Social Affiliation in Same-Class and Cross-Class Interactions

Stéphane Côté

University of Toronto

Michael W. Kraus

Yale University

Nichelle C. Carpenter

University of South Carolina

Paul K. Piff

University of California, Irvine

Ursula Beermann

University of Innsbruck

Dacher Keltner

University of California, Berkeley

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Abstract

Historically high levels of economic inequality likely have important consequences for relationships between people of the same and different social class backgrounds. Here, we test the prediction that social affiliation among same-class partners is stronger at the extremes of the class spectrum, given that these groups are highly distinctive and most separated from others by institutional and economic forces. An internal meta-analysis of four studies ($N = 723$) provided support for this hypothesis. Participant and partner social class were interactively, rather than additively, associated with social affiliation, indexed by affiliative behaviors and emotions during structured laboratory interactions and in daily life. Further, response surface analyses revealed that paired upper- or lower-class partners generally affiliated more than average-class pairs. Analyses with separate class indices suggested that these patterns are driven more by parental income and subjective social class than by parental education. The findings illuminate the dynamics of same- and cross-class interactions, revealing that not all same-class interactions feature the same degree of affiliation. They also reveal the importance of studying social class from an intergroup perspective.

Keywords: social class; socioeconomic status; social affiliation; social interaction

Social Affiliation in Same-Class and Cross-Class Interactions

I stay in my lane, people, I stay in my financial lane.

– comedian Kevin Hart, 2011

Many countries are facing historic levels of economic inequality (Piketty & Saez, 2014). These unequal environments radically alter the life experiences and developmental trajectories of the people at the top and bottom of the class hierarchy (Kohn & Schooler, 1969; Snibbe & Markus, 2005; Stephens, Fryberg, & Markus, 2011). As the wealth gap rises, social and economic institutions, neighborhoods, and individual material resources—education, food, recreation, and opportunities for leisure—all create barriers that separate those from relatively higher- and lower-class backgrounds (Ridgeway, 2014). These barriers lead to stagnant economic mobility and make opportunities to enact policy change scarce for those at the bottom of the hierarchy, who lack the social and political connections of their more advantaged counterparts (Domhoff, 1998).

In this research, we extend what is known about the consequences of economic inequality to its effects upon intergroup relations. We predict that social affiliation among same-class interaction partners will be strongest at the extremes of the social class spectrum, where class groups are most separated by institutional and economic forces. We test this overarching hypothesis by examining interactions between friends and strangers from varying levels of social class backgrounds, using polynomial regression and response surface analysis (Edwards & Parry, 1993; Nestler, Grimm, & Schönbrodt, 2015) and then evaluating the robustness of the results via meta-analysis (Borenstein, Hedges, Higgins, & Rothstein, 2009; Schmidt & Hunter, 2014). This

combination of analytical approaches provides robust and detailed information about how the social class of two people combines to predict social affiliation. Such a study has the potential to elucidate the ways in which social class influences patterns of social interaction, and determine the positions in the class hierarchy where cross-class interactions are most fraught.

A Group Process Perspective on Social Class

As in recent psychological research, we construe social class as a relatively stable facet of social identity that is rooted in objective, socially-valued resources (e.g., income, education) and subjective perceptions of rank vis-à-vis others (Kraus, Piff, Rheinschmidt, Mendoza-Denton, & Keltner, 2012; Snibbe & Markus, 2005; Stephens et al., 2011). The literature on intergroup relations has devoted limited attention to social class (DiMaggio, 2012; Fiske, Moya, Russell, & Bearns, 2012; Ridgeway & Fisk, 2012). In a meta-analysis of findings on intergroup relations, there were not enough studies to aggregate findings on social class (unlike, for example, ethnicity and sexual orientation)—instead, social class was combined with various other dimensions in an “other” category (Pettigrew & Tropp, 2006). This is partly because psychological research on class has focused separately on how the class of actors predicts their behavior in general (Côté, 2011; Kraus et al., 2012) or on how the class of targets influences others’ perceptions (Fiske, Cuddy, Glick, & Xu, 2002; Kraus & Keltner, 2009). According to Lareau and Calarco (2012), “while scholars have shown that class-based cultural resources matter for outcomes in institutional settings, ... they rarely explore how these cultural resources actually operate in interactions” (p. 81). The present research addresses the paucity of research on how social class shapes interpersonal interactions from an intergroup perspective.

Despite the limited attention paid to social class in research on intergroup relations, several lines of research indicate that social class represents a distinct social group category in

society. Social class groups, like other group-based categories, are associated with unique stereotypes, particularly at the extremes of the class hierarchy. For instance, rich people are systematically judged as competent but cold, whereas the poor are judged as low in both warmth and competence (Fiske et al., 2002). As well, signals of one's class identity are transmitted in interactions, just like signals of membership in other group categories. In one study, undergraduate students interacted for 60-sec, and these interactions were watched by a separate sample of observers who estimated the social class of the students based on the videos. Results revealed above chance accuracy in perceptions of social class (Kraus & Keltner, 2009). In addition to the separation of social classes based on structural factors, large scale surveys suggest that people have strong and consistent self-identified social class group memberships across time (DiMaggio, 2012; Fiske & Markus, 2012; Hout, 2008). Together, these findings suggest that social class is a significant and salient source of group processes and represents a meaningful form of group categorization for individuals.

Social Class and Social Affiliation

We predict that social affiliation—attitudes, emotions, and behaviors that connect people and promote closeness to others during interactions (Gump & Kulik, 1997; Sasaki & Kim, 2011)—with a same-class interaction partner will be strongest among those who occupy extreme (i.e., the lowest and highest) positions along the social class spectrum. This prediction is based on two lines of converging research on social class and patterns of intergroup affiliation.

The first line of reasoning is based on distinctiveness theory and the similarity effect. Distinctiveness theory posits that social categories such as social class are more salient and more centrally featured in the self-concept of people who belong to numerically smaller groups (McGuire, McGuire, & Winton, 1979; McGuire & Padawer-Singer, 1976). For instance, gender

becomes more salient as the number of opposite-gender others increases (McGuire et al., 1979). If being lower- or upper-class is distinctive, then social affiliation based on these more extreme social class groups is likely to be heightened. Evidence indicates that people are scarcer at the extreme ends of the social class spectrums: According to U.S. Census data, there are fewer people with advanced degrees (Doctorate, Professional, or Master's degrees) at one end of the education continuum, and people with no high school diploma at the other end, compared to people with high school or Bachelor's degrees in the middle of the education distribution (U.S. Census Bureau, 2013a). Moreover, there are fewer people with extreme wealth at one end of the income continuum, and people from abject poverty at the other, compared to people in the middle of the income distribution (U.S. Census Bureau, 2013b). Thus, we reason that social class salience is highest at the extremes of the social class spectrum because these individuals are smaller in number and more distinctive within the population, compared to individuals in the middle of the class spectrum.

The similarity effect posits that people are more attracted to others who share their characteristics than others with different characteristics (Byrne, 1961; Nahemow & Lawton, 1975). Meta-analytic research on the similarity effect suggests that people are more attracted to others who share characteristics that are central to their identity, whereas peripheral characteristics that are not strongly tied to identity are less likely to lead to attraction (Montoya & Horton, 2012). To the extent that, as argued above, social class standing is more central to the identity of relatively distinctive upper- and lower-class individuals, these individuals should exhibit the similarity effect more than middle-class individuals. This suggests that upper- and lower-class individuals should exhibit more social affiliation than average-class individuals.

A second line of reasoning is also based on the similarity effect, plus evidence that signals of other people's social class are "louder" (i.e., more salient) at the extremes than in the middle of the class continuum. The structural barriers that physically separate individuals from different social classes—from neighborhoods to schools children attend to patterns of social contact (e.g., in church, at clubs)—are likely to be strongest at the extremes of the class hierarchy. As a result of these barriers, people at the extremes of the class hierarchy shape unique cultural patterns and interests that exclude those at other levels of the hierarchy (Kohn & Schooler, 1969; Stephens, Fryberg, Markus, Johnson, & Covarrubias, 2012). In contrast, people toward the middle of the social class spectrum may have more opportunities to cross class boundaries and interact both with those above them (e.g., an upwardly mobile first-generation college student) and below them (e.g., a middle class university student who takes on a summer retail job for extra spending money) in the class hierarchy. Both upper- (e.g., expensive vehicles and jewelry) and lower-class (e.g., older, used vehicles and second-hand clothes) signals should be clearer than signals of middle-class standing (Bourdieu, 1979; Kraus & Mendes, 2014). For these reasons, it should be easier to detect the class standing of interaction partners at the extreme ends of the class continuum than interaction partners in the middle of the continuum.

