

Shared Attention Increases Mood Infusion

Garriy Shteynberg
University of Tennessee

Jacob B. Hirsh
University of Toronto

Adam D. Galinsky
Columbia University

Andrew P. Knight
Washington University in St. Louis

The current research explores how awareness of shared attention influences attitude formation. We theorized that sharing the experience of an object with fellow group members would increase elaborative processing, which in turn would intensify the effects of participant mood on attitude formation. Four experiments found that observing the same object as similar others produced more positive ratings among those in a positive mood, but more negative ratings among those in a negative mood. Participant mood had a stronger influence on evaluations when an object had purportedly been viewed by similar others than when (a) that same object was being viewed by dissimilar others, (b) similar others were viewing a different object, (c) different others were viewing a different object, or (d) the object was viewed alone with no others present. Study 4 demonstrated that these effects were driven by heightened cognitive elaboration of the attended object in the shared attention condition. These findings support the theoretical conjecture that an object attended with one's ingroup is subject to broader encoding in relation to existing knowledge structures.

Keywords: shared attention, group attention, social influence, mood infusion, attitude formation

Attitudes are often contagious, spreading from one person to the next through the forces of imitation and social influence. Indeed, the power and ubiquity of attitudinal contagion is one of the cornerstones of social psychology (Allport, 1924; Festinger, 1950). Decades of studies have shown that observing subtle signals from one's social groups can influence both explicit (e.g., Sechrist & Stangor, 2001) and implicit (e.g., Sinclair, Lowery, Hardin, & Colangelo, 2005) attitudes. Indeed, merely observing shifts in another's eye-gaze toward an object can increase or decrease the object's perceived value depending on whether the social signal of the other's gaze is positive or negative (e.g., Bayliss, Frischen, Fenske, & Tipper, 2007; Bayliss, Paul, Cannon, & Tipper, 2006). Beyond psychology, attitudinal contagion has gained traction as a key concept in evolutionary biology (Dawkins, 2006) and anthropological philosophy (Girard, 1965) under the terms memetics and mimetics, respectively. Others' attitudes, whether communicated explicitly through verbal messages or implicitly through facial displays, postures, or behavioral acts, can powerfully influence one's own judgment.

Although imitation is a common and well-studied form of attitudinal contagion, we propose that there are other important routes of social influence. Even when knowledge of another's attitude is lacking—and attitudinal contagion is therefore impossible—we argue that the social context can still powerfully shape evaluative judgments. Specifically, we propose that the belief that one is experiencing an object in common with one's social group is enough to alter a person's attitude toward that object. In the current research, we explore whether sharing attention on an object with one's social group heightens the influence of mood on evaluative judgments. We draw on theories of shared attention and affect infusion to develop this prediction.

The Importance of Shared Attention

A major factor that influences the strength of a memory trace is the amount of elaborative processing that occurs during encoding. Elaborative processing reflects the extent to which an attended object is encoded in relation to a broad versus narrow range of existing knowledge structures (Anderson & Reder, 1979; Craik & Tulving, 1975). Previous work suggests that shared attention with one's social group increases elaborative processing of the jointly attended object, enhancing object memory and object-related goal pursuit (Eskenazi, Doerrfeld, Logan, Knoblich, & Sebanz, 2012; He, Lever, & Humphreys, 2011; Shteynberg, 2010; Shteynberg & Galinsky, 2011). A similar idea has received support in studies on infant development, where objects that are jointly attended by the infant and the caregiver are found to hold particular relevance (Baron-Cohen, 1995; Bruner, 1983; Tomasello, 1999; Tomasello, Carpenter, Call, Behne, & Moll, 2005). Indeed, such effects emerge at a very young age, as even 4-month olds display greater

Garriy Shteynberg, Department of Psychology, University of Tennessee; Jacob B. Hirsh, Rotman School of Management, University of Toronto, Toronto, Ontario, Canada; Adam D. Galinsky, Columbia Business School, Columbia University; Andrew P. Knight, Olin Business School, Washington University in St. Louis.

Correspondence concerning this article should be addressed to Garriy Shteynberg, Department of Psychology, University of Tennessee, 303F Austin Peay Building, Knoxville, TN 37996-1330. E-mail: gshteynb@utk.edu

neural processing of an object that is being simultaneously gazed at by an adult (Reid, Striano, Kaufman, & Johnson, 2004). Shared attention with one's social group can even heighten elaborative processing when nobody else is physically present and the sharing of attention is merely inferred (Shteynberg, 2010).

These ideas are broadly consistent with philosophical scholarship on the importance of the "we-mode"—a collective orientation toward the world or the perspective one takes as a member of a group (Searle, 1995; Tuomela, 2007). Tomasello (1999) argued that the "we-mode" is a key adaptation that gave the human species an unprecedented capacity for social learning, allowing for the emergence of generative cultures. Recent models of human evolution similarly highlight the importance of cognitive adaptations that promote attentional coordination with members of one's social group (Boyd & Richerson, 2009; Tsai, Lan, Chen, Henrich, & Boyd, 1998). In line with these models, objects that are jointly attended with one's social group may be subject to greater cognitive elaboration as they stand a better chance of serving as an axis of social coordination and communication at a later date (Sperber & Wilson, 1986). Indeed, assuming human genetic survival relied on adaptive mechanisms promoting within-group coordination and collective action (Kesebir, 2012; Wilson & Wilson, 2007), greater cognitive elaboration of objects that are jointly attended with one's social group may have constituted a critical evolutionary adaptation.

