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The Role of Depressed Mood and Family Expressiveness in Young Adults' Ability to Recognize Facial Expressions of Emotions

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Abstract

Young adults' ability to recognize others' emotions has been linked to the emotional expressiveness they experienced in their families of origin, with individuals from highly expressive families showing lower competency in identifying emotions. Current research has not yet explored the possible role of depressive symptoms in young adults' perceptions of their families' expressiveness, although there is evidence that parental depression impacts family expressiveness. In addition, past research on young adults' emotion recognition has not considered that depression may influence correct identification of facial expressions, though studies on mothers' Postpartum Depression suggest that depression may lead to misjudgments of the type and intensity of emotional expressions. The present study sought to examine the relationship between depressive symptoms, family expressiveness, and facial recognition of emotions in young adults. A sample of 194 undergraduate students completed an emotion recognition task consisting of 60 pictures of male and female faces portraying 5 different types of emotions (happy, sad, angry, scared, and disgusted) at 6 different intensity levels (15% to 100%). Participants also reported on their families' positive and negative expressiveness on the Family Expressiveness Questionnaire (FEQ) as well as their depressive symptoms on the Center for Epidemiologic Studies-Depression Scale (CES-D). Results indicated that greater negative family expressiveness was associated with more depressive symptoms. In addition, young adults who perceived their family-of-origin expressiveness as more negative were *better* at recognizing facial expressions of emotions and rated expressions as more intense. Contrary to prediction, young adults who experienced greater depressive symptoms were *not* less accurate in their facial recognition of emotions. Negative family expressiveness may sensitize young adults to attend to facial expressions of emotions and may encourage greater competency in emotion recognition.

The role of depressed mood and family expressiveness in young adults' ability to recognize facial expressions of emotions

Emotion recognition is defined as an individual's ability to interpret or perceive another's emotions based on facial expressions (Adolphs, 2002). It involves the ability to identify specific visual stimuli in a person's face, and correctly interpret that visual information into a social understanding of that individual's mood (Guarnera, Hichy, Casicio & Carrubba, 2015). The information gathered from facial expressions allows the interpreter to gain a better understanding of the environment he or she is in. Charles Darwin believed that the ability to recognize the emotions of others was innate and necessary for survival (Ekman & Friesen, 1971). For example, the ability to interpret another's fearful emotional expression correctly could alert a person to potentially dangerous stimuli in the environment, and activate the person's nervous system to engage in either a fight or flight response that will ensure survival. Accurate emotion recognition also allows individuals to respond adaptively in social situations, which is important for example in order to select conversational partners, to avoid becoming a target of another's anger, or to show empathy.

There are several different kinds of emotion recognition including facial, vocal, behavioral and situational recognition. These different kinds of emotion recognition help to provide a context for and insight into what another person may be experiencing. Situational emotion recognition occurs when individuals consider factors inherent in specific situations, including, objects, people, or events in their environment that hint at the emotion another may be experiencing. The Situational Test of Emotion Management (STEM) and the Situational Test of Emotion Understanding (STEU) are commonly used when assessing situational emotion recognition and often involve emotions of fear, anger, and sadness (MacCann & Roberts, 2008).

In addition to facial recognition of emotion, which was previously defined (Guarnera et al., 2015), a person may also recognize vocal cues of emotions that lead to auditory processing of another's statement or of the tone of another's voice (Amorim, Anikin, Mendes, Lima, Kotz& Pinheiro, 2019). Amorim et al. discovered that the pattern of vocal recognition of emotion was similar to that of facial recognition; as individuals mature from childhood into young adulthood, accuracy for both facial and vocal recognition increases, while accuracy of emotion recognition from young to older adulthood begins to decrease.

Young adulthood can be a stressful time in an individual's life that is filled with unpredictable changes and life stressors. Arnett (2000) defines the time period between ages 18 to 25 years as a distinct developmental period characterized by young adults' search for career paths, romantic relationships, and other adult pursuits that are not yet finalized. He proposes that most young adults in industrialized countries undergo some type of exploration during this time in their lives, though they do not necessarily experience significant distress about it. During this stage, many young adults are moving away from home and living on their own for the first time, forming new friendships, and making decisions that can have a lasting impact on their futures. Young adulthood is also a period when many mental disorders first emerge. According to the Center for Collegiate Mental Health Report (2017), depression and anxiety were the leading factors that drove college-aged students to seek out professional help. This report also indicated a rise in need for counseling centers on colleges campuses as a result of depression and anxiety becoming more prevalent.

Young adults' ability to accurately recognize others' emotional expression plays a vital role in their success in navigating this developmental stage. Their ability to establish and maintain interpersonal relationships facilitates young adults' work towards emotional and

financial independence from their families of origin. Emotional intelligence is an important factor in interpersonal relationships; any condition that leads to inaccurate appraisals of others' feelings, either in the valence or intensity of their expression, will likely result in lowered adaptation during the transition to adulthood. The aim of this thesis is to explore young adults' ability to recognize others' emotions, specifically their facial expressions of emotions. The role of two specific factors, young adults' depression and emotional expressiveness in their families of origin, are assessed as potential predictors of young adults' ability to accurately recognize others' facial expressions of emotion.

