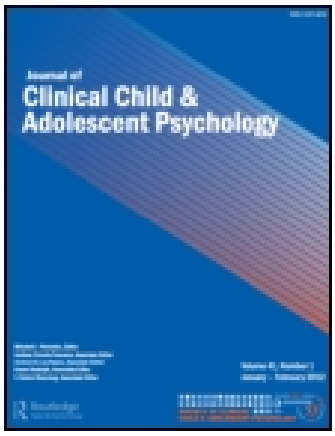

Journal of Clinical Child & Adolescent Psychology
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/hcap20

Misclassification and Identification of Emotional Facial Expressions in Depressed Youth: A Preliminary Study

Jessica L. Jenness[a], Benjamin L. Hankin[a], Jami F. Young[b] & Brandon E. Gibb[c]
[a] Department of Psychology, University of Denver
[b] Graduate School of Applied and Professional Psychology, Rutgers University
[c] Department of Psychology, Binghamton University (SUNY)
Published online: 14 Apr 2014.

Journal of Clinical Child & Adolescent Psychology, 44(4), 559–565, 2015

ISSN: 1537-4416 print/1537-4424 online
DOI: 10.1080/15374416.2014.891226

Routledge
Taylor & Francis Group

Misclassification and Identification of Emotional Facial Expressions in Depressed Youth: A Preliminary Study

Jessica L. Jenness and Benjamin L. Hankin
Department of Psychology, University of Denver

Jami F. Young
Graduate School of Applied and Professional Psychology, Rutgers University

Brandon E. Gibb
Department of Psychology, Binghamton University (SUNY)

Accurate processing of social and affective cues, especially facial cues, is important for human adaptation. Previous studies have examined depressed adults' sensitivity to identify emotional facial expressions, yet only one study has investigated this in depressed youth. In addition, very little is known about whether depressed individuals exhibit biases when incorrectly labeling, or misclassifying, emotional expressions. Therefore, this preliminary study explored whether sensitivity to, or misclassification of, emotional facial expressions differed among currently depressed youth, those with a history of depression, and never-depressed control participants. A community sample of 280 youth (7–16 years; $M = 11.51$, $SD = 2.44$; 56% girls) completed a forced-choice emotion identification task consisting of a series of randomly presented facial images that morphed an emotional expression (angry, happy, and sad) with a neutral expression in 10% increments (e.g., 10% sad/90% neutral; 20% sad/80% neutral). Findings demonstrated that currently depressed were more likely than remitted and never-depressed youth to misclassify happy and sad facial expressions as angry. No depression group differences were found in sensitivity to identify emotional expressions. Results suggest that currently depressed youth show biased perceptions of threat, which may contribute to the maintenance of their depressive symptoms.

Approximately 8% to 16% of adolescents experience an episode of depression each year (Avenevoli, Knight, Kessler, & Merikangas, 2008), and research has shown adolescent-onset depression to substantially increase the risk for recurrence of depression in adulthood (Rutter, Moffitt, & Caspi, 2006). In addition, clinically significant rates of depression are seen in children as young as age 8, with depressive symptoms and episodes increasing considerably in both boys and girls from childhood into adolescence (Avenevoli et al., 2008). Therefore, understanding factors that contribute to the development and maintenance of depression in youth is of particular importance.

Interpersonal dysfunction (e.g., interpersonal conflict or negative cognitions surrounding interpersonal interactions) contributes to both the development and maintenance of depression (Rudolph, 2009). Biased processing of socially imbued affective cues, such as emotional facial expressions, may underlie such interpersonal difficulties and contribute to the development, maintenance, and recurrence of depression. Specifically, currently depressed adults demonstrate attention and memory biases for negative material (Mathews & MacLeod, 2005). Negative biases in identification of, and attention to, emotional expressions may lead to detrimental interpersonal interactions (Carton, Kessler, & Pape, 1999),

Correspondence should be addressed to Jessica L. Jenness, Department of Psychology, University of Denver, 2155 South Race Street, Denver, CO 80208. E-mail: jjenness@du.edu

which are likely to contribute to the maintenance of depressive symptoms (Geerts & Bouhuys, 1998).