Meta-analytic research reveals that the similarity effect is more potent for characteristics that are easier to detect in others, because similarity on these characteristics can be more reliably identified than similarity on characteristics that are more ambiguous and difficult to detect (Montoya & Horton, 2012). Because people should be more aware of class signals from their partners at the extremes of the continuum, partners' class should guide individuals' affiliative behavior to a greater extent. For average-class interaction partners, their class should be a less reliable guide for individuals' behaviors. Thus, the similarity effect should be more potent within

upper-class and lower-class pairs, where similarity can be more easily diagnosed, than within average-class pairs, where similarity is more difficult to diagnose. This argument, like the previous, suggests higher social affiliation in interactions between pairs matched at the extremes of the class continuum, relative to matched average-class pairs.

The Present Research

We tested our hypothesis that same-class affiliation is strongest at the extremes of the class continuum in four studies of interpersonal interactions with participants from a range of class backgrounds sampled from different parts of the United States. In the studies, two participants discussed a range of topics, and social affiliation was measured in terms of self- and peer-reports and nonverbal behaviors reflecting increased social connection. We relied on meta-analysis to cumulate the effects in the four studies because of the limitations of evaluating separate individual studies using hypothesis testing (Borenstein et al., 2009; Braver, Thoemmes, & Rosenthal, 2014; Goh, Hall, & Rosenthal, in press; Schmidt & Hunter, 2014), particularly for testing non-linear associations that require high power to detect (Aguinis, 1995; Frazier, Tix, & Barron, 2004). Additionally, meta-analysis addresses a fundamental issue with the relatively small sample sizes of individual studies by estimating cumulative associations without the biasing effects of sampling error (Borenstein et al., 2009; Braver et al., 2014; Schmidt & Hunter, 2014). As such, meta-analysis reduces both Type I and Type II error rates.

In the present research, meta-analysis revealed if the associations between participant and partner social class and social affiliation were non-linear. Meta-analysis generated an effect size and a confidence interval for the set of non-linear terms (i.e., the interaction term between participant and partner social class plus their squared terms) in the model in which participant and partner social class predicted social affiliation (Edwards & Parry, 1993; Nestler et al., 2015).

Following previous meta-analyses of non-linear associations (Grijalva, Harms, Newman, Gaddis, & Fraley, 2015; Verhaeghen & Salthouse, 1997; Williams & Livingstone, 1994), after conducting the meta-analysis, we inspected the specific patterns of interaction in each study to determine if these patterns supported our hypothesis. Further, we repeated all analyses controlling similarity in gender and ethnicity to rule out spurious associations.

In addition to testing our hypothesis that social affiliation is higher in matched higher- or lower-class pairs than in matched average-class pairs, we explored social affiliation as it differs between same- and cross-class interaction partners. We explored whether same-class interactions are higher in social affiliation than cross-class interactions, particularly during the formation of new relationships. In a previous investigation, participants reported being more attracted to strangers from the same rather than a different social class group (Byrne, Clore, & Worchel, 1966), but this pattern was not examined in established relationships. In new relationships, affiliation across groups is likely to be influenced by shared interests and group stereotypes, thus eliciting in-group preferences for affiliation (Brewer & Miller, 1984; Shelton & Richeson, 2006). In contrast, in established friendships, people tend to know personal characteristics more and rely on group stereotypes less, making same-class preferences less likely to color interactions. In this vein, in past research, intergroup contact reduced intergroup bias (Davies, Tropp, Aron, Pettigrew, & Wright, 2011; Page-Gould, Mendoza-Denton, & Tropp, 2008).

Method

Overview and Participants

We tested our hypothesis that same-class affiliation is strongest at the extremes of the social class continuum in four studies of social affiliation in daily life and during structured laboratory interactions, with a total of 746 participants belonging to 373 dyads across the four

studies (due to missing data, the sample sizes for each separate meta-analysis are slightly lower). Participants in all studies were undergraduate students recruited from research participation and subject volunteer programs at the University of California, Berkeley (Study 1) and the University of Illinois (Studies 3 and 4), or from classroom announcements and advertisements posted around the University of California, Berkeley campus seeking pairs of friends to participate in a study (Study 2). Samples sizes and descriptive statistics for each study are presented in Table 1.

Procedures

Participants in Studies 1, 3, and 4 first completed a packet of questionnaires that included measures of social class and other demographic characteristics (one week before the laboratory session in Study 1, and at the beginning of the session in Studies 3 and 4), were then randomly paired with another unacquainted participant (of the same gender only in Study 1) in the laboratory, and took part in one or more video-recorded structured interactions. Because participants were paired randomly, in these studies there were pairs from different social class backgrounds and pairs from the same social class background. There were two main differences in Study 2. First, the packet of questionnaires (completed a week before the laboratory session) also included measures of social affiliation with the friend in daily life. Second, for the structured interactions, participants were paired with the friend with whom they enrolled (M duration of friendship = 31 months, SD = 40 months, median = 16 months, range = 0 to 216 months). The details of the interactions were as follows:

Study 1. Participants first completed unrelated tasks, including a touch task where partners were separated by a curtain and instructed not to speak or otherwise interact with one another (Piff, Purcell, Gruber, Hertenstein, & Keltner, 2012). After the curtain dropped, participants had two video-recorded conversations about the meaning of life. In the first

conversation, one participant talked while the other listened, and in the second conversation, the roles were reversed.¹

Study 2. Friends had a series of discussions. After one of these discussions—a discussion of the impact of race on participants’ friendship—participants completed two measures of social affiliation: commitment to their friendship and feelings during the interaction. We examined this discussion of the impact of race on friendship because this type of discussion represents an opportunity to express affiliative thoughts and emotions, such as appreciation for the friendship. At the same time, this discussion is fraught with challenges, such as the potential for distancing oneself from a partner from a different ethnic group or the same ethnic group (for example, to avoid appearing prejudiced). Further, measures of social affiliation were available.²

Study 3. Participants were connected to EEG equipment for the purposes of another study before taking part in two interactions. The first interaction was a three-minute basketball challenge where participants were teammates who tried to make basketball shots. The second interaction was a ten-minute tangram exercise where participants worked together to make as many solid figures as possible using geometric shapes displayed on the table.

Study 4. Participants engaged in two consecutive three-minute interactions. Participants first discussed their preferences in film and television, and in the next interactions they discussed their preferences for food and beverages. For the purposes of a different study, the room lights were switched on in one interaction, and switched off (with the door shut) in the other. The interactions were recorded using night-vision cameras.

Measures of Social Class

For purposes of generalizability, social class was indexed by parental education (all studies), parental income (Studies 2-4), and a subjective social class ranking (Study 1). Focusing

on parental characteristics is typical in research with students because students typically have little or no income, their education is ongoing, and they typically have not yet entered an occupation (Kraus & Keltner, 2009; Matthews & Gallo, 2011; Stephens et al., 2011). Because parental education and income were measured in at least two studies, we could conduct separate meta-analyses to explore if the results were similar across these indices.

Study 1. Participants completed the MacArthur Scale of subjective social class (Adler, Epel, Castellazzo, & Ickovics, 2000). Participants were presented with a drawing of a ladder with 10 rungs representing people with different levels of education, income, and occupation prestige, and placed an X on the rung where they feel they stand in their community. Higher numbers reflect higher placement on the ladder ($M = 5.86$, $SD = 1.44$). A subset of participants reported the education levels of their parents by choosing: (1) less than 12 years; (2) high school graduate; (3) some College; (4) College graduate; or (5) Graduate/Professional school. The means were 3.69 ($SD = 1.29$; 23 unreported) for fathers and 3.33 ($SD = 1.21$; 23 unreported) for mothers. The education of fathers and mothers was highly correlated, $r(47) = .65$, $p < .001$, and averaged ($M = 3.51$, $SD = 1.14$). The correlation between subjective social class and parental education was positive, $r(47) = .29$, $p = .05$. As input for meta-analysis, we standardized each index and averaged the standardized scores to create an overall index of social class ($M = -.01$, $SD = .8$). There was no correlation between partners' social class, $r(70) = -.05$, $p = .69$.

