



Approaching extraverts: Socially excluded men prefer extraverted faces

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ABSTRACT

Social exclusion creates a powerful motivation for individuals to seek affiliation with others. Satisfying this affiliative motive would be facilitated by the ability to detect cues in others indicative of their own affiliative propensity. Given the association of extraverted personality with affiliative interest and social access, gravitating toward more extraverted others could serve to ensure satisfaction of one's own affiliation goals. Consistent with past research, we hypothesized that social exclusion (relative to social inclusion) would heighten preferences for faces that veridically connote extraversion. Results partially supported this primary hypothesis as socially excluded men upregulated their preferences for extraverted faces following an exclusionary experience, whereas no difference emerged for women's extraversion preferences based on inclusionary status. These findings suggest men favored the affiliative benefits of extraversion over its potential interpersonal costs following exclusion. Conversely, socially included men did not prefer extraverted faces, which could reflect greater wariness of dominant conspecifics, despite the potential gregariousness communicated in target faces, when such men's affiliative needs are adequately met. We frame these results using an evolutionary framework discussing how salient needs influence interpersonal preferences.

1. Introduction

Social support systems are crucial to humans' wellbeing and sense of belonging. Research finds greater social support is associated with successful coping in stressful life events and pursuing opportunities for growth and development (Feeney & Collins, 2015). People use various interpersonal cues to identify potentially supportive others, including information about their past behavior, both inferred through one's own observations and reports from others, and inferences about others' personality traits that may themselves be associated with sociality. Given their potential for extensive social networks and greater willingness to connect with other people (Ashton & Lee, 2007; Pollet, Roberts, & Dunbar, 2011), extraverted individuals could be particularly interested in providing social support and be especially desirable when one's affiliative needs have been thwarted through social exclusion.

To benefit from others' extraversion, it would thus be adaptive for humans to possess the ability to infer others' level of extraversion, in part, through an individual's appearance (Funder, 2012). Such accurate inferences could even occur with minimal information for more immediate assessments of another's social value quickly and efficiently (Borkenau, Mauer, Riemann, Spinath, & Angleitner, 2004). One channel through which inferences about another's extraversion can occur is through facial structures that reliably connote the trait (Sacco

& Brown, 2018a; Zebrowitz & Collins, 1997). By obtaining a relatively accurate estimate of another's trait extraversion from brief exposure to another's face, those seeking affiliative opportunities would have an efficient channel for identifying how well another person could satisfy their affiliative needs. Given the enhanced affiliative interest of excluded individuals and their concomitant ability to infer others' affiliative intentions, particularly from facial information (Bernstein, Sacco, Brown, Young, & Claypool, 2010), social exclusion should adaptively augment preferences toward faces that connote extraversion.

1.1. Affiliative motives and social sensitivity

Humans possess a fundamental need to belong that motivates the pursuit of relatively stable social access to others (Baumeister & Leary, 1995). Such affiliation would provide access to the benefits of group living, including reciprocal altruism and alloparenting (Trivers, 1971). To facilitate inclusion, it has been hypothesized that humans evolved a sociometer, a psychological system alerting them to feelings of exclusion in the service of identifying affiliative opportunities, either through reparation of threatened existing relationships or the establishment of new ones, to ensure feelings of inclusion (Leary, Tambor, Terdal, & Downs, 1995). This alarm system further elicits considerable desire to

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ensure access to those capable of satisfying belongingness needs. Those motivated to affiliate following an exclusionary experience become more prosocial (Maner, DeWall, Baumeister, & Schaller, 2007), contribute more in cooperative tasks in the service of signaling desirability (Williams & Sommer, 1997), and are more accepting of others with low social value (Sacco & Bernstein, 2015; Sacco, Brown, May, & Medlin, 2018).

It would further be adaptive for the sociometer to heighten perceptual acuity toward those affording greater affiliative opportunities. Exclusionary experiences heighten acuity and attention toward facial cues connoting another's affiliative interest (e.g., smiles; DeWall, Maner, & Rouby, 2009). Such experiences further increase accuracy at discerning between Duchenne smiles, a genuine affiliative signal, and non-Duchenne smiles, “fake” smiles, which possibly connote deceptive or non-affiliative intentions. Heightened smile discrimination is in the service of identifying high-probability affiliative opportunities and avoiding non-affiliative others following exclusion (Bernstein, Young, Brown, Sacco, & Claypool, 2008). This elicited sensitivity further increases preferences to engage those displaying Duchenne smiles compared to non-Duchenne smiles, which could be in the service of increasing opportunities for engaging those most interested in affiliation (Bernstein et al., 2010).