Many studies with adults have examined the link between the ability to identify emotional expressions and depression (e.g., Carton et al., 1999; Joormann & Gotlib, 2006). Results from these studies have yielded mixed findings. Whereas some show a general deficit in emotion identification (Carton et al., 1999), others demonstrate deficits in labeling specific emotions, such as sadness and happiness (Joormann & Gotlib, 2006). A recent meta-analysis examining the extant literature found depressed adults exhibited a general impairment in emotion identification (Demenescu, Kortekaas, den Boer, & Aleman, 2010). However, the majority of previous studies utilized prototypical (i.e., full intensity) emotional facial expressions, which lack ecological validity as individuals most typically encounter subtle emotional expressions in everyday social interactions.

More recently, researchers have begun to use facial stimuli that represent various degrees of emotional intensity (faces morphed gradually from neutral to full intensity emotion) to examine the relation between depression and how sensitively one can detect specific emotions (i.e., what is the lowest threshold necessary for identifying an emotion). For example, in two studies (Joormann & Gotlib, 2006; LeMoult, Joormann, Sherdell, Wright, & Gotlib, 2009) adult participants viewed an emotional face as it slowly morphed from 0 to 100% of the target emotion (angry, happy, or sad) and were asked to stop the task at the lowest intensity necessary for them to identify the emotion. Results from studies using this task indicated that currently depressed adults and remitted adults with a history of recurrent depression were less sensitive in identifying happy expressions (i.e., needed greater emotional intensity before stopping the task and correctly identifying happy expressions) compared to never-depressed adults (Joormann & Gotlib, 2006; LeMoult et al., 2009). Although informative for investigating the amount of emotional intensity required for accurately identifying emotional faces, this task precludes examination of whether participants exhibit biases across the full range of emotional intensity. That is, because responses were limited to that point along the morph continuum when participants first recognize the target emotion, it is unclear whether biases exist only at that point or are more generally evident across a broader range of emotional intensity.

In addition, almost no research has examined whether depressed individuals of any age demonstrate systematic biases in the type of errors made when incorrectly labeling, or misclassifying, emotional expressions (i.e., labeling a happy face as sad). Given the previously noted deficits in how sensitively emotion is identified among depressed adults, investigating whether there are systematic misclassification biases could provide a critical next step in understanding the emotion processing difficulties experienced by depressed individuals. However, no adult research has examined systematic biases in misclassification, and only one study among youth has examined biases in both the sensitivity to identify and tendency to misclassify emotional expressions. Utilizing a clinic-referred sample (ages 8–18) of depressed youth, youth with comorbid depression and conduct disorder, and healthy controls, Schepman, Taylor, Collishaw, and Fombonne (2012) found that depressed youth more often perceived low-intensity emotional faces of any emotion as sad. Although these results are intriguing, it is still unknown whether currently asymptomatic youth with a history of depression demonstrate similar patterns of emotion identification biases as those who are currently depressed. Understanding whether these biases exist as a latent risk factor among youth is a notable gap in the literature and could provide valuable information for the creation of depression treatment or prevention protocols that aim to improve emotion identification.

Although there is little research among depressed youth to inform us what specific biases to expect when examining youths' sensitivity to detect and misclassify emotional expressions, general information processing research (e.g., attention to emotion) and research among at-risk youth (children of depressed mothers) suggests that depressed individuals demonstrate biased processing of negative emotions, including sadness and anger. For example, depressed youth experience increased amygdala response when attending to threat (Beesdo et al., 2009), and youth at-risk for depression show biased identification of sad faces (Joormann, Gilbert, & Gotlib, 2010; Lopez-Duran, Kuhlman, George, & Kovacs, 2013) and make more errors when identifying angry faces (Joormann et al., 2010). Further investigation into whether depressed youth and youth with a history of remitted depression demonstrate biases when identifying and misclassifying emotional expressions may provide a greater understanding of the social difficulties that are commonly experienced by depressed youth (e.g., Rudolph, 2009).