Young Adults' Emotion Recognition

The ability to recognize facial emotions develops over the course of childhood. A study assessed groups of children ages 5, 7, 9, and 11 years old, and adults with an average age of 22 years to determine their ability to recognize emotions displayed in both upright and upside-down facial stimuli (Durand, Gallay, Seigneuric, Robichon& Baudoin, 2007). Participant were presented with photos of different facial expressions of emotions in one orientation (either upright or upside down), and then again with the same expressions in the opposite orientation. The study found that children as young as 5 were accurately able to recognize the emotions of happiness and sadness. The recognition of fear was not accurately decoded until age 7, and of a neutral emotion not until age 9. By age 12, the children's emotion recognition level was the same as adults. These findings applied to both the upright and upside-down faces for both children and adults. Durand et al., attribute these age differences in emotion recognition to experiences individuals gather with certain emotions. At age 5, emotions such as disgust are not well-defined for children in social contexts, so this lack of experience makes it more difficult for them to

recognize disgust. However, with increasing age, individuals gain experiences with the more ambiguous emotions, and thus are better able to correctly label the them.

Emotion recognition also varies between young adults and older adults. It is commonly known that with age, emotion recognition accuracy decreases due to an overall cognitive decline. However, recognition of specific emotions may begin to decline even before age-related cognitive declines begin. A large-scale cross-sectional study investigated emotion recognition using both vocal expressions and visual facial expressions in adults between 18-84 years and found that accuracy of emotion recognition across the age groups was dependent upon the type of emotion expressed (Mill, Alink, Realo & Valk, 2009). Mill et, al., found that younger adults between 18-40 years were significantly better at recognizing the emotions of sadness and anger than older adults. Moreover, when comparing 21-30-year-old with the 18-20-year old's, it was discovered that the younger group was even better at recognizing negative emotions (sadness and anger) than the 21-30-year-old group. While there is some information on adult's ability to recognize emotions, significantly less is known about the factors that might contribute to adult's ability to recognize emotions.

Family Emotion Expression and Emotion Recognition

One of the factors contributing to adults' emotion recognition is the emotional expressiveness they experienced in their families of origin. Family expressiveness involves one important way in which family members communicate relevant information to one another, whether that information consists of verbal expression or non-verbal expression of emotions. Expressiveness includes the expression of different types of emotion that vary in valence, frequency, and intensity. There are several different ways in which family expressiveness has been studied. While direct observation of expressiveness in families has numerous advantages, it

is time consuming, expensive and necessitates the use of extensive coding systems, which

usually result in small sample sizes that limit analyses and generalizability of findings. For these

reasons, most studies have relied on faster, cost- and time-efficient self-reporting questionnaires,

such as the Family Expressiveness Questionnaire (FEQ, Halberstadt, 1986), which allow for the

collection of individuals' perceptions of emotional expressiveness in their families. Despite the

efficiency of using self-report measures like the FEQ to assess family members' perception of

expressiveness, it is important to keep in mind that self-reports have some limitations ranging

from reporting biases, inaccuracies of remembering past life events and lack of awareness of

subtle family expressions.

When self-report measures of family expressiveness are used, it is often the parents who

are asked to report on their perceptions of expressiveness in the family, unless the focus is on

adults who can report on their own expressiveness and that of their families of origin. Parental

expressiveness is defined as a pattern or specific style of showing both verbal and nonverbal

expressions, measured often with respect to the frequencies of specific emotions expressed in the

family (Halberstadt, Cassidy, Stifter, Parke, &Fox, 1995). Expressiveness can be divided into

two general categories depending on emotional valences: Positive and negative expressiveness.

Positive expressiveness involves expressions of positive emotions such as admiration, praise,

joy, pride, and gratitude. Negative emotional expressiveness is associated with expressions of

negative emotions such as sadness, anger, despair, fear, guilt or threats.

Studies using self-reported perceptions of expressiveness have found that family

members are more likely to express emotions with higher intensity levels within the family

compared to their expressions towards other people outside of their family (Matsumoto,

Takeuchi, Andayani, Kouznetsova & Krupp, 1998). Emotional expressions amongst families can

also be contagious, meaning that family members are often inadvertently "infected" by the

emotions expressed by other family members, which in turn impacts their moods and their own

emotional expressions (Levenson, 1996).

Emotional expressiveness in families has been linked to children's ability to interpret

emotional information. Halberstadt and Eaton (2002) conducted a meta-analysis to determine the

impact of family expressiveness on individuals ranging across different studies in their analysis

from infancy to young adulthood. They found that negative expressiveness by parents affected

how well offspring were able to receive and interpret emotional information from others.

Specifically, they found that individuals from highly negative expressive families were less able

to accurately recognize facial expressions of emotion. Furthermore, Halberstadt and Eaton's

results from their meta-analysis indicated that positive parental expressiveness did not impact

offspring's understanding though it affected offspring's positive expressiveness. Moreover,

greater negative parental expressiveness was positivley correlated with greater negative child

expressiveness, but this relationship was age dependent. The study found that the relationship

between family and child expressiveness was age dependent, meaning that as age increased in

childhood, the correlation grew stronger. As the child grew into adolescents and young

adulthood, this correlation weakened. This weakened correlation may be due to the fact that

these young adults have now had much more experience with individuals outside of the family,

and the level of expressiveness experienced in the family of origin is no longer as impactful as it

was in childhood when parents were the main model for expressivity.

