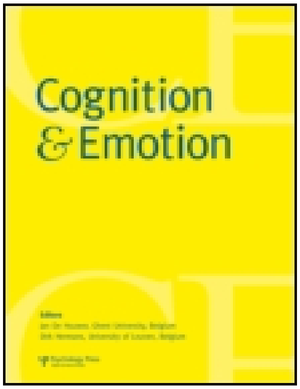

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Contact high: Mania proneness and positive perception of emotional touches

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BRIEF REPORT

Contact high: Mania proneness and positive perception of emotional touches

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How do extreme degrees of positive emotion—such as those characteristic of mania—influence emotion perception? The present study investigated how mania proneness, assessed using the Hypomanic Personality Scale, influences the perception of emotion via touch. Using a validated dyadic interaction paradigm for communicating emotion through touch (Hertenstein, Keltner, App, Bulleit, & Jaskolka, 2006), participants ($N = 53$) received eight different touches to their forearm from a stranger and then identified the emotion via forced-choice methodology. Mania proneness predicted increased overall accuracy in touch perception, particularly for positive emotion touches, as well as the over-attribution of positive and under-attribution of negative emotions across all touches. These findings highlight the effects of positive emotion extremes on the perception of emotion in social interactions.

Keywords: Hypomania/mania; Mania proneness; Positive emotion; Touch; Individual differences.

The scientific study of emotional expression has documented that humans convey an array of emotions through three different modalities: the face, the voice, and touch. This nonverbal language of emotion has clear evolutionary origins, is a strong human universal, and is a central language of human social life (see Keltner & Lerner, 2010, for a review).

Emotion-related signalling between an encoder (signaller) and decoder (perceiver) is also subject to important variation in terms of the accuracy with which emotions are communicated. This theme has emerged as central to the study of emotional expression. With respect to the encoder, research finds that certain individuals convey emotions in clearer signals and receive

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more empathy from others as a result (Zaki, Bolger, & Ochsner, 2008). With respect to the decoder, new studies have documented significant variation in levels of accuracy in emotion recognition based on facial expressions depending on the individual's culture (e.g., Elfenbein & Ambady, 2003), history of abuse (Pollak & Tolley-Schell, 2003), and social class (Kraus, Côté, & Keltner, 2010). Emotional communication, though universal, is subject to systematic individual variation.

In the present research, we tested the influence of proneness toward mania upon the perception of emotion through the tactile modality. A defining criterion of mania is extreme and persisting levels of positive emotion (American Psychiatric Association, 2000). Furthermore, mania is associated with social difficulties that may stem from extremes of positive emotion—increased social contact (e.g., Biegel & Murphy, 1971), invasion of personal boundaries (Bech, Bolwig, Kramp, & Rafaelsen, 1979), and interpersonal difficulties (e.g., MacQueen, Young, & Joffe, 2001). The study of mania, therefore, represents a clear means by which scientists can examine how chronically elevated levels of positive emotion influence the perception of emotion. Here we ask: How do individual tendencies toward extreme and persistent levels of positive emotion bias the perception of emotional displays through touch?

Mania proneness, heightened positive emotionality, and touch

Elevations in extreme positive emotion are a central feature of mania proneness (Gruber, 2011). For example, mania proneness is associated with heightened and chronic positive emotion across positive, negative, and neutral contexts (e.g., Gruber, Johnson, Oveis, & Keltner, 2008). Proneness toward and a clinical diagnosis of mania are also associated with a bias toward perceiving positive emotion. Mania proneness, measured using the Hypomanic Personality Scale (Eckblad & Chapman, 1986), predicts an increased ability to recognise subtle happiness facial expressions following a positive mood induction (Trevisani, Johnson, & Carver, 2008). Moreover, manic individuals have been found to show deficits in recognising several negative facial expressions (e.g., fear, anger) but no recognition errors for happy faces (Lembke & Ketter, 2002). Though important, the studies above examined emotion perception in non-naturalistic settings. No studies have tested whether mania proneness affects emotional perception in interpersonal settings, a striking lacuna given the interpersonal nature of emotion perception (Zaki et al., 2008).

