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Deanna C. Whelan¹ and John M. Zelenski¹

Abstract

Although intuitive and predicted by the broaden-and-build theory of positive emotions, previous research has not seriously tested the idea that positive moods can cause sociability. The authors developed a new measure to assess preferences for social (vs. nonsocial) situations, carefully controlling for the fact that social situations are, on average, also more pleasant. Across two additional experiments (combined $n = 237$), the authors induced positive, negative, and neutral moods with film clips (between-subjects) and found that participants in the positive conditions felt more social (adjective ratings) and indicated stronger preferences for social situations (on the new measure), compared to those in both negative and neutral conditions. Beyond filling an important gap in the empirical record, the authors also explore the implications of this finding for broaden-and-build theory and a large literature linking trait extraversion with happiness.

Keywords

positive affect, mood, sociability, social situations

As a social species humans likely evolved a basic need for connecting with other people (Baumeister & Leary, 1995), and strong social relationships seem essential to happiness (Diener & Seligman, 2002). Consistent with this notion, spending time in social situations is associated with positive moods (Clark & Watson, 1988; Watson, 1988; Watson, Clark, McIntyre, & Hamaker, 1992). Social situations are perceived as being more pleasant than nonsocial situations (Lucas & Diener, 2001), and social interactions generally promote positive emotions (McIntyre, Watson, Clark, & Cross, 1991; Vittengl & Holt, 2000). Similarly, trait extraversion is a good predictor of positive emotions (Diener, Suh, Lucas, & Smith, 1999). Even dispositional introverts report more positive affect when acting sociable both in natural settings (experience sampling) and when instructed to do so in the lab (Fleeson, Malanos, & Achille, 2002). Thus, research supports the idea that being social can *cause* positive emotions. However, positive emotions might also function to promote sociability and social bonds (cf. Fredrickson, 1998). That is, positive emotions might also cause sociability, motivating people to seek out opportunities to socialize. A wealth of correlational data is consistent with a bidirectional relationship between positive affect and sociability (Clark & Watson, 1988; McIntyre et al., 1991; Watson, 1988; Watson et al., 1992). Moreover, although little experimental data address the hypothesis, many researchers have suggested or assumed a bidirectional relationship (Diener, Sandvik, Pavot, & Fujita, 1992; Emmons & Diener, 1986; McIntyre et al., 1991; Pavot, Diener, & Fujita, 1990). The idea

that positive affect causes sociability appears to be one of those things that everyone knows, but has never been well tested. Here we report research that helps fill this empirical gap by assessing positive moods' effect on feelings of sociability and the desire for social (vs. nonsocial) situations.

Fredrickson's (1998, 2001) broaden-and-build model provides a theoretical perspective that suggests why positive emotions might cause sociability. It posits that positive moods serve an adaptive function by *broadening* the scope of attention and cognition and by *building* physical, intellectual, and social resources. Positive emotions have been associated with expansion of attention (Gasper & Clore, 2002), creativity (Isen, Daubman, & Nowicki, 1987), and thought-action repertoire (Fredrickson & Branigan, 2005), providing support for the broadening component of the theory. The build hypothesis posits that repeated broadening of attention and cognition (from positive emotions) results in additional physical, intellectual, and social resources in the long term (e.g., Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008). These resources are then available during times of adversity and stress and thus provide enduring benefits.

¹ Carleton University, Ottawa, Ontario, Canada

Corresponding Author:

Deanna C. Whelan, Department of Psychology, Carleton University, 1125 Colonel By Drive, Ottawa, Ontario K1 S 5B6, Canada
Email: dwhelan@connect.carleton.ca

Fredrickson and colleagues have also demonstrated some cognitive changes consistent with the building function. For example, induced joy (vs. fear and neutral conditions) reduced own-race bias in a facial recognition test (i.e., joy improved White participants' ability to recognize Black faces; Johnson & Fredrickson, 2005). This cognitive change may promote social inclusion and thus interaction, though it could also result from attentional changes ("broadening") without further consequence. Kryś (2010) found that amusement was associated with less hesitation and stammering at the beginning of a recorded statement and standing closer to a camera, indicating momentarily increased "social courage." At a deeper level, positive emotions were associated with greater self-other overlap and a more complex understanding of new roommates in a longitudinal study (Waugh & Fredrickson, 2006). This suggests improved social interaction more directly, but with a correlational design. Conceptually, similar results were found in an experiment where male participants induced to feel positive moods disclosed more personal information when interacting with female confederates (Cunningham, 1988a). However, because this study included a negative (rather than neutral) comparison condition, the specific effects of positive moods remain unclear.