Study 2. Participants reported the education of their parents by choosing: (1) did not finish high school; (2) finished high school; (3) some college; (4) Bachelor's degree; (5) some graduate work; or (6) advanced degree. The means were 3.29 ($SD = 1.88$; 15 unreported) for fathers and 3.19 ($SD = 1.80$; 8 unreported) for mothers. The education of fathers and mothers was highly correlated, $r(218) = .74$, $p < .001$, and averaged ($M = 3.21$, $SD = 1.72$). Participants

reported the income of their household during their childhood by choosing: (1) less than \$10,999/year; (2) \$11,000 - \$20,999/year; (3) \$21,000 - \$30,999/year; (4) \$31,000 - \$40,999/year; (5) \$41,000 - \$50,999/year; (6) \$51,000 - \$60,999/year; or (7) more than \$61,000/year. We assigned the midpoint income amount corresponding to the selected category, and assigned \$61,000 to participants who chose the highest category ($M = \$41,974$, $SD = \$18,639$; 8 unreported). To aid interpretation of findings, we divided income values by 10,000. Parental education and parental income were highly correlated, $r(223) = .64$, $p < .001$. As in Study 1, as input for meta-analysis, we created an overall index of social class ($M = 0$; $SD = .92$). There was a moderate, positive correlation between the social class of friends, $r(236) = .37$, $p < .001$, consistent with past findings that people form more social ties with others with whom they share characteristics (Brown, Novick, Lord, & Richards, 1992; Cialdini & de Nicholas, 1989). Even so, there were many pairs of friends from different classes, allowing us to test how variation in the social class of participants and friends combined to predict social affiliation.

Study 3. Participants indicated the education level of each parent by choosing High school graduation or equivalent (0) or College graduation or higher (1). We averaged the education of the father ($M = .78$, $SD = .41$; 8 unreported) and mother ($M = .74$, $SD = .44$; 3 unreported) to create a composite score ($M = .73$, $SD = .36$; 3 unreported). Participants reported their annual family income by choosing: (1) less than \$15,000; (2) \$15,000 - \$25,000; (3) \$25,000 - \$35,000; (4) \$35,000 - \$50,000; (5) \$50,000 - \$75,000; (6) \$75,000 - \$100,000; (7) \$100,000 - \$150,000; (8) more than \$150,000. We assigned the midpoint income amount corresponding to the selected category, and a value of \$150,000 to participants who chose the highest category ($M = \$89,187$, $SD = \$41,560$; 4 unreported). We divided income values by 10,000. Parental education and parental income were moderately correlated, $r(161) = .31$, $p <$

.001. We again created an overall index of social class ($M = -.01$, $SD = .83$). There was no correlation between the social class of the (randomly paired) participants, $r(168) = .12$, $p = .13$.

Study 4. The measures of father ($M = .69$, $SD = .46$; 13 unreported) and mother education ($M = .72$, $SD = .45$; 9 unreported) were the same as in Study 3, and we created a composite score ($M = .70$, $SD = .39$). The measure of family income was also the same ($M = \$84,582$, $SD = \$43,768$; 9 unreported). Parental education and parental income were moderately correlated, $r(251) = .42$, $p < .001$. We standardized and averaged these indices to create an overall social class index ($M = 0$, $SD = .84$). There was again no correlation between the social class of the randomly paired participants, $r(260) = .04$, $p = .52$.

Measures of Social Affiliation

Study 1. Social affiliation was indexed by expert codings of (in)authentic expressions of emotion during the interactions while participants were in the role of listener. We coded Duchenne laughter (Ekman & Friesen, 1982; Frank, Ekman, & Friesen, 1993) as an index of high affiliation, given past findings that observers interpret authentic positive emotional expressions, including laughter, as signals of interpersonal warmth (Bayes, 1972). We used the Facial Action Coding System (FACS; Ekman, Friesen, & Hager, 2002)—a standardized and validated instrument to code subtle facial muscle movements (called Action Units, or AUs) based on objective criteria. Duchenne laughter involves (a) the activation of the *zygomatic major* muscle (AU 12), which raises the mouth corners, (b) the activation of the *orbicularis oculi, pars orbitalis* muscle (AU 6), which creates “crowfeet” around the eyes, and (c) unvoiced or voiced forced respiration (Ruch & Ekman, 2001). In addition, we coded fake smiling as an index of low affiliation, given past findings that observers perceive inauthentic expressions of positive emotions as unfriendly and insincere (Grandey, 2003; Grandey, Fisk, Mattila, Jansen, &

Sideman, 2005). Fake smiling involves the activation of the *zygomatic major* muscle, but not the *orbicularis oculi, pars orbitalis* muscle, a pattern that signifies that enjoyment is not genuine (Ekman & Friesen, 1982).

We coded 30-sec. slices of behavior while participants were in the role of listener. We coded the last 30 seconds of each interaction, because at the beginning of the interactions, participants warmed up and often took some time before beginning the discussions. Raters were FACS-certified and blind to the social class of participants and hypotheses. Following Ekman et al. (2002), we used an event-coding approach. In this approach, events represent configurations of muscle movements. We first identified the time when events began and ended. Then, for each event, we coded the maximum intensity of the expression on a scale of 1 (*trace/minimal*) to 5 (*extreme/maximal*). We used codes of the timing of events and maximum intensity of expressions during the events to compute three scores—frequency, intensity, and duration—per 30-sec. slice of behavior. Frequency consisted of the number of times a particular expression was shown during the 30-sec. slice. Intensity consisted of the average intensity with which an expression was shown across all events during the 30-sec. slice. Duration consisted of the sum of the number of sec. (out of 30) when the expression was shown. One rater coded all of the dyads. To determine inter-rater reliability, a second rater coded the frequency and duration of muscle movements in eight conversations. The 30-sec. periods were segmented into 500-ms. time bins, and we calculated Cohen's κ for the two raters across the time bins (see Shiota & Levenson, 2009, for a similar approach). The inter-rater reliabilities were moderate to substantial (Landis & Koch, 1977): $\kappa = .60, p < .001$ for Duchenne laughter, and $\kappa = .73, p < .001$ for fake smiling. We calculated scores for Duchenne laughter and fake smiling by standardizing the frequency, intensity, and duration of each index, and then averaging these standardized scores (Keltner &

Bonanno, 1997). To create an overall index of social affiliation, we multiplied the scores for fake smiling by -1 and then averaged these scores with Duchenne laughter scores ($M = .01$, $SD = .67$).

Study 2. Social affiliation was assessed with three measures self-reported by participants, one concerning friendship in daily life and two concerning reactions to a structured interaction. We first created a measure of *social affiliation in daily life*. Participants indicated how often they engaged in 22 affiliative thoughts and behaviors with their friends (e.g., “How often do you spend free time with your friend?” and “How much do you care about your friend?”) on a scale of 1 (*less than once a month*) to 5 (*every day*). The full list of items appears in the supplementary materials. Participants also completed an adapted Inclusion of Other in the Self scale (IOS; Aron, Aron, & Smollan, 1992). Participants viewed seven pictures of pairs of circles representing the self and their friend. In the first pair, the circles did not overlap, representing no inclusion of the friend in the self. In the last pair, the circles overlapped highly, representing high inclusion of the friend in the self. Participants circled the picture that best described their relationship. This measure was developed to be applicable to a wide variety of relationships, including relationships between partners who differ in their social class (Aron et al., 1992). We created an index of social affiliation by standardizing responses to the 23 items (the 22 behavioral items plus the IOS scale), and then averaging these standardized scores ($M = 0$; $SD = .55$; $\alpha = .90$).

We also created a measure of *commitment to friendship*. After the structured interaction, participants rated four statements (“How sure are you that your friendship will continue in the years to come?”, “How committed are you to your friendship?”, “How much do you care about your friend?”, and “How open and honest were you in the last discussion?”) on a scale of 1 (*not at all*) to 5 (*completely*; $M = 4.52$; $SD = .49$; $\alpha = .79$; 9 unreported).