In contrast to links between reported and observed family expressiveness and child

functioning, much less is known about how emotions expressed in the family of origin impact

individuals when they are young adults. One exception involves a series of studies conducted by

Halberstadt and colleagues, who asked college students to judge the intensity of emotions expressed in their families of origin on a scale from ranging from no intensity to very intense (Halberstadt, Dennis, & Hess, 2011). In addition, participants were asked to identify facial expression for four different emotions (anger, disgust, happiness, and sadness) for two males and two females selected from the JACFEE stimuli. Pictures varied in intensity including 20%, 40%, 60%, 80% and 100% intensity levels. Participants viewed the stimuli for 3 seconds and then asked to identify the emotion displayed as: happiness, sadness, anger, disgust, surprise, contempt, or fear. They were then asked to rate the intensity of each emotion displayed from "not at all" to "very intensely." Halberstadt et al.'s findings indicated that participants from less expressive families (low in intensity and frequency of emotions expressed at home) were better able to recognize prototypical facial expression than those individuals who came from highly expressive families (Halberstadt, et al., 2011). Moreover, it was discovered that individuals from highly expressive families perceived greater emotional intensity in facial expressions presented in the experiment. This research shows that family expressiveness has a direct and lasting impact on the offspring's ability to recognize others' emotions. In other words, adults' ability to recognize others' emotions is associated with the kind of emotional expressions in their families of origin that have socialized their emotion understanding.

In addition to family expressiveness, another factor that is likely to play an important role in adults' ability to understand emotions is the experience of depression. None of the published studies to date have explored whether young adults' experience of depressive symptoms influences their emotion understanding, though there is evidence that depression impacts family expressiveness.

Family Expressiveness and Depression in Young Adults

Depression, or more formally Major Depressive Disorder (MDD), is a mood disorder that often leads to experiences of persistent feelings of sadness over the course of long periods of time. An individual diagnosed with MDD must experience at least one Major Depressive Episode, which involves five or more symptoms of depression including a depressed mood, loss of interest or enjoyment in activities, disturbances in sleep and appetite, and suicidal ideation or attempts (APA, 2013). Depression can begin at any age; however, it is very common for depression to begin during childhood, adolescence, or young adulthood (Birmaher, Ryan, Williamson & Nelson, 1996;) The onset of depression is oftentimes precipitated by the experience of a stressful life event, such as moving away from home to start College. According to the Center for Collegiate Mental Health Report (2017), depression and anxiety were the leading factors that drove college-aged students to seek out professional help. In addition, the number of students seeking appointments at College counseling centers has increased by 30% between 2009/2010 and 2014/2015. One concerning finding is that the onset of depression in young adulthood is associated with poorer long-term outcomes, such as an increased risk of developing bipolar disorder that includes alternations between mania and depression, an increased risk of substance abuse, and maladaptive social functioning (Smith & Blackwood, 2004).

A family member's depression impacts emotional expressiveness in their families. The expression of sad or depressed feelings in families, usually by parents, has received considerable attention in the literature. Consistent with family systems theory (Von Bertalanffy, 1968), each family members' expressiveness influences the emotions of the other members in the family unit. In other words, family members' emotional expressions are interrelated, which means that when one family member expresses an abundance of negative emotions, for example due to feeling

depressed, this negative expressiveness is likely to impact the whole family unit. There is ample

research evidence to support this notion based on studies of children affected by parental

depression including parents' Postpartum Depression (PPD).

Children of depressed parents are two to five times more likely to develop a psychiatric

disorder than offspring of nondepressed parents (Goodman, 2007), though it is unclear whether

family expressiveness plays a role in the transmission of parental depression to mental health

problems in the offspring. Furthermore, no published study to date has explored the potential link

between family expressiveness and depression in adult offspring, though there is some evidence

that family expressiveness is associated with adolescents' depression. Bodner, Allen and Sheeber

(2017) explored whether family interactions including expressions of anger were associated with

depression in adolescents. Families including a mother, father, and an adolescent who was either

depressed or not depressed were observed during various problem-solving tasks. Findings

indicated that families with depressed adolescents expressed anger far more often than families

with non-depressed adolescents, though the direction of influence between family expression of

anger and adolescents' depression was suggested to be bidirectional. Bodner et al. suggested that

one family member's expression of anger most likely sparked other members' anger expressions.

Since depressed individuals perseverate on their negative emotional states for longer periods of

time than do non-depressed individuals, adolescents who are depressed may provoke other

family members to express more anger towards one another, and this increased family

expressions of anger in turn may increase the intensity and length of the adolescents' depression.

Indirect evidence for potential links between young adults' depression and their families'

emotional expressiveness also comes from a different line of research focused on the impact of

parental depression. Depression in adults is often mediated by heightened negative emotional

expressiveness towards the family. This type of expressiveness has been shown to have negative impacts on the offspring. For example, a longitudinal study reports that parental depression and negative emotions parents expressed to their offspring affected school-aged children's capacity for emotional regulation (Cummings, Cheung, Koss & Davies 2014). This negative emotional expressiveness elicited emotional insecurity in children, making it difficult for them to express emotions appropriately. In addition, it also increased the child's vulnerability to developing a psychiatric disorder or symptoms over time. The effects of parental depression on their emotional expressions in the family are particularly clear in studies on the effects of maternal MDD on children.