One avenue to examine emotion perception in interpersonal contexts is via touch, a dynamic modality of emotion communication. Touch is critical to human social life (Field, 2001) and a rich channel of the communication of emotion. Emerging research finds that a mere touch to the body can reliably communicate several distinct emotions—including sympathy, gratitude, love, disgust, fear, and anger (e.g., Hertenstein, Keltner, App, Bulleit, & Jaskolka, 2006; Thompson & Hampton, 2011). As such, the empirical study of interpersonal touch offers a unique opportunity to investigate whether mania proneness predicts a positive bias in emotion perception in the interpersonal domain.

The present research

Participants engaged in a well-validated interpersonal touch paradigm (Hertenstein et al., 2006; Thompson & Hampton, 2011). In the touch paradigm, participants received eight emotional touches to the forearm from a stranger they could not see, and then identified the emotion associated with each touch from a list of emotion words. Guided by research linking mania proneness to heightened positive emotion across positive and negative stimuli (Gruber et al., 2008) and mania symptoms to increased social contact (e.g., Biegel & Murphy, 1971), we hypothesised that mania proneness would predict greater accuracy in identifying the emotional content of touches, particularly those conveying positive emotions, as well as increased perception of positive emotion across positive and negative touches.

METHOD

Participants

124 undergraduates and adults from the community received partial course credit or financial compensation for participation. Participants were brought into the lab in same-sex unacquainted pairs and assigned to the role of encoder (toucher) or decoder (touchee). The decoder identified the emotional content of a touch, and enabled us to examine how mania proneness influences the *perception* of emotional touch. Of the 62 decoders, nine were excluded due to missing data, leaving a final sample of 53 participants. Participants were 64.2% female, ranged in age from 18 to 59 ($M=23.21$, $SD=9.29$), and were ethnically diverse (26.4% European American, 54.7% Asian American, 7.5% Latino/a, 1.9% African American, and 9.4% Other).

Materials

Mania proneness. Proneness to mania was measured using the well-validated Hypomanic Personality Scale (HPS; Eckblad & Chapman, 1986). The HPS consists of 48 true–false items that measure shifts in emotion (e.g., "I often feel excited and happy for no apparent reason"), behaviour (e.g., "I often get into excited moods where it's almost impossible for me to stop talking"), and energy (e.g., "I often get so happy and energetic that I am almost giddy"). Responses were summed so that higher scores corresponded to greater mania proneness. Participants with high HPS scores have an increased risk for the development of manic episodes at a 13-year follow-up (Kwapil et al., 2000). The HPS demonstrated good internal consistency ($\alpha=.86$) with scores representative of a university sample ($M=15.40$, $SD=8.00$).

Potential confounds. We assessed several individual difference variables that might co-vary with mania proneness and account for our findings. To measure current symptoms common in those prone toward mania, we used the 5-item Altman Self-Rating Mania Index (ASRM; Altman, Hedeker, Peterson, & Davis, 1997; $\alpha=.76$, $M=8.96$, $SD=3.51$) and the 13-item short form of the Beck Depression Inventory (BDI-SF; Beck & Beck, 1972; $\alpha=.82$, $M=4.04$, $SD=4.30$). We assessed individual differences in reactions to touch using the Touch Avoidance Measure (TAM; Andersen & Leibowitz, 1978), an 18-item measure of aversion to same-sex ($\alpha=.82$, $M=3.71$, $SD=0.95$) and opposite-sex touches ($\alpha=.81$, $M=2.69$, $SD=0.89$). See Table 1 for correlations between measures.