Given the significant lack of research in youth populations, the primary goal of this study was to provide a preliminary investigation of depression-related biases in the identification of emotional facial expressions among youth. Specifically, we compared currently depressed, youth with a history of depression (i.e., remitted depressed), and never-depressed youth in their sensitivity to identify emotional expressions (angry, happy, and sad) and potential systematic biases in the misclassification of emotional expressions. Given previous mixed findings in currently depressed adults, we examined whether depressed youth would demonstrate biased sensitivity to identify emotional expressions, and if so, whether these biases reflect a general or specific deficit

in their sensitivity to identify emotion. Second, we explored whether currently depressed youth would demonstrate biased processing of negative emotions (i.e., sadness and anger) when misclassifying emotional expressions, as compared to remitted depressed and never-depressed youth. We hypothesized that depressed youth would misclassify emotional faces more frequently as sad and angry. Last, we examined whether remitted depressed youth would exhibit similar biases as currently depressed youth in identification and misclassification of emotional expressions. Findings in the adult literature suggest remitted adults with a history of recurrent depression show similar biases in emotion identification as currently depressed adults (Joormann & Gotlib, 2006; LeMoult et al., 2009); therefore, we expected that currently depressed and remitted depressed youth would exhibit similar identification and misclassification biases.

METHOD

Participants

Brief informational letters were mailed to families in participating school districts in suburban New Jersey. Approximately 725 families contacted the laboratory for more information, and 407 (56%) agreed to participate in the study, with 280 youth having complete data for the purposes of the current study. The study's 56% participation rate is comparable to that found in previous community-based, general samples examining youth depression (e.g., 61% in Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993). Youth were in third, sixth, or ninth grade (ages ranged from 7 to 16 years; $M = 11.51$, $SD = 2.44$). The present sample was representative of both the broader population of the geographical area and school districts from which the sample was drawn, including ethnicity and race (see Table 1). Youth were excluded if their parents reported during a phone screening that their child had a developmental disability (e.g., autism) or were not fluent in English, which were factors likely to interfere with completion of an extensive laboratory protocol.

TABLE 1
Descriptive Statistics by Depression Categorization

	Never-Depressed[a]	*Remitted Depressed*[b]	*Currently Depressed*[c]	*Total Sample*[d]
Gender[†]				
Girls	52%	66%	67%	56%
Boys	48%	34%	33%[†]	44%
Grade[***]				
3rd	37%	16%	8%	30%
6th	38%	29%	25%	35%
9th	25%	55%	67%	34%
Ethnicity				
Hispanic	9%	7%	8%	9%
Non-Hispanic	91%	93%	92%	91%
Race				
Caucasian	56%	78%	75%	63%
African American	19%	12%	17%	17%
Asian/Pacific Islander	19%	6%	8%	16%
Other	6%	4%	0%	5%

Note: Significant depression group differences indicated by $^{\dagger}p < .10$ and $^{***}p < .001$.
[a] $n = 200$.
[b] $n = 68$.
[c] $n = 12$.
[d] $n = 280$.

Materials

Diagnostic Status

Trained interviewers administered the Mood Disorders and Psychosis subsections of the well-validated Schedule for Affective Disorders and Schizophrenia for School Age Children (K-SADS-PL; Kaufman, Birmaher, Brent, & Rao, 1997) to youth and parents about their child to assess for current and past episodes of depression and mania. No youth was diagnosed with a bipolar spectrum disorder or psychosis. Interviewers then utilized both youth report and parent report about youth to determine youth diagnostic status using best estimate diagnostic procedures. Interviewers and graduate students were trained by Ph.D.-level, licensed psychologists to conduct the diagnostic interviews. Another graduate student reviewed all interviews containing a subthreshold or threshold criterion symptom of depression for accuracy,and a best estimate diagnosis was determined through consensus. In addition, diagnostic interview reliability meetings showed 85% agreement among all trained interviewers. Youth participants were included in the currently depressed group ($n = 12$) if they met *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; American Psychiatric Association, 1994) criteria for a clinically significant depressive episode (i.e., major depressive disorder or depressive disorder- not otherwise specified) at the time of the diagnostic interview. Participants were included in the remitted depressed group ($n = 68$) if they had a history of clinical depression but were not currently depressed. Youth with a history of remitted depression had been symptom free for at least 9 weeks ($M = 124.42$ weeks, $SD = 107.71$). Finally, the never-depressed group ($n = 200$) consisted of youth with neither a current nor past depressive episode. The rates of current and past depression found in the sample are similar to those found in other studies utilizing community samples of youth (e.g., Avenevoli et al., 2008; Lewinsohn et al., 1993).

