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THE ROLE OF DISGUST IN EATING DISORDERS

A Dissertation
presented in partial fulfillment of requirements
for the degree of Doctor of Philosophy
in Clinical Psychology
The University of Mississippi

by

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ABSTRACT

Disgust, a basic emotional response, which influences approach/avoidance behaviors, has been studied in various psychological disorders, including anxiety, depression, and eating disorders. The current study employed exploratory correlations and hierarchical linear regressions (controlling for race, anxiety, and depression) in order to be able to observe the relationships among three traditional domains of disgust (i.e., core, animal-reminder, contamination) and eating disordered behaviors. Results revealed significant correlations between core disgust and dieting behaviors, in addition to contamination disgust and bulimia and symptoms of food preoccupation as well as behaviors concerning self-control around food-related stimuli (i.e., oral control). More importantly, disgust sensitivity was significant in predicting oral control and significantly accounted for 4.7% of the unique variance in predicting symptoms of bulimia and preoccupation with food. These results reveal the significant role of contamination disgust in the development and maintenance of eating pathology above and beyond known predictors of maladaptive eating and other domains of disgust. Implications of the current findings as well as future directions are discussed.

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CHAPTER I

INTRODUCTION

1.1. Disgust

Disgust is a basic emotional response (Ekman, 1992) characterized by rejection of threatening oral stimuli due to fear of contamination (Olatunji & Sawchuk, 2005). As the definition indicates, disgust is most commonly associated with the mouth, and while in its most basic sense, it means “bad taste,” the emotion of disgust differs from a rejection of food based on taste, smell, and/or texture (Rozin & Fallon, 1987); it is the rejection of food based on ideation of stimulus origins and perception of its contamination properties (Olatunji & Sawchuk, 2005). While the role of disgust is not limited to food-related elicitors, the role of contamination in disgust is similar across all domains as it influences approach/avoidance behaviors. According to Rozin et al. (2008), four properties of contagion define disgust, including necessitated physical contact, the presence of an all-or-nothing response (i.e., even brief contact leads to contamination), irreversibility of contagion (i.e., once contaminated, always contaminated), and a valence distinction (i.e., the effects of negative contagion create a greater impact than positive ones).

Darwin defined disgust as, “... something revolting, primarily in relation to the sense of taste, as actually perceived or vividly imagined; and secondarily to anything which causes similar feeling through the sense of smell, touch and even of eyesight” (Darwin, 1872/1965, as cited in Olatunji & Sawchuk, 2005). Later, the definition of disgust was expanded to encompass the body and skin as a barrier to infection (e.g., Plutchik, 1980). According to the disease-

avoidance model, disgust originated as an adaptive emotional response to prevent animals from coming into contact with something that could potentially cause disease (Rozin & Fallon, 1987). However, via socialization processes in which individuals interacted under established cultural norms, disgust was further expanded to include experiences in other domains (e.g., death-related ideations, moral offenses, reminders of our animal origins) that did not necessarily pose an immediate threat of harm to the physical body (Rozin, Haidt, & McCauley, 2008). Instead, these newly developed domains of disgust served to maintain social order and protect the self from moral contamination. Today, disgust is conceptualized to be experienced in response to these multiple domains of elicitors (detailed further below).

1.2 Disgust Domains

With the expansion of disgust to social contexts, specific domains have been identified, including food, animals, sexual behaviors, death, body products, body-envelope violations (e.g., blood, internal organs), hygiene, interpersonal, and moral (Fallon & Rozin, 1983). While traditional theories have posited disgust as a one-factor (Darwin, 1872/1965, as cited in Olatunji & Sawchuk, 2005) and five-factor (i.e., animal-reminder, spoilage and decay, distance from humans, anomaly, feces; Rozin & Fallon, 1987) construct, more recent research posits disgust to include three factors, including core, animal-reminder and contamination (i.e., disgust elicited by the properties of contagion) domains (Olatunji, Cisler, McKay, & Phillips, 2010). Other research suggests a more prominent role of moral and sexual disgust in addition to the more “general” disgust (i.e., pathogen disgust), as recent studies have provided implications for social processes (Tybur, Lieberman, & Griskevicius, 2009). This is in contrast to the disgust domains outlined by Olatunji and colleagues (2010), which is more implicated in psychopathology.

The core domain of disgust constitutes a real or perceived threat of oral ingestion, eliciting an aversive reaction and evaluation of the stimulus as being contaminated (Olatunji & Sawchuk, 2005). Included in the core domain are subdomains, such as foods that have come in contact with a contaminated substance (e.g., cookie touched by a spider) and/or contain other disgust-eliciting characteristics (e.g., rotten fruit). Disgust elicitors in this subdomain are largely based upon cultural norms in that certain foods may be perceived as palatable in one culture but disgusting in another (e.g., insects, arachnids). The animal subdomain of core disgust is also culture-specific and constitutes foods of animal origin. Examples of avoidance behaviors include the preparation of foods in the absence of its animal-like features and refusal to consume culturally domesticated animals such as dogs. Finally, core disgust also includes a subdomain of body products (e.g., feces, urine, mucous), in which individuals experience disgust in response to experiences such as finding hair in food and consuming foods with mucous-like properties (e.g., snails).

The animal-reminder disgust domain constitutes reminders of human mortality and inherent animal-like nature, including attitudes and practices surrounding sex (e.g., intimacy as opposed to self-gratification), personal hygiene (e.g., washing, grooming), body-envelope violations (e.g., blood, veins, organs) and death (e.g., mortality salience) (Olatunji & Sawchuk, 2005). Under this domain of disgust elicitors, people who engage in promiscuous sexual behaviors, as well as those with poor hygiene practices, are perceived as animal-like and avoided out of fear of acquiring such negative properties. Likewise, exposure of internal bodily components (typically enclosed by a barrier) as well as reminders of human mortality results in an obstruction of the social hierarchy and subsequent feelings of disgust. Thus, the animal-

reminder domain of disgust serves as a cognitive defense to maintain the distinction between humans and animals (Haidt, McCauley, & Rozin, 1994).