Taken together, this handful of studies suggests that positive emotions may indeed facilitate social closeness or skill, but they have explored a relatively small subset of potential paths and consequences, and there are some nontrivial methodological limitations that prevent firm conclusions. We are interested in broadening the nomological network around positive emotions and sociability, and, more specifically, addressing how positive moods might foster the *desire* to be social. We propose that positive moods make people *feel* more social and prefer social situations. In other words, positive moods might include a tendency toward social behavior, that is, altering motivation toward social contact. We view this kind of change as relatively consistent with broaden-and-build theory and past research. Feeling social and preferring social situations, would, in turn, increase the probability of interacting with new others. Pleasantly engaging with other people expands and deepens social networks, ultimately building resources for the future. On the other hand, we propose that motivation is directed toward specific kinds of situations and behaviors (i.e., being social), and thus could also be construed as narrowing rather than broadening. Thus, we explore a novel route by which positive moods might ultimately increase social resources.

We are aware of only one article that reports on experimentally induced moods and preferences for social situations. Cunningham (1988b) used Velten (1968) mood inductions to create three mood conditions: elation, neutral, and depression. Elated participants preferred social events, and depressed participants preferred more solitary events. Unfortunately, methodological limitations prevent firm conclusions. Most importantly, although the Pleasant Events Schedule (PES; MacPhillamy & Lewinsohn, 1982) includes all relatively pleasant events, it still confounds socialness with pleasantness (e.g., *going to a party* vs. *sitting and thinking*). Social situations are generally more pleasant than nonsocial situations (Lucas & Diener, 2001), and

this is not controlled in the PES. Therefore, Cunningham's results suggest that people prefer social situations when they are feeling good, but we do not know if this is because the events are *social* per se or if it is because they are more pleasant. It is possible that people prefer situations that match their mood or simply make mood-congruent ratings. Cunningham's results, thus, allow us to predict preferences but remain unsatisfying at a theoretical level. We still do not know *why*.

In sum, the broaden-and-build model of positive emotions and conventional wisdom suggest that pleasant affects increase sociability. Despite this, very little research has tested these intuitions experimentally, and Cunningham's (1988b) remains the only test of the more specific hypothesis that positive moods promote a desire to associate with other people. Although results are suggestive, there are some serious methodological questions (particularly the pleasantness confound) that prevent firm conclusions. We conducted two experiments to address this gap and more rigorously test the idea that positive emotions cause sociability. More specifically, we created a new questionnaire to assess social and nonsocial situations that carefully controlled for (i.e., empirically matched situations on) pleasantness. We also included pleasant and unpleasant mood conditions that clearly differed from neutral conditions so it would be possible to dissociate the effects of pleasant mood from unpleasant mood. The goal of this research was to explore whether or not people in positive moods, relative to people in negative and neutral moods, would feel more social and desire more social situations (while controlling for the pleasantness of the situation).

Study 1: Creating the Situation Measure

Method

Participants. Introductory psychology students ($n = 62$) were recruited for an online study on perceptions of situations and received course credit for participating. Data cleaning (e.g., removing string responding, and improbable completion times) resulted in a trimmed sample of 58 students (19 males and 39 females).

Materials and procedure. A large initial pool of situation items was created by asking friends (mostly students) to list situations that were pleasant or unpleasant. We then selected items that were frequently mentioned and seemed widely applicable, with a special emphasis on retaining normatively uncommon types of situations (i.e., unpleasant-social and pleasant-nonsocial). Some items were modified to clarify socialness (e.g., *go to the museum with a group of friends*). A pool of 82 items was then put online where participants rated each on two 5-point Likert-type scales: pleasantness (1 – *very pleasant*, 5 – *very unpleasant*) and socialness (1 – *very social*, 5 – *not at all social*).