In sum, research in social, cognitive, and developmental psychology, as well as evolutionary anthropology, converges on the idea that objects experienced jointly with ingroup members are subject to greater elaborative processing.

Shared Attention and the Influence of Mood on Judgments

We propose that the increased elaborative processing of objects that are jointly attended to by other members of one's social group will have important implications for object evaluation. Previous research has shown that heightened elaborative processing tends to increase the extent to which an individual's mood—an affective state that is relatively subtle and diffuse (Forgas, 1995)—influences evaluative judgments (Fiedler, 1991). This counterintuitive finding is explained by Forgas's (1995) affect infusion model (AIM), which suggests that because mood pervades a broad range of existing knowledge structures, and elaborative processing involves the encoding of an object in relation to a broader range of existing knowledge structures (Craig & Tulving, 1975), elaborative processing increases the likelihood that mood will influence attitude formation (Forgas, 1993, 1994).

In sum, objects that are experienced jointly with socially significant others are imbued with greater relevance (Baron-Cohen, 1995; Bruner, 1983; Tomasello, 1999), receiving greater elaborative processing (Eskenazi et al., 2012; He et al., 2011; Shteynberg, 2010; Shteynberg & Galinsky, 2011). Enhanced elaborative processing, in turn, heightens the influence of mood on evaluations (Forgas, 1995; Forgas & Fiedler, 1996).

Combining these two perspectives leads us to our main hypothesis, that mood is more likely to influence object evaluation when the object is experienced jointly with one's social group. We propose that observing the same object with similar others will thus lead those in a positive mood to evaluate the object more

positively, but those in a negative mood to evaluate it more negatively. Notably, we examine whether simply *believing* that a similar other is attending the same object can produce these evaluative consequences. Such an effect would imply that the presumed attention of one's social group is sufficient to increase elaborative processing and increase the infusion of mood on attitudes toward the jointly attended object.

Overview

We tested our hypothesis that mood will have a greater effect on attitudes under conditions of shared attention in four studies in which we manipulated (Study 1) and measured (Studies 2, 3, and 4) participant mood. We also manipulated shared attention. In the focal condition, participants experienced an object with similar others. We compared this focal condition with four other conditions: (a) dissimilar others were viewing the same object, (b) similar others were viewing a different object, (c) dissimilar others were viewing a different object, or (d) the object was viewed alone with no mention of others. We predicted that shared attention with similar others would increase the effect of pre-existing moods on attitudes. Finally, Study 4 examined whether participants in the shared attention condition did indeed demonstrate greater elaborative processing of the observed object, and whether this greater elaborative processing increased mood infusion.

Study 1: Manipulated Mood and Shared Attention

Study 1 manipulated mood to test whether mood has a greater effect on attitudes under conditions of shared attention.

Method

Participants and design. Participants were 84 adults sampled from an online subject pool maintained by a Midwestern university (76.2% female; mean age = 40.47 years, $SD = 15.39$) who were randomly assigned in a 2 (positive vs. negative mood) \times 3 (similar-others/same-painting; different-others/same-painting; similar-others/different-painting) between-subject design.

Procedure.

Mood manipulation. Participants were first asked to take 2–3 min to recall and write about a specific event from their past that made them feel happy, cheerful, or overjoyed (*positive mood condition*) or an event from their past that made them feel unhappy, miserable, or sad (*negative mood condition*). As a manipulation check, they then reported how happy they felt (1 = *very unhappy*, 5 = *very happy*).

Following the mood manipulation, we evoked the perception of shared attention with one's social group via a minimal group manipulation (Tajfel, Billig, Bundy, & Flament, 1971), where other participants were either minimally similar to the self or not. Following Shteynberg (2010), participants were asked to choose an avatar to represent themselves within the context of a three person online focus group. They were informed that they would be asked to give their opinions on a variety of objects and that they should be absolutely honest in their responses. Participants were told that choosing an avatar to represent themselves would help to protect their identity and render their opinions anonymous. Participants chose their avatar from five possible avatar colors (red, blue, yellow, green, orange).

Shared attention manipulation. We then manipulated the avatar colors of the other two purported participants to either match or mismatch the participant's color choice. Participants in the *similar-others/same-painting condition* saw that the others chose the same avatar color as they did and were told they would all be asked to look at the same painting. In the *similar-others/different-painting condition*, participants saw that others chose the same avatar color as they did, but were told that they would all be asked to look at different paintings. In the *different-others/same-painting condition*, participants saw that others chose a different avatar color but were told that they would all be looking at the same painting. In reality, participants across all conditions were asked to look at the same painting.

Our main dependent variable was each participant's attitude toward the painting. After looking at a monochromatic abstract painting, participants were asked to what extent they liked the painting (1 = *not at all*, 11 = *very much*).

After evaluating the painting, we collected perceptions of opinions within their focus group (i.e., "Do you think other participants in your focus group liked the painting?" "Do you think your judgment of the painting was similar to that of other participants in the focus group?"). Questions about others' opinions were not asked in the similar-others/different-painting condition where other participants supposedly did not see same painting.

