28$, $p > .250$, $\eta^2 = .007$, 90% CI = [0, .040], or inequality, $F(1, 185) = 2.24$, $p = .136$, $\eta^2 = .012$, 90% CI = [0, .050], though the latter result again trended in a direction fitting our social-capital hypothesis. The power × inequality interaction was also not significant, $F(1, 185) = 0.65$, $p > .250$, $\eta^2 = .004$, 90% CI = [0, .031].

Discussion

Overall, Experiment 1 demonstrated that increasing the income gap between a high- and low-power individual decreased participants' desire to affiliate with their partner, thus providing initial support for our hypothesis that greater inequality between individuals reduces face-to-face social capital. Experiment 1, though, was limited in several ways. First, we relied exclusively on self-report measures. Moreover, though participants in the high-inequality condition perceived their partner to be less warm, competent, and trustworthy than their low-inequality counterparts, these results did not reach statistical significance. This was perhaps due to the limited exposure participants had to the confederate, as the interaction took place over instant message chat and confederates only gave brief, largely scripted answers.

To address these limitations, Experiment 2 used a video chat platform instead of instant message, with the aim of creating a more socially-engaging interaction between the participant and confederate. This platform also gave us video recordings of the interactions that we could code for behavioral indicators of social capital (i.e., expressions of warmth), thereby allowing us to test if inequality's effects extend to perceivable behaviors that are essential to the formation of affiliative bonds (e.g., Bachorowski & Owren, 2001; Kogan et al., 2011). Finally, we gathered

self-reported emotion to ascertain whether inequality reduces positive emotion, as found in correlational studies (Oishi et al., 2011). Building upon Experiment 1's results, we hypothesized that participants in the high-inequality condition would report a reduced desire to affiliate with their partner, less positive emotions, and more negative partner perceptions. Finally, we hypothesized that greater inequality would lead to less behavioral warmth (e.g., smiles)—a finding that would represent the first empirical demonstration of inequality's impact on observable interpersonal behavior.

Experiment 2

Method

Participants. A total of 262 undergraduates at the University of California, Berkeley (152 female, 110 male) participated via the Berkeley Experimental Social Science Laboratory in exchange for $7 plus a variable bonus payment. Eight were excluded from all analyses: four due to technical errors and five due to failing attention checks (described below). As in Experiment 1, participants were randomly assigned to one of four conditions in a 2 (power: low vs. high) × 2 (inequality: low vs. high) between-subjects design.