In addition to the influences of family members' depression on overall emotional expressiveness in the family, there is also evidence that the experience of a depressed mood affects an individual's ability to express his or her own emotions. For example, depression causes mothers to express more negative emotions towards their children (Downey & Coyne, 1990). While this finding may not be particularly surprising given that one of the symptoms of depression is the expression of sadness and presence of a depressed mood, another study reported that formerly-depressed individuals were found to inhibit their overall emotional expressiveness when compared to individuals who had never been depressed (Brockmeyer, Holtforth, Pfeiffer, Backenstrass, Friederich, Bents, 2012). These findings suggest that expressiveness was still impacted long after active symptoms of depression had improved. Brockmeyer and colleagues also found that formerly depressed individuals showed a decreased ability to regulate negative emotion and strongly avoided emotional experience. These formerly depressed individuals inhibited emotional expressions due to their inability to regulate their negative emotions (Brockmeyer et al., 2012).

In sum, past research has shown that family expressiveness is impacted by a family'

members' experience of depression. Depression affects how the individual expresses his or her

own feelings and alters the interactions the individual has with other family members, which

ultimately shapes overall family expressiveness. It is not yet known whether young adults' own

depressive symptoms color their perceptions of emotional expressiveness in their families of

origin. It is also unclear whether depression impacts young adults' ability to recognize emotions

in others. Since family expressiveness plays an important role in young adults' emotion

recognition, it is likely that family expressiveness when a member experiences depression may

also impact their ability to recognize others' emotions. In other words, depression is

hypothesized to directly impact emotion recognition or to indirectly impact emotion recognition

via its influence on family expressiveness. While no published study to date has focused on the

role of depression in young adults' ability to recognize facial expressions of emotions, there is

some indirect evidence that depressed individuals' emotion recognition differs from those of

nondepressed individuals. This research will be reviewed next.

Emotion Recognition and Depression

As noted, before, the ability to recognize others' emotions involves an interpretation of

facial and situational cues in order to determine their underlying emotional experience. Studies

of the impact of maternal Postpartum Depression (PPD) indicate these mothers' depression

resulted in difficulties in their emotion recognition and processing. PPD oftentimes involves the

same symptoms that are present in Major Depressive Disorder (MDD), with the difference being

that in PDD the onset of the symptom's beings during pregnancy, or during the postpartum

period. Flanagan, White, and Carter (2011) explored differences in emotion recognition between

women who had PPD, women who had MDD, and women who were not diagnosed with

depression. They discovered that women with PPD and MDD performed significantly worse when asked to recognize happiness and fear in comparison to the healthy control group (Flanagan et al., 2011). Furthermore, women with PPD also had greater difficulty recognizing anger and disgust. This research suggests that any form of depression influences adults' ability to recognize others' emotions, at least for females.

Another study found that women diagnosed with PPD were less responsive to negative stimuli than healthy postpartum women (Gollan, Hoxha, Getch, Sankin &, Michon, 2013). Moreover, Gollan et al. (2013) discovered that women with PPD demonstrated lower ratings of arousal and reported lower intensity ratings of negative emotional images compared to healthy woman. These finding demonstrate difference in the processing of external stimuli between depressed and non-depressed individuals. Informational processing for negative emotional images seems to be blunted or hindered when an individual is in a depressed state. Combined with findings that depression hinders the ability to recognize positive emotions in others, these findings suggest that a depressed family member may be less responsive to emotions expressed by other family members.

In sum, while there are currently no published studies that have focused on the role of depression in young adults' ability to recognize emotions, there is some evidence from studies of mothers with PPD that this link exists at least in women who have given birth. These studies also indicated that the experience of PPD appears to impact emotion recognition for specific types of facial expressions; depressed women had greater difficulty recognizing expressions of happiness and fear. The present study explored whether links between depressive symptoms and emotion recognition exist for young adult college students, both male and female, who have not yet experienced parenthood.

The Present Study

The main purpose of this study was to examine what role young adults' perceptions of emotional expressiveness in their families of origin and their experience of depressive symptoms play in their ability to recognize facial expressions of emotions. Specifically, the first study question sought to extend the findings by Halberstadt and colleagues regarding associations between young adults' perceptions of their families' emotional expressiveness and their ability to recognize others' emotions. This study question asked whether young adults' perceptions of positive and negative expressiveness in their families of origin are associated with their accuracy in recognizing facial expressions of happiness, anger, sadness, fear, and disgust. Based on Halberstadt's findings, I hypothesized that young adults from families with greater negative expressiveness would show less accuracy in recognizing others' facial expressions of emotion. A second study question asked whether young adults' depressive symptoms are associated with their perceptions of expressiveness in their families of origin. Based on evidence from studies on the impact of maternal depression on family expressiveness, I hypothesized that higher levels of young adults' depressive symptoms would be associated with overall lower family expressiveness of emotions but with greater expressiveness of negative emotions. A third study question explored whether depressive symptoms for both male and female young adults play a role in their ability to recognize others' emotions. I hypothesized that young adults' level of depression may magnify their difficulties in recognizing others' emotions, especially for happy and fearful expressions, and that they would rate negative expressions as less intense. Provided that an association between young adults' depression and ability for emotion recognition is indeed found, a related question will ask whether young adults' negative family expressiveness will magnify the association between their depressive symptoms and their difficulties in

recognizing others' emotions. No specific hypothesis were formulated for this specific study question, as no prior research has explored young adults' depression in relation to their family expressiveness and emotion recognition ability.

