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One may consider adolescents to have an extreme difference when categorized into groups such as healthy and depressed. Needless to say, adolescents come from unique backgrounds with creative mindsets and an urge to be understood, transporting into a broader aspect of reading cues and communication from others. Emerging into the title, "Adolescents with major depression demonstrate increased amygdala activation" allows the reader to receive a keen sense of what the researchers are trying to gain knowledge of.

Ultimately the goal of this study evolves from adolescents with major depressive disorder (MDD) and how they compare to healthy adolescents (controls). The study involves twenty-four participants (12 adolescents diagnosed with MDD whom did not take medication for their disorder and whom were not diagnosed with another psychiatric disorder; and 12 paralleled, healthy controls, also adolescents), all right-handed, ranging from the ages of 13-17. Depressed participants were initiated from mental health clinics in San Diego California while healthy participants were sporadically picked from the larger San Diego area. All participants were given similar tests (CDRS-R, CGAS) and completed an inquiry to conclude if there were any other present psychiatric disorders within the participants. The participants were then scaled for a facial emotion-matching task and tested using functional neuroimaging to match adjectives with certain facial emotions (happy, sad, fearful, angry, etc.) through an fMRI. As the participants lay in the fMRI, they were asked to determine what facial expression each face provided by pressing one of two buttons connected to the fMRI. The order of the pictures were randomized and kept steady throughout 2 seconds of instructions, with the remaining 10 seconds left for the participants to watch the face. Instead of the participants saying what adjective their observed facial expression was similar to, they were directed to match that expression with

shapes of ovals/circles within the task. The variables measured used coronal imaging to show left and right hemispheres of amygdala activation for healthy (CTL) and depressed (MDD) adolescents and were seen through separate graphs for left and right amygdala's pertaining to each emotion shown on the pictures.

The results of this study showed that there was no significant difference between the depressed adolescents and healthy controls involving the right amygdala activation when viewing the pictures. The researchers came to some important conclusions: this analysis of the facial-emotion task activated bilateral amygdala in both pairs of participants; the left amygdala in depressed adolescents was more active than that of healthy adolescents, and that this study was the first to demonstrate this task to show differences between brain activity in adolescents with MDD and healthy adolescents.

The amygdala results from the article can relate to the balance between subcortical structures/frontal lobes by understanding the purpose of both the amygdala in its relation to emotions, and of the frontal lobes in its relation to controlling one's behavior and emotions. The amygdala generally is a processing control network that triggers activation in the brain in response to negative emotions. According to the video watched in lecture on adolescent brain development, Inside the Teenage Brain, two crucial aspects of the brain are the Amygdala, which categorizes the onset of emotions such as fear and happiness, and the Frontal Lobes, which are involved in movement, decision-making, problem solving, and planning (Dobbs, 2011). These balances between the subcortical and frontal lobes also show a slower development of the frontal lobes relating to involvement in controlling one's behavior and emotions. During adolescence, these two structures (the amygdala and the frontal lobes) are maturing at different times causing there to be an imbalance between the growth processes of the two structures within the

adolescent's brain. The amygdala matures faster than the frontal lobes in adolescence, therefore categorizing why there is more activation within the amygdala in response to this study. "Adolescents' brain development has a lack of balance between the amygdala and the frontal lobes and has a conclusion of large increases in myelin during adolescence and beyond" (Monk 2012, Lecture # 13). As mentioned briefly before, "significant bilateral amygdala activation in depressed and healthy adolescents considers significantly greater left amygdala activation in depressed adolescents compared to controls" (Yang et.al, 2010). These results relate to the comparison of both adolescents and the main focus of depression because the left amygdala brain analysis revealed areas of significantly different brain activity more so in depressed adolescents than controlled adolescents. In conclusion, this also suggests that depressed adolescents seemed to exhibit an abnormally excitable amygdala when compared to healthy controlled adolescents (Yang et.al, 2010).

In considering risk factors for depression, Dr. Monk described different onsets of possible acres to contribute to depression or depressive disorders in adolescents. According to the text, early maturing girls are at higher risks for onsets of depression. "Because we select friends who are like us, early maturing girls tend to gravitate toward becoming friends with older girls and boys" (Belsky 2010). We can indicate that girls may start to get more involved in riskier adult activities such as sex, drugs, and/or smoking and drinking at a younger age. The onset of females only to be compatible with MDD can relate back to the Yang et.al article because the study could have captured only females with depression and healthy controls to see if their brain activation in the amygdala was consistent with the healthier female participants. Another possible onset of depression that could spiral from being a girl involved in more adult like activities could cause special risk of getting more anxious, which could also result in depression. "Moreover, these

negative effects happen only when girls enter the high risk setting of dating and having older friends" (Belsky 2010). Ultimately, when girls are involved with older crowds that participate in more adult like activities, it may become compressing for the female to seem more anxious, nervous, resulting to peer pressure and possibly convinced in doing things that her older friends are more involved in.

With both onsets of depression relating to adolescent females such as hanging out with older crowds, becoming anxious because of these relationships, and becoming more involved in adult like activities, I would expect to find a larger amount of depressed females than healthy females when searching for participants in the study. The educational structure of the town may classify what types of activities or serious threatening situations the females may become involved in. I would also expect the researchers to still notice all of the female participants to experience some form of a gradual event of puberty which may lead to depression, tampered relationships and tarnished communication skills among expressing any issues that may be experiencing. These risk factors for depression might lead to similar or a different set of results because the female adolescents would be applicable for depression based off the signs for depression mentioned earlier. These results could relate to the previous study because there could be a chance of these depressed female adolescents to have a hyperactive amygdala in their brain when given this particular treatment while the healthy female adolescents may experience similar findings as the previous study.

In conducting my own study using an fMRI and incorporated treatment, I would classify the activation of the different structures of the brain by asking participants what colors may affect their mood. I would choose a total of 30 female participants, all of which are from the general Ann Arbor/Ypsilanti high school area, half whom are diagnosed with depression and the

other half of whom are healthy participants, all of which live at home with their care provider or parent(s). My question would be, “Do certain colors change the effect of your mood (basic colors such as red, yellow, blue, purple, black, green, etc.)? I would have the participants be tested for comorbidity, daily attitude styles from both the participant’s parents and themselves, and their personality types. These characteristics would be used to classify what type of females are participating in the study, how their personalities will compliment their decisions in color themes while assuring observation from close relatives such as parents, and differentiating healthy female adolescents with depressed female adolescents. The pictures from the fMRI will involve different colors within different backgrounds of the image. The main color will be boxed in the center with another color just as a background. The participants’ will then press a number relating to the emotion felt when they observed the color. They will get two seconds to look at the centered color and five second to press the number in which their color relates to the adjective. Shorter time indicates their immediate reaction to the color rather than contemplating on how they feel about the color after longer time staring at it. Options will be happy, sad, uneasy, or excited.

The predictions and hypotheses that would be made based on this treatment, would be to indicate that darker colors affect both healthy and depressed females similarly, causing them to feel more depressed or unhappy about the image. While the lighter colors would indicate the same purpose, just causing them to feel more happy or excited in general. I am trying to prove that no matter the condition of the female adolescent, the colored images shown will still affect the participants’ mood all the same. If the predictions were confirmed, these results would tell us that both females are affected by mood in altering colors and that the depressed female adolescent is no more depressed in viewing colors than the healthy adolescent.

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