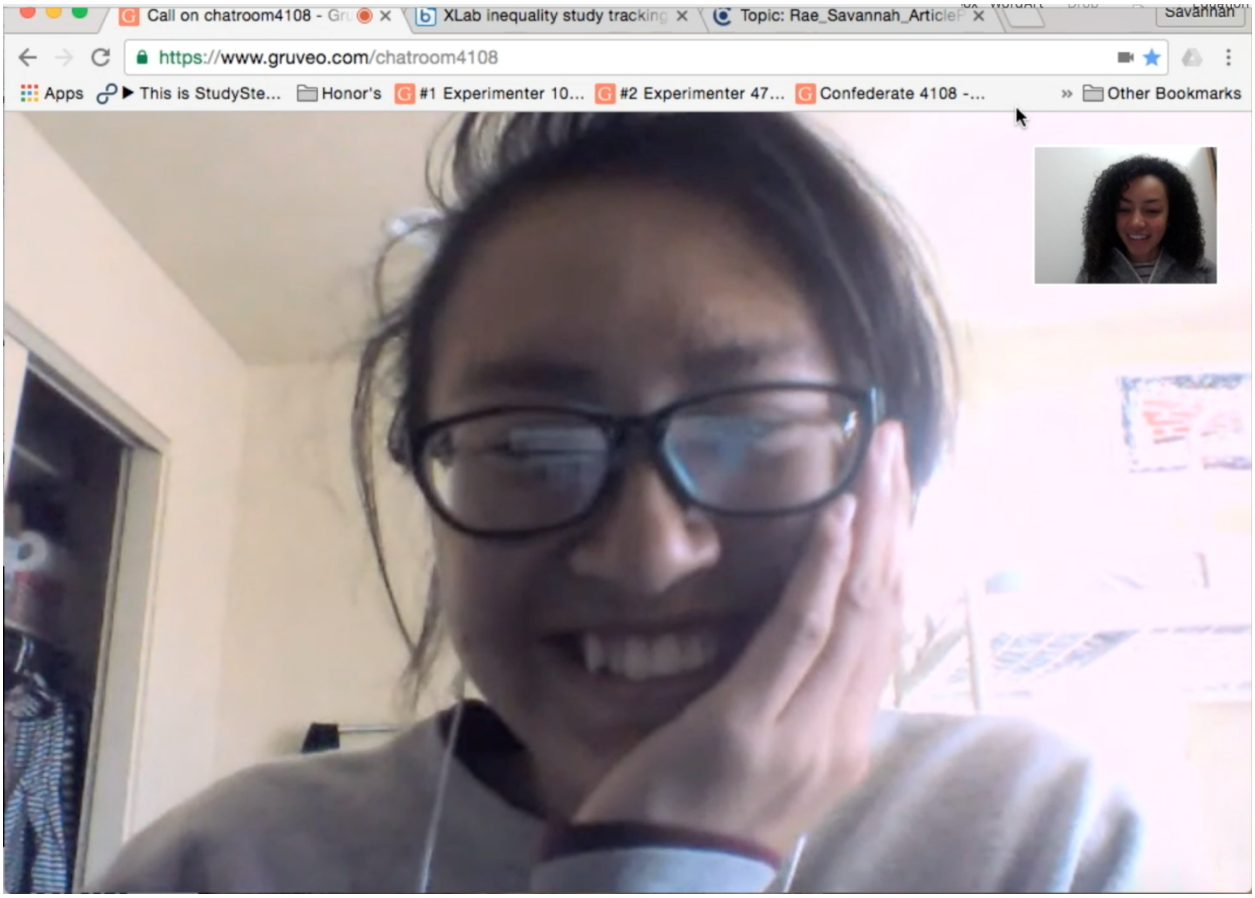
To determine our target sample size, we aggregated the effects of our inequality manipulation on our four dependent measures in Experiment 1, which yielded an f of 0.14. Based on this, our 2 × 2 between-subjects design could achieve 80% power to detect our hypothesized main effects of inequality with as few as 231 participants. Similar to Experiment 1, we aimed for a larger sample of 260 participants to leave ample room for exclusions due to technical issues.

Procedure. Participants accessed the survey in the same way as in Experiment 1 and received the same instructions and manipulations (Chen et al., 2009). In Experiment 2, participants interacted with confederates via live face-to-face video chat (see Fig. 3 for a

screenshot showing this interface). Given that this setup allowed the two to see each other, participants and confederates were actually matched by gender in this study. Every other aspect of the procedure was identical to that of Experiment 1, with one exception. In Experiment 1, confederates acting in the low-power role were seen as overwhelmingly incompetent due to being instructed to always defer to the participant—instructions that may have been too extreme, thereby confounded the effect of power condition. Thus, in Experiment 2, we instructed confederates in the low-power role to still ultimately defer to the participant's opinion, but also be more willing to offer at least tentative opinions of their own.

After completing the task, participants were reminded of how much they and their partner earned for completing the task. They then completed our dependent measures, including attention-check items, before being debriefed and thanked.

Fig. 3. Screenshot from confederate's desktop displaying the video chat platform from Experiment 2. Coders rated participant behavior as was captured on these videos.



Measures.

