The Red River Psychology Journal

PUBLISHED BY THE MSUM PSYCHOLOGY DEPARTMENT

ISSUE: 2014 VOLUME: 1

Adult Attachment Behavior on Facial Detection of Emotion

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The ability to correctly identify emotions is essential to everyday life. A number of studies have investigated the relationship between adult attachment styles and the ability to detect emotion on faces (Niedenthal, Brauer, Robin, & Innes-Ker, 2002; Dewitte, & De Houwer, 2008). The present study aimed to further these results by not only examining the relationship between adult attachment style and ability to identify emotions, but also investigating where people look when they make their decisions. Using an Adult Attachment Questionnaire, pictures depicting very intense and less intense happy, sad, and angry emotions, and eye-tracking software, we expected to find a relationship between attachment orientation, detection of intensity of emotion, and pattern of looking. Results indicated that there was not a significant relationship between adult attachment level and type of emotion on ability to correctly identify emotions. However, there was a main effect of emotion type on angry faces compared to sad faces, and a main effect of location of looking on eyes compared to the mouth. For secure participants, studying the eyes (opposed to the mouth) of the person in the picture was used in determining the intensity of the emotions. Further, for secure participants, the type of emotion depicted significantly affected the total fixation duration, when the face displayed was angry or sad.

The ability to distinguish between real and fake emotions is an essential skill in many settings. Whether people are trying to determine if a salesperson is a crook, trying to pick an "honest" politician to vote for, or trying to figure out if their spouse actually forgives them; facial discrimination is important in everyday life. Being able to distinguish someone's emotions from their facial expressions can also improve the trust in relationships with significant others. Trust is a major component in healthy relationships; being able to detect emotion and intensities of emotion on one's partner's face could increase that trust. One way to see the level of trust in a relationship is to look at the attachment level of the couple.

Attachment Theory describes attachment as the emotional bond between two people. The premise of attachment theory is that the earliest bonds that a child makes with their caregivers greatly impact their future behaviors and relationships (Ainsworth & Bell, 1970). Important to this study, attachment theory can be applied to adult attachment styles and the different styles lead to different levels of support, satisfaction, and trust in the relationship (Simpson & Rholes, 2010).

A number of studies have investigated the relationship between adult attachment styles and the ability to detect emotion on faces. Findings show that the ability to detect emotion correctly depends on the attachment style of the person and the type of emotion perceived on the displayed face (Niedenthal, Brauer, Robin, & Innes-Ker, 2002; Fraley,

Niedenthal, Marks, Brumbaugh, & Vicary, 2006; Dewitte, & De Houwer, 2008).

Adult Attachment

While it is important to understand where people look when detecting emotions, studies have shown that another important factor in detecting emotions is attachment level. Initially, adult attachment orientation (the quality of attachment) was divided into three groups: secure, anxious-ambivalent, and avoidant (Hazan, & Shaver, 1987). Securely attached adults agree with the statement, "It is relatively easy for me to become emotionally close to others and I am comfortable depending on others and having others depend on me." Anxious-ambivalent attachment adults agree with the statement, "I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like." Lastly, avoidant attached adults would most likely agree with the statement, "It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me."

Bartholomew and Horowitz (1991) then expanded this idea by proposing a four group measurement: secure, anxious-ambivalent or preoccupied, fearful avoidant and dismissive avoidant. Brennan, Clark, and Shaver (1998) created a measure of the four levels based on two fundamental dimensions in connection to adult attachment patterns. One critical variable is attachment-related anxiety. People who score high on this variable tend to worry whether their partner is available, responsive, or attentive. People who score on the low end of this variable are more secure in the perceived responsiveness of their partners.

The other critical variable is attachment-related avoidance. People on the high end of this dimension prefer not to rely on others or open up to others. People on the low end of this dimension are more comfortable being intimate with others and are more secure depending upon others and having others depend upon them. (Brennan, Clark, & Shaver, 1998).