Results

Manipulation check. Confirming the effectiveness of the mood manipulation, participants in the positive mood condition reporting being happier ($M = 3.69$, $SD = 0.77$) than participants in the negative mood condition ($M = 2.69$, $SD = 1.00$), $F(1, 82) = 26.16$, $p < .001$.

To test our specific hypothesis, we conducted a planned interaction contrast that compared the effect of mood on attitudes in the similar-others/same-painting condition versus the effect of mood on attitudes in the other two conditions. This test indicated a significant difference, $F(1, 80) = 5.13$, $p = .03$ (see Figure 1). Mood influenced evaluations within the similar-others/same-painting condition, $t(78) = 2.29$, $p = .03$, but not within the different-others/same-painting condition, $t(78) = 0.36$, $p = .72$, or within the similar-others/different-painting condition, $t(78) = 0.27$, $p = .79$. Participants across social context conditions did not differ in mean ratings of the painting, $F(2, 81) = 0.91$, $p = .41$ (similar-others/same-painting $M = 6.95$, $SD = 2.7$; different-others/same-painting $M = 6.50$, $SD = 2.81$; similar-others/different-painting $M = 7.38$, $SD = 2.09$).

Participants who experienced the same object as similar others were more influenced by a manipulation of mood than participants who experienced the object with dissimilar others or participants who experienced the object while similar others viewed a different object. The results demonstrate that sharing the experience of an object with similar others increases the effect of mood on attitudes.

Somewhat puzzling is the fact that mood did not have any influence on attitudes in either of the control conditions. The object may have contained so little relevance for the participants in the non-shared attention conditions that too little elaborative processing occurred for mood to infuse their judgments. This possibility is returned to in Study 4.

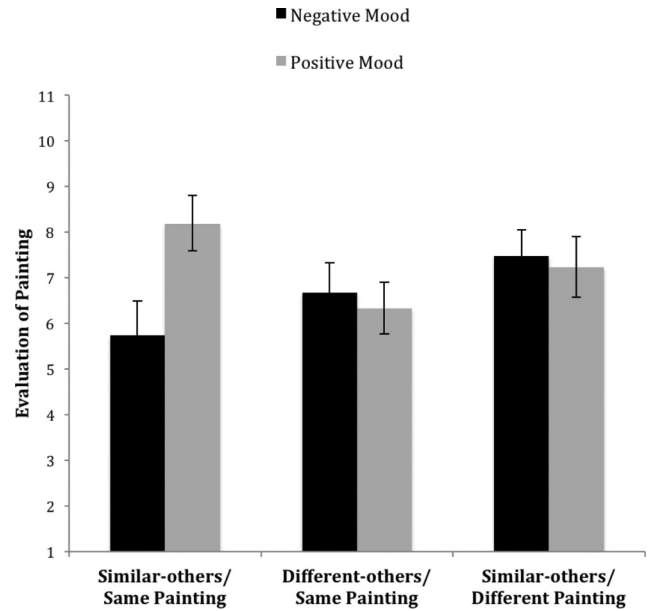


Figure 1. Social Context \times Mood interactions on evaluation of painting (Study 1). Errors bars indicate ± 1 SE.

Importantly, the results of Study 1 are difficult to understand in terms of attitudinal imitation, as no cues were given as to the content of other people's attitudes. However, it is possible to argue that participants assumed that others received the same affect manipulation as they did, such that they would have a similar affective state and hence evaluation of the painting. Countering this possibility is the finding that participants in the shared attention condition were no more likely to believe that others in their group had similar opinions to themselves. Indeed, across all studies, participants in the similar-others/same-painting condition did not think that others in their focus group liked the painting more (all $ps > .21$) or had similar opinions to them (all $ps > .27$) compared with participants in the different-others/same-painting condition. The next study measured mood to eliminate this possible explanation.

Study 2: Measured Mood and Shared Attention

Study 2 explored the influence of shared experience on attitude formation by measuring pre-existing mood rather than experimentally manipulating it. Conceptually replicating Study 1, we predicted that participants' baseline moods would be a stronger determinant of attitudes when the attitude object was shared with similar others than when shared attention was absent. We also included an alone condition as a baseline for attitude formation in a purely non-social context.

Method

Participants and design. Participants were 133 adults sampled from an online subject pool maintained by a Midwestern university (75.4% female; mean age = 42.06 years, $SD = 14.38$). Participants were randomly assigned to one of four

conditions: similar-others/same-painting, different-others/same-painting, similar-others/different-painting, and alone.

Procedure. The procedure in the second experiment was similar to that in the first experiment, with two exceptions. First, we measured participants' preexisting mood by asking them to complete the state version of the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) before choosing their avatar. By reverse coding the negative affect items and averaging them with positive affect items, we created an index of overall mood ($\alpha = .86$; Leue & Beauducel, 2011).

Second, we included an *alone condition* in which the participant was told that no other participants were present. This condition allowed us to examine mood infusion in a non-social context. Otherwise, Study 2 proceeded in the same manner as Study 1.

Results

We again conducted a planned interaction contrast to test the effect of mood on attitudes in the similar-others/same-painting condition compared with the effect of mood on attitudes in the other three control conditions. This test indicated a significant difference, $F(1, 129) = 5.39, p = .02$ (see Figure 2). Participants in the similar-others/same-painting condition displayed a stronger relationship between prior mood and evaluation of the painting ($r = .38, p = .03$) compared with participants in the different-others/same-painting condition ($r = -.10, p = .57$), the similar-others/different-painting condition ($r = -.15, p = .42$), and the alone condition ($r = -.07, p = .69$).