Finally, we created a measure of *affiliative emotions* by aggregating ratings of 12 positive emotions (amusement, appreciation, compassion, curiosity, empathy, enthusiasm, gratitude, happiness, hope, joy, love, and pride) during the interaction, using a scale of 0 (*no emotion*) to 8 (*extreme emotion*; $M = 3.26$; $SD = 2.07$; $\alpha = .94$; 7 unreported).

We created an overall index of social affiliation by standardizing the scores on the three measures, and then averaging these standardized scores ($M = -.01$, $SD = .8$; $\alpha = .62$).

Study 3. Social affiliation was assessed through partner ratings of behaviour during the structured interactions. Participants rated the extent to which their partner was cooperative and a good teammate, using a scale of 1 (*disagree strongly*) to 7 (*agree strongly*), after both the basketball ($M = 5.75$, $SD = .87$; $\alpha = .88$) and the tangram task ($M = 5.78$, $SD = .93$; $\alpha = .84$; 1 unreported). We create an overall index of social affiliation by averaging the four ratings (i.e., two adjectives rated after two tasks; $M = 5.77$, $SD = .77$; $\alpha = .81$).

Study 4. Social affiliation was assessed through expert codings of non-verbal behavior during the structured interactions. We coded the frequency and duration of face touching and postural constriction, two nonverbal indicators of low social affiliation in past research (Keltner & Buswell, 1997; Tracy & Matsumoto, 2008). Face touching includes any touching of the face, head, or hair with the hands and fingers. Postural constriction occurs when individuals hunch over and cross both their arms across their chest or torso.

A coder, blind to the hypotheses of the study, met with one of the authors (MK) to go over the types of behaviors that demonstrate face touching and postural constriction in detail. The coder then watched the video-recorded interactions to compute frequency and duration for each nonverbal behavior. Duration codes were computed in half-second increments, and the precise time of each behavior was also recorded. To establish the reliability of the coded

expressions, one of the authors (MK) independently watched 20 video recorded interactions and coded frequency, time of occurrence, and duration of nonverbal behavior. Correlations between the coder and the author—calculated by comparing frequency and duration scores across all coded participants—were high for face-touching frequency ($r = .90$) and duration ($r = .88$), as well as for postural constriction frequency ($r = .93$) and duration ($r = .94$). We also assessed the percent agreement of coded frequency expressions, based on the criteria that the two coders recorded the same behavior occurring during the same two-second increment. Across all frequency codes, coders agreed on 81% of all coded behaviors.

We aggregated scores for face-touching frequency ($M = 2.72$, $SD = 2.39$), face-touching duration ($M = 12.99$, $SD = 21.00$), postural constriction frequency ($M = .90$, $SD = 1.59$), and postural constriction duration ($M = 16.14$, $SD = 32.01$) across the two interactions. We then standardized and averaged the four indices to create an overall index ($M = 0$, $SD = .70$; $\alpha = .65$).

Analysis

Our central hypothesis involves assessing levels of social affiliation as a function of participant and partner social class, with the prediction that affiliation will be highest at the extremes of the class spectrum, and lowest at the center when two people share social class. To test this hypothesis across our four studies, we conducted a meta-analysis where we computed a squared semi-partial correlation representing the combination of participant and partner social class independent from their respective linear relationships (Verhaeghen & Salthouse, 1997). This change in R^2 (ΔR^2) represents the increment in variance explained by the entry of the set of non-linear terms (the interaction and squared terms) after controlling for the linear effects. Critically, the square-root semipartial correlation is a Pearson r . Thus, we meta-analyzed the square-root semipartial correlation using established random effects meta-analytic procedures

(Schmidt & Hunter, 2014). We employed bare-bones meta-analytic procedures that estimate the average effect size and its variability from the obtained studies, but do not correct for statistical artifacts (e.g., unreliability; Schmidt & Hunter, 2014). These meta-analytic procedures determine whether the observed variance in effect sizes across the individual samples can be accounted for by sampling error. To obtain effect sizes that were appropriate for meta-analysis, we took the following steps, which were suggested by previous scholars.

First, we conducted a polynomial regression analysis in each of the four independent samples, whereby we regressed the criterion (social affiliation) on the predictors (participant and partner social class), their squared terms, and the interaction term (Edwards & Parry, 1993; Nestler et al., 2015). In the analyses of composite indices of social class, the components of the composite were standardized prior to aggregation. The composites were thus already centered with a mean of 0 (or close to 0 due to rounding error), and were not centered again. In the analyses of distinct social class indices, the variables were centered so that 0 represents the midpoint of the scale, as recommended for polynomial regression (Edwards & Parry, 1993). We centered the variables before creating the interaction terms. We did not center social affiliation. Only the variables of interest were included so as to enable direct comparisons across samples.³

A significant set of non-linear terms is a necessary, but not sufficient, condition to infer support for our hypothesis, because we predicted a specific type of non-linear association (Grijalva et al., 2015; Nestler et al., 2015). Following previous procedures (Grijalva et al., 2015; Verhaeghen & Salthouse, 1997; Williams & Livingstone, 1994), after conducting the meta-analysis, we examined if the distinct patterns in each study were consistent with our prediction. We used the RSA package for R (Schönbrodt, 2015) to generate response surface graphs and tests of the slopes and curvatures of the lines of congruence and incongruence in the response

surface (Edwards & Parry, 1993). In response surface graphs, the predictors (participant and partner class) are on the x and y axes, and the outcome (social affiliation) is on the z axis. See Figure 1 for a sample response surface graph. Inferences about how participant and partner social class combine to predict social affiliation are drawn from tests of the slope and curvature along the lines of congruence and incongruence in the response surface pattern.

The line of congruence represents people who are matched on social class. The test of the slope of this line reveals whether congruence at one end of the class continuum (e.g., matched upper-class partners) features a different level of social affiliation than congruence at the other end (e.g., matched lower class partners). The curvature of this line reveals whether there is a curvilinear trend from one end of the class continuum to the other. In particular, a positive estimate for the curvature of this line reveals that social affiliation is higher in matched pairs at extreme rather than average levels of social class—our central prediction of this investigation. The diagram in Figure 1 shows a hypothetical pattern of results that would be consistent with our hypothesis.

The line of incongruence represents people who are matched vs. mismatched on social class. A significant slope along the line of incongruence reveals that one direction of a social class difference is associated with a different level of social affiliation than the other direction. This test reveals whether upper-class participants affiliate more with lower-class partners than the reverse (or vice versa). Though we did not have specific predictions for the slope of the line of incongruence analysis, prior research finds that lower-class individuals show higher intentions to affiliate with upper-class others than the reverse (Byrne et al., 1966). Inferences about differences between same- vs. cross-class interactions are based on the test of the curvature of the line of incongruence. In particular, a negative estimate for the curvature of this line indicates

that same-class interactions feature higher levels of social affiliation than cross-class interactions. Additional explanations on how to interpret the slopes and curvatures of the lines of congruence and incongruence are provided in the supplementary materials.

Results

Meta-Analysis

Social class and social affiliation. The results from each of the four independent samples—specifically the effect size for entering the interaction and squared terms after controlling for the linear effects—were combined for the meta-analysis. The results of the meta-analysis are displayed in Table 2. In Table 2, the top row displays the results for the aggregate index of social class, and the other rows display the results for specific social class indices. The average effect size for the aggregate social class index was .10. The 95% confidence interval around this estimate did not overlap with zero (lower limit = .03, upper limit = .18), indicating that this effect was significantly different from zero. This suggests that the association between participant and partner social class and social affiliation is non-linear.

Table 3 displays the results of the same analyses while controlling for whether partners were matched on ethnicity and gender. All significant results resisted controls.

Facets of social class and social affiliation. To evaluate whether the results varied for different operationalizations of social class, we conducted meta-analyses of the results for parental education (across the four samples), and separately for parental income (across the three samples in which it was measured). We could not meta-analyze results for subjective social class because it was only measured in Study 1. For both parental education and parental income, the effect size was significant, with average effect sizes of .16 for and .11 respectively. Moreover, neither of the respective 95% confidence intervals overlapped with zero (see Table 2).

Tentative conclusions concerning the moderating role of type of class measure can be reached by examining whether the confidence intervals for separate meta-analytic estimates overlap (Schmidt & Hunter, 2014). The confidence intervals for parental income and parental education overlapped, suggesting that the index of class was not a moderator.