Subjective Emotional Experiences. Participants reported on their subjective emotional reactions to the interaction using twelve items from the Modified Differential Emotions Scale (Fredrickson, Tugade, Waugh, & Larkin, 2003). Each item lists three words corresponding to a different emotion (e.g., "joyful, glad, or happy," "angry, irritated, or annoyed") and asks participants the extent to which they are currently experiencing each on a 1 (*not at all*) to 7 (*extremely*) scale. Fitting past research (Fredrickson et al., 2003), we created separate aggregate subscales for positive ($M = 4.55$, $SD = 1.36$, $\alpha = 0.90$) and negative emotions ($M = 1.71$, $SD = 1.00$, $\alpha = 0.87$).

Perceptions of Partner. Participants reported on their desire to affiliate with their partner with the same scale used in Experiment 1 ($M = 4.59$, $SD = 1.07$, $\alpha = 0.88$). Using a 7-point scale (1 = *strongly disagree*; 7 = *strongly agree*), participants also rated the confederate on three traits indicative of warmth ($M = 5.67$, $SD = 1.02$, $\alpha = 0.91$), three of competence ($M = 5.24$, $SD = 1.05$, $\alpha = 0.86$), and three of moral integrity ($M = 5.40$, $SD = 1.13$, $\alpha = 0.86$; Leach et al., 2007).

Behavioral Warmth. Confederates recorded their interactions with participants, thus providing clear audio of the conversation as well as high-quality video footage of participants' facial expressions, gaze activity, and body movements and posture. We trained two independent coders (one female and one male) who were blind to inequality condition and study hypotheses to watch the recorded video of each participant and rate them on overall warmth on a 1 (*not at all warm*) to 5 (*very warm*) scale. Our coders demonstrated adequate levels of agreement (ICC = .74, 95% CI = [.45, .85]. As such, the two raters' scores were averaged into a single index of warmth (M = 3.09, SD = 0.77). In rating participants' overall level of warmth, coders were trained to determine the extent to which the individual regarded the confederate in a way that

was outgoing and pleasant (e.g., displaying consideration towards the confederate's opinions when discussing paintings, having a friendly or playful vocal tone; Simon-Thomas, Keltner, Sauter, Sinicropi-Yao, & Abramson, 2009) versus cold and distant (e.g., not acknowledging the confederate's opinions and feelings, having a cold or distant vocal tone).

Results

To analyze each dependent measure, we used a 2 (power) × 2 (inequality) ANOVA.

Emotional responses.

Subjective emotional experience. Here we report the results of our analyses testing the influence of our manipulations on both emotion subscales. Results for each discrete emotion are reported in the SI text.

Positive Emotions. We found that participants in the high-power role (M = 4.78, 95% CI = [4.55, 5.01]) reported higher levels of positive emotions such as joy, gratitude, and interest after evaluating the paintings than did those in the low-power role (M = 4.35, 95% CI = [4.11, 4.58]), $F(1, 245) = 6.74$, $p = .010$, $\eta^2 = .027$, 90% CI = [.004, .068]. This result fits prior research showing that individuals in high- relative to low-power positions are more prone to experiencing positive affect (e.g., Anderson & Berdahl, 2002; Keltner et al., 2003). More important, and extending Experiment 1's results, we also found a significant inequality effect: participants in the high-inequality condition (M = 4.32, 95% CI = [4.09, 4.55]) felt lower levels of positive emotion than those in the low-inequality condition (M = 4.81, 95% CI = [4.57, 5.04]), $F(1, 245) = 8.55$, $p = .004$, $\eta^2 = .034$, 90% CI = [.006, .078]. We note there was also a marginally significant power × inequality interaction, $F(1, 245) = 3.16$, $p = .077$, $\eta^2 = .013$, 90% CI = [0, .045]. A simple effects analysis showed that, for participants in the low-power condition, there was a significant effect of inequality condition, such that participants in the high-inequality condition (M = 3.95,

95% CI = [3.64, 4.26]) reported significantly less positive emotion than did participants in the low-inequality condition (M = 4.74, 95% CI = [4.38, 5.09]), $F(1, 245) = 10.79$, $p = .001$, $\eta^2 = .042$, 90% CI = [.011, .090]. Inequality condition did not exert a significant effect for participants in the high-power condition, $F(1, 245) = 0.67$, $p > .250$, $\eta^2 = .003$, 90% CI = [0, .024].