Participants across social context conditions did not differ in their mean ratings of their mood, $F(3, 130) = 1.42, p = .24$, or the painting, $F(3, 129) = 0.16, p = .84$ (similar-others/same-painting:

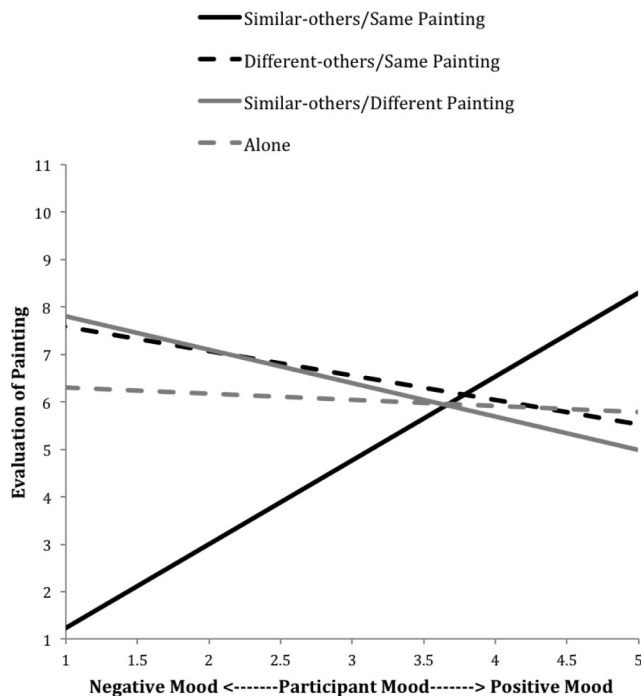


Figure 2. Relationship between mood and evaluation across social contexts (Study 2).

$M_{\text{mood}} = 3.94, SD = 0.55/M_{\text{painting}} = 6.42, SD = 2.58$; different-others/same-painting: $M_{\text{mood}} = 3.86, SD = 0.49/M_{\text{painting}} = 6.11, SD = 2.59$; similar-others/different-painting: $M_{\text{mood}} = 3.69, SD = 0.54/M_{\text{painting}} = 5.91, SD = 2.56$; alone: $M_{\text{mood}} = 3.81, SD = 0.47/M_{\text{painting}} = 5.90, SD = 2.90$).

Study 2 results provide further support for our hypothesis—pre-existing mood strongly influenced attitudes toward objects that were simultaneously experienced with one's social group.

Study 3: Mood Infusion Into Overall Experiences

Study 3 examined whether shared attention with similar others can influence the evaluation of the study experience as a whole. As part of a different research project, Study 3 had participants look at a series of advertisements and rate their persuasiveness in shared versus non-shared attention contexts. Relevant to the subject at hand, however, we included a one-item measure of mood at the beginning of the study and asked participants whether they enjoyed participating in the study when they completed it. Given our hypothesis, we expected that looking at a series of advertisements with one's social group would lead to greater mood infusion into the evaluation of their overall study experience.

Method

Participants and design. Participants were 402 adults sampled from an online subject pool maintained by Amazon's Mechanical Turk (49.4% female; mean age = 31.97 years, $SD = 11.18$), a valid source of online data (Buhrmester, Kwang, & Gosling, 2011). Participants were randomly assigned to one of four conditions: similar-others/same-advertisements, different-others/same-advertisements, similar-others/different-advertisements, and alone.

Procedure. The procedure in the third experiment was similar to that in the second experiment. Unlike Study 2, however, in Study 3 we measured mood more unobtrusively by including a self-assessment mannequin (SAM) pictorial assessment item of one's mood (1 = *very unhappy*, 5 = *very happy*; Bradley & Lang, 1994). After exposure to a series of advertisements and rating their impact in one of the four conditions used in Study 2, participants were asked whether they enjoyed participating in the study (1 = *no*, 2 = *yes*).

Results

Using logistic regression (due to a dichotomous dependent variable), we conducted a planned interaction contrast to test the effect of mood on study enjoyment in the shared ingroup attention condition compared with the effect of mood in the three control conditions. This test indicated a significant effect, $b = -1.40, SE = 0.54, Wald = 6.73, p = .01, \text{Exp}(B) = .247$. Participants in the similar-others/same-advertisements condition had a stronger relationship between prior mood and evaluation of the study experience ($r = .26, p = .01$) compared with participants in the different-others/same-advertisements condition ($r = .08, p = .40$), the similar-others/different-advertisements condition ($r = -.18, p = .08$), and, finally, the alone condition ($r = -.14, p = .17$). Notably, although participants in the latter two conditions exhibited a trend toward significance, it was in the opposite direction, where more positive mood resulted in less enjoyment of the study.

Participants across social context conditions did not differ in their mean ratings of their mood, $F(3, 400) = 0.65, p = .58$, or their experience, $b = 0.24, SE = 0.20, Wald = 1.44, p = .23$ (similar-others/same-painting: $M_{mood} = 3.64, SD = 0.86/M_{experience} = 1.92, SD = 0.27$; different-others/same-painting: $M_{mood} = 3.57, SD = 0.69/M_{experience} = 1.94, SD = 0.23$; similar-others/different-painting: $M_{mood} = 3.65, SD = 0.72/M_{experience} = 1.95, SD = 0.22$; alone: $M_{mood} = 3.72, SD = 0.80/M_{experience} = 1.96, SD = 0.20$).