Procedure

Prior to the experimental session ($M=7.29$ days, $SD=8.33$), participants completed the HPS, BDI-SF, ASRM, and TAM. Unacquainted participants were randomly grouped into same-sex dyad pairs and, upon arrival to the lab, seated across from each other facing separate computers

Table 1. *Correlations between self-report measures*

	HPS	*ASRM*	*BDI-SF*	*TAM (same sex)*	*TAM (opposite sex)*
HPS	—	.39**	.02	−.37**	−.29*
ASRM	.39**	—	−.19	−.18	−.22
BDI-SF	.02	−.19	—	.13	.10
TAM (same sex)	−.37**	−.18	.13	—	.63**
TAM (opposite sex)	−.29*	−.22	.10	.63**	—

Notes: HPS = Hypomanic Personality Scale; ASRM = Self-Rating Mania Index; BDI-SF = Beck Depression Inventory – Short Form; TAM = Touch Avoidance Measure. *$p<.05$; ** $p<.01$.

in a 2×3 meter room. Paralleling Hertenstein et al. (2006), a black curtain was positioned diagonally in between the two participants to reduce possible non-tactile and verbal communication. Participants, both of whom were naïve to the content and nature of the touch task, were randomly assigned to either the role of encoder (toucher) or decoder (touchee) and presented with computer instructions. For the encoder, eight emotion words (anger, fear, disgust, sadness, love, gratitude, awe, and sympathy) were displayed serially in a randomised order. The encoder was shown a target emotion on the computer screen and asked to express that emotion via a touch to the other participant's forearm. The encoder was told to be as "expressive as possible in [their] touch" and that the touches could "last as long as you think they need to". Two lines of tape demarcated where the decoder's forearm should be positioned on the table for each touch trial. The encoder expressed each emotion via a touch to the decoder's bare arm, positioned under the curtain on the encoder's side. The encoder was not given practice trials or told how to touch, and the decoder could only feel and not see the touches received. After each touch, the decoder rated his/her perception of the emotional content of the touch by selecting from a forced-choice list of nine terms (the eight target emotions and an "other" option).

RESULTS

Preliminary analyses

Gender (0 = *female*, 1 = *male*), ethnicity (0 = *European American*, 1 = *non-European American*), and age did not moderate the results (ps $> .10$). We therefore collapsed across these variables in subsequent analyses. As seen in Table 1, HPS scores were negatively correlated with both TAM same-sex and opposite-sex scores, indicating that mania proneness is associated with less aversion to touch. HPS was also associated with increased ASRM but not BDI-SF ($p > .10$; see Table 1).

Manipulation checks

There was no difference in the accuracy of perceiving the first touch compared to the last touch ($p > .50$), suggesting no learning effects. Binomial tests (chance = 25%; Hertenstein et al., 2006) indicated that anger (45%, $p < .01$), fear (40%, $p < .05$), disgust (51%, $p < .01$), love (36%, $p = .05$), and sympathy (40%, $p < .05$) were identified at levels significantly greater than chance, and accuracy levels for gratitude were marginal (34%, $p = .09$). Sadness was not accurately decoded at above-chance levels, replicating Hertenstein et al. (2006), and neither was awe. The most frequently chosen emotions for each touch are listed in Table 2.

Table 2. *Decoding accuracy and the most frequently chosen emotions for each touch*

	Frequently chosen		
Touch	*1*	*2*	*3*
Awe	Sympathy (30%)	Gratitude (15%)	Other (11%)
Love	Love (36%)†	Sympathy (30%)	Gratitude (9%)
Gratitude	Gratitude (34%)††	Sympathy (23%)	Love (15%)
Sympathy	Sympathy (40%)*	Love (24%)	Gratitude (17%)
Anger	Anger (45%)**	Fear (17%)	Disgust (15%)
Disgust	Disgust (51%)**	Anger (15%)	Fear (15%)
Fear	Fear (40%)*	Anger (19%)	Awe/Gratitude (9%)
Sadness	Sympathy (34%)	Sadness (21%)	Love (19%)

Note: $^{*}p < .05$; $^{**}p < .01$; $^{\dagger}p = .05$; $^{\dagger\dagger}p < .10$.