Social class and social affiliation among previously unacquainted individuals. We evaluated whether the pattern held when participants were previously unacquainted. In this analysis, we meta-analyzed the results of Studies 1, 3, and 4, leaving out Study 2 with participants who were friends. The results are shown in the bottom rows of Table 3. The overall average effect size was .09. The 95% confidence interval around this estimate overlapped with zero (lower limit = -.001, upper limit = .17). When we limited this analysis to parental income, the overall average effect size was .06, and the 95% confidence interval around this estimate overlapped with zero (lower limit = -.04, upper limit = .15). Thus, we could not conclude that these effects were significantly different from zero.

When we limited this analysis to parental education, however, the overall average effect size was .17, and the 95% confidence interval around this estimate did not overlap with zero (lower limit = .08, upper limit = .26). Thus, participant and partner parental education are non-linearly associated with social affiliation among unacquainted individuals.

Sampling error and variability. We examined if the variability in effects across samples (SD_r) can be accounted for by sampling error. Specifically, we examined SD_{res} , the standard deviation of effect sizes after removing variability due to sampling error, and % Var, the proportion of variance in effect sizes due to sampling error (Schmidt & Hunter, 2014). We found that sampling error explained variability in effect sizes for the aggregate social class measure ($SD_{res} = 0$ and % Var = 100), parental education ($SD_{res} = 0$ and % Var = 100), and the

analysis examining unacquainted individuals ($SD_{res} = 0$ and % Var = 100). This indicates that relying on the individual estimates of the effect would likely lead to erroneous conclusions. Each sample would yield different estimates of the effect because of sampling error. These results further tentatively suggest that variability in effect sizes is not caused by other features of the studies, such as the contexts in which the interactions took place or the measures of social affiliation.

For parental income, 67% of the variability in effects across samples is due to sampling error; thus, there is the possibility that there are substantive moderators (e.g., sub-populations or ways of measuring social affiliation) operating on the relationship. This is why the SD_{res} is a non-zero value: There is additional variance even after accounting for sampling error. We return to potential moderators of this latter effect in the discussion.

Interpretation of Response Surface Graphs in Individual Studies

The initial meta-analytic results indicate that participant and partner social class interact to predict social affiliation, although the evidence was weaker when the analysis was limited to previously unacquainted participants. To more completely test our hypothesis that matched upper- and lower-class participants affiliate more than average-class participants, we used response surface analysis to examine how participant and partner social class related to social affiliation in each study (Edwards & Parry, 1993; Nestler et al., 2015). In this step, we also explored whether same-class participants affiliated more than different-class participants.

Aggregate index of social class. We first examined the patterns for the aggregate index of social class. The results of the polynomial regression appear in the first set of rows in Table 4, and the response surfaces are graphed in Figure 2 (Panels A to D display the graphs for Studies 1 to 4). We first examined our central prediction that social affiliation is higher among class-

matched pairs at the extremes of the class continuum than among class-matched pairs in the middle of the continuum, which involved examining the pattern along the line of congruence. The line of congruence runs from the front of the surface, where participants are both lower class, to the back, where participants are both upper class (Edwards & Parry, 1993). A positive estimate for the curvature along the line of congruence suggests a U-shaped relationship, indicating that among matched pairs, social affiliation is higher at the extremes than in the middle on the class spectrum. As seen in Table 4, all four estimates were positive. Further, as can be seen in Figure 2, in Studies 1, 2, and 4, social affiliation was lower in the middle of the figure, which represents average-class partners, than in the front and back of the graph, which represent lower- and upper-class partners, respectively. These patterns support our hypothesis. The pattern in Study 3 was somewhat different: Affiliation was higher among matched-pairs at the low end but not at the high end of the social class continuum, partially supporting our hypothesis. Thus, the patterns supported our hypothesis in three studies and partially supported it in the other study.

In exploratory analyses, we then examined other features of the response surfaces that provide additional insights about how social class predicts social affiliation. First, the comparison of matched lower-class and matched upper-class pairs was not consistent across the studies. In two studies, the estimate for the slope of the line of congruence was positive, suggesting that matched upper-class individuals affiliate more than matched lower-class individuals, and the other two studies, the estimate for this slope was negative, suggesting the opposite. Thus, while we can confidently conclude that matched individuals at the extremes affiliate more than matched individuals in the middle of the class spectrum, we cannot conclude that matched upper-class individuals differ from matched lower-class individuals.

We then compared same- versus cross-class pairs. This involved examining tests of the line of incongruence. The line of incongruence runs from the far left to the far right of the surface (Edwards & Parry, 1993). The far left of this line represents interactions between lower-class participants and upper-class partners. Moving from left to right, participants' class increases and their partners' class decreases until they are equal at point (0, 0). After this point, participants' class exceeds that of their partners. The far right of this line represents interactions between upper-class participants and lower-class partners. The findings do not provide consistent evidence regarding social affiliation in same- versus cross-class pairs. In two studies, the estimate for the curvature along the line of incongruence was negative, revealing an inverted U-shaped pattern whereby individuals affiliate more with same-class partners. In the other two studies, the estimate was positive, revealing a U-shaped pattern whereby individuals affiliate more with different class partners.

The slope along the line of incongruence reveals whether upper-class individuals affiliate more with lower-class partners than vice-versa. In three studies, the coefficient for the slope of the line of incongruence was negative, suggesting that lower-class individuals affiliate more with upper-class partners than vice versa. This is consistent with past findings that lower-class individuals are more attracted to upper-class strangers than vice versa (Byrne et al., 1966). One study, however, suggested the opposite. Taken together, the results do not suggest a consistent pattern of affiliation in cross- and same-class interactions.

Parental education. To determine if the patterns differed for separate class indices, we examined the response surface graphs for parental education and parental income separately. The results of the polynomial regression analysis for parental education appear in the second set of rows in Table 4, and the response surfaces for parental education are graphed in Figure 3 (Panels

A to D display the graphs for Studies 1 to 4, respectively). Unlike the results for the aggregate index of social class, when only parental education is examined, the results for the curvature of the line of congruence were inconsistent across the studies. In two studies, the sign of the coefficient was positive, suggesting that social affiliation is highest at the extremes of the class continuum, and in the other two studies, the sign of the coefficient was negative, suggesting that social affiliation is highest in the middle of the class continuum. This suggests that the pattern that we identified with the aggregate indices of social class is not driven by parental education.

The other results for parental education were also inconsistent across studies. We observed switches in the sign of the slope of the line of congruence, and both the slope and curvature of the line of incongruence. Taken together, these results suggest that the parental education of individuals and their interaction partners do not interact to shape social affiliation during interactions in a consistent manner.

Parental income. The results of the polynomial regression analysis for parental income appear in the third set of rows in Table 4, and the response surfaces for parental income are displayed in Figure 4 (Panels A to C display the graphs for Studies 1 to 3 respectively). Several results for parental income were consistent across studies. In particular, the coefficient for the curvature of the line of congruence was consistently negative, suggesting higher affiliation at the extremes than in the middle of the parental income continuum, and supporting our hypothesis. Thus, social interactions feature more affiliation when both individuals have either wealthy or poor parents, compared to when both individuals have average-income parents.

Further, the coefficient for the slope of the line of incongruence was consistently negative, suggesting that while pairs matched at the extremes generally affiliated more than pairs

matched in the middle of the parental income continuum, lower-income pairs affiliated more than higher-income pairs.

We then compared social affiliation in interactions among individuals with the same parental income versus individuals with different parental income. The coefficient for the curvature along the line of incongruence was positive in two studies, and negative in the other. Thus, it is not clear that pairs with similar parental income affiliate more (or less) than pairs with different parental income. All coefficients for the slope of the line of incongruence, however, were negative, suggesting that individuals with poorer parents affiliate more with individuals with wealthier parents than vice versa.

Subjective social class. The results for subjective social class appear in the last row of Table 4 and are displayed in Figure 5. The results should be interpreted with caution because they are from a single, small-sample study. Social affiliation is higher among pairs matched at the extremes of the subjective social class continuum, supporting our hypothesis. Matched lower- and upper-class individuals exhibited comparable levels of social affiliation.

Same-class partners were overall more affiliative than cross-class partners, although in interpreting this finding, it is important to keep in mind that same-class pairs showed different levels of social affiliation at different levels of the subjective social class continuum. Upper-class individuals did not affiliate more with lower-class partners, compared to vice versa.