Results

Despite overselecting for seemingly unpleasant-social and pleasant-nonsocial items, the nonsocial situations were still

Table 1. Means and Standard Deviations for Sociability and Pleasantness by Situation Category (Study 1)

| Pleasantness Category | Rating | Social | | Non-Social | | t Test | p Value |
|-----------------------|----------|--------|------|------------|------|--------|---------|
| | | M | SD | M | SD | | |
| High | Social | 4.28 | 0.47 | 1.49 | 0.25 | 28.10 | <.001 |
| | Pleasant | 4.58 | 0.36 | 4.59 | 0.31 | -0.24 | .81 |
| Medium | Social | 4.19 | 0.49 | 1.57 | 0.59 | 26.19 | <.001 |
| | Pleasant | 3.93 | 0.55 | 3.94 | 0.70 | -0.07 | .94 |
| Low | Social | 4.06 | 0.55 | 1.48 | 0.24 | 23.55 | <.001 |
| | Pleasant | 3.18 | 0.68 | 3.14 | 0.56 | 0.47 | .64 |
| Total | Social | 4.17 | 0.37 | 1.51 | 0.56 | 29.73 | <.001 |
| | Pleasant | 3.90 | 0.40 | 3.88 | 0.42 | 0.22 | .83 |

For easier interpretation, scores here were reversed from participant ratings; high scores indicate greater socialness/pleasantness here.

rated as less pleasant than social situations, with eight nonsocial items being rated more extremely than the least pleasant social item. Furthermore, of the 25 most pleasant items, only 8 were nonsocial. These findings further suggest the pervasiveness of the socialness–pleasantness confound and highlight the difficulties of using unselected and unbalanced items (Lucas & Diener, 2001).

We selected for extreme scores on the socialness scale to create social ($M = 4.17$, $SD = .37$) and nonsocial situation categories, $M = 1.51$, $SD = .56$; $t(57) = 29.73$, $p < .001$. Items were also selected into three valence categories: high, medium, and low pleasantness,¹ such that valence categories were significantly different in pleasantness, $F(2, 107) = 219.09$, $p < .001$, yet comparable on socialness. A total of 28 items comprised the final situations questionnaire with the *pleasantness* between the social and nonsocial situations balanced, $t(57) = 0.22$, $p = .83$. Pleasantness was also balanced between the social and nonsocial situations at each level of pleasantness (see Table 1).

Study 2

Participants. Introductory psychology students ($n = 145$) received course credit for participation. Due to technical issues with computers or students not following instructions (phone calls/texts during study), the sample was trimmed to 138 participants (49 male and 89 female). Conditions were randomly assigned prior to participants' arrival (positive $n = 48$, negative $n = 47$, and neutral $n = 43$).

Materials

Mood inductions. Moods were induced with three film clips, all approximately 10 min long. The positive mood clip from "E.T.: The Extra-Terrestrial" depicts the recovery of an injured, friendly extraterrestrial, and children's successful efforts to help him escape and return home (Spielberg, 1982). The neutral mood clip was a documentary about a local painter (Ostroff, 2005). The negative mood clip from "My Girl" shows a young girl forming a close relationship with, and then dealing with the sudden death of, her best friend. Although very sad, she is surrounded by supportive family and friends (Zieff, 1991).

Affect. Participants rated mood adjectives on a 7-point Likert-type scale (1 – *very slightly or not at all*, 7 – *extremely or a lot*) based on how much each was being experienced *right now at this moment*. Scales for positive affect (5 items, $\alpha = .77$), negative affect (5 items, $\alpha = .69$), and pleasantness (4 items, $\alpha = .84$) were calculated as means. Similar to the widely used Positive Affect Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), positive affect included *active, alert, excited, interested, and strong*, and negative affect included *distressed, irritable, jittery, nervous, and upset*. Pleasantness was designed to capture valence, independent of arousal, and included *happy, pleased, sad* (reversed), and *unhappy* (reversed).