Mania proneness and emotion perception via touch

We conducted a series of linear regressions to test whether mania proneness, as indexed by HPS, significantly predicted behaviour in the touch task. Specifically, we examined whether HPS predicted differential levels of accuracy in emotion perception across all emotions in the touch task, and proceeded to test if these effects were specific to positive or negative emotions. We also investigated whether HPS was associated with varying perceptions of positive and negative emotions across all emotional touches. In testing the effects of HPS on touch perception, we also sought to account for several third variables that could influence our results. Thus, we conducted follow-up analyses that controlled for the decoder's TAM scores and current symptoms (ASRM, BDI-SF) and—to account for possible partner (dyadic) effects—the partner's (encoder) scores on HPS, ASRM, BDI-SF, and TAM (Kenny, Kashy, & Cooke, 2006).

How accurate was the perception? We tested whether mania proneness (HPS scores) predicted emotion perception accuracy in the touch task. A total accuracy score was computed as the proportion of times out of eight that the participant correctly identified an emotional touch. We used an arcsine transformation to normalise the distribution of these proportion-based accuracy scores (similarly, we conducted an arcsine transformation on the other proportion-based variables reported below to normalise their distribution; Sokal & Rohlf, 1995). In a linear regression framework, we entered HPS scores as the independent variable and total accuracy as the dependent variable. This model was significant, $F(1, 51) = 6.44$, $p < .05$, and explained 11% of the variance in touch accuracy. Importantly, as hypothesised, HPS predicted increased accuracy in the touch task, $b = 0.01$, 95% confidence interval = 0.002–0.017. In a follow-up analysis, we tested whether the association between HPS and touch accuracy held while accounting for decoder's TAM, BDI-SF, and ASRM scores, and encoder's TAM, BDI-SF, ASRM, and HPS scores. Even while accounting for these third variables, HPS remained a significant predictor of total accuracy ($b = 0.02$, $p < .01$), indicating that mania proneness was specifically associated with increased accuracy in perceiving emotions via touch.

We next examined whether HPS predicted greater accuracy in perceiving positive or negative emotions through touch. We did so by collapsing levels of decoding accuracy for positive emotions (love, gratitude, and awe) and for negative emotions (anger, disgust, fear, and sadness). Sympathy was excluded from either category, being neither a clearly positive nor negative emotion (e.g., Fredrickson, Tugade, Waugh, & Larkin, 2003). Valence accuracy scores were computed as the proportion of correctly identified emotions out of the three positive touches (positive valence accuracy) or out of the four negative touches (negative valence accuracy). Results indicated that HPS scores significantly predicted increased accuracy of perceiving positively valenced touches, $F(1, 51) = 7.58$, $p < .01$, $b = 0.02$, 95% confidence interval = 0.005–0.031, and explained 13% of the variance in accuracy in decoding positive touches. HPS scores did not predict increased accuracy of perceiving negatively valenced touches, $F(1, 51) = 0.40$, $p > .05$. In follow-up analyses with covariates entered, HPS scores remained a significant predictor of accuracy in decoding positive touches ($b = 0.02$, $p < .05$) and a non-significant predictor of accuracy in decoding negative touches ($b = 0.02$, $p > .05$). These results suggest that mania proneness is specifically related to increased accuracy in the perception of positive emotional touches.