1.2. Benefits of and identifying extraversion

Extraverted individuals are especially sociable and would therefore be desirable among those seeking affiliation (Anderson & Shirako, 2008; Ashton & Lee, 2007). The extensive social networks of more extraverted persons would afford those sensitive to cues connoting another's extraversion considerable downstream social benefits in the form of access to extraverts' extensive social networks, ensuring affiliative opportunities that would benefit survival and reproductive fitness (Pollet et al., 2011). With these social benefits, it becomes incumbent upon individuals to recognize features of another that connote extraversion in the service of identifying affiliative opportunities. Individuals can infer others' personality through their physical appearance, particularly the interpersonal components of extraversion (Borkenau et al., 2004). Extraverted individuals are also more likely to display positive emotionality, such as smiling more (Naumann, Vazire, Rentfrow, & Gosling, 2009), which could suggest the preference for affiliative signals following social exclusion could serve to identify individuals with sociable personalities (e.g., Bernstein et al., 2010; DeWall et al., 2009). These personality inferences could subsequently inform perceivers of an individual's likely behavioral repertoire, thus indicating that individual's social value.

The human face is a robust social stimulus from which individuals can infer considerable information about conspecifics, including their personality and behavioral intentions (Parkinson, 2005). In fact, research has identified typical facial structures of various personality traits. For example, using composites of faces of individuals who completed a personality inventory, Little and Perrett (2007) created images connoting the typical facial structures of individuals who are high and low on the Big Five traits. Importantly, extraversion was the most accurately inferred in these structures, and this inference occurs within 150 ms of exposure (Borkenau, Brecke, Möttig, & Paelecke, 2009; Little & Perrett, 2007). The identification of facially communicated personality would subsequently elicit recognition of the target's affordances and form the basis of a preference as a function of the perceiver's salient social motives (Sacco & Brown, 2018a). Thus, individuals may be able to recognize the beneficial affiliative opportunities in an extraverted face. Dispositionally heightened affiliative motives heighten preferences for facially communicated extraversion (Brown & Sacco, 2017a), suggesting individuals recognized the sociability of prospective conspecifics to ensure access to affiliative opportunities. However, previous research is limited insofar as there was no consideration of acutely activated affiliative motives. It would

nonetheless seem sensible to predict that an acute exclusionary experience would heighten preferences for facially communicated extraversion.

1.3. Current research

The current research sought to extend previous research suggesting a social desirability of extraversion, particularly following exclusionary experiences. Given extraverted individuals' affiliative nature (e.g., Pollet et al., 2011), and the fact that social exclusion heightens preferences for cues connoting genuine affiliative intent (Bernstein et al., 2010), we predicted exclusionary experiences would heighten preferences for extraverted faces in the service of ingratiating oneself with an optimally affiliative person.

2. Method

2.1. Participants

We recruited 253 participants from a public university in Southeast U.S. for course credit. A power analysis indicated that a study of 200 participants would sufficiently detect small-medium effects (Cohen's $f = 0.15$, $\beta = 0.95$). We deliberately oversampled in case we had to exclude data from analyses. A computer malfunction during one session resulted in excluding one participant from final analyses ($n = 252$; 169 Women, 83 Men; $M_{Age} = 20.01$, $SD = 3.37$; 47.6% Black, 45.2% White, 7.2% Other).¹

2.2. Materials

2.2.1. Cyberball

Participants played an online ball-tossing game, ostensibly with other students, through a simulated Cyberball interaction (Williams & Jarvis, 2006). Three other players were preprogrammed agents who either included or excluded participants in the game. Exclusion occurred when the agents ceased throwing the ball to participants ($n = 124$), whereas continued passing of the ball constituted inclusion ($n = 128$). Following Cyberball, participants completed a manipulation check including a Basic Needs Questionnaire (Williams, Cheung, & Choi, 2000). Operating along 5-point Likert-type scales (1 = *Not at All*; 5 = *Extremely*), Basic Needs items assessed need satisfaction related to belongingness, self-esteem, control, and meaningful existence (4 items each; $\alpha > 0.73$). Basic Needs scores were highly related ($\alpha = 0.89$), prompting us to average scores into a single score (Bernstein, Sacco, Young, & Hugenberg, 2014; Sacco & Bernstein, 2015; Sacco et al., 2018). Participants also indicated their positive and negative affect (4 items each; $\alpha > 0.85$), and how painful they found Cyberball (2 items; $r = 0.58$).