State sociability. A new measure of "feeling social" drew from multiple sources. For example, Fleenor et al. (2002) assessed *state* extraversion using adjectives from factor analytic studies of personality traits (i.e., Goldberg, 1992), but with altered (state) instructions. We adapted this technique by asking participants to rate adjectives based on how much they were feeling each *right now at this moment*. We retained Fleenor's more "social" items and added additional adjectives after reviewing phrases in other trait sociability measures and consulting a thesaurus. Feeling social was the mean of *antisocial**, *approachable, friendly, gregarious, impolite**, *quiet**, *social*, and *talkative* ($\alpha = .72$, asterisks note reverse-scored items).

Situations. Participants rated 28 items (see Study 1) on a 7-point Likert-type scale (1 – *very slightly or not at all* to 7 – *extremely or a lot*) indicating *how much you want to do the activity "right now."* Composite mean scores for three levels of pleasantness (high [5 items], medium [4 items], and low [5 items]) were calculated for both social ($\alpha = .81$) and nonsocial situations ($\alpha = .79$).

Procedure. Participants were recruited for a study on film and personality. They were run individually, but with up to three participants (each occupying a small room with a computer) simultaneously. Following informed consent, participants completed personality questionnaires (not considered in this report). Participants were then instructed to put on headphones

Table 2. Comparison of Affect Scales (Manipulation Check) and Sociability by Mood Condition (Study 2)

| Affect | Condition | | | | | |
|-----------------|-------------------|-----------|-------------------|-----------|-------------------|-----------|
| | Positive | | Neutral | | Negative | |
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> |
| Positive affect | 4.35 _a | 1.22 | 3.54 _b | 1.12 | 3.75 _b | 0.85 |
| Negative affect | 2.22 _a | 0.97 | 2.03 _a | 0.86 | 3.28 _b | 1.23 |
| Pleasantness | 5.52 _a | 1.03 | 4.99 _b | 0.94 | 3.20 _c | 1.27 |
| Feeling social | 4.70 _a | 0.84 | 4.28 _b | 0.97 | 4.21 _b | 0.66 |

Means with different subscripts are different at $p < .05$ level with Games-Howell. (Games-Howell was used because the group variances were not homogeneous.)

and watch a film that was positive, negative, or neutral, depending on their randomly assigned condition. Following the film, a brief questionnaire about the film (cf. the study's premise), affect, feeling social, and situations questionnaires were completed. To reverse possible negative moods, participants viewed a positive film before being debriefed.

Results

Manipulation check. To determine if films produced the desired moods, analyses of variance (ANOVAs) were conducted. The omnibus tests were significant for positive affect, $F(2, 135) = 7.15, p = .001, \eta_p^2 = .31$; negative affect, $F(2, 135) = 19.42, p < .001, \eta_p^2 = .22$; and pleasantness, $F(2, 135) = 58.45, p < .001, \eta_p^2 = .46$. Post hoc comparisons revealed that all three conditions differed on pleasantness. For positive affect, the positive mood condition differed from neutral and the negative condition (which did not differ). For negative affect, the negative condition differed from both positive and neutral conditions (which did not differ). In sum, the film clips created distinct positive, negative, and neutral moods (see Table 2).

Feeling social. To determine if participants in positive moods reported feeling more social compared to those in neutral and negative moods, an ANOVA with post hoc comparisons was conducted. Again, the omnibus test was significant, $F(2, 135) = 4.80, p = .01, \eta_p^2 = .07$, and post hoc comparisons indicated that the positive condition ($M = 4.70, SD = 0.84$) differed from negative ($M = 4.21, SD = 0.66$) and neutral conditions ($M = 4.28, SD = 0.97$), which did not differ. Thus, consistent with our hypotheses, participants in the positive mood condition reported feeling more social compared to participants in neutral and negative conditions.

Situation preferences. To examine mood differences in situation preferences, a repeated measures ANOVA with socialness (social vs. nonsocial) and situation pleasantness (high, medium, low) as the within-subject factors and mood condition (positive, neutral, negative) as the between-subjects factor was conducted. The main effect of mood condition was not significant, $F(2, 135) = 0.37, p > .50, \eta_p^2 = .01$. There were no differences in amalgamated ratings of situations due to mood.