Study 3 results conceptually replicated the findings of the first two studies by showing that mood infusion during shared attention with one's ingroup influenced evaluative judgments of the overall study experience.

Study 4: Shared Attention, Cognitive Elaboration, and Mood Infusion

The final study examined whether participants in the shared attention condition would display greater elaborative processing of the attended objects and whether this greater elaborative processing would yield larger mood infusion effects. To address this question, we again asked participants in each social context condition to look at a painting, but additionally asked them to provide verbal descriptions of the paintings. The descriptions provided by participants were then examined for verbal complexity because it serves as a classic measure of cognitive elaboration (Craik & Tulving, 1975). We also asked participants to report their mood and the extent to which they liked the painting.

We expected that participants in the shared attention condition would demonstrate heightened elaborative processing of the paintings, as reflected in greater sentence complexity in their verbal descriptions. Moreover, we expected that this heightened sentence complexity would be associated with larger mood infusion effects.

Method

Participants and design. Participants were 498 adults sampled from an online subject pool maintained by Amazon's Mechanical Turk (60.6% female; mean age = 32.59 years, $SD = 11.93$). After reporting their mood (self-assessment mannequin from Study 3), participants were randomly assigned to one of five social context conditions: similar-others/same-painting, different-others/same-painting, similar-others/different-painting, different-others/different-painting, and alone. Participants then looked at a painting and were asked to take a few minutes to write about the painting. Finally, as in the preceding studies, participants reported whether they liked the painting (1 = *not at all*, 11 = *very much*).

Results

We examined whether participants in the similar-others/same-painting condition displayed greater cognitive elaboration of the painting than participants in the other four social contexts, as reflected in more complex descriptions of the paintings. Words per sentence and clauses per sentence were computed as indices of verbal complexity using the L2 Syntactic Complexity Analyzer software (Lu, 2010). Participants who did not produce any words or clauses, as determined by the analyzer software, were not included in the analyses, since the extent of their cognitive elaboration could not be ascertained. Following Bock (1985), we

natural log transformed the words per sentence and clauses per sentence dependent variables. Notably, including participants that did not produce any words or clauses in the analyses by coding them with a 0 did not materially alter the results reported.¹

Cognitive elaboration. Overall analyses of variance (ANOVAs) indicated a marginal effect of condition on words per sentence, $F(4, 493) = 1.95, p = .10$, and clauses per sentence, $F(4, 391) = 1.79, p = .13$. Planned contrasts to examine the difference between the shared ingroup attention condition versus the other social context conditions indicated a significant difference for words per sentence, $t(493) = 2.17, p = .03$, and a significant difference for clauses per sentence, $t(391) = 2.49, p = .013$. The patterns of results were similar across both measures of verbal complexity, indicating higher scores in the shared ingroup attention condition compared to the other social contexts (similar-others/same-painting $M_{wps} = 2.31, SD = 0.53/M_{cps} = 0.24, SD = 0.41$; different-others/same-painting $M_{wps} = 2.24, SD = 0.62/M_{cps} = 0.13, SD = 0.50$; similar-others/different-painting $M_{wps} = 2.19, SD = 0.63/M_{cps} = 0.12, SD = 0.47$; different-others/different-painting $M_{wps} = 2.16, SD = 0.54/M_{cps} = 0.08, SD = 0.37$; alone $M_{wps} = 2.10, SD = 0.54/M_{cps} = 0.06, SD = 0.53$).

Moderated mediation. We next used a moderated mediation analysis to directly test our hypothesis that the effects of shared attention on mood infusion are mediated by heightened cognitive elaboration. We used the PROCESS program to test a moderated mediation model (Model 14; Hayes, 2012), where shared attention predicted elaboration, as measured by words per sentence and clauses per sentence indexes, and elaboration interacted with baseline mood to predict attitudes toward the painting. Reflecting the cognitive elaboration results reported, we found that participants in the shared ingroup attention condition had marginally more words per sentence ($b = -0.11, SE = 0.06, t = -1.84, p = .07$) and significantly more clauses per sentence ($b = -0.14, SE = 0.06, t = -2.48, p = .01$), as can be seen in Figure 3. Moreover, the clauses per sentence measure interacted with mood to influence attitudes ($b = 0.97, SE = 0.49, t = 1.99, p = .047$). This significant interaction suggests that individuals who produced more clauses per sentence also experienced greater mood infusion (see Figure 4). The words per sentence measure of elaboration did not interact with mood to influence attitudes ($b = -0.35, SE = 0.50, t = -0.87, p = .38$).

As in previous studies, participants across social context conditions did not differ in their mean ratings of their mood, $F(4, 491) = 1.28, p = .27$, or the painting, $F(4, 493) = 0.34, p = .85$.