Discussion

In this investigation, we tested the prediction that affiliative tendencies directed toward same class partners would be most pronounced at the extremes of the social class spectrum. We theorized that people with the highest or lowest social class levels would be most distinctive from others, and that their social class would be most easily identified by others, leading to

higher social affiliation within these groups, compared to those in the middle of the class spectrum. Using meta-analysis (Borenstein et al., 2009; Schmidt & Hunter, 2014) and polynomial regression analysis (Edwards & Parry, 1993), we tested whether participants and partner social class interacted to predict social affiliation. Then, we examined response surface graphs (Edwards & Parry, 1993) to determine if any non-linear associations were consistent with our prediction.

The results of our internal meta-analysis suggested that the non-linear terms explained a significant amount of variance, above and beyond the linear terms. After determining the significance of the non-linear terms, following established procedures in the literature (Grijalva et al., 2015; Verhaeghen & Salthouse, 1997; Williams & Livingstone, 1994), we examined the response surface graphs in each study. We inferred support for our hypothesis if the curve along the line of agreement in the response surface graphs was consistently U-shaped, suggesting that social affiliation is higher among same-class pairs at the extremes compared to same-class pairs in the middle of the class continuum (Edwards & Parry, 1993).

We first conducted our analyses with aggregate measures of social class. These analyses generally supported our hypothesis. Meta-analysis suggested that the association between participant class, partner class, and social affiliation was non-linear. Further, the curvature along the line of agreement was U-shaped (and thus consistent with our hypothesis) in three studies (with magnitudes that varied across the studies). In the other study, social affiliation decreased along the line of agreement, suggesting that lower class pairs, but not upper class pairs, exhibited particularly high levels of affiliation (and providing partial support for our hypothesis).

Follow-up analyses with separate indices of social class suggested that these patterns are driven by parental income and subjective social class, but not parental education. The response

pattern graphs for parental income revealed consistent support for our prediction: the curvature along the line of agreement was U-shaped in all three studies that included this measure. By contrast, for parental education, the response surface graphs provided weak support for our hypothesis. The curvature along the line of agreement was U-shaped in two studies (consistent with our hypothesis) and inversely U-shaped in the other two (failing to support our hypothesis). While only one study administered a measure of subjective social class, and thus the results must be interpreted with caution, the pattern in that study was particularly pronounced. Matched pairs with high or low subjective class affiliated more than matched pairs with average perceived class. The findings suggest that among students, parental income and subjective social class might be the facets of social class that drive habits and behaviors that signify class to oneself and others and, in turn, serve as signals that shape affiliation in interactions. These results also align with prior findings showing consistency between subjective class measures and income measures (e.g., Kraus & Tan, 2015).

These findings reveal the importance of distinguishing between different matched pairs in models of in- and out-group interactions. Theories that propose that matched individuals on a dimension will have the same outcomes regardless of the level of that dimension will likely be over-simplistic, because it is not necessarily the case that matched individuals with higher levels of a dimension (such as social class) will have the same outcomes as matched individuals with average or lower levels of that dimension.

Why did no clear pattern emerge for parental education? One possibility is that signals of a partner's parental education are less readily discernible than signals of parental income or subjective class standing in face-to-face interactions. For instance, interaction partners with wealthy parents may wear expensive clothes or talk about their material possessions. By contrast,

signals that one has highly educated parents (or parents with little education) may be weaker because education is less strongly tied to material possessions and other signals that are visible to others in face-to-face interactions. Thus, two people who both have highly educated parents (or two parents with little education) may have difficulty identifying that they are similar. It is also possible that parental education as a signal of social class is less prominent in a university context where individuals' educational attainment is generally similar, as opposed to income, where some university students clearly have more and others have less. Another possibility is that matches in education occur on dimensions other than the absolute level of education. For example, two people, one with a medical degree and the other with a Ph.D. in art history, may display similarly high levels of education in different ways. Children of medical professionals may have difficulty detecting the signals of high education displayed by children of art historians, and vice versa. Thus, particularly at the high end of the spectrum, similarity in parental education levels may not necessarily trigger similarity-attraction processes, to the extent that similar levels of education in different domains are expressed and perceived differently. These and other possibilities should be examined in future research.

The analyses comparing affiliation in same- versus different-class partners did not suggest that same-class partners affiliate more than cross-class partners. In 7 of 12 distinct analyses, the curvature of the line of incongruence in the response surface graphs had a negative sign, indicating more social affiliation among same-class pairs, but in the other 5 analyses, the curvature had a positive sign, indicating the opposite (see last column of Table 4). The results more consistently (in 10 of 12 distinct analyses) suggested that lower-class individuals affiliate more with upper-class partners than vice versa (see results for the slope of the line of incongruence in Table 4). This result is consistent with a previous study showing that lower-class

individuals are more attracted to the profile of an upper-class stranger than vice versa (Byrne et al., 1966). These findings reveal the importance of modeling the behavior of each person involved in an interaction, rather than assuming that their behavior is interchangeable.

The Benefits of Polynomial Regression and Response Surface Methodology

Our research illustrates the strength of polynomial regression and response surface methodology (Edwards & Parry, 1993) to further understanding of intergroup relations. This analytical approach enables researchers to unpack in- and out-group interactions, test assumptions about how the characteristics of participants and their partners combine to predict outcomes, and, thus, develop more accurate theories of intergroup dynamics.

In particular, this approach allowed us to find that social affiliation varied along the same-class continuum. This is a substantive finding that cannot be detected by other analytical approaches, such as difference scores and traditional moderated regression (Edwards & Parry, 1993; Nestler et al., 2015). This analytical approach provides high resolution for studying continuous variables, such as social class, age, and personality in intergroup contexts.

Limitations and Future Research Directions

There are several limitations to this work. First, our investigation does not identify the reason why preferences for same-class partners—and particularly same parental income and subjective social class—were stronger at the extremes of the spectrum, relative to the middle of the spectrum. It remains unclear if class was more central to the identity of upper- and lower-class participants, the class standing of interaction partners at the extremes of the spectrum was easier to detect, or other mechanisms explain this pattern.

Second, our conclusions regarding differences between separate indices of social class are tentative. In particular, it is possible that class identity, which is better captured by subjective

measures of social class, is more important in shaping overall preferences for same-class partners than objective class characteristics. However, because only one study included a measure of subjective social class, we could not aggregate it with other studies and obtain a confidence interval for this index. The present research also does not speak to differences based on how social affiliation was indexed. In Studies 1 and 4, social affiliation was coded unobtrusively, in Study 2, it was self-reported, and in Study 3, it was peer-reported. It is possible that reduced social affiliation in cross-class interactions is manifested in subtle ways that are best captured with unobtrusive measures. Moreover, self-presentation bias might have limited our ability to detect different levels of affiliation in same- vs. cross-class relationships because participants were unwilling to report reduced affiliation with cross-class partners. Future research should examine the factors that facilitate or inhibit social affiliation in cross-class pairings.

Additionally, by studying undergraduate students, the range of social class was necessarily limited. On the one hand, this feature may have made our tests more conservative by limiting the range of the variables. On the other hand, research finds that a lower-class standing may be a particularly salient identity in university settings, given that lower-class students are historically under-represented and their values may clash with those that are promoted by universities (Johnson, Richeson, & Finkel, 2011; Stephens et al., 2012). Moreover, students with very wealthy backgrounds may also form a unique sub-group, especially at public universities like the ones where the current studies were conducted. Thus, generalizability to other populations is unclear and should be examined in future research. Factors like exposure to cross-class interaction partners and levels of overall local economic inequality might be important moderators in these associations. That is, to the extent that one's community is particularly insular, inhabited by individuals who are similar to the self, we might expect these findings to be

particularly strong. In contrast, in truly diverse sociodemographic communities, it may be less common to prefer same-class interaction partners at the extremes of social class.