2.2.2. Facial extraversion

Participants indicated preferences among face pairs manipulated to communicate high and low levels of extraversion (Brown & Sacco, 2016; see Fig. 1). Faces were 20 unique Caucasian individuals of both sexes between the ages of 18–40 years, which were subsequently morphed with extraverted and introverted (i.e., low-extraversion) composite face prototypes connoting high and low levels of

¹ Because of the possibility that White and non-White participants could have differential preferences for extraversion in Caucasian faces (i.e., cross-race effect; Young, Hugenberg, Bernstein, & Sacco, 2012), especially considering the relatively even split between White and non-White participants in this sample, we conducted an exploratory analysis to consider whether participant race moderated these findings (i.e., White versus non-White participants). The effects reported in this paper were not moderated by race nor was there a main effect of race, $F_s < 1.64$, $p_s > 0.20$.



Fig. 1. Examples of male and female faces communicating high (left) and low levels of extraversion.

extraversion. Faces were generated using a morphing software (Morpheus Animation Suite v3.10) that afforded a standardized generation technique. Specifically, Holtzman (2011) generated the prototypes by imposing faces of 10 men and 10 women, for both high and low levels of extraversion, into single composite images; extraversion was determined based on both self- and other-reports on a personality inventory. Each face was comprised of 50% of each unique identity and 50% of the matched-sex composites for extraversion and introversion, resulting in 20 male and 20 female high-low face pairs that differed in relative levels of extraversion from each other. Participants viewed each unique identity pair separately in a randomized order with the presentation of stimuli counterbalanced. Participants selected the face in each pair they preferred in a self-paced task assessing participants' general preference for each face. Trials ended after participants indicated their decisions. Responses indicating preferences for extraversion were coded as "1" and introversion as "0," with higher values reflecting preferences for extraversion. A relative preference score was calculated by comparing the amount of times participants selected a high-extraversion face by summing the frequency of selection and dividing it by total number of trials, separately for male and female targets.

2.3. Procedure

Upon entering the laboratory, consenting participants first played Cyberball before responding to the Basic Needs, mood, and pain questionnaires. Then, participants indicated their preferences among the face pairs. Finally, participants provided demographics information and were debriefed.

3. Results

3.1. Manipulation check

Consonant with previous research, included participants reported greater satisfaction of basic needs and positive affect than excluded participants, $|ts| > 10.00$, $ps < 0.01$, $ds > 1.35$. Excluded participants also reported greater negative affect and pain than included participants, $|ts| > 4.80$, $p < 0.01$, $ds > 0.59$.

3.2. Extraversion preference

We submitted our data to a 2 (Condition: Exclusion vs. Inclusion) \times 2 (Participant Sex: Male vs. Female) \times 2 (Target Sex: Male vs. Female) mixed-model ANOVA with repeated factors over Target Sex. Levene's test for homogeneity indicated no violations of homogeneity emerged in this omnibus analysis ($F_s < 1.44$, $ps > 0.230$). Consistent with previous research (Brown & Sacco, 2016, 2017a, 2017b), a Target Sex main effect indicated participants preferred extraversion more in female faces ($M = 0.59$, $SD = 0.13$) than male faces ($M = 0.48$, $SD = 0.14$), $F(1, 248) = 91.88$, $p < 0.01$, $\eta^2 = 0.27$. A Participant Sex main effect indicated women ($M = 0.55$, $SD = 0.13$) preferred extraversion more than men ($M = 0.51$, $SD = 0.12$), $F(1, 248) = 7.58$, $p < 0.01$, $\eta^2 = 0.03$. A significant main effect of Condition indicated excluded participants ($M = 0.54$, $SD = 0.13$) preferred extraverted faces more than included ($M = 0.52$, $SD = 0.14$), $F(1, 248) = 5.66$, $p = 0.02$, $\eta^2 = 0.02$, suggesting that our hypothesis was supported.

Unexpectedly, however, effects were further qualified by a Condition \times Participant Sex interaction, $F(1, 248) = 4.60$, $p = 0.03$, $\eta^2 = 0.02$ (see Fig. 2). Simple effects tests revealed no difference in extraversion preferences between excluded men ($M = 0.54$, $SE = 0.02$)

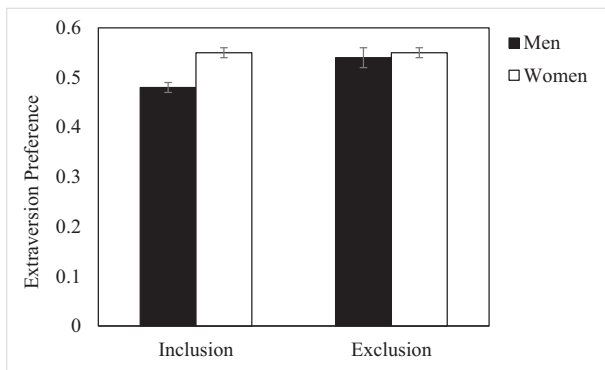


Fig. 2. Men's and women's preferences for facially communicated extraversion as a function of inclusionary status. Note: Higher scores connote greater preference for extraversion.