Morphed Faces Task

Stimuli. Facial expressions were taken from a standardized stimulus set (Matsumoto & Ekman, 1988). Stimuli for the morphing task were created by morphing a neutral expression and emotional expression (i.e., angry, happy, and sad) from each actor to form a continuum of 10% increments, resulting in nine morphed images for each actor (e.g., 90% neutral/10% sad; 80% neutral/20% sad). Each emotion was represented by four actors (two male and two female) for a total of 12 sets of morphed emotional faces. This resulted in 108 morphed facial stimuli that were presented one at a time in random order over two blocks (216 facial stimuli total). Participants were asked to choose which emotion (angry, happy, sad, or neutral) was being presented after viewing each randomly presented morphed face across all increments of morphed emotional faces (i.e., the task included all levels of morph for each of the three target emotions; cf. Gibb, Schofield, & Coles, 2009).

Sensitivity to identify emotional expressions was measured as the proportion of times the participant correctly indicated the target emotion (angry, happy, or sad) per level of morph. Responses were averaged across low (10–30%), medium (40–60%), and high (70–90%) morph levels. Also, to differentiate our measures of sensitivity versus misclassification, we included only the trials in which the participant responded with "neutral" or the target emotion for these indices. In contrast, misclassification of emotional expressions was measured by the proportion of times the participant indicated an incorrect emotion (angry, happy, sad, or neutral) in lieu of the target emotion (angry, happy, or sad) per level of morph, again averaged across low (10–30%), medium (40–60%), and high (70–90%) morph levels. To reduce the influence of outliers for each of the sensitivity and misclassification indices, values were Winsorised at 3 standard deviations above and below the mean.

Procedure

Each eligible youth visited the laboratory to complete the morphed faces task and diagnostic interview, in that order. Parents provided informed written consent for their child's participation; youth provided written assent. The Institutional Review Board approved all procedures. Youth and parents were reimbursed for their participation.

RESULTS

There were no depression group differences in ethnicity or race ($ps > .05$; see Table 1). Consistent with epidemiological studies of youth depression (e.g., Avenevoli et al., 2008), the remitted and currently depressed youth sample consisted of slightly more female than male youth and more ninth- and sixth-grade than third-grade youth (see Table 1).

To evaluate participants' sensitivity in detecting facial displays of emotion, we conducted a 3 (depression group: current, past, never) × 3 (target emotion: angry, happy, sad) × 3 (morph level: low, medium, high) repeated measures analysis of variance, with proportion of faces correctly identified per level of morph serving as the dependent variable. The main effect of depression group was not significant nor was any interaction involving depression group (lowest $p = .22$).

However, we found significant main effects for target emotion, $F(2, 556) = 305.31$, $p < .001$, $\eta_p^2 = .52$, and morph level, $F(2, 556) = 727.64$, $p < .001$, $\eta_p^2 = .72$, as well as a significant Target Emotion × Morph Level interaction, $F(4, 1112) = 116.00$, $p < .001$, $\eta_p^2 = .29$. Examining the form of the significant Target Emotion × Morph Level interaction, we found that although there were significant morph level effects for the angry, $F(2, 560) = 2115.60$, $p < .001$, $\eta_p^2 = .88$; happy, $F(2, 560) = 1040.21$, $p < .001$, $\eta_p^2 = .79$; and sad, $F(2, 560) = 1063.37$, $p < .001$, $\eta_p^2 = .79$, continua, there were differences in the pattern of the effects across emotion (see Figure 1). Specifically, whereas for the sad continuum there was a generally linear increase in the proportion of faces endorsed as sad from low ($M = .32$) to the medium ($M = .53$) to the high ($M = .67$) morph levels, for happy faces there was greater endorsement at the low morph level ($M = .64$) and participants reached near perfect recognition by the medium morph level ($M = .93$) and increased only slightly at the high morph level ($M = .97$). Sensitivity to detect angry facial expressions fell in between these two patterns, with relatively low endorsement at low morph levels ($M = .31$) but with much greater endorsement at medium ($M = .76$) and high ($M = .93$) morph levels.