Likewise, the present study investigated patterns of social class affiliation in the United States and it is premature to conclude at this time that these patterns hold across other countries or cultures. Generalizability to other concealable attributes is also unclear. The mechanisms suggesting that social affiliation varies across levels of social class sometimes apply and sometimes not to other concealable attributes. With some attributes, these mechanisms may even cancel each other out. For example, people with extreme positive and negative racial attitudes might be small in number and thus more distinctive. This would suggest that racial attitudes might be more salient to one's self-concept and, in turn, drive similarity effects more strongly for people with extreme rather than average racial attitudes. By contrast, contrary to social class, signals of extreme racial attitudes might be "louder" in the middle rather than extremes of the continuum for racial attitudes, because people with extreme racial attitudes might conceal their attitudes for fear of ostracism. If these two mechanisms operate simultaneously, then social affiliation might be the same across the continuum of racial attitudes.

Conclusion

The current findings reveal the importance of studying social class from an intergroup relations perspective, as studies that examine only the social class of one person in social interactions provide limited information about the dynamics and outcomes of these interactions. Our findings reveal that individuals show a stronger preference for interaction partners with the same parental income or same subjective social class at the extremes rather than the middle of the social class spectrum. Not all same-class interactions are the same.

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Author Note

Stéphane Côté, Joseph L. Rotman School of Management, University of Toronto; Michael W. Kraus, School of Management, Yale University; Nichelle C. Carpenter, Darla Moore School of Business, University of South Carolina; Paul K. Piff, Department of Psychology and Social Behavior, University of California, Irvine; Ursula Beermann, Department of Psychology, University of Innsbruck; Dacher Keltner, Department of Psychology, University of California, Berkeley.

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Correspondence concerning this article should be addressed to Stéphane Côté, Joseph L. Rotman School of Management, University of Toronto, 105 St. George Street, Toronto, ON, Canada, M5S 3E6. E-mail: scote@rotman.utoronto.ca.

Footnotes

¹ Study 1 participants were selected for the study from a larger sample of 124 participants used previously to investigate associations between social class and generosity in an economic game (Piff, Kraus, Côté, Cheng, & Keltner, 2010, Study 1), mania proneness and the detection of emotions via touch (Piff et al., 2012), and the association between spirituality and compassion (Saslow et al., 2013, Study 1). Participants appeared in the current study if they and their dyad partner filled out measures of social class, video-recordings were obtained that were visible for the pair, and the pair of participants followed instructions for the interaction (i.e., taking turns in the discussion and speaking for longer than 30 seconds). Social affiliation was not correlated with generosity in the economic game, $r(68) = -.13, p = .30$.

² The Study 2 sample was previously used to examine how social class predicts hostile reactions to teasing (Kraus, Horberg, Goetz, & Keltner, 2011, Study 1). For the purposes of another investigation, participation was open to individuals of European American, Hispanic, or African American ethnicity. Four dyads could not be included in the analyses reported in the current paper because they were missing one or both social class measurements.

³ We conducted the analyses with ordinary least squares regression because we needed a meta-analyzable effect size. However, participants were nested within dyads, and thus observations were non-independent. Therefore, it was important to verify that the results were similar when the nesting of observations within dyads is taken into account. We repeated all analyses using hierarchical linear modeling, using the nlme package for R (Pinheiro, Bates, DebRoy, & Sarkar, 2014). In these analyses, social affiliation was regressed on participants' social class, partners' social class, the two squared terms, and the interaction term at Level 1. There were no predictors

at Level 2. All results of polynomial regression analyses and response surface graphs revealed the same conclusions. These results are reported in the supplementary materials.

Table 1

Descriptive Statistics for Individual Primary Samples

	Study 1	Study 2	Study 3	Study 4
Total sample size	72	238	170	266
Total number of dyads	36	119	85	133
Gender				
Female participants	54 (75%)	238 (100%)	110 (65%)	171 (64%)
Male participants	18 (25%)	0	59 (35%)	95 (36%)
Participants with gender unreported	0	0	1 (1%)	0
Ethnicity				
African American participants	0	30 (13%)	9 (5%)	26 (10%)
Asian American participants	0	0	60 (35%)	75 (28%)
European-American participants	42 (58%)	108 (45%)	78 (46%)	139 (52%)
Hispanic participants	0	95 (40%)	23 (14%)	26 (10%)
Participants selecting “other” for ethnicity	21 (29%)	5 (2%)	8 (5%)	9 (3%)
Participants with ethnicity unreported	9 (13%)	0	0	0
Age				
Mean age	22.97	19.7	--	--
Standard deviation of age	8.52	1.47	--	--

Note. Age was not collected in Studies 3 and 4.

Table 2

Meta-Analysis Results

Index of social class	<i>k</i>	<i>N</i>	<i>r_m</i>	<i>SD_r</i>	<i>SD_{res}</i>	% Var	CI _{L95}	CI _{U95}
All samples								
Aggregate class index	4	705	.10	.05	--	100	.03	.18
Parental education	4	690	.16	.05	--	100	.08	.23
Parental income	3	632	.11	.08	.05	67.63	.04	.19
Samples of unacquainted participants								
Aggregate class index	3	502	.09	.05	--	100	-.00	.17
Parental education	3	462	.17	.05	--	100	.08	.26
Parental income	2	410	.06	.03	--	100	-.04	.15

Note. *k* = number of effect sizes; *N* = total sample size; *r_m* = sample-size weighted mean correlation indicating the non-linear association between participant and partner social class and social affiliation; *SD_r* = sample size weighted observed standard deviation of correlations; *SD_{res}* = standard deviation of correlations after removing sampling error variance; % Var = percent of variance accounted for by sampling error; CI = confidence interval for observed correlation; L = lower limit; U = upper limit.

Table 3

Meta-Analysis Results Controlling for Similarity in Gender and Ethnicity

Index of social class	k	N	r_m	SD_r	SD_{res}	% Var	CI _{L95}	CI _{U95}
All samples								
Aggregate class index	4	661	.10	.05	--	100	.03	.18
Parental education	4	668	.14	.04	--	100	.07	.22
Parental income	3	610	.11	.09	.05	62.98	.03	.19
Samples of unacquainted participants								
Aggregate class index	3	468	.08	.05	--	100	-.01	.17
Parental education	3	450	.16	.04	--	100	.07	.25
Parental income	2	398	.05	.05	--	100	-.05	.15

Note. k = number of effect sizes; N = total sample size; r_m = sample-size weighted mean correlation indicating the non-linear association between participant and partner social class and social affiliation; SD_r = sample size weighted observed standard deviation of correlations; SD_{res} = standard deviation of correlations after removing sampling error variance; % Var = percent of variance accounted for by sampling error; CI = confidence interval for observed correlation; L = lower limit; U = upper limit.

Table 4

Tests of Slope and Curvature along Lines of Congruence and Incongruence.

							along line of congruence		along line of incongruence	
	intercept	X	Y	X^2	XY	Y^2	slope	curve	slope	curve
Aggregate class index										
Study 1	.02	.07	.14	-.03	.22	.02	.21	.21	-.08	-.23
Study 2	-.19	.02	-.08	.13	.01	.10	-.06	.23*	.10	.22
Study 3	5.74***	-.11	.05	.02	.00	.03	-.07	.05	-.16	.05
Study 4	.00	.01	.04	-.02	.09	.02	.06	.08	-.03	-.09
Parental education										
Study 1	-.06	.10	.13*	.01	.03	-.05	.24**	-.02	-.03	-.07
Study 2	-.01	.01	.00	-.02	.03	.01	.01	.02	.01	-.05
Study 3	5.55***	-.18	-.03	.88	.16	.45	-.20	1.49	-.15	1.17
Study 4	.05	.05	.07	-1.20**	.36	.71	.13	-.13	-.02	-.85
Parental income										
Study 2	-.21	-.10*	-.06	.06**	-.01	.02	-.16**	.07**	-.04	.10***
Study 3	5.75***	-.04*	-.00	.00	.00	.00	-.05	.01	-.04	.00
Study 4	.01	-.01	-.00	-.00	.00	-.00	-.01	.00	-.00	-.00
Subjective social class										
Study 1	.06	-.11	-.09	-.02	.16***	.03	-.19	.18***	-.02	-.15**

Note. X = participant social class. Y = partner social class. For columns labeled intercept, X , Y , X^2 , XY , and Y^2 , values represent regression coefficients with all predictors entered simultaneously. Positive curve estimates for the line of congruence indicate that affiliation is highest at the extremes of the social class spectrum and lowest at the average.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Figure 1. Hypothetical response surface graph for the predicted association between participant social class, partner social class, and social affiliation. In this hypothetical figure, social affiliation is higher at extreme levels of social class similarity (high-high and low-low pairings in the front and back of the Figure, respectively), compared to average levels of social class similarity (in the middle of the Figure). The Figure is color-coded so that green depicts the highest levels of social affiliation and red depicts the lowest levels.