Negative Emotions. We found a significant power effect, such that participants in the low-power condition (M = 1.86, 95% CI = [1.69, 2.03]) reported greater negative emotions such as anger, sadness, and guilt after the task than did those in the high-power condition (M = 1.53, 95% CI = [1.37, 1.70]), $F(1, 248) = 7.30$, $p = .007$, $\eta^2 = .029$, 90% CI = [.004, .071]. In keeping with our central social-capital hypothesis, we found a significant inequality effect, such that participants in the high-inequality condition (M = 1.94, 95% CI = [1.78, 2.11]) felt more negative emotions than those in the low-inequality condition (M = 1.45, 95% CI = [1.28, 1.62]), $F(1, 248) = 17.13$, $p < .001$, $\eta^2 = .065$, 90% CI = [.024, .119]. These main effects were qualified by a marginally significant power × inequality interaction, $F(1, 248) = 3.62$, $p = .058$, $\eta^2 = .014$, 90% CI = [0, .048]. A simple effects analysis showed that, for participants in the low-power condition, there was a significant inequality effect, with high-inequality participants (M = 2.22, 95% CI = [2.00, 2.44]) reporting more negative emotion than did low-inequality participants (M = 1.49, 95% CI = [1.24, 1.75]), $F(1, 248) = 18.03$, $p < .001$, $\eta^2 = .068$, 90% CI = [.026, .123]. The inequality effect was not significant among participants in the high-power condition, $F(1, 248) = 2.53$, $p = .113$, $\eta^2 = .010$, 90% CI = [0, .040].

Perceptions of partner.

Desire to affiliate. Unlike in Experiment 1, we did not find a significant effect of power on the desire to affiliate with one's partner, $F(1, 210) = 0.31$, $p > .250$, $\eta^2 = .002$, 90% CI = [0, .022][2]. We speculate that this may have been due to the more empowering instructions given to

confederates enacting the low-power role, making the low-power confederate less unappealing than in Experiment 1.

We did, however, observe a significant inequality effect, such that participants in the high-inequality condition (M = 4.45, 95% CI = [4.24, 4.65]) expressed less desire to affiliate with their partner compared to those in the low-inequality condition (M = 4.76, 95% CI = [4.55, 4.96]), $F(1, 210) = 4.47$, $p = .036$, $\eta^2 = .021$, 90% CI = [.001, .063]. The power × inequality interaction was not significant, $F(1, 210) = 1.23$, $p > .250$, $\eta^2 = .006$, 90% CI = [0, .035].

Perceptions of partner's warmth, competence, and moral integrity. Here we report the results of our analyses on ratings of partner warmth, competence, and moral integrity (Fig. 4 portrays these results, combining the trait ratings into a single score with higher numbers corresponding to more positive perceptions of personality).

Warmth. Unlike in Experiment 1, we did not find a significant effect of power on partner warmth, $F(1, 211) = 0.37$, $p < .250$, $\eta^2 = .002$, 90% CI = [0, .023]. We did, importantly, find a significant inequality effect; participants in the high-inequality condition (M = 5.43, 95% CI = [5.24, 5.62]) rated their partner as less warm than did those in the low-inequality condition (M = 5.91, 95% CI = [5.72, 6.10]), $F(1, 211) = 12.53$, $p < .001$, $\eta^2 = .056$, 90% CI = [.016, .113]. The power × inequality interaction was not significant, $F(1, 211) = 0.79$, $p < .250$, $\eta^2 = .004$, 90% CI = [0, .029].