Methods

This project was part of Dr. Kuersten-Hogan's Perceptions of Your Family Study and Roommate Study, both of which assessed coparenting dynamics and family emotion expressions in College students living on campus. This present study only reports on measures pertaining to participants' perceptions of expressiveness in their families of origin, self-ratings of their depressive symptoms, and their performance on an emotion recognition task.

Participants

Participants included 194 undergraduate students living on campus of Assumption College. Participants' mean age was 19.4 years (range 18-22 years), and they were predominantly female (75.1%) and white (79.7%). Undergraduate students were recruited via the SONA system from a variety of different psychology classes and provided with course credit or a $10 gift card for their participation in this study.

Procedures

Participants completed a set of questionnaires and a self-administered, computerized emotion recognition task. The two questionnaires relevant to this proposed thesis are the Center for Epidemiologic Studies – Depression Scale (CES-D) measuring participants' depressed mood and the Family Expressiveness Questionnaire (FEQ)- both measures are described below. Participants were also asked to judge the type and intensity of 6 different emotions portrayed in photographs of facial expressions presented on a computer screen.

Measures

Center for Epidemiologic Studies-Depression Scale (CES-D; Radloff, 1977). Participants

completed the CES-D, a 20-item measure which asked them to indicate the frequency with

which they experienced various depressive symptoms within the past 7 days. Item responses

ranged from 0 to 3, where a '0' represented an absence of the depressive symptom and a score of

'3' represented the greatest frequency with which the depressive symptom was

experienced. Total scores ranged from 0 to 60 with scores of 16 or higher suggesting clinical

levels of depression. Statistical reliability for the CES-D has been shown to be high- 0.93

(Holden, Ramirez, & Gallion, 2012).

Family Expressiveness Questionnaire (FEQ, Halberstadt et al., 1995). Participants were

asked to rate the frequency of emotions expressed in their families in 40 different hypothetical

family situations on a 9-point scale. Frequencies ranged from 'Not at all frequently' (score of 1)

to 'Very frequently' (score of 9). Two composite scores were calculated; one composite score

measured parental reports of positive expressiveness (23 items) and the other parental reports of

negative expressiveness (17 items).

Recognition of Facial Expressions of Emotions Task. Participants judged a series of 60

photographs (Matsumoto & Ekman, 1988) portraying males' and females' expressions of

happiness, sadness, anger, fear, and disgust at 6 intensity levels (15%, 30%, 45%, 60%, 75% and

100% intensity) using a computerized program (E-Prime). Participants were asked to identify the

type of emotion depicted in the photograph (forced choice format: Neutral, happiness, sadness,

anger, fear, and disgust) as well as to rate the intensity of the emotional expressions.

Results

Descriptive Results

The means, standard deviations, and ranges for the depression (CES-D), expressiveness in the family of origin (FEQ), and emotion recognition scores are presented in Table 1. Of note is that overall, participants in this study reported depressive symptoms on the CES-D that reached a mean of 16, which is considered the cut-off for determining clinical depression. This indicates that as a group, the young adults participating in this study experienced significantly elevated levels of depression. Differences in depressive symptoms between female and male participants were not significant ($F(1,188) = 2.25$, $p = .14$).

A repeated measures ANOVA with the type of facial expression as within-subject variable (5 levels) and the recognition of correct facial expression as dependent variable indicated significant differences in young adults' emotion recognition scores for the five different emotions ($F(3.6, 1035.7)=191.47$, $p<.001$). Facial expressions for happy facial expressions were significantly easier to recognize for young adults than any of the other facial expressions, and of the negative facial expressions, angry expressions were easier to recognize than any of the other negative expressions. Recognition of fear was the least accurate compared to young adults' recognition of happy, angry, and disgusted expressions.

Another repeated measures ANOVA indicated that the intensity of the facial expressions influenced whether they were correctly identified ($F(4.2, 1210.8)=2752.0$, $p<.001$); young adults were significantly better at recognizing emotional expressions displayed at intensity levels of 100% and 75% than they were at recognizing expressions displayed at intensity levels of 60%, 45%, 30% and 15%. Interestingly, emotion recognition of male facial expressions ($M= 20.87$) was generally more accurate than correct identification of female expressions ($M=17.98$) ($t(287)=-16.95$, $p<.001$).

Associations between family expressiveness and emotion recognition

Pearson correlations were performed with positive, negative, and total FEQ scores and young adults' respective emotion recognition scores. Contrary to prediction, findings indicated that individuals who perceived their family-of-origin expressiveness as more negative were *better* able to recognize facial expressions of emotions overall ($r=.72$, $p <.01$). Greater negative family expressiveness was also positively correlated with the ability to recognize low intensity emotions, specifically those at 15% intensity ($r=.14$, $p <.05$) and with better recognition of emotional expressions depicted by males ($r=.14$, $p< .05$) and specifically male facial expressions of disgust ($r=.13$, $p< .05$).