The last domain of disgust (i.e., contamination) involves the interpersonal and moral subdomains of disgust elicitors that serve to protect the “soul” and maintain one’s distinct human qualities (Olatunji et al., 2010). The contamination domain includes disgust elicited by unwanted contact with strangers and materials of unknown origin, individuals considered morally tainted (e.g., molesters, enemies, rapists), those who are ill and serve as reminders of our vulnerability to sickness as well as individuals who are disfigured (i.e., frail, less than human; Olatunji & Sawchuk, 2005).

1.3 Disgust Components: Physiology, Behavior and Cognition

The experience of disgust in the aforementioned domains can be broken down into physiological, behavioral and cognitive mechanisms (Olatunji & Sawchuk, 2005). In contrast to the emotions of fear and anger, which are relevant to the sympathetic nervous system, disgust is conceptualized to be more relevant to the parasympathetic nervous system (Levenson, 1992). Activation of the disgust response leads to reductions in heart rate (Levenson, Ekman, & Friesen, 1990), decreases in blood pressure (Sledge, 1978) and rate of respiration (Curtis & Thyer, 1983), lower skin temperature (Zajonc & McIntosh, 1992), increase in salivation (Carlson, 1994) and greater gastrointestinal mobility (Ekman, Levenson, & Friesen, 1983). Further, disgust has been shown to elicit nausea coinciding with a salivary response (Angyal, 1941), although no studies have analyzed the relationship between nausea and salivation to the disgust experience (Rozin et al., 2008).

Particular brain regions have been studied in association with disgust. More specifically, the processing of facial expressions, a commonly observed behavioral indication of disgust, may

be linked to the insular cortex, which serves to integrate sensory and visceral information in addition to playing a role in regulating parasympathetic cardiovascular activity (e.g., Calder, Lawrence, & Young, 2001). Other brain regions associated with viewing disgust elicitors include: the ventrolateral prefrontal cortex, anterior temporal cortex, visual cortex and the basal ganglia (Phillips, Senior, Fahy, & David, 1998; Sprengelmeyer, Rausch, Eysel, & Przuntek, 1998; Wicker et al., 2003).

Despite this burgeoning area of physiological findings, disgust facial expression processing is primarily studied behaviorally. Researchers are not in complete agreement about the constituents of a disgust facial response, although the following three components have been consistently reported: gaping, retraction of the upper lip, and wrinkling of the nose (Olatunji & Sawchuk, 2005). These facial characteristics have found to be similar across cultures (Ekman, 1982), as well as adaptive in discouraging entrance of unwanted stimuli (e.g., wrinkling of the nose) and encouraging discharge of a substance that has already been ingested (e.g., gape) (Rozin et al., 2008). Interestingly, the disgust face is also elicited by non-food stimuli, where some may argue that an immediate adaptive response is not warranted given the evolutionary function of these behaviors (Rozin, Lowery, & Ebert, 1994).

In addition to associated facial expressions of disgust, avoidance behaviors have been shown to be a common response to disgust stimuli, serving as a mechanism by which the body is defended against contamination (Olatunji & Sawchuk, 2005). These are typically categorized in two domains. Active avoidance constitutes physically moving away from the stimulus and over time choosing not to enter a situation in which the stimulus is present. Passive avoidance, in contrast, is triggered once an individual is exposed to a disgusting stimulus and includes behaviors such as pushing stimuli away, closing the eyes, physically turning the body away from

the stimuli, and plugging one's nose. Research exists to suggest that disgust leads mostly to passive avoidant as opposed to active avoidant responses (Rozin et al., 2008).

Cognitive manifestations of disgust include beliefs about the threat value of the stimulus and/or concerns related to one's own physiological and behavioral reactions to the stimulus (Olatunji & Sawchuk, 2005). Concerns about contamination, disease acquisition, and possible infection (Angyal, 1941; Rozin & Fallon, 1987) are often maintained in spite of contradicting evidence. Three most common cognitive errors when experiencing disgust are observed in the form of estimation biases, the law of contagion, and the law of similarity. Estimation biases refer to the tendency of the individual to overestimate the likelihood of the stimulus carrying a disease and their vulnerability to acquire the disease (Olatunji & Sawchuk, 2005). Likewise, the law of contagion refers to the belief that once an individual comes into contact with a stimulus the individual will always be in contact with the properties of the stimulus (Haidt et al., 1994). Finally, the law of similarity posits that objectively safe objects (e.g., fudge shaped like dog feces) are to be avoided if they resemble a threat-relevant disgust elicitor (Olatunji & Sawchuk, 2005).

1.4 Individual Differences in Disgust

Despite the pervasive manifestation of disgust across multiple domains, research reports the absence of disgust experiences prior to around four years of age (Siegal & Share, 1990). Moreover, studies utilizing various disgust stimuli (e.g., feces, animals) suggest that children below eight years of age do not have the cognitive ability to experience disgust (e.g., Rozin & Fallon, 1987). Any indication of disgust expression may result from vicarious learning experiences (Rozin & Fallon, 1987), providing further support for cultural influences in the elicitation of disgust. Yet, even within cultures, individual differences in disgust sensitivity (i.e.,

tendency to over-estimate the negative consequences associated with experiencing disgust; Olatunji, Tart, Ciesielski, McGrath, & Smits, 2011