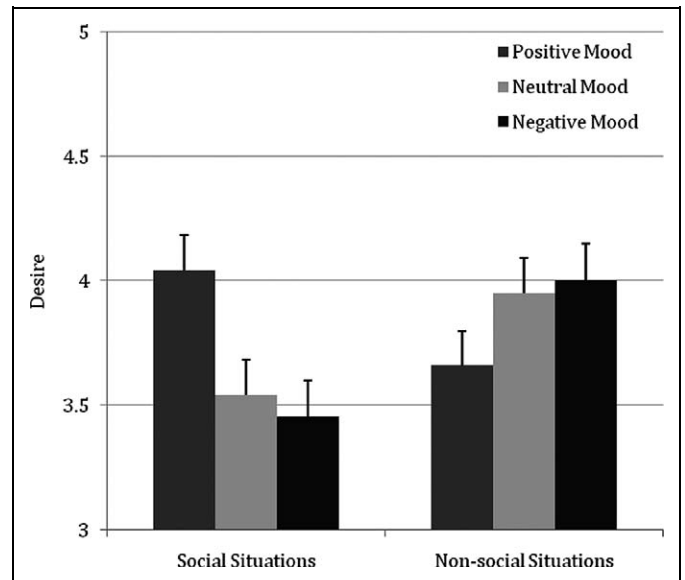


Figure 1. Mean rating of desire for situations (with standard error bars) for Socialness \times Mood condition interaction (Study 2).

Unsurprisingly, there was a significant main effect for pleasantness, $F(2, 270) = 261.85, p < .001, \eta_p^2 = .82$, indicating that subjects desired highly pleasant situations more than low pleasantness situations. The main effect for socialness was marginally significant with a preference for social over nonsocial situations, $F(1, 135) = 3.49, p = .06, \eta_p^2 = .02$. Most importantly, there was a significant two-way interaction between socialness and mood condition, $F(2, 135) = 8.37, p < .001, \eta_p^2 = .11$; see Figure 1. The interaction indicated that participants in the positive mood condition preferred social over nonsocial situations, ($F(1, 135) = 4.97, p = .03, \eta_p^2 = .04$), whereas participants in the negative, $F(1, 135) = 9.89, p = .002, \eta_p^2 = .07$, and neutral conditions, $F(1, 135) = 5.00, p = .03, \eta_p^2 = .04$, preferred nonsocial over social situations. Examination of a marginally significant three-way interaction, $F(4, 270) = 2.33, p = .06, \eta_p^2 = .03$, showed that the preferences between social and nonsocial activities by condition were “driven” by the high pleasantness situations more than the less pleasant situations.² Thus, consistent with hypotheses, participants in the positive mood condition preferred social over nonsocial situations.

Discussion

Drawing on psychologists' intuitions, suggestions of past correlational research, and the broaden-and-build model of positive emotions, we predicted that pleasant moods would incline people to feel more social and prefer more social situations. Study 2's design carefully avoided confounding social situations with pleasantness (cf. Cunningham, 1988b) and included both neutral and negative mood conditions to more clearly isolate the effect of positive moods. Results provided robust support for the idea that positive moods can indeed make people more socially motivated (i.e., *feel* more social and

indicate a preference for social situations). Although this causal direction has often been assumed, we believe this is the first study to empirically demonstrate it (i.e., without the pleasantness confound). Combined with ample previous research establishing the reverse causal direction (i.e., sociability causing positive moods), our findings provide support for the idea that pleasant moods and sociability have a bidirectional relationship. Before exploring the implications of this finding more broadly, we sought to replicate it. Study 3 retained the dependent measures used in Study 2 but employed new films to induce moods. This allows us to address the possibility that differences among film clips (other than the moods they created) accounted for the differences we observed in sociability. Furthermore, to remove any possible experimenter effects, we programmed computers to randomly select films, creating a double blind mood manipulation.

Study 3

Method

Participants. Introductory psychology students ($n = 104$) received either course credit or \$10 for participating. Due to technical problems the sample was trimmed to 99 (47 males, 52 females). A computer program randomly assigned participants to conditions (positive $n = 32$, negative $n = 32$, and neutral $n = 35$).