Young adults' perceptions of greater overall and more negative family expressiveness were associated with more intense ratings of facial expressions, though mostly for stimuli that were depicted in the mid-range of intensity. Specifically, young adults' perceptions of greater overall expressiveness in families was associated with their ratings of more intense sadness for sad facial expression at 15% ($r=.16$, $p<.01$) and 30% ($r=.13$, $p<.05$) of intensity, as well as more intense fear at 60% ($r=.15$, $p<.05$) and happiness at 45% ($r=.15$, $p<.05$) of intensity. In addition, greater negative expressiveness in families was associated with young adults' higher intensity ratings for angry facial expression at 60% ($r=.16$, $p<.01$) and 75% ($r=.12$, $p<.05$) of intensity and of scared facial expressions at 60% ($r=.15$, $p<.01$) and 75% ($r=.13$, $p<.05$) of intensity. Interestingly, young adults from more negatively expressive families also perceived happy expressions at 45% stimulus intensity as more intense ($r=.18$, $p<.01$) and young adults from more positively expressive families perceived sad expressions at 15% stimulus intensity as more intense ($r=.13$, $p<.05$).

Associations between depression and family expressiveness

Another set of Pearson correlations were performed with participants' CES-D scores and their respective total scores for perceptions of family expressiveness (FEQ), as well as their subscores for positive and negative family expressiveness. As predicted, findings indicated that individuals who had higher levels of depressive symptoms perceived their families' emotional expressiveness as less positive ($r= -.42$, $p < .001$) and more negative ($r= .25$, $p <.01$). In addition, higher levels of young adults' reported depression symptoms also correlated negatively with lower overall family expressiveness ($r= -.18$, $p< .05$), which means that young adults who came from less expressive families of origin reported higher levels of depressive symptoms.

Associations between depression and emotion recognition

A third set of Pearson correlations with participants CES-D scores and their respective emotion recognition scores were performed to determine whether individuals with greater levels of depression would be less successful in recognizing facial expressions of emotions. Contrary to my hypothesis, participants' levels of depressive symptoms were not significantly correlated with their ability to recognize facial expressions of emotions. Another set of correlational analyses explored whether young adults' levels of depressive symptoms were associated with their intensity ratings of facial expressions, which yielded only one significant finding: The greater individuals' experience of depressive symptoms, the more intense they rated anger expressions at 60% of intensity ($r=.15$, $p<.05$).

Since depressive symptoms are more commonly reported in females compared to males, and prior research focused on links between depression and emotion recognition only in females, all correlational analyses were repeated on a subset of only female participants. However, these analyses did not yield any significant correlations either between the level of depressive symptoms and accuracy of recognition for facial expressions of emotions in young adult females.

A separate set of analyses was performed using ANOVAs with level of depression as independent variable and various emotion recognition scores as respective dependent variables. For these analyses, the sample of young adults was divided into two groups: The low depression group included participants with CES-D scores below 16, and the high depression group which included individuals with clinically significant levels of depression as indicated by CES-D scores of 16 or above. No significant differences emerged on any of the emotion recognition scores between participants in the high compared to the low depression groups. However, between-group differences for participants' ability to recognize sad facial expressions approached significance ($F(1, 168)=3.19$, $p<. 07$. Specifically, individuals in the low depression group had lower scores ($M= 6.25$, $SD=2.01$) for recognizing sad emotions compared to individuals who were in the depressed group ($M=6.75$, $SD= 1.56$).

Discussion

The present study sought to examine two different factors proposed to play significant roles in young adults' ability to accurately recognize emotions: depression and family of origin emotional expressiveness. Findings supported the proposed role of family expressiveness in young adults' facial recognition, though did not suggest that depressive symptoms were systematically related to emotion recognition. Specifically, the results of this study indicated that young adults from families with higher levels of negative expressiveness were better able to recognize facial expressions of emotions, even those emotions displayed with low intensity. However, young adults who experienced more depressive symptoms were not less accurate in their ability to recognize facial expressions of emotions, although they were more likely to report high levels of negative expressiveness in their families of origin.

While families' expressiveness and young adults' ability to recognize facial expressions of emotions were found to be associated in the present study as predicted based on prior research, the direction of this association was unexpected. Earlier findings by Halberstadt and colleagues suggested negative correlations between negative family expressiveness and emotion recognition, while present findings involved positive correlations between negative family expressiveness and emotion recognition. One possible explanation for finding links between negative family expressiveness and better facial recognition is related to the kind of emotion socialization highly negative expressive families may provide for their offspring. When children are frequently exposed to negative emotional expressiveness in their families growing up, these emotional experiences may heighten their attention to emotional stimuli in general. Emotional expressions in families, especially negative ones, provide valuable information to children that can help them avoid parental anger or frustration or alert them to potential danger. Families who express negative emotions more frequently and at higher intensity levels may therefore sensitize their offspring to recognize emotional expressions in others and provide more extensive practice which would not only explain why young adults growing up in these emotional climates are generally better at emotion recognition but also specifically why they are better at recognizing the most difficult, low intensity expression at 15% of stimulus intensity.

The inconsistent results in the present study compared to Halberstadt and colleagues' findings are interesting especially since the methodology and participant characteristics in the two studies were similar: Both studies used the same populations, namely college students, and both studies used the same instrument to measure family expressiveness and a similar task to measures emotion recognition; yet their findings indicated correlations between family expressiveness and emotion recognition in the opposite direction. It is possible that some

differences between the young adults across the two studies exist that affected either their family

expressiveness or their emotion recognition. The lower ratio of males to females in the present

study compared to the study by Halberstadt is unlikely to have played a role, since the present

study did not find significant gender differences for any of the emotion recognition scores,

family expressiveness or levels of depression. However, participants in the present study had

surprisingly high levels of depressive symptoms for a non-referred group of young adults and it

is possible that young adults in Halberstadt and colleagues' study were less depressed. As

present findings indicated that those individuals with higher depressive symptoms came from

more negatively expressive families, and in turn performed better on the emotion recognition

task, it is possibly that difference in depressive symptoms across the samples played a role. Since

Halberstadt did not assess levels of depression in their participants, this potential explanation

cannot be verified. Of note is that present findings of positive correlations between family

expressiveness and emotion recognition were consistent with those reported by Ogren et al.,

(2018) for infants. In their study, Ogren et al. reported that 9-month-old infants from families

with higher expressiveness in general were better able to recognize happiness.