A

B

C

D

Figure 2. Response surface graphs for the association between participant social class (aggregate index), partner social class (aggregate index), and social affiliation. Results for Studies 1-4 appear in panels A-D, respectively. The Figures are color-coded so that green depicts the highest levels of social affiliation and red depicts the lowest levels.

A

B

C

D

Figure 3. Response surface graphs for the association between participant parental education, partner parental education, and social affiliation. Results for Studies 1-4 appear in panels A-D, respectively. The Figures are color-coded so that green depicts the highest levels of social affiliation and red depicts the lowest levels.

A

B

C

Figure 4. Response surface graphs for the association between participant parental income, partner parental income, and social affiliation. Results for Studies 2-4 appear in panels A-C, respectively. The Figures are color-coded so that green depicts the highest levels of social affiliation and red depicts the lowest levels.

Figure 5. Response surface graph for the association between participant subjective social class, partner subjective social class, and social affiliation. Results are for Study 1. The Figure is color-coded so that green depicts the highest levels of social affiliation and red depicts the lowest levels.

Supplementary Materials**Items Assessing Social Affiliation in Daily Life in Study 2**

Please circle the number that best reflects your relationship:

- 1 less than once a month
- 2 once a month
- 3 a few times a month
- 4 a few times a week
- 5 every day

- 1. How often do you spend free time with your friend?
- 2. How often do you talk to your friend in person or on the phone?
- 3. How often do you email this friend or use an instant messaging service?
- 4. How often do you and your friend sit around and talk about things like school, sports, or anything else?
- 5. How often do you and your friend do things to have fun together, like play sports or games?
- 6. How often do you and your friend go places together, like a movie, shopping, or out to eat?
- 7. How often do the two of you get together on weekdays or weekends?

Please circle the number that best reflects your relationship:

- 1 never
- 2 not often
- 3 sometimes
- 4 often
- 5 always

- 8. When you feel really good about something, how often do you tell your friend about it?
- 9. How often do you talk about race or ethnicity with your friend?
- 10. How often do you get into arguments with your friend?
- 11. How often do you and your friend borrow things from each other, like class notes, music, or other things?
- 12. How often do you tell your friend things about yourself that you wouldn't tell most other people?
- 13. How often do you feel like it's hard to get along with your friend?
- 14. If you needed help with something, how often would you ask your friend to help you?
- 15. When something is bothering you, how often do you talk to your friend about it?

Please circle the number that best reflects your relationship:

- 1 not at all
- 2 not very
- 3 a little
- 4 very much

5 completely

16. How sure are you that your friendship will continue in the years to come?
17. How likely is it that you and your friend will still be friends six months from now?
18. How likely is it that your friendship will be permanent?
19. How much does your friend know about what you like and how you feel about things?
20. How committed are you to your friendship?
21. How sure are you that your friendship will last no matter what?
22. How much do you care about your friend?

Supplementary Materials

Additional Guidelines for Interpreting Tests of the Response Surface

The interpretation of the results of polynomial regression and response surface analysis typically focuses on four coefficients reflecting the slope and curvature of the lines of congruence and incongruence (i.e., the four right-most columns in Table 4; Edwards & Parry, 1993). Each coefficient reveals unique information about how the social class of two individuals combine to predict social affiliation. To fully understand how the social class of individuals and their partners relate to social affiliation, all four coefficients should be interpreted together.

Interpreting tests of the line of congruence.

The slope of the line of congruence. This slope reveals whether matches at high levels of a construct feature more (or less) social affiliation than matches at low levels of this construct. Applied to our research, this slope indicates if upper class interaction partners affiliate more (or less) with each other than lower class interaction partners. A positive slope indicates that upper class interaction partners affiliate more than their lower class counterparts, and a negative slope indicates that lower class interaction partners affiliate more than their upper class counterparts. Thus, a significant slope along the line of congruence in either direction indicates that not all same-class interactions are the same, and thus broad comparisons of same-class versus cross-class interactions are over-simplistic.

The curvature of the line of congruence. This curvature reveals whether matches at extreme levels of a construct feature more (or less) social affiliation than matches at mid levels of the construct. Applied to our research, this curvature indicates if interactions partners with extreme levels of social class (two upper-class or two lower-class interaction partners) affiliate more (or less) compared to middle-class interaction partners. Thus, this is the most important

feature of the response surface for testing our central hypothesis that social affiliation among same-class partners is stronger at the extremes of the class spectrum (although the other features qualify the results in important ways, as described in the results section). A positive coefficient for the curvature indicates a convex (upward) curve, so that matches at progressively higher and lower levels of social class feature more social affiliation than matches at mid-levels. A negative coefficient indicates a concave (downward) surface, so that social affiliation is highest between two middle-class individuals and diminishes for both upper-class and lower-class pairs. The implications of significant curvature of the line of congruence are also that not all same-class interactions are the same, and thus it is over-simplistic to treat all matches as the same.

Interpreting tests of the line of incongruence.

The slope of the line of incongruence. This slope reveals whether the direction of the difference between two constructs matters for social affiliation. Specifically, this slope reveals if the person with the lower level of the construct affiliates more (or less) than the person with the higher level. Applied to our research, this slope reveals whether the lower class individual shows more affiliative behavior toward the upper-class individual, or vice versa, during a cross-class interaction. A positive slope indicates that the upper class individual engages in more affiliative behavior than the lower class individual. A negative slope, however, indicates that the lower class individual engages in more affiliative behavior than the upper class individual. A significant slope of the line of incongruence in either direction reveals that it is incorrect to assume that cross-class interaction partners behave the same during the interaction, and thus general comparisons of same-class versus cross-class interactions are over-simplistic.

The curvature of the line of incongruence. This curvature reveals whether matches feature more (or less) social affiliation than mismatches. Applied to our research, this curvature

reveals whether same-class interaction partners affiliate more (or less) than cross-class interaction partners. This coefficient is the critical test of whether same-class partners generally affiliate more (or less) than cross-class partners. A positive coefficient reflects a convex (upward) curve, suggesting that social affiliation is lowest among same-class pairs and increases as interaction partners become more different in their social class. A negative coefficient reflects a concave (downward) surface, suggesting that social affiliation is highest among same-class pairs and decreases as interaction partners become more different in their social class.

Tests of Slope and Curvature along Lines of Congruence and Incongruence – Results from Hierarchical Linear Modeling

							along line of congruence		along line of incongruence	
	intercept	X	Y	X^2	XY	Y^2	slope	curve	slope	curve
Aggregate class index										
Study 1	.02	.07	.14	-.03	.22	.02	.21	.21	-.08	-.23
Study 2	-.19	.02	-.08	.14	.01	.10	-.06	.23	.09	.25
Study 3	5.74***	-.11	.05	.02	.00	.03	-.07	.05	-.16	.05
Study 4	.00	.01	.04	-.02	.09	.02	.06	.08	-.03	-.09
Parental education										
Study 1	-.06	.10	.13	.01	.03	-.05	.24	-.02	-.03	-.07
Study 2	-.01	.01	.00	-.02	.03	.00	.01	.02	.01	-.05
Study 3	5.55***	-.18	-.03	.88	.16	.45	-.20	1.49	-.15	1.17
Study 4	.05	.05	.07	-1.20**	.36	.71	.13	-.13	-.02	-.85
Parental income										
Study 2	-.21	-.10*	-.06	.06**	-.01	-.02	-.16*	.07	-.04	.10
Study 3	5.75***	-.04*	-.00	.00	.00	.00	-.05	.01	-.04	.00
Study 4	.01	-.01	-.00	-.00	.00	-.00	-.01	.00	-.00	-.00
Subjective social class										
Study 1	.05	-.11	-.09	-.02	.16**	.03	-.19	.18**	-.02	-.15*

Note. X = participant social class. Y = partner social class. For columns labeled intercept, X , Y , X^2 , XY , and Y^2 , values represent regression coefficients with all predictors entered simultaneously.

* $p < .05$. ** $p < .01$. *** $p < .001$.