Materials

Mood inductions. Films, all approximately 11 min long, induced moods. The positive clip “*Akeelah and the Bee*” depicted a preteen girl’s efforts and triumph in cowinning a national spelling bee, thereby uniting her neighbourhood (Atchison, 2006). The neutral clip showed a lively roundtable discussion of *Beowulf* (Harryson, 2006). The negative clip from “*Stepmom*” depicted a mother diagnosed with cancer confiding in a friend, then celebrating her last Christmas with her two young children, and saying good-bye to them (Columbus, 1998).

Questionnaires. Mood, feeling social, and situations were assessed with the measures described in Study 2.

Procedure. Participants were recruited for a study on film and personality and run individually (but up to three simultaneously). Following informed consent, participants completed personality questionnaires (not considered here). Participants were instructed to wear headphones and shown a button that would begin the movie after the experimenter left the room. Computers then randomly assigned and showed a film. After the clip, the computer screen instructed participants to contact the researcher. Participants were then given a brief questionnaire about the film (cf. the study’s premise), affect, feeling social, and situations questionnaires. Participants then watched a positive clip and were debriefed.

Table 3. Comparison of Affect Scales (Manipulation Check) and Sociability by Mood Condition (Study 3)

| Affect | Condition | | | | | |
|-----------------|-------------------|------|-------------------|------|-------------------|------|
| | Positive | | Neutral | | Negative | |
| | M | SD | M | SD | M | SD |
| Positive affect | 4.78 _a | 0.98 | 3.37 _b | 0.94 | 4.18 _c | 0.97 |
| Negative affect | 2.03 _a | 0.95 | 2.18 _a | 0.92 | 2.79 _b | 1.03 |
| Pleasantness | 5.70 _a | 0.95 | 4.88 _b | 0.85 | 3.91 _c | 1.40 |
| Feeling social | 5.14 _a | 0.72 | 4.61 _b | 0.74 | 4.61 _b | 0.83 |

Means with different subscripts are different at $p < .05$ with Tukey’s Honestly Significant Difference.

Results

Manipulation check. To determine if the films produced the desired moods, ANOVAs were conducted. The omnibus tests were significant for positive affect, $F(2, 96) = 18.22$, $p < .001$, $\eta_p^2 = .28$; negative affect, $F(2, 96) = 5.53$, $p = .005$, $\eta_p^2 = .10$; and pleasantness, $F(2, 96) = 21.84$, $p < .001$, $\eta_p^2 = .31$. Post hoc comparisons, revealed that for positive affect and pleasantness, all three conditions differed from each other. For negative affect, the negative condition differed from both positive and neutral conditions that did not differ (see Table 3).

Feeling social. An ANOVA with post hoc comparisons was conducted to determine if participants in the positive mood condition reported feeling more sociable. The omnibus test revealed significant differences, $F(2, 96) = 5.13$, $p = .008$, $\eta_p^2 = .10$, and post hoc tests confirmed that the positive condition ($M = 5.14$, $SD = 0.72$) differed significantly from negative ($M = 4.61$, $SD = 0.83$) and neutral conditions ($M = 4.61$, $SD = 0.74$) that did not differ. Thus, participants in the positive mood condition reported feeling more social compared to people in neutral and negative mood conditions; Study 2’s result replicated.

Situation preferences. To examine mood differences in preferences for situations, a repeated measures ANOVA with socialness (social vs. nonsocial) and pleasantness (high, medium, and low) of the situations as within-subject factors and mood condition (positive, neutral, negative) as the between-subjects factor was conducted. In line with Study 2, the main effect for mood condition was not significant, $F(2, 96) = 2.44$, $p = .09$, $\eta_p^2 = .05$; there was a significant main effect for pleasantness, $F(2, 192) = 176.10$, $p < .001$, $\eta_p^2 = .65$, and the interaction between socialness and condition was significant, $F(2, 96) = 4.45$, $p = .01$, $\eta_p^2 = .08$. The interaction was similar to Study 2 in that participants in the positive mood condition desired social situations over nonsocial situations, $F(1, 96) = 6.00$, $p = .02$, $\eta_p^2 = .06$, whereas people in the neutral condition had no significant preference, $F(1, 96) = 0.00$, $p > .50$, $\eta_p^2 = .00$, and people in the negative mood condition marginally significantly desired nonsocial over social situations, $F(1, 96) = 3.06$, $p = .08$, $\eta_p^2 = .03$; see Figure 2. No other main effects or interactions were significant.