Overall, inconsistencies between findings from different studies suggest that the

relationship between family expressiveness and emotion recognition must be more complex than

anticipated. Other factors that have yet to be explored may mediate or moderate the impact of

family expressiveness on adults' emotion recognition capabilities.

Consistent with family systems theory, this study expanded upon the idea that each

individual family member is interconnected with the other members, and that family members

cannot be understood in isolation from one another. Present findings can be understood within

this systemic perspective, which highlights the interrelationship between young adults' mood and

the nature of their families' expressiveness, at least as viewed by the young adult. However, since present findings were merely correlational in nature, it is unclear whether young adults' experience of growing up in highly negatively expressive families caused them to become more depressed, whether their greater depressive symptoms caused them to view their families of origin in a more pessimistic light, or whether no causal relationship exists at all between depression and family expressiveness. What is clear, however, is that young adults' depressive symptoms should be considered in future studies exploring family expressiveness.

Emotional expressiveness is an important aspect of how the family members communicate with one another, so gaining a better understanding of how family expressiveness might impact relationships with others and the world is highly valuable. Findings indicate that highly expressive families, especially families with high negative expressiveness, foster better emotion understanding but also higher levels of depression in their offspring. This suggests ways in which families may change to create a home environment conducive of producing emotionally intelligent but also mentally healthy children.

Although the present study did not uncover significant findings for the interrelationship between emotion recognition and depression, differences between high and low depressed young adults' ability to recognize sadness approached significance, indicating that those who were highly depressed were better able to recognize sadness than those who had few depressive symptoms. Though not compelling, these findings appear to be incongruent with those reported by Kan et al., (2004) who found that depressed individuals tended to have a negative bias in recognizing facial expressions and those by Gollan et al.(2013) reporting worse emotion recognition for certain feelings (though not sadness) in depressed mothers. Future studies should further explore emotion recognition abilities in depressed young adults using a greater variety of

emotional stimuli and tasks, because it is possible the depression exerts more influence on emotion recognition in naturalistic, social situations than it does in a contrived laboratory task. Another possibility, however absurd it may appear, is that findings regarding impaired emotion recognition in depressed mothers simply do not apply to young adults who have not yet experienced parenthood. Moreover, among just the female participants in this study, level of depression was not systematically related to emotion recognition scores, either overall or for any of the specific emotions. As the sample size was adequate and the measure of depression used in this study is a commonly used self-rating tool with adequate reliability and validity, the lack of associations between depression and emotion recognition is difficult to explain. It is important to note, however, that participants were not diagnosed with MDD and that their depressive symptoms were not documented via a clinical interview but simply via participants' completion of a paper-and-pencil rating form. Perhaps determining whether young adults actually meet criteria for the diagnosis of MDD may have uncovered evidence of links between depression and emotion recognition that have been reported in previous studies for mothers diagnosed with MDD or PPD. It is also plausible that the impact of young adults' depression on emotion recognition is mediated by family expressiveness or by another factor not yet identified. Future studies should replicate present findings and also explore potential mediating factors between depressive symptoms and adults' processing of emotional information.

A curious and unexpected finding in the present study was that men's faces were more easily recognized across participant, regardless of their own gender than were women's faces. Specifically, males' expressions of disgust at 15% intensity levels were more easily recognized by individuals from highly negative expressive families. These findings are not in line with previous studies who reported that female facial expressions of emotion are typically easier to

recognize than are male expressions (Dimitrovsky, Spector& Levy-Shiff, 2000). Though we cannot rule out the possibility male faces expressed emotions more clearly in the study stimuli than did female faces, this explanation is unlikely since the present study used the same facial expression stimuli than Ekman's studies that validated them.

Somewhat surprising were the facts that young adults in this sample of College students self-reported an overall high level of average depressive symptoms and that gender differences in depressive symptoms commonly observed in adult samples were not found. Perhaps these findings provide some indication that young adults in the present sample were somewhat unusual, at least with respect to their mental health. Of note is that data was collected over the course of several semesters and at different times during each semester, which rules out idiosyncrasies in students' depressive symptoms during certain semesters or times of year that may have been more stressful for students. The literature does indicate that levels of depression in college students are steadily increasing so the high levels of depressive symptoms reported by participants in the present study may be reflective of this general risk for depression found in this age group.

Limitations

A few limitations need to be mentioned with respect to the present study. First, the sample used in the present study was a population of undergraduate students who were all attending and residing within a Catholic college. Most of the participants were recruited from psychology courses and came from two-parent, intact families from at least middle-class backgrounds. There was little diversity in the sample, which was predominately white and female and thus limits the generalizability of present findings to the entire population of young adults. The fact that many participants were psychology students could have also resulted in

either greater awareness of depressive symptoms or greater concerns about depression in this sample compared to young adults from the general population. This would in part explain participants' endorsement of high levels of depressive symptom in the present study.