Study 4 provides direct evidence that shared ingroup attention increases elaborative processing. Specifically, participants in the shared ingroup attention condition displayed higher scores on two measures of sentence complexity, which serve as classic indicators of greater elaborative processing (Craik & Tulving, 1975). This pattern was more robust for the number of clauses per sentence index. Moreover, the clauses per sentence measure of sentence complexity increased the influence of mood on attitudes, demonstrating moderated mediation. It is possible that number of clauses

¹ Participants in the shared ingroup attention condition had significantly more clauses per sentence ($b = -0.23, SE = 0.08, t = -2.90, p = .004$), and the clauses per sentence measure interacted with mood to influence attitudes ($b = 0.65, SE = 0.29, t = 2.22, p = .03$).

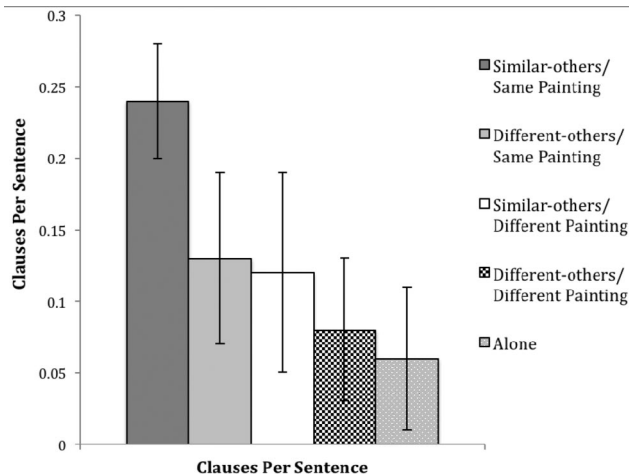


Figure 3. The influence of social context on clauses per sentence (Study 4). Errors bars indicate ± 1 SE.

per sentence is a more accurate measure of cognitive elaboration than mere sentence length, as it requires greater attention to sentence structure. It is also conceivable that given the moderate to high correlation between the two indexes ($r = .54$, $p < .0001$), greater sentence length is derivative of the number of clauses per sentence measure.

Notably, we did not find that shared attention directly moderated the mood to attitude relationship in Study 4. This is most likely due to the fact that we asked all participants, across all social contexts, to write about the object and thus to cognitively elaborate, at least to some extent. This likely increased mood infusion across all conditions. This possibility is supported by the finding that moods were associated with painting attitudes across all social contexts ($r = .16$, $p < .0001$).

General Discussion

Across four experiments, attitudes toward an object formed at the intersection of mood and the social context in which the object was attended. Regardless of whether mood was experimentally manipulated or naturally occurring, sharing attention with similar others increased the effect of participants' moods on subsequent evaluations. Based on the empirical evidence in both the shared attention and mood infusion literatures, we predicted that shared attention would increase the infusion of mood because elaborative processing increases for jointly attended objects (Eskenazi et al., 2012; He et al., 2011; Shteynberg, 2010). That is, because socially shared objects evoke greater elaborative processing—encoding that involves a broader range of existing knowledge structures (Craik & Tulving, 1975)—mood has a greater propensity to influence attitudes (Forgas, 1995). Study 4 directly supports this interpretation, as participants in the shared ingroup attention condition demonstrated heightened elaboration in their sentences when describing the attitude object. In turn, greater sentence complexity, as measured by number of clauses per sentence, increased the influenced of mood on attitudes, suggesting that the heightened object elaboration produced by shared ingroup attention led to greater mood infusion.

Beyond Attitudinal Imitation

The current studies demonstrate that mere awareness of shared attention with similar others can influence attitude formation, even in the absence of knowledge of how others are evaluating the same object. Most demonstrations of attitudinal influence only show conformity to the attitudes expressed by an individual's social group (e.g., Sechrist & Stangor, 2001; Sinclair et al., 2005). In contrast, we found that shared attention effects occurred even when attitudinal contagion was unlikely given the absence of direct knowledge of others' opinions. Indeed, participants in the key condition did not anticipate that they were conforming to the group's attitude as indicated by the perceived consensus measures. Although attitudinal contagion is one of the intellectual cornerstones of social psychology (Allport, 1924; Festinger, 1950), it may not be the only path by which a social group exerts influence on a group member's attitudes. Indeed, as our results suggest, the social situation may have a more subtle power with which to shape individuals' attitudes. Namely, group attention bolsters the use of mood in attitudinal formation.

Toward Attitudinal Consensus

Festinger (1950) provided a point of departure for understanding why attitudes are subject to social influence, proposing that attitudinal formation, maintenance, and change should be ultimately conducive to achieving attitudinal agreement within groups, hence facilitating collective action. It is thus reasonable to ask whether reliance on mood cues to evaluate objects of shared attention actually facilitates attitudinal consensus. There are good reasons to believe that this indeed is the case. Considerable empirical work suggests that social group members converge in their mood states (Barsade & Gibson, 2012; Niedenthal & Brauer, 2012), while diverging from the mood states of out-group members (Weisbuch & Ambady, 2008). This suggests that within-group mood states may have been relatively homogeneous in ancestral environments in which humans first faced the problem of attitudinal alignment and collective action. Assuming that group members have rela-