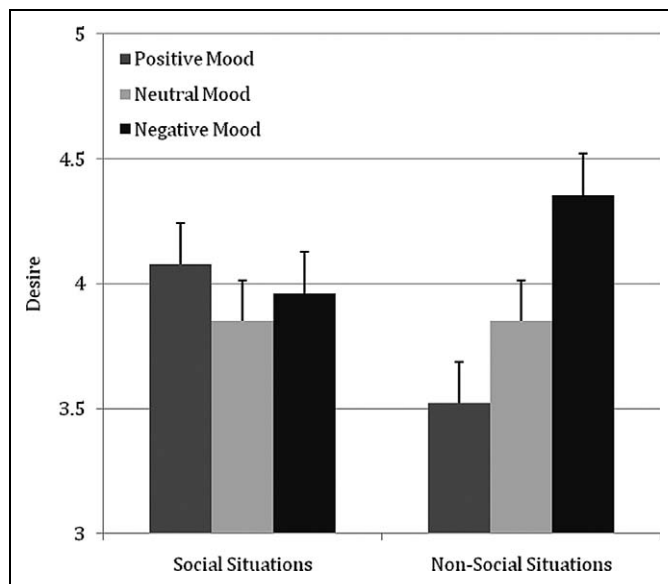


Figure 2. Mean rating of desire for situations (with standard error bars) for Socialness \times Mood condition interaction (Study 3).

General Discussion

The primary goal of this research was to explore whether or not positive moods could cause sociability. Surprisingly, past research has failed to provide a strong test of this intuitive and often assumed effect. That is, previous studies have used correlational methods (thus ambiguous with regard to causal direction), focused on peripheral manifestations of sociability (e.g., facial recognition or intimacy), confounded sociability with pleasantness, or failed to differentiate between the effects of negative and positive moods. Our methods carefully avoided these limitations (e.g., using neutral mood comparisons and carefully dissociating pleasantness from socialness), and across two experiments, revealed that positive moods can indeed cause people to feel more sociable and to prefer more social situations. (There was also a tendency for people in unpleasant moods to prefer social isolation; future research might explore this process further, e.g., in relation to depression.) Beyond filling a significant gap in the empirical record, these findings have important implications for Fredrickson's (1998) broaden-and-build theory of positive emotions and the relationship between happiness and trait extraversion.

At a general level, our results appear consistent with broaden-and-build theory. That is, because positive affect promotes sociability and preference for social situations, it may also facilitate deeper social resources. Wanting to interact with people is a first step toward building more lasting, supportive bonds. Moreover, the interactions might provide practice, and thus increase social intelligence, conversation skills, and so on.

On the other hand, our results also suggest a new process that has not been well articulated in the past. That is, our dependent variables (feeling sociable and situation preferences) seem to occupy a middle ground between the more immediate cognitive effects of positive emotions (e.g., broadening attention)

and the more long-term "building" of substantive resources. Even though we assessed the consequences of positive emotions across a short timeframe, it is not clear that they *broadened* cognition per se. Our participants' preference for social situations and simultaneously *against* nonsocial situations could be interpreted as a narrowing cognitions and motivations (cf. Gable & Harmon-Jones, 2008). Said another way, participants in the positive mood conditions indicated *less* desire for nonsocial activities. We are not suggesting that positive emotions create specific action tendencies (e.g., "only be social," cf. the flight response that accompanies fear); it is clear that positive emotions have consequences beyond making people feel more social. Nonetheless, our results provide a caveat to strict interpretations of the broaden-and-build theory. Positive affect does not always broaden or make people more open to *all* kinds of situations or experiences, but rather can direct people toward certain environments more than others (e.g., social situations). Furthermore, some positive emotions might ultimately assist in building social resources, yet could then also impede developing other resources (e.g., the specific intellectual resource gained by reading a book alone).