There are many benefits to discovering a person's adult attachment level. Knowing a person's attachment style can help the person learn why their relationships succeed or fail and how to maintain and improve those relationships. In addition, a study done by Kafetsios (2004) showed that secure attachment was consistently, positively related to the Emotion Intelligence (IE) branches of facilitation, understanding, and management. Furthermore, preoccupied attachment orientation was negatively correlated to EI, but only significantly negative in the perception ability branch. Most importantly to this study, adult attachment style may influence how well people can "read" their significant others. As previously stated, being able to trust one another is an important component of relationships; the better one can read his/her significant other's emotions, the better the relationship will be.

Emotion Detection

People began studying the faces of others as early as four-months-of-age, and by 12 months, an infant can begin to distinguish between positive and negative emotions (Klinnert, 1984; Sorce, Emde, Campos, & Klinnert, 1985). This research clearly shows that emotion recognition is important, even as an infant. That said, research has found that older children and adults are much better emotion detectors (Gosselin, Beaupré, & Boissonneault, 2002; De Sonneville et al., 2002; Del Giudice, & Colle, 2007; Durand, Gallay, Seigneuric, Robichon, & Baudouin, 2007).

In addition to being able to correctly detect emotions, adults are also able to detect inauthentic emotions. For example, subtle differences in smiles determine the sincerity in

an emotion (Ekman, & Friesen, 1988; Gosselin et al., 2002), and what's more important is that people tend to look at the mouth and the eyes when determining the emotion of another. A study done by Eisenbarth and Alpers (2011) found that depending on the emotion of the face being perceived, people tended to look at only the mouth, only the eyes, or both the eyes and mouth equally. Using an eye tracking system, they found that people focused mainly on the mouth when they perceived happy expressions and focused mainly on the eyes for sad or angry expressions.

Emotion Detection and Adult Attachment

Current research on the relationship between emotion detection and adult attachment has found some interesting conclusions. Attachment orientation level and ability to perceive emotions depend on what emotion one is trying to perceive (Niedenthal, Brauer, Robin, & Innes-Ker, 2002; Fraley, Niedenthal, Marks, Brumbaugh, & Vicary, 2006; Dewitte, & De Houwer, 2008). Niedenthal et al. (2002) found that attachment orientation does affect the ability to recognize emotion when the facial expression was happy or sad. Specifically, preoccupied and dismissive orientation styles could recognize emotion (happy, sad, and angry) on a face that gradually turned into a neutral expression longer than secure or fearful styles. In addition, secure orientation styles recognized the emotions of happiness and anger significantly longer than the fearful orientation styles as the expression slowly turned to neutral. This data seems to suggest that preoccupied and dismissive styles are more cautious of both negative and positive social cues.

Conclusion

In conclusion, research has shown that attachment orientation level and ability to perceive emotions depend on what emotion one is trying to perceive (Niedenthal, Brauer, Robin, & Innes-Ker, 2002**;** Fraley, Niedenthal, Marks, Brumbaugh, & Vicary, 2006**;** Dewitte, & De Houwer, 2008). Furthermore, depending on the emotion of the face being perceived, people tend to look at only the mouth, only the eyes, or both the eyes and mouth equally (Eisenbarth, & Alpers, 2011). There is very little research that looks at the relationship between these two findings.

Present Study

The current study questions if there is a relationship between attachment orientation level and where the person looks on the face in order to correctly perceive intensity of emotion. By adding the component of eye tracking to past studies that looked just at adult attachment level and emotion detecting, the research aims to find a relationship between the three variables. The hypothesis is that the study will find that people with adult attachment styles of preoccupied and dismissive will correctly identify the intensity of emotions significantly better than secure or fearful styles. Furthermore, using an eye tracking device, the study could help determine where different attachment styles spend the most time looking on a face, and could determine whether focusing on different parts of the faces helps or hinders the amount of correct responses. The direction of this second hypothesis had not been determined.