Competence. Again, we did not find an effect of power in this experiment, $F(1, 210) = 2.24$, $p = .136$, $\eta^2 = .011$, 90% CI = [0, .045], but did find a significant inequality effect, with participants in the high-inequality condition (M = 5.09, 95% CI = [4.89, 5.29]) rating their partner as less competent than did their low-inequality counterparts (M = 5.41, 95% CI = [5.21,

5.61]), $F(1, 210) = 4.78$, $p = .030$, $\eta^2 = .022$, 90% CI = [.001, .065]. The interaction was not significant, $F(1, 210) = 2.05$, $p = .154$, $\eta^2 = .010$, 90% CI = [0, .043].

Moral integrity. We observed a marginal effect of power, such that participants in the high-power role ($M = 5.28$, 95% CI = [5.06, 5.49]) rated their partner as marginally less moral than did participants in the low-power role ($M = 5.54$, 95% CI = [5.32, 5.75]), $F(1, 210) = 2.89$, $p = .091$, $\eta^2 = .014$, 90% CI = [0, .050]. More importantly, we found a significant inequality effect such that participants in the high-inequality condition ($M = 5.23$, 95% CI = [5.01, 5.44]) rated their partner as less moral than did those in the low-inequality condition ($M = 5.59$, 95% CI = [5.37, 5.80]), $F(1, 210) = 5.54$, $p = .020$, $\eta^2 = .026$, 90% CI = [.002, .070]. The interaction was not significant, $F(1, 210) = 0.20$, $p < .250$, $\eta^2 = .001$, 90% CI = [0, .019].

Observer ratings of warmth. The results for these ratings appear in Fig. 5. We discovered a significant effect of power, such that participants in the high-power role ($M = 3.22$, 95% CI = [3.07, 3.37]) behaved more warmly than did participants in the low-power condition ($M = 2.97$, 95% CI = [2.82, 3.11], $F(1, 193) = 5.41$, $p = .021$, $\eta^2 = .018$, 90% CI = [.002, .075], in keeping with approach-related tendencies associated with elevated power (e.g., Keltner et al., 2003). We found a significant inequality effect with high-inequality participants ($M = 2.96$, 95% CI = [2.81, 3.11]) displaying less warmth verbally (e.g., verbal affirmations) and nonverbally (e.g., interested vocalizations) in their spontaneous behavior than their counterparts in the low-inequality condition ($M = 3.23$, 95% CI = [3.08, 3.39]), $F(1, 193) = 6.36$, $p = .013$, $\eta^2 = .032$, 90% CI = [.004, .082][3]. The power × inequality interaction was not significant, $F(1, 193) = 0.17$, $p < .250$, $\eta^2 = .001$, 90% CI = [0, .020].

Fig. 4. Results from Experiment 2: Aggregated trait ratings (i.e., warmth, competence, moral integrity) as a function of inequality and power conditions. Higher scores on the y-axis indicate more positive ratings. The small symbols indicate individual scores on our measure of desire for affiliation. The large symbols indicate the means for each cell in our 2 × 2 design; error bars represent 95% confidence intervals.