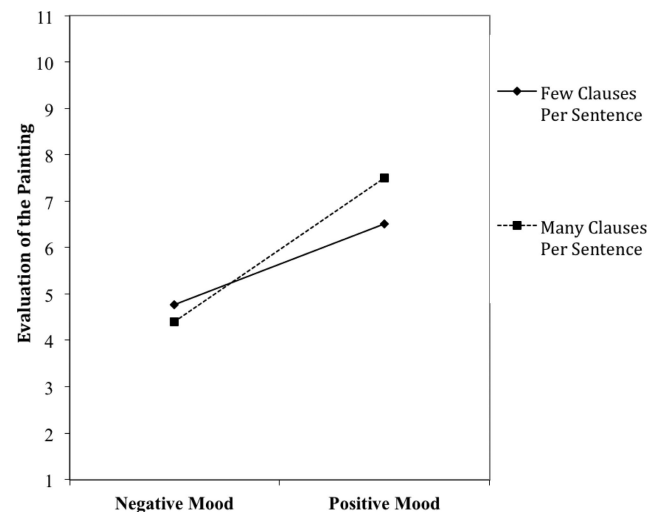


Figure 4. The relationship between mood and evaluation as moderated by number of clauses per sentence (Study 4).

tively similar moods as one another during object evaluation, the reliance on mood cues when evaluating jointly attended objects can facilitate attitudinal consensus. From an evolutionary perspective, greater mood infusion during states of shared attention may thus be a key adaptation supporting social coordination in humans (Boyd & Richerson, 2009; Spoor & Kelly, 2004; Tsai et al., 1998).

Mass Media Implications

The reported findings also have important implications for understanding the impact of non-present audiences during the consumption of mass and social media. The intake of information through television, newspapers, film, and radio has become commonplace. What these mass media channels share in common with one another is that their audiences are aware that the information being broadcast is subject to joint attention. The current findings suggest that if other members of one's social group are presumed to be part of the audience, greater mood infusion effects are likely to occur during the consumption of mass media. Consequently, the affective context in which mass information is presented may have substantial implications for the evaluation of mass content.

Conclusion

Based on and the integration of two previous findings—that shared attention increases elaborative processing (Eskenazi et al., 2012; He et al., 2011; Shteynberg, 2010) and that elaborative processing increases affect infusion into judgments (Forgas, 1995; Forgas & Fiedler, 1996)—the current research found that shared ingroup attention increases the infusion of mood into attitudes. To the extent that mood convergence is common within social groups, greater mood infusion during joint attention may be an important mechanism for obtaining attitudinal consensus with one's group members. Examining the relationship between shared attention and evaluative processes is thus a promising area of investigation for future research.

References

- Allport, F. H. (1924). *Social psychology*. Boston, MA: Houghton Mifflin Company.
- Anderson, J. R., & Reder, L. M. (1979). An elaborative processing explanation of depth of processing. In L. S. Cermak & F. I. M. Craik (Eds.), *Levels of processing in human memory* (pp. 385–404). Hillsdale, NJ: Erlbaum.
- Baron-Cohen, S. (1995). *Mindblindness: An essay on autism and theory of mind*. Cambridge, MA: MIT Press.
- Barsade, S. G., & Gibson, D. E. (2012). Group affect: Its influence on individual and group outcomes. *Current Directions in Psychological Science*, 21, 119–123. doi:10.1177/0963721412438352
- Bayliss, A. P., Frischen, A., Fenske, M. J., & Tipper, S. P. (2007). Affective evaluations of objects are influenced by observed gaze direction and emotional expression. *Cognition*, 104, 644–653. doi:10.1016/j.cognition.2006.07.012
- Bayliss, A. P., Paul, M. A., Cannon, P. R., & Tipper, S. P. (2006). Gaze cuing and affective judgments of objects: I like what you look at. *Psychonomic Bulletin & Review*, 13, 1061–1066. doi:10.3758/BF03213926
- Bock, R. D. (1985). *Multivariate statistical methods in behavioral research*. Skokie, IL: Scientific Software International.
- Boyd, R., & Richerson, P. J. (2009). Culture and the evolution of human cooperation. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 364, 3281–3288. doi:10.1098/rstb.2009.0134
- Bradley, M. M., & Lang, P. J. (1994). Measuring emotion: The self-assessment manikin and the semantic differential. *Journal of Behavior Therapy and Experimental Psychiatry*, 25(1), 49–59.
- Bruner, J. (1983). *Child's talk: Learning to use language*. New York, NY: Norton.
- Buhrmester, M., Kwan, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality data? *Perspectives on Psychological Science*, 6, 3–5. doi:10.1177/1745691610393980
- Craik, F. I. M., & Tulving, E. (1975). Depth of processing and the retention of words in episodic memory. *Journal of Experimental Psychology: General*, 104, 268–294. doi:10.1037/0096-3445.104.3.268
- Dawkins, R. (2006). *The selfish gene*. New York, NY: Oxford University Press.
- Eskenazi, T., Doerrfeld, A., Logan, G. D., Knoblich, G., & Sebanz, N. (2012). Your words are my words: Effects of acting together on encoding. *The Quarterly Journal of Experimental Psychology*. Advance online publication. doi:10.1080/17470218.2012.725058
- Festinger, L. (1950). Informal social communication. *Psychological Review*, 57, 271–282. doi:10.1037/h0056932
- Fiedler, K. (1991). On the task, the measures and the mood in research on affect and social cognition. In J. P. Forgas (Ed.), *Emotion and social judgments* (pp. 83–104). Elmsford, NY: Pergamon Press.
- Forgas, J. P. (1993). On making sense of odd couples: Mood effects on the perception of mismatched relationships. *Personality and Social Psychology Bulletin*, 19, 59–70. doi:10.1177/0146167293191007
- Forgas, J. P. (1994). Sad and guilty? Affective influences on the explanation of conflict episodes. *Journal of Personality and Social Psychology*, 66, 56–68. doi:10.1037/0022-3514.66.1.56
- Forgas, J. P. (1995). Mood and judgment: The affect infusion model (AIM). *Psychological Bulletin*, 117, 39–66. doi:10.1037/0033-2909.117.1.39
- Forgas, J. P., & Fiedler, K. (1996). Us and them: Mood effects on intergroup discrimination. *Journal of Personality and Social Psychology*, 70, 28–40. doi:10.1037/0022-3514.70.1.28
- Girard, R. (1965). *Deceit, desire, and the novel: Self and other in literary structure*. Baltimore, MD: Johns Hopkins Press.
- Hayes, A. F. (2012). *PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling* [White paper]. Retrieved from <http://www.afhayes.com/public/process2012.pdf>
- He, X., Lever, A. G., & Humphreys, G. W. (2011). Interpersonal memory-based guidance of attention is reduced for ingroup members. *Experimental Brain Research*, 211, 429–438. doi:10.1007/s00221-011-2698-8
- Kesebir, S. (2012). The superorganism account of human sociality: How and when human groups are like beehives. *Personality and Social Psychology Review*, 16, 233–261. doi:10.1177/1088868311430834
- Leue, A., & Beauducel, A. (2011). The PANAS structure revisited: On the validity of a bifactor model in community and forensic samples. *Psychological Assessment*, 23, 215–225. doi:10.1037/a0021400
- Lu, X. (2010). Automatic analysis of syntactic complexity in second language writing. *International Journal of Corpus Linguistics*, 15, 474–496. doi:10.1075/ijcl.15.4.02lu
- Niedenthal, P. M., & Brauer, M. (2012). Social functionality of human emotion. *Annual Review of Psychology*, 63, 259–285. doi:10.1146/annurev.psych.121208.131605
- Reid, V. M., Striano, T., Kaufman, J., & Johnson, M. H. (2004). Eye gaze cuing facilitates neural processing of objects in 4-month-old infants. *NeuroReport*, 15, 2553–2555. doi:10.1097/00001756-200411150-00025
- Searle, J. R. (1995). *The construction of social reality*. New York, NY: The Free Press.
- Sechrist, G. B., & Stangor, C. (2001). Perceived consensus influences intergroup behavior and stereotype accessibility. *Journal of Personality and Social Psychology*, 80, 645–654. doi:10.1037/0022-3514.80.4.645