Method

Participants

Eighty undergraduate students of both genders over the age 18 were tested. They were recruited on a volunteer basis from a sign-up sheet posted in the Psychology Department at MSUM. Participants had to have been in a romantic relationship in order

to participate. Students received extra credit in their Psychology course if appropriate.

Materials

Participants filled out a brief demographics questionnaire in paper form asking for age, ethnicity, how long they have been in a relationship, etc. (see Appendix A) provided by Fraley, Waller and Brennan (2000). Participants also had to go to an online site (http://www.web-research-design.net/cgi-bin/crq/crq.pl) and complete an Adult Attachment questionnaire created by Fraley, Waller and Brennan (2000). The questionnaire consisted of 36 questions on a Likert-scale ranging from strongly disagree to strongly agree concerning the participant's current relationship (Appendix B). Examples included: "It's easy for me to be affectionate with my partner" and "I tell my partner just about everything." Validity and reliability of the questionnaire can be found at http://internal.psychology.illinois.edu/~rcfraley/measures/ecrr.htm. Pictures of intense and less intense emotions: happy, sad, and angry (see Appendix C) were shown to participants. The pictures had been previously tested by a class of psychology students to ensure validity. This experiment used four pictures of each facial emotion, two of which were very intense, two of which were least intense, and three of which were neutral (15 pictures total). A brief set of questions were used to ask participants about the pictures they see (Appendix D). Lastly, a Tobii X120 infrared visual eye tracker was used to track participant's eye movements.

Procedure

Undergraduates arrived in the lab and were given a consent form, which they read and signed. Participants then completed a brief demographics form and then were asked to sit in front of the eye tracker. Participants were tested individually, beginning with a short computerized calibration procedure where subjects pointed to areas on the screen with their eyes to calibrate the eye tracking program. Then participants viewed all of the facial expressions, one at a time, and answered questions about each facial expression before moving on to the next picture. For each participant, the order in which the pictures were shown was randomized. After the participants finished looking at the pictures, they took a 5 minute Adult Attachment Questionnaire online. The participants were thanked and debriefed.

Results

Twenty-one participants were tested on Adult Attachment Level. Participants' attachment orientation was determined by using an online Adult Attachment questionnaire provided by Fraley, Waller and Brennan (2000). Eighteen participants were categorized as secure. One participant was preoccupied, one dismissive, and one was fearfully attached. Since only the secure category had enough participants, the preoccupied, dismissive, and fearful participants were grouped together into an "insecure" category.

The pictures of different emotions used in the study were pretested for emotion and intensity identification. Percentage of emotion intensities correctly identified was scored by first scoring the number of emotions correctly identified from the 15 pictures. Intensity ratings were then categorized from 1-2 (least intense emotion) to 4-5 (intense emotion) and 6 (no emotion, neutral face). The rating 3 (moderate) intensity was considered wrong as all pictures had been previously scored as either intense or least intense. If a participant

incorrectly categorized an emotion (marked it as sad when it was a happy emotion depicted), the corresponding intensity score was not looked at. High percentage correct means that a participant can correctly identify different intensities of emotions in the real world.

Total duration of time spent looking at the eyes or mouth was scored by using Tobii eye-tracking software. The eye tracker recorded how long a participant studied the eyes or mouth during the five seconds the picture was displayed. High duration amounts meant the participant mostly used that part of the face (eyes or mouth) when making their decision on the emotion and intensity level.

Percentage Correct Variable

A 2 (adult orientation level: Secure, Insecure) x 4 (type of face: happy, sad, angry, neutral) mixed design analysis of variance (ANOVA) was performed on the ability to correctly identify the intensity of emotions (percent correct). There was not a significant main effect of adult orientation level, $F(1, 84)=2.353$, $p=.129$, or type of face, $F(3, 84)=1.017$, $p=.390$. Likewise, there was not a significant interaction, $F(3,84)=.087$, $p=.967$. However, Figure 1 shows that the data did suggest that insecure participants ($M=68.69$, $SD=10.18$) were better at identifying intensities of emotions than secure participants ($M=58.15$, $SD=14.61$).