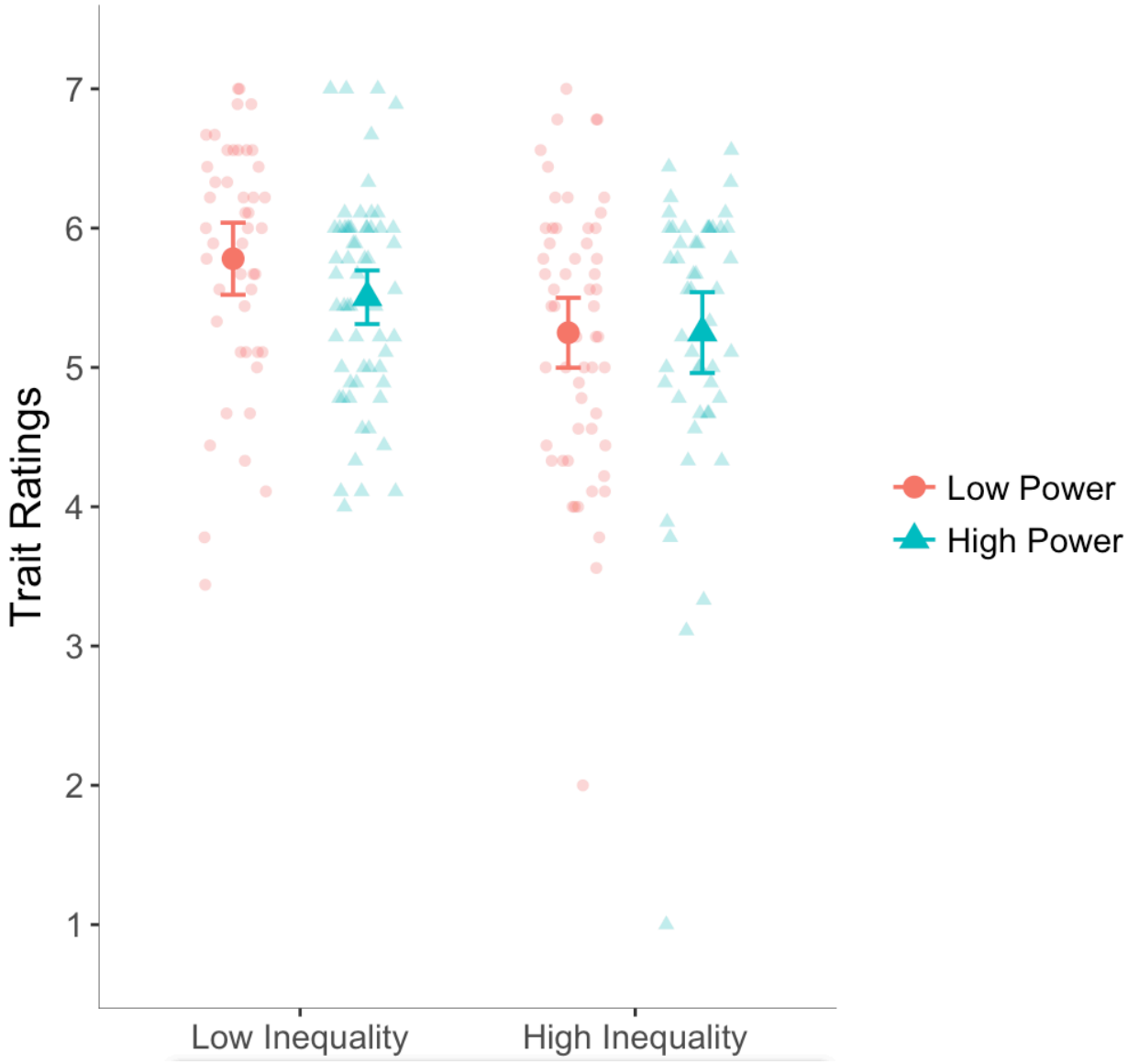
