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Confusing acceptance and mere politeness: Depression and sensitivity to Duchenne smiles

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ABSTRACT

Background and objectives: Whereas the association between depression and the perception of emotions has been widely studied, only few studies have examined the association between depression and the ability to discriminate genuine (Duchenne) from fake (non-Duchenne) smiles. The present study examined this by comparing currently depressed, previously depressed, and healthy control individuals. Guided by recent theory, the present study also investigated the effect of depression recurrence on smile identification.
Methods: Participants were 27 healthy controls, 33 with past depression (51% with recurrent depression), and 22 with current depression (77% with recurrent depression). Participants were presented with a series of 20 videos depicting smiling individuals, and were asked to indicate whether each smile was genuine or fake.
Results: Having (or having had) a first episode of depression was associated with more mistakes in categorizing smiles as genuine or fake compared to having recurrent depression or to having no history of depression.
Limitations: Cross sectional design and a (relatively) small sample size.
Conclusions: Our results show that an impaired ability to differentiate between markers of affiliation and politeness is specific to first-episode depression, even after the depression has remitted.

Depressed individuals have less satisfying and more problematic social relationships than do non-depressed individuals (e.g., Coyne et al., 1987; Nezlek, Hampton, & Shean, 2000; Rehman, Gollan, & Mortimer, 2008). Compared with non-depressed individuals, they have fewer social interactions (Gotlib & Lee, 1989), enjoy these interactions less (Nezlek et al., 2000), and experience more interpersonal difficulties, including marital discord (Rehman et al., 2008). The association is bidirectional - the interpersonal difficulties also play a role in the etiology and maintenance of depression (cf., Joiner, 2002; e.g., Teo, Choi, & Valenstein, 2013).

One process that has been considered a mediator of the association between depression and interpersonal difficulties is interpersonal perception (e.g., Bouhuys, Geerts, & Gordijn, 1999a; Gadassi, Mor, & Rafaeli, 2011; Overall & Hammond, 2013). Depression is characterized by negative biases in processing emotional facial expressions (e.g., assigning more negative than positive emotions to neutral expressions; cf., Bistricky, Ingram, & Atchley, 2011). The strength of this bias is associated with greater depression severity (Hale, 1998), less improvement following treatment (Bouhuys et al., 1999a) and higher likelihood of relapse (Bouhuys, Geerts, & Gordijn, 1999b).

Whereas inaccurate perception of negative interpersonal stimuli is a robust finding in depression, findings regarding the association between depression and the perception of positive stimuli, including positive emotions, are less consistent (e.g., Gadassi et al., 2011; Yoon, Joormann, & Gotlib, 2009). Similarly, whereas the association between depression and sensitivity to behaviors that indicate social rejection (e.g., Gilbert, Irons, Olsen, Gilbert, & McEwan, 2006) has received considerable support, to our knowledge, no studies to date have examined the association of depression and cues of social acceptance.

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A main cue for social acceptance is the smile that indicates genuine enjoyment. Duchenne (1862/1990), and more recently, Ekman, Davidson, and Friesen (1990), have reported physiognomic distinction between enjoyment and non-enjoyment smiles. The former, often referred to as Duchenne smiles, involve the automatic contraction of the orbicularis oculi muscles (surrounding the eyes) in response to the experience of pleasure. Duchenne smiles are considered indicative of cooperation and affiliation (Brown & Moore, 2002). In contrast, masking (non-Duchenne) smiles are associated with politeness (Bonanno et al., 2002) and may conceal the experience of negative emotions (Ekman, Friesen, & O'Sullivan, 1988). Duchenne but not non-Duchenne smiles elicit trust and a desire for connection in perceivers (Johnston, Miles, & Macrae, 2010). Although recent research has shown that individual differences in reactivity to others' emotions (susceptibility to emotional contagion for negative, but not positive, emotions; Manera, Grandi, & Colle, 2013) is related to the ability to differentiate between Duchenne and non-Duchenne smiles, the link between depression and this ability, remains largely unexplored.

Therefore, the aim of the present study was to explore the association between depression and accuracy in distinguishing between these two types of smiles. Specifically, based on knowledge on negativity biases in social information processing in individuals with depression (e.g., Gilboa-Schechtman et al., 2008), we examined whether depressed individuals show decreased accuracy in the perception of smiles, compared to non-depressed individuals. This perceptual inaccuracy may play a role in the interpersonal stress generation cycle in depression, whereby these perceptions lead to behaviors that cause interpersonal strife, depriving depressed individuals of trust and connection, and contributing to further depression (Hammen, 1991; Liu & Alloy, 2010).