- Shteynberg, G. (2010). A silent emergence of culture: The social tuning effect. *Journal of Personality and Social Psychology*, 99, 683–689. doi:10.1037/a0019573
- Shteynberg, G., & Galinsky, A. D. (2011). Implicit coordination: Sharing goals with similar others intensifies goal pursuit. *Journal of Experimental Social Psychology*, 47, 1291–1294. doi:10.1016/j.jesp.2011.04.012
- Sinclair, S., Lowery, B. S., Hardin, C. D., & Colangelo, A. (2005). Social tuning of automatic racial attitudes: The role of affiliative motivation. *Journal of Personality and Social Psychology*, 89, 583–592. doi:10.1037/0022-3514.89.4.583
- Sperber, D., & Wilson, D. (1986). *Relevance: Communication and cognition*. Cambridge, MA: Harvard University Press.
- Spoor, J. R., & Kelly, J. R. (2004). The evolutionary significance of affect in groups: Communication and group bonding. *Group Processes & Intergroup Relations*, 7, 398–412. doi:10.1177/1368430204046145
- Tajfel, H., Billig, M. G., Bundy, R. P., & Flament, C. (1971). Social categorization and intergroup behaviour. *European Journal of Social Psychology*, 1, 149–178. doi:10.1002/ejsp.2420010202
- Tomasello, M. (1999). *The cultural origins of human cognition*. Cambridge, MA: Harvard University Press.
- Tomasello, M., Carpenter, M., Call, J., Behne, T., & Moll, H. (2005). Understanding and sharing intentions: The origins of cultural cognition. *Behavioral and Brain Sciences*, 28, 675–691. doi:10.1017/S0140525X05000129
- Tsai, S. F., Lan, I. K., Chen, C. L., Henrich, J., & Boyd, R. (1998). The evolution of conformist transmission and the emergence of between-group differences—A reappraisal of a century of research. *Evolution and Human Behavior*, 19, 215–241.
- Tuomela, R. (2007). *The philosophy of sociality: The shared point of view*. New York, NY: Oxford University Press.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063–1070. doi:10.1037/0022-3514.54.6.1063
- Weisbuch, M., & Ambady, N. (2008). Affective divergence: Automatic responses to others' emotions depend on group membership. *Journal of Personality and Social Psychology*, 95, 1063–1079. doi:10.1037/a0011993
- Wilson, D. S., & Wilson, E. O. (2007). Rethinking the theoretical foundation of sociobiology. *The Quarterly Review of Biology*, 82, 327–348. doi:10.1086/522809

Received October 3, 2011

Revision received December 6, 2012

Accepted December 14, 2012 ■