and women ($M = 0.55$, $SE = 0.01$), $F(1, 248) = 0.17$, $p = 0.67$, $\eta^2 = 0.00$. However, included women ($M = 0.55$, $SE = 0.01$) preferred facial extraversion more than included men ($M = 0.48$, $SE = 0.01$), $F(1, 248) = 12.82$, $p < 0.01$, $\eta^2 = 0.05$. Viewed another way, regardless of inclusionary status, women indicated similar levels of extraversion preferences, $F(1, 248) = 0.04$, $p = 0.84$, $\eta^2 = 0.00$. Conversely, excluded men preferred extraversion more than included men, $F(1, 248) = 7.61$, $p < 0.01$, $\eta^2 = 0.03$. No other interactions emerged in this analysis, $F_s < 1.00$, $p_s > 0.30$.

Subsequent one-sample t -tests to determine categorical preferences for both sexes in each condition indicated women in both conditions and excluded men preferred extraverted faces, $t_s > 2.80$, $p_s < 0.01$, $d_s > 0.55$. However, included men displayed neither a preference for introverted nor extraverted faces, $t(45) = -1.36$, $p = 0.18$, $d = 0.40$. Taken together, these results suggest excluded men upregulate their preference for extraversion, whereas women displayed similar above-chance extraversion preferences, regardless of inclusionary status condition.

4. Discussion

Our results provided partial support for our hypothesis. That is, a heightened preference emerged for extraverted faces following an exclusionary experience. Unexpectedly, however, this preference shift occurred only for men, whereas women preferred extraversion independent of inclusionary status. Men's preferences could represent a tradeoff between the costs and benefits of extraversion. Despite numerous affiliative benefits, extraversion nonetheless connotes interpersonal dominance, particularly in the face (Cheng, Tracy, & Henrich, 2010; Kramer, King, & Ward, 2011). Extraversion is associated with a direct, oftentimes assertive, pursuit of status and social bargaining within a group that could invoke competition (Anderson, John, Keltner, & Krings, 2001; Lund, Tammes, Moestue, Buss, & Vollrath, 2007). Extraverted men also tend to be physically formidable, implicating them as likely to win such conflicts, which would impede other men's access to status and resources (Fink, Weege, Pham, & Shackelford, 2016; Lukaszewski & Roney, 2011; Sell, Hone, & Pound, 2012). Given men's proclivity toward competition through physical conflict (e.g., Griskevicius et al., 2009; Van Vugt, De Cremer, & Janssen, 2007), it would benefit men's interpersonal decisions to consider the costs of other men's extraversion primarily. Exclusionary experiences may ultimately downregulate other motivations in men to ensure satisfaction of unfulfilled affiliative motives (e.g., Sacco, Brown, Young, Bernstein, & Hugenberg, 2011), leading to an emphasis on the benefits of extraversion (e.g., Ashton & Lee, 2007; Pollet et al., 2011) while minimizing concerns for costs.

Extraverted women, on the other hand, may not provide similar adversarial concerns for men, given physical size asymmetries imposed

by sexual dimorphism (Lassek & Gaulin, 2009). Nonetheless, excluded men's preference for extraversion was similar for male and female faces, suggesting extraverted women may provide their own unique form of competition for men. Extraverted women tend to be more physically attractive, affording them greater social bargaining power, which could also impede men's access to resources (Lukaszewski, 2013; Lukaszewski & Roney, 2011). Extraverted women are also competitive and interpersonally dominant themselves (Anderson et al., 2001; Cheng et al., 2010), which could implicate them to men as another obstacle in status acquisition, making it advantageous for socially included men not to prefer them. Nonetheless, these considerations of participant and target sex were not predicted a priori, thus necessitating future research to understand the granularity of these tentative post hoc explanations of the current findings.

Irrespective of inclusionary status, women preferred extraversion regardless of their inclusionary status. Further bolstered by the main effect of participant sex, our findings suggest men and women possess different baselines in extraversion preferences. Given that women are typically more sociable and reliant on social interaction than men (Feingold, 1994), even in stressful environments (i.e., tend-and-befriend; Taylor et al., 2000), differences in baseline preferences would seem sensible. Because of women's heightened sociability, selection would favor women who had heightened sensitivity toward facial features connoting affiliative intent in the service of optimizing their social opportunities. In fact, women with heightened concerns for their physical safety are particularly sensitive to facial features connoting trustworthiness, whereas men with such concerns are not (Sacco, Brown, Lustgraaf, & Young, 2017). Such sensitivity further elicits considerable aversion from women concerned about physical safety to facial structures connoting exploitative intent (Brown, Sacco, Lolley, & Block, 2017). This recognition of the sociability connoted in extraversion would be adaptive in the service of identifying affiliative opportunities without much concern for the costs of affiliating with dominant conspecifics.