Sociability is a substantial part of virtually every trait extraversion measure and is often suggested as its core (McCrae & Costa, 1987). Extraversion is also a strong predictor of happiness, particularly positive affect (Lucas & Fujita, 2000). The processes explaining extraversion's link with happiness are widely debated and are ultimately intertwined with discovering the causes of this ubiquitous trait. Instrumental explanations suggest that extraverts seek out social situations (e.g., perhaps for stimulation; Eysenck, 1967), and that these situations increase positive affect because they are typically pleasant. In other words, extraverts are happy because social situations cause positive affect and extraverts spend more time in them. Recent results suggest that this process can partially account for extraverts' greater happiness (Lucas, Le, & Dyrenforth, 2008; Srivastava, Angelo, & Vallereaux, 2008), but that a substantial direct effect of extraversion remains—there must be more to it. Alternative or complementary temperamental explanations suggest that extraverts respond to pleasant situations with more positive affect than introverts, that is, they are more reactive to positive stimuli. Although extraverts do sometimes appear more susceptible to positive mood inductions (Zelenski & Larsen, 1999), findings are mixed (Lucas & Baird, 2004) and the moderators are not fully clear. Moreover, available evidence suggests that social situations, in particular, are *not* enjoyed more by extraverts than introverts (Lucas et al., 2008; Zelenski, Santoro, & Whelan, 2011).

The results of our current experiments support other temperamental explanations, and even support the possibility of reversing the causal direction between trait extraversion and happiness. That is, people might be extraverted (at least in part) because they are happy or prone to happiness. The causal core of extraversion could be a higher *set point* for positive affect (Lucas & Baird, 2004; Lykken & Tellegen, 1996). This high positive affect might motivate sociability, just as induced positive moods increased feelings of sociability and preferences

for social situations in our studies. Alternatively, something like reward responsiveness (Gray, 1981) might create more positive affect (independent of social situations), which in turn motivates more sociability (Lucas, Diener, Grob, Suh, & Shao, 2000). Taking a different approach, Fleeson et al. (2002) have shown that “acting extraverted” in the moment creates positive affect in almost everyone (even trait introverts). Our results do not negate this, but suggest the reverse causal direction could also be true. Acting sociable (or extraverted) seems to cause positive affect, but positive affect also seems to cause sociability. Theories about the link between extraversion and happiness need not be constrained by one causal direction.

To be clear, our data do not speak directly to which of the many processes linking extraversion and positive affect are correct, or, allowing for multiple processes, are most common outside the lab. We also refrain from speculating about whether positive affect is more likely to cause state sociability, or if state sociability is more likely to cause positive affect in daily life. Our methods allow for limited generalizability. We included only student samples, used film clips as the sole induction method, induced and assessed general affects rather than specific emotions,³ and assessed sociable feelings and situation preferences (internal motivations) rather than social behavior. Rather than representativeness, our experiments instead focus on providing an important demonstration of what is possible. That is, because we are the first to rigorously test the idea that positive affect can cause sociability, they provide a unique demonstration that bolsters the plausibility of happiness causing extraversion, and a route by which positive emotions might promote social resources. Clearly, additional research is required to address the breadth of our effects and these larger theoretical suggestions.

Notes

1. We avoid the term “unpleasant” here because the mean of even the least pleasant group still slightly exceeds the pleasantness scale’s midpoint. Situation items are available in the Supplemental Appendix found online at <http://spps.sagepub.com/supplemental>, but please note that other (e.g., nonstudent) populations might view the situations, and thus our categorization, differently.
2. The full ANOVA table is available in the Supplemental Appendix.
3. Our positive films probably produced amusement and elevation, and negative films primarily sadness, but our mood assessment did not distinguish among specific emotions. It is quite possible that our effects will not generalize across all pleasant (e.g., interest vs. amusement) or unpleasant (e.g., anger vs. sadness) affects.

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Bios

Deanna C. Whelan is a graduate student at Carleton University. Her interests include statistical methods, emotional and cognitive implications of acting out of character, and exploring methods of improving well-being.

John M. Zelenski is an associate professor of Psychology at Carleton University. He studies individual differences in happiness, often as momentary cognitive and emotional processes, and the precursors of sustainable behavior.