Turning next to misclassification errors, we conducted a 3 (depression group: current, past, never) × 3 (target emotion: angry, happy, sad) × 2 (misclassification type: which of the two nontarget emotions was endosed) × 3 (morph level: low, medium, high) repeated measures ANOVA, with proportion of faces misclassified into each emotion type per level of morph serving as the dependent variable. We found a number of significant effects in this analysis including main effects of target emotion, $F(2, 556) = 3.99$, $p = .02$, $\eta_p^2 = .01$; misclassification type, $F(1, 278) = 5.76$, $p = .02$, $\eta_p^2 = .02$; and morph level, $F(2, 556) = 46.94$, $p < .001$, $\eta_p^2 = .14$, as well as several significant interactions involving these variables: Target Emotion × Misclassification Type, $F(2, 556) = 8.51$, $p < .001$, $\eta_p^2 = .03$; Target Emotion × Morph Level, $F(4, 1112) = 5.40$, $p < .001$, $\eta_p^2 = .02$; and Misclassification Type × Morph Level, $F(2, 556) = 18.59$, $p < .001$, $\eta_p^2 = .06$.

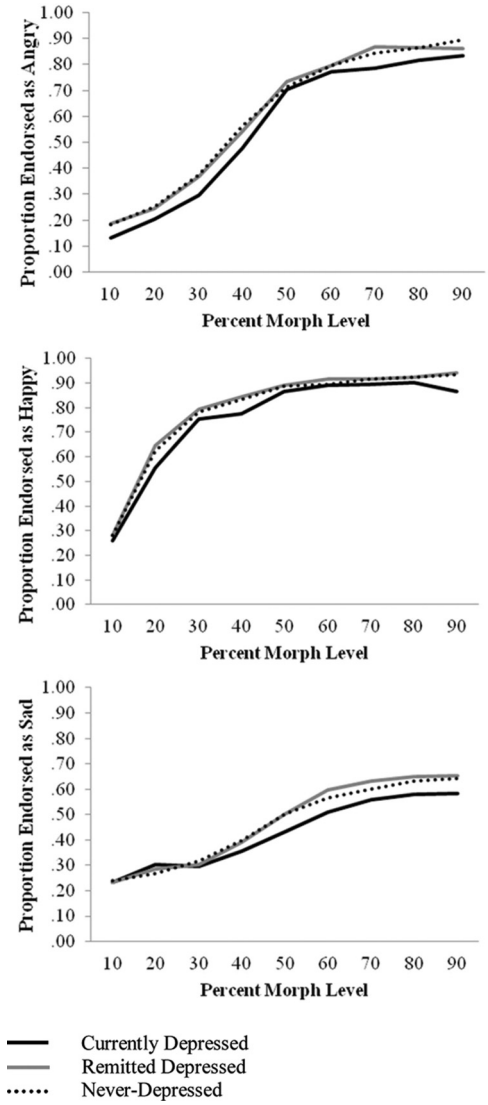

FIGURE 1 Sensitivity to identify angry (top), happy (middle), and sad (bottom) emotional faces separated by diagnostic status.

Of importance, we also found a significant Depression Group × Misclassification Type interaction, $F(2, 556) = 4.16$, $p = .02$, $\eta_p^2 = .03$ (see Figure 2). Examining the form of this interaction, we examined average levels of misclassifications into each of the three emotion types, collapsing across target emotion type and morph level. In these analyses, we found significant group differences in the tendency to misclassify facial expressions as angry, $F(2, 278) = 4.31$, $p = .01$, $\eta_p^2 = .03$, but not happy, $F(2, 278) = 0.25$, $p = .78$, $\eta_p^2 = .002$, or sad, $F(2, 278) = 0.72$, $p = .49$, $\eta_p^2 = .002$. More specifically, youth with a current depressive diagnosis were more likely to misclassify facial expressions as angry ($M = .06$, $SE = .01$) than were those with past depression ($M = .03$, $SE = .005$) or no lifetime history of a depressive disorder ($M = .03$, $SE = .003$), with the latter two groups not differing significantly.