For men, however, their lack of a baseline preference may represent a more minimal interest in social connections compared to women and a more immediate awareness of the costs in associating with extraverted conspecifics. Social exclusion may heighten interest in extraversion to ensure access to sociable others but only because of a relative deficit in affiliation for men. Men's upregulated preference following exclusion could further indicate differential emphases on the affiliative benefits and competitive costs of extraverted faces, namely cues to sociability and dominance (Kramer et al., 2011).

4.1. Limitations and future directions

This study presented several limitations that could provide impetus for subsequent investigations to determine the robustness of effects. First, although inclusionary status influenced men's face preferences, there is concern about whether social inclusion is an appropriate baseline, as it ultimately satisfies a basic need (Dvir, Kelly, & Williams, 2018). Future research would benefit from providing a second control that would not manipulate inclusionary status directly. For example, recent findings suggest a neutral experience called Cybertree demonstrates equivocal psychological experiences to social inclusion without satisfying affiliative motives (Dvir et al., 2018). Cybertree could provide researchers the opportunity to determine if included men's preferences are indeed a baseline.

Although extraverted faces are perceived as both dominant and sociable (Kramer et al., 2011), these data do not immediately indicate the basis of participants' preferences. Future research would benefit from determining whether perceptions of sociability and dominance form the basis of these preferences, particularly whether these perceptions mediate the link between inclusionary status and preferences. Previous research indicates temporally activated motivational states heighten sensitivity to the communicative properties of facial features,

with social exclusion specifically heightening sensitivity to facial features that veridically connote affiliative intent (Bernstein et al., 2008; Brown & Sacco, 2018). A future study could task participants with rating extraverted and introverted faces on sociability and dominance following Cyberball. With the benefits of extraversion being particularly salient, men may perceive extraverted faces as friendlier, which could motivate their preference for such faces. Conversely, men whose affiliative needs are met could more readily perceive the costs of high-extraversion more than those with unmet needs and could be more likely to perceive dominance and downregulate their preference.

Future research could also address facial features connoting other Big Five facial features and their affiliative value. Agreeableness could prove fruitful. Indeed, highly agreeable faces are preferred overall (Sacco & Brown, 2018b), but manipulating inclusionary status could elicit stronger preferences for these faces in the service of identifying conspecifics who appear benevolent without necessarily invoking the tradeoff. A heightened preference for agreeableness would provide evidence that thwarted affiliative needs facilitate the identification and selection of benevolent conspecifics. In fact, this lack of dominance connoted in agreeableness could demonstrate similar preferences for affiliative personalities for both men and women. Given this information about preferences for extraversion and agreeableness, research could then create a study pitting high levels of these traits against each other to determine which trait would optimally satisfy affiliative needs. Future research would further benefit from employing different stimulus manipulation techniques that would complement morphing by considering more multidimensional aspects of trait inferences through facial features. Although morphing has merit in assessing relative preferences along a single dimension (i.e., high and low levels of a personality trait), other techniques could address perceptions of different facets of a single trait. Transformation manipulation techniques could allow researchers to assess traits multidimensionally (e.g., DeBruine, 2005). For example, sexual dimorphism considers dimensions of masculinity and femininity in which low levels of one does result in high levels in the other and a morphing technique may not afford an effective manipulation to assess these dimensions within the same face (i.e., androgyny; DeBruine, Jones, Little, & Perrett, 2008). If one were to consider facets related to sociability and interpersonal dominance in extraversion separately, a transformation technique would afford consideration of these nuances separately. In fact, a future study could manipulate men's inclusionary status before assessing preferences for faces communicating high and low levels of sociability and dominance facets of extraversion.

5. Conclusion

The current study sought to demonstrate how affiliative motives shape perceptions of sociable conspecifics who could optimally satisfy belongingness needs. Specifically, we found that exclusion upregulates preferences for extraversion, whereby participants seem to emphasize the benefits of such conspecifics over the costs (i.e., gregariousness versus dominance). These preferences indicate that exclusion elicits a tradeoff over introversion, particularly for men, when evaluating facial features. These results indicate the importance of multimodal personality inferences in identifying optimal friends and group members.

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