Duration and Location of Looking

A 4 (type of face: happy, sad, angry, neutral) x 2 (location: eyes, mouth) within-subjects design analysis of variance (ANOVA) on secure participants was performed on the total fixation duration (seconds). Insignificant amounts of data were collected for preoccupied, dismissive, and fearful participants; therefore, only secure data was examined. Main effects were found for emotion, $F(3,30)=3.487$, $p=.033$, $\eta^2=.322$, and location of looking, $F(1,30)=159.509$, $p<.001$, $\eta^2 =.879$. There was a main effect of emotion on angry faces ($M=1.317$, $SD= .078$) when compared to sad faces ($M=0.967$, $SD=.078$), $p=.026$. There was also a main effect of location of looking on eyes ($M=1.672$, $SD=0.057$) when compared to mouth ($M=0.649$, $SD=0.057$), $p<.001$. See Figure 2.

Discussion

The purpose of this study was to analyze the relationship between adult attachment levels, ability to correctly identify intensity of emotions, and patterns of looking. As the results show, there was a main effect of emotion and location of looking on total duration fixation. For secure participants, studying the eyes (opposed to the mouth) of the person in the picture was used in determining the intensity of the emotions. This coincides with research done by Eisenbarth and Alpers (2011). They found that when studying where people look on faces depicting different emotions, the eye region is most frequently fixated upon in all emotional expressions. The participants Eisenbarth and Alpers's study were classified as healthy (scored in the normal range on Social Phobia and Anxiety Inventory and Trait Anxiety Inventory), so there is a good chance that they would score low on the anxiety part of the Adult Attachment Scale. It would be interesting to further the research on where people look with participants high on the anxiety scale or in any of the three insecure categories.

Further, for secure participants, the type of emotion depicted significantly affected the total fixation duration, when the face displayed was angry or sad. This is a relatively new area of research so and research on the topic would be helpful in understanding how people identify emotions and where they look to determine the emotion.

Lastly, although significance was not found for adult attachment level or type of face on

percentage correct, the data did seem to suggest direction in favor of insecurely attached adults. Insecure participants were better at identifying intensities of emotions than secure participants. This data is parallel to research done by Niedenthal et al. (2002), which suggested that dismissive and preoccupied (insecure attachments) participants paid more attention to both positive and negative social cues when compared to secure participants. Perhaps insecure participants need to be more attentive to others' emotions because they don't feel comfortable and confident that others are being honest with them.

The present study could be extended in a number of ways. First and foremost, the study could be replicated with another population or over a longer period of time in hopes to gain more preoccupied, dismissive, and fearful participants. As stated by Simpson and Rholes in 2010, different levels of adult attachment affect many aspects of people's lives. It might be that a four year undergraduate college promotes securely attached students over insecure students. It would be beneficial to see if there are significant differences in patterns of looking on ability to identify intensity of emotions between attachment levels in a different population.

The study could also be redone using a larger amount of pictures presented to the participants. The current study only had four pictures of each emotion, therefore participants could only get 0%, 25%, 50%, 75%, or 100% correct. In addition, participants could only get 0%, 50%, or 100% correct on the intensity of each individual emotion presented (e.g. intense anger male or female). It could be valuable to increase the number of pictures of each emotion and intensity in order to generalize one's ability to detect emotions and intensities on many different people's faces.

Conclusions

The present study cannot fully support the hypotheses due to lack of insecurely attached participants. However, the data concerning where a securely attached person looks when detecting intensity of emotions did support previous research. Clearly, more testing would need to be done before we could state any confident direction, but the data does show that there is some sort of relationship between attachment orientation levels, emotion depicted, and where the person looks on the face in order to correctly perceive intensity of emotion.

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