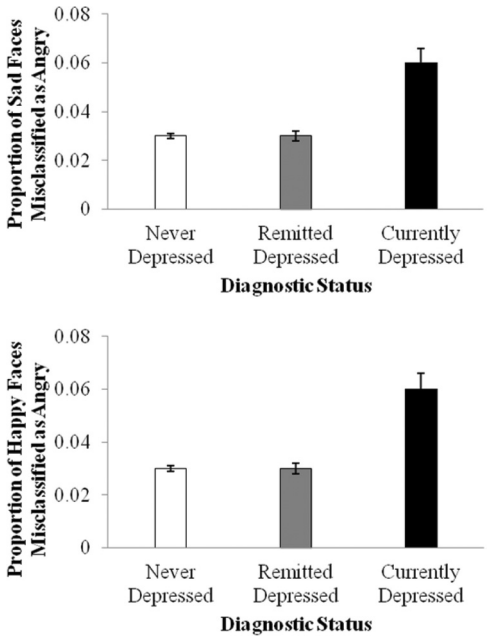

FIGURE 2 Misclassification of sad (top) and happy (bottom) faces as angry separated by diagnostic status.

DISCUSSION

The primary aims of this study were to investigate whether currently depressed youth demonstrated a general or specific processing bias in their sensitivity to identify emotional expressions and whether they exhibited biased misclassification of particular types of emotion, especially misperceptions of negative emotions. Last, we explored whether biased processing would be seen only among currently depressed versus remitted depressed and never-depressed youth.

Currently depressed youth exhibited biased processing of angry faces when misclassifying sad and happy expressions. Specifically, depressed youth misclassified happy and sad faces as angry at over twice the rate on average when compared with remitted depressed and never-depressed youth (see Figure 2) across all morph levels. Processing of anger is a relatively understudied topic in youth depression; however, it has been highlighted as an important area based on developmental approaches to emotion (Cole & Hall, 2008). Our results are consistent with the broader information processing literature showing depressed individuals demonstrate processing biases to angry faces or threatening stimuli (e.g., Beesdo et al., 2009; Beevers, Wells, Ellis, & Fischer, 2009). These findings also provide important insight into emotion identification deficits experienced by depressed

youth as perceiving anger when it is not present could lead to interpersonal challenges (Rudolph, 2009) when attempting to interpret an emotionally charged situation.

The current study's findings differ from those in Schepman and colleagues' (2012) study that found depressed youth more frequently misclassified emotional faces as sad. However, Schepman et al. utilized a clinic-referred sample as opposed to a community sample of youth. Although clinic referred sampling generally leads to larger sample sizes ($n = 29$ in Schepman et al., 2012), community samples, as utilized in the current study, increase accuracy of statistical analyses (Cohen & Cohen, 1984) and decrease biases seen in participants seeking treatment (i.e., less representative of the geographical area, greater symptom severity, and higher comorbidity; Goodman et al., 1997). Taken together, our findings are consistent with research demonstrating the link between feelings of anger and depression (Koh, Kim, & Park, 2002), and studies showing those with current depression (e.g., Beevers et al., 2009) exhibit processing biases to interpersonally threatening facial expressions.

Contrary to our hypothesis that this effect would be obtained in both current and remitted depression youth, biased processing of emotional faces depended upon a diagnosis of current depression. Youth with remitted depression demonstrated patterns of misclassification of emotional expressions similar to never-depressed youth. This finding suggests that the misperceptions of threat may be a state-dependent feature of depression as opposed to a more traitlike predisposition to disorder. These findings differ from the adult literature. LeMoult and colleagues (2009) investigated biases in emotion identification among women with a history of recurrent depression (i.e., at least two or more past episodes of depression), whereas the current study did not require participants to have experienced more than one past episode of depression. Perhaps adults with severe, recurrent depression experience more cognitive and emotional impairment outside of a depressive episode, thus exhibiting biases when not currently depressed. Examining the effect of remitted depression severity and recurrence within youth samples will be necessary before drawing firm conclusions on whether emotion identification biases exist as a state-dependent or traitlike vulnerability factor.