What was perceived? Moving beyond accuracy, we tested whether HPS predicted increased perceptions of positive or negative emotions by calculating the proportion of times each valence category (positive, negative) was attributed to an emotional touch across the eight touches. HPS scores significantly predicted increased attributions of positive emotion, $F(1, 51) = 5.60$, $p < .05$, $b = 0.01$, 95% confidence interval = 0.001–0.013, and explained 10% of the variance in attributing positive emotions across touches. HPS scores also predicted decreased attributions of negative emotion, $F(1, 51) = 12.66$, $p < .01$, $b = -0.01$, 95% confidence interval $= -0.014 - -0.004$, and explained 20% of the variance in attributing negative emotions to touches. Moreover, in regression analyses with covariates entered, HPS scores remained a significant predictor of increased attributions of positive emotions ($b = 0.01$, $p < .05$) and decreased attributions of negative emotions ($b = -0.01$, $p < .01$). In sum, mania proneness predicted an increased likelihood of attributing positive emotion, and a decreased likelihood of attributing negative emotion, to positive and negative touches.[1]

DISCUSSION

The study of emotional communication has recently turned to the question of how individual differences shape the encoding and decoding of emotional expression. The vast majority of research in this area has focused on the face and voice (e.g., Keltner & Lerner, 2010; Zaki et al., 2008). Here, for the first time in the literature to our knowledge, we identified an individual difference variable—proneness to mania—that underlies the ability to interpret specific emotions via touch, a severely neglected modality.

Results suggested that mania proneness predicted increased overall accuracy in interpreting emotional touches, but this was driven by increased accuracy for positive and not negative touches. These findings align with work suggesting mania proneness is associated with greater sensitivity to positive stimuli (Trevisani et al., 2008). Mania proneness was also associated with increased attributions of positive emotions and decreased attributions of negative emotions to positive and negative touches. Importantly, effects held when accounting for aversion to touch, current symptoms, and possible partner effects, suggesting that mania proneness specifically underlies individual differences in emotion perception via touch.

In sum, these results indicate that mania proneness predicts a general bias toward perceiving positive emotion across several positive and negative interpersonal touches, consistent with prior work reporting a positive emotional bias in mania proneness (Gruber et al., 2008). These findings also align with prior work arguing that mania is associated with increased social contact and sexual interest (Bech et al., 1979; Biegel & Murphy, 1971). The current results point to the specific pathways—e.g., increased desire for intimacy, higher levels of Extroversion—through which mania proneness might influence interpersonal behaviour. Our results also suggest that mania proneness may be associated with positivity even in the face of negative touches from a stranger, an important area for future examination given the role of mania proneness in responses to anger (Harmon-Jones et al., 2002).

Conclusions and future directions

The current study introduced touch as a new modality for studying the influence of mania proneness on emotional communication. However, findings should be interpreted within the confines of several caveats and with suggested directions for future research. First, findings in the present study relied solely on self-reported responses. As such, future work should incorporate direct assessments of the potential mechanisms underlying responses to particular touches, including measures of physiology. Second, although we measured a variety of emotional touches, future work should investigate other emotions likely to be affected by mania proneness, including happiness and sexual desire. Third, although we adopted a well-validated touch task,

[1]Including sympathy in either the negative emotion category or the positive emotion category did not significantly alter the pattern of results. Specifically, when sympathy was categorised as a positive emotion, HPS scores continued to predict increased accuracy in perceiving positive touches ($b = 0.02$, $p < .05$) and increased attributions of positive emotion across touches ($b = 0.01$, $p < .01$). Further, when sympathy was categorised as a negative emotion, HPS scores did not predict accuracy in perceiving negative touches ($b = 0.01$, $p > .05$) but did predict decreased attributions of negative emotion ($b = -0.01$, $p < .05$).

it was limited to only brief tactile contact to the arm. Future studies should examine contexts where touch is less circumscribed and that include additional modalities of emotion expression. Fourth, the present study focused on a non-clinical sample of undergraduates and so generalisations to individuals at risk for mania or with a clinical history of mania (i.e., bipolar disorder) must be drawn with caution. Future work is needed to replicate these findings in clinical patient samples. Finally, research should further explore the interpersonal consequences of mania proneness. For instance, extreme positive emotionality among mania-prone individuals might cause their romantic partners to report reduced relationship satisfaction. Such investigations would further understanding of how mania proneness may create a "contact high" that biases emotional perception in interactions with others.

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