Only one study, to our knowledge, examined differences between individuals with depression and healthy controls in the perception of Duchenne smiles (Douglas, Porter, & Johnston, 2012), and failed to find differences between these two groups. This failure may be accounted for by the fact that participants were asked to indicate whether the person portraying the facial expression truly felt happy. This task may have been ambiguous, thus creating noise and perhaps masking group differences. More importantly, Douglas et al. (2012) did not take into account two aspects of depression: first, the study did not include individuals with remitted depression (i.e., those who experienced a depressive episode but are currently a-symptomatic; for a full definition of remission, see the Method Section), and second, it did not consider differences between those with first-episode and recurrent depression.

The present study will examine the link between these two aspects of depression and accuracy in the perception of smile authenticity. If deficient interpersonal perception (and specifically, inaccurate perception of Duchenne smiles) plays a role in the recurrence of depression, such deficits cannot be merely a concomitant of current depressive symptoms, but rather must be a stable characteristic of depression-prone individuals (Liu & Alloy, 2010). Thus, it would be instructive to assess this perception in individuals with both current and remitted depressive episodes, as well as in individuals who have never been depressed.

Depression-related deficits in accuracy of interpersonal perception have been extensively documented (cf. Bistricky et al., 2011), but only few studies have examined previously depressed individuals (Anderson et al., 2011; Harkness, Jacobson, Doung, & Sabbagh, 2010), and only one study, to our knowledge, compared previously-depressed people with currently depressed individuals and with healthy controls (Anderson et al., 2011). This study applied signal detection theory (Wickens, 2002) to the assessment of interpersonal perception. Signal detection theory allows researchers to distinguish between *sensitivity*, which is the ability to correctly distinguish between stimuli (e.g., between neutral and emotional expressions, in the case of Anderson et al., 2011), and *bias*, which is a measure of the direction of the errors (i.e., when making a mistake, are individuals more likely to mistakenly identify neutral expressions as emotional rather than emotional expressions as neutral, or vice-versa).

Anderson et al. (2011) showed that those with past depression correctly identified more emotional expressions compared to controls, but this increased accuracy was due to a response bias (i.e., to a lower threshold for detecting emotion, even when it is not truly there). In contrast, those with current depression made more mistakes in identifying emotional expressions compared to controls because they had decreased sensitivity. Based on these results we can hypothesize that previously depressed individuals would be more biased compared to healthy controls, whereas currently depressed individuals would be less sensitive compared to healthy controls.

A second aspect of depression that may be related to accurate perception of smile authenticity is depression recurrence. Although depression is highly recurrent, approximately 40% of those who experience a single depressive episode never meet diagnostic criteria for depression again. Thus, two subtypes of depression have been proposed: *recurrent* and *acute (single-episode)*. These two subtypes are associated with different developmental factors. Specifically, research suggests that compared to single-episode depression, recurrent depression is more genetically-based as it is associated with an earlier age of onset (Eaton et al., 2008), a lifetime history of minor depression, and parental history of recurrent depression (Pettit, Hartley, Lewinsohn, Seeley, & Klein, 2013).

To date, differences between single-episode and recurrent depression in interpersonal perception have not been examined. However, there is some evidence concerning the differences between these subtypes by comparing individuals' event-related potentials evoked by viewing negative versus positive emotional words (Nandrino, Dodin, Martin, & Henniaux, 2004). This study found that participants who were currently experiencing their first episode of depression had decreased P300 reactions (indicating decreased processing) in response to positive, but not negative words. In contrast, those with recurrent depression showed increased processing of negative but not positive words. Following successful treatment, those with a first-episode of depression still showed decreased reactivity to positive words, whereas those with recurrent depression no longer showed increased reactivity to negative words. These results could suggest that decreased sensitivity to Duchenne smiles would be evident among those with a single-episode depression but not among those with recurrent depression, and that this decreased sensitivity will remain even after the remission of the first episode.

In sum, as the literature review suggests, there is little research on interpersonal perception in past depression, and none on interpersonal perception and depression recurrence. The little available research does not consolidate into a coherent picture, but it does suggest that when studying depression and interpersonal perception one needs to take into account differences between (a) current and past depression (Anderson et al., 2011), (b) first-episode[1] and recurrent depression, and (Nandrino et al., 2004), and (c) negative and positive emotional stimuli (Gadassi et al., 2011; Nandrino et al., 2004). The present study will be the first to take into account all three factors when studying the association between depression and interpersonal perception.

[1] We use the term "first-episode depression" for clarity sake – because we do not have longitudinal data on our subjects we cannot know if they indeed have single-episode depression and not the recurrent subtype.