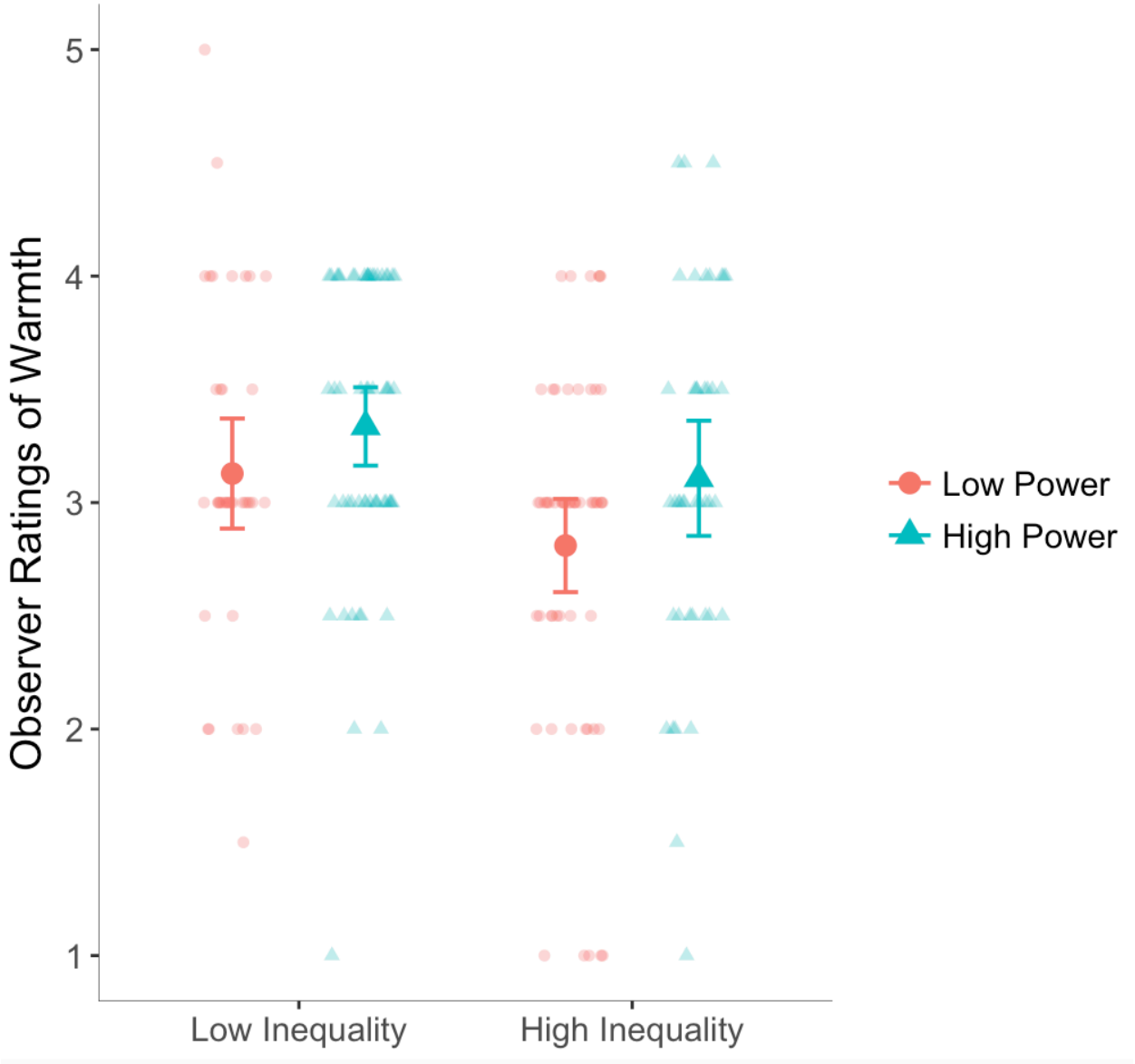