Secondly, the emotion recognition task used to evaluate facial recognition for the emotions of sad, scared, angry, disgusted, and happy only included one positive emotion, which may have skewed the results. However, most other studies have not included a variety of positive facial expressions, since happiness is the only universally identified positive emotion. It is unclear whether the lack of variety of emotional stimuli presented in this study impacted the findings in any meaningful ways. However, of note is that a computerized task flashing facial expressions morphed to different intensity levels provides very artificial stimuli completely unlike naturalistic displays of emotions individuals have to identify in their everyday lives. So, findings need to be interpreted within the context of this artificial way of measuring emotion understanding. Further research should be conducted using a variety of emotion understanding tasks that include other forms of emotional intelligence as well as stimuli providing a variety of positive emotional displays for emotion recognition tasks.

Finally, present findings need to be interpreted with caution as this study used a sample of non-referred, volunteer participants who were not evaluated for the presence or absence of Major Depressive Disorder or any other mental disorder, for that matter. The CES-D used in the present study is a self-report measure. As previously noted, self-report measures may not always accurately represent the true level of depression the individual experiences and certain does not support assigning a clinical diagnosis. In addition, the FEQ is also a self-report questionnaire, which leaves open the possibility for reporting biases, lack of insight or awareness, and various other factors that could have affected the results. Since participants in the present study

experienced overall a fairly high level of depressive symptoms, their perceptions of their family

expressiveness as more negative may have been due to their pessimistic and negative appraisals

likely to occur in depressed individuals. Ideally, observational measures of family expressiveness

should have been obtained that were not colored by depressive appraisals of these young adults,

though these kinds of evaluations are neither practical, feasible, nor commonly used in studies

focused on College students or other young adults.

Future Directions

Future studies should illuminate possible reasons for the discrepancies in findings

between the present study and those by Halberstadt et al. and include more diversified

populations and measures than those commonly used. Based on our current knowledge about

highly expressive families and their ability to foster facial recognition of emotions, studies

investigating different cultures and different types of emotional expression are needed to advance

this field. In addition, analyzing different types of emotional cues, for example vocal

expressions, could provide more insight into the magnitude of the effects of family

expressiveness on their offspring. Cultural influences have been proven to have implications for

how intensely some cultures judge emotions (Ekman et al., 1987). Reframing study questions to

examine why these ratings of intensity of emotions differ and examining the varying ways in

which cultural factors impact family expressiveness and parental emotion socialization would

not only help to generalize findings to a wider population but provide a context for these

differences.

The present study was the first to explore the roles of young adults' depressive

symptoms in their ability to recognize facial expressions of emotions. In addition, while

previous studies provided ample evidence of the importance of parental depression for family

expressiveness, the present study extended this literature by uncovering the interrelationship between young adults' moods and their families' emotional expressiveness. Findings suggest that emotion socialization in families is far more complex than had been previously assumed. Future studies should explore potential mediators of family expressiveness and emotion recognition that could place young adults at risk for developing depression.

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Appendix

Table 1: Means, standard deviations, and range for dependent variables

Dependent Variables:	Means	SD	Range
Depressive Symptoms (CES-D)	15.98	10.23	0-45
Depressive Symptoms Females	16.58	10.23	0-45
Depressive Symptoms Males	13.95	10.04	0-38
Family of Origin Total Expressiveness (FEQ Total)	233.30	29.14	115-303
Females' FEQ Total Score	234.59	29.48	115-303
Males' FEQ Total Score	229.71	28.18	171-293
FEQ Positive	133.45	22.51	45-173
FEQ Negative	99.81	20.08	54-163
Total Emotion Recognition	38.85	4.14	20-49
Recognition of Happy	9.83	1.38	3-12
Recognition of Angry	8.15	1.45	4-11
Recognition of Sad	6.67	1.7	0-10
Recognition of Disgusted	7.74	2.11	0-12
Recognition of Scared	6.47	1.73	0-10
Recognition of 100% Intensity Expressions	9.2	0.89	4-10
Recognition of 75% Intensity Expressions	9.05	1.02	4-10
Recognition of 60% Intensity Expressions	8.49	1.21	3-10
Recognition of 45% Intensity Expressions	6.68	1.46	3-10
Recognition of 30% Intensity Expressions	3.80	1.32	1-8
Recognition of 15% Intensity Expressions	1.63	0.89	0-5
Recognition of Female Expressions	17.98	2.53	10-24
Recognition of Male Expressions	20.71	2.51	7-27

Table 2: Pearson correlations between family expressiveness (FEQ) and emotion recognition

Emotion Recognition:	Family Expressiveness (FEQ):		
	Total	Negative	Positive
Total Facial Recognition	.05	.13*	-.05
Angry	.06	.23	.02
Scared	.02	.07	-.04
Happy	-.00	-.03	.02
Sad	-.00	.09	-.08
Disgusted	.05	.10	-.03
All Expressions at 100% Intensity	.02	.07	-.03
All Expressions at 75% Intensity	.07	.10	-.01
All Expressions at 60% Intensity	.05	.09	-.02
All Expressions at 45% Intensity	-.00	.06	-.04
All Expressions at 30% Intensity	-.02	.04	-.07
All Expressions at 15% Intensity	.11	.14*	.02

Note: *p< .05 level