Contrary to previous studies (e.g., Demenescu et al., 2010; Joormann & Gotlib, 2006), we did not find depression group differences in the sensitivity to identify emotional expressions. It is possible that the small sample of depressed youth affected our ability to detect differences. However, subtle task differences may explain discrepancies in findings. Previous studies (e.g., Joormann & Gotlib, 2006) asked participants to stop the task at the earliest emotion detection rather than examining emotion identification across the full range of emotional intensity as seen in the present study. It is possible that differences in emotion identification are found at discrete points along the emotion continuum, but not when looking across the entire spectrum of intensity. Further investigations are necessary as little research has examined emotion processing among depressed youth with these particular methods and stimuli (i.e., morphed emotion faces with full range of intensity).

Taken together, these findings have important implications for understanding youth depression and its maintenance, though future replications are needed given this is one of the first studies to provide a preliminary examination of biased emotion processing among depressed youth. Specifically, overidentification of anger may play a role in depression maintenance by contributing to a transactional cycle of misperceptions of social threat (Fischer & Roseman, 2007) followed by depressive symptoms increases (Carton et al., 1999). In addition, these findings suggest a target for intervention. As depressed youth are more likely to falsely perceive nonthreatening emotions as hostile, therapy could incorporate a greater emphasis on emotion classification and utilization of additional social cues (e.g., tone of voice, content of speech, or gestures) to assist youth to more accurately perceive the degree of threat in interpersonal interactions.

There were several strengths of this study. Most prior studies have investigated sensitivity to identify emotional expressions in clinically depressed adults (Joormann & Gotlib, 2006), and only one study has examined identification and misclassification of emotion among youth with comorbid depression and conduct disorder (Schepman et al., 2012). Therefore, this is one of the first studies to examine differences in the sensitivity to identify emotion among depressed youth and the misclassification of emotion among depressed individuals of any age. In addition, the present study is the first to directly compare emotion processing biases in currently and remitted depressed youth. Last, we utilized a task that examined sensitivity to and misclassification of facial expressions across the full spectrum of emotional intensity rather than to only prototypical expressions.

Limitations of the study provide avenues for future research. Although we examined several facial expressions (angry, happy, sad), future research can examine whether depressed youth demonstrate biased perception of other negative emotions (e.g., fear or disgust) and whether misperceptions are specific to anger. In addition, this study utilized a community sample of youth that was representative of the target population but resulted in a relatively smaller sample size in the currently depressed group. Due to the small sample size of currently depressed youth, there was not enough

power to examine higher order interactions, which is a notable limitation; therefore, future studies with larger sample sizes are needed for replication and examination of theoretically relevant moderators, such as gender or age. Finally, our study focused on depression among youth and did not examine the effects of other Axis I diagnoses, such as anxiety disorders. It will be important for future work to assess for other disorders highly comorbid with depression to distinguish whether emotion identification biases differ among various diagnostic groups.

In sum, currently depressed youth differ from remitted depressed and never-depressed youth by exhibiting misperceptions of anger when misclassifying emotional expressions. These preliminary findings suggest that depression may influence the likelihood of misperceiving emotions as interpersonally threatening, which could indirectly contribute to the maintenance of a depressive episode.

REFERENCES

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Avenevoli, S., Knight, E., Kessler, R. C., & Merikangas, K. R. (2008). Epidemiology of depression in children and adolescents. In J. R. Z. Abela & B. L. Hankin (Eds.), *Handbook of depression in children and adolescents* (pp. 6–32). New York, NY: Guilford.

Beesdo, K., Lau, J. F., Guyer, A. E., McClure-Tone, E. B., Monk, C. S., Nelson, E. E., … Pine, D. S. (2009). Common and distinct amygdala-function perturbations in depressed vs anxious adolescents. *Archives of General Psychiatry*, *66*, 275–285.

Beevers, C. G., Wells, T. T., Ellis, A. J., & Fischer, K. (2009). Identification of emotionally ambiguous interpersonal stimuli among dysphoric and nondysphoric individuals. *Cognitive Therapy and Research*, *33*, 283–290.

Carton, J. S., Kessler, E. A., & Pape, C. L. (1999). Nonverbal decoding skills and relationship well-being in adults. *Journal of Nonverbal Behavior*, *23*, 91–100.

Cohen, P., & Cohen, J. (1984). The clinician's illusion. *Archives of General Psychiatry*, *41*, 1178–1182.