Fig. 5. Results from Experiment 2: Observer ratings of warmth as a function of inequality and power conditions. The small symbols indicate individual scores on our measure of desire for affiliation. The large symbols indicate the means for each cell in our 2 × 2 design; error bars represent 95% confidence intervals.



Discussion

Overall, Experiment 2's results converge with correlational evidence suggesting reduced social capital due to inequality. Replicating Experiment 1, inequality reduced participants' affiliative desire. In addition, we found that interacting within the context of inequality harmed emotional responses and led participants to perceive their partner as less competent, warm, and moral. Finally, Experiment 2 yielded novel behavioral findings: inequality undermined behavioral expressions of social capital, with participants in the high-inequality context showing less warmth, interest, and engagement with their partner in their utterances, body, and patterns of expression and vocalization.

General Discussion

Guided by Wilkinson and Pickett's (2009) social-capital hypothesis, which suggests that poorer health and well-being seen in unequal societies stem in part from diminished interpersonal trust and affiliation, we tested the hypothesis that income inequality within the context of a role-playing task would undermine the affiliative desire and self-reported and expressed warmth. Support for this hypothesis emerged across two experiments that used nationwide and university samples and multiple indices of face-to-face social capital. In brief interactions defined by inequality, participants reported reductions in positive emotions and increases in negative emotions and lessened desire to affiliate with their partner. Additionally, they perceived their partner to be less warm, competent, and moral, and showed fewer observable signs of warmth. Inequality influences emotion, social perception, and observable social behavior between individuals in ways that damage social ties.

Crucially, our two experiments found that the problematic effects of inequality upon perception and behavior were not moderated by role-based power, which yielded systematic

effects consistent with the literature on social power (e.g., Guinote, 2017; Keltner et al., 2003). When it comes to declining social capital in the form of trust and affiliative behavior, it appears that both the less powerful and more powerful are swayed by inequality's problematic effects (though one intriguing exception to this, pertaining to emotion, emerged in Experiment 2).

While prior studies have begun to elucidate the causal impact of inequality on some social outcomes (e.g., Côté et al., 2015; Nishi et al., 2015), the current investigation is among the first to document how greater income disparities in face-to-face interactions can lead to breakdowns in social capital. Additionally, our experiments reveal the impact of inequality using a range of indices, including emotional responses, judgments of others, desire to socially engage with others, and behavioral indicators of warmth—outcomes that, crucially, coincide with correlational data establishing relations between inequality and outcomes in each of these domains (e.g., Alessina & La Ferrara, 2000; de Vries et al., 2011; Oishi et al., 2011).

Limitations and Future Directions

Importantly, the current results do not illuminate the mechanisms underlying how inequality diminishes social capital. According to the social-capital hypothesis, inequality reduces social cohesion due to increased harmful social comparison tendencies (Wikinson & Pickett, 2009). A number of approaches could be taken to test this. For example, inequality may promote greater attention to status as a salient characteristic driving how people engage with their social worlds (Payne et al., 2017; Walasek & Brown, 2015; Wilkinson & Pickett, 2017). Alternatively, one could directly examine the mediating role of the emotional underpinnings of social comparison (e.g., envy vs. contempt; Fiske et al., 2002). These processes represent different paths to the same outcomes—reduced interpersonal closeness and more negative evaluations of others—and should be explored in future research.

Finally, future studies should examine potential moderators of the link between inequality and negative social outcomes. Emerging evidence suggests that social mobility may be one such variable. In particular, recent work has shown that perceptions of mobility increase acceptance of large income disparities (Shariff, Wiwad, & Aknin, 2016). It would be intriguing to explore whether introducing income mobility into our experimental design would alter the influences of inequality upon social capital observed here. Such a focus would be in keeping with the promise of the findings documented here, that macroeconomic level variables such as inequality and mobility shape basic social processes within the mind and between people in everyday interactions.

Footnotes

1. All mentions of the term "inequality" refer to *income* inequality.
2. The discrepancies between the study N and *df*s in some of the Experiment 2 analyses are due to a programming error which prevented some participants from receiving the desire-for-affiliation and trait-rating measures.
3. The discrepancy between the study N and *df*s in the observer-rating analyses are due to errors in the video-recording process that led to missing observer warmth ratings.

Author Contributions

D. M. Stancato and S. Chen developed the study concept. All authors contributed to the study design. Data collection was performed by D. M. Stancato, who also performed the data analyses and interpretation under the supervision of D. Keltner and S. Chen. D. M. Stancato drafted the manuscript, and S. Chen and D. Keltner provided critical revisions. All authors approved the final version of the manuscript for submission.

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