Cole, P. M., & Hall, S. E. (2008). Emotion dysregulation as a risk factor for psychopathology. In T. P. Beauchaine & S. P. Hinshaw (Eds.), *Child and adolescent psychopathology* (pp. 265–298). Hoboken, NJ: Wiley.

Demenescu, L. R., Kortekaas, R., den Boer, J. A., & Aleman, A. (2010). Impaired attribution of emotion to facial expressions in anxiety and major depression. *Plos ONE*, *5*(12).

Fischer, A. H., & Roseman, I. J. (2007). Beat them or ban them: The characteristics and social functions of anger and contempt. *Journal of Personality and Social Psychology*, *93*, 103–115.

Geerts, E., & Bouhuys, N. (1998). Multi-level prediction of short-term outcome of depression: Non-verbal interpersonal processes, cognitions and personality traits. *Psychiatry Research*, *79*, 59–72.

Gibb, B. E., Schofield, C. A., & Coles, M. E. (2009). Reported history of childhood abuse and young adults' information processing biases for facial displays of emotion. *Child Maltreatment*, *14*, 148–156.

Goodman, S. H., Lahey, B. B., Fielding, B., Dulcan, M., Narrow, W., & Regier, D. (1997). Representativeness of clinical samples of youths with mental disorders: A preliminary population-based study. *Journal of Abnormal Psychology*, *106*, 3–14.

Joormann, J., Gilbert, K., & Gotlib, I. H. (2010). Emotion identification in girls at high risk for depression. *Journal of Child Psychology and Psychiatry*, *51*, 575–582.

Joormann, J., & Gotlib, I. H. (2006). Is this happiness I see? Biases in the identification of emotional facial expressions in depression and social phobia. *Journal of Abnormal Psychology*, *115*, 705–714.

Kaufman, J., Birmaher, B., Brent, D., & Rao, U. (1997). Schedule for Affective Disorders and Schizophrenia for School-Age Children–Present and Lifetime version (K-SADS-PL): Initial reliability and validity data. *Journal of the American Academy of Child & Adolescent Psychiatry*, *36*, 980–988.

Koh, K., Kim, C., & Park, J. (2002). Predominance of anger in depressive disorders compared with anxiety disorders and somatoform disorders. *Journal of Clinical Psychiatry*, *63*, 486–492.

LeMoult, J., Joormann, J., Sherdell, L., Wright, Y., & Gotlib, I. H. (2009). Identification of emotional facial expressions following recovery from depression. *Journal of Abnormal Psychology*, *118*, 828–833.

Lewinsohn, P., Hops, H., Roberts, R., Seeley, J., & Andrews, J. (1993). Adolescent psychopathology: I. Prevalence and incidence of depression and other *DSM-III–R* disorders in high school students. *Journal of Abnormal Psychology*, *102*, 133–144.

Lopez-Duran, N. L., Kuhlman, K. R., George, C., & Kovacs, M. (2013). Facial emotion expression recognition by children at familial risk for depression: High-risk boys are oversensitive to sadness. *Journal of Child Psychology and Psychiatry*, *54*, 565–574.

Mathews, A., & MacLeod, C. (2005). Cognitive vulnerability to emotional disorders. *Annual Review of Clinical Psychology*, *1*, 167–195.

Matsumoto, D., & Ekman, P. (1988). *Japanese and Caucasian facial expressions of emotion and neutral faces* [slides]. San Francisco State University, San Francisco, CA.

Rudolph, K. D. (2009). The interpersonal context of adolescent depression. In S. Nolen-Hoeksema, L. M. Hilt, S. Nolen-Hoeksema, & L. M. Hilt (Eds.), *Handbook of depression in adolescents* (pp. 377–418). New York, NY: Routledge/Taylor & Francis.

Rutter, M., Moffitt, T. E., & Caspi, A. (2006). Gene-environment interplay and psychopathology: Multiple varieties but real effects. *Journal of Child Psychology and Psychiatry*, *47*, 226–261.

Schepman, K., Taylor, E., Collishaw, S., & Fombonne, E. (2012). Face emotion processing in depressed children and adolescents with and without comorbid conduct disorder. *Journal of Abnormal Child Psychology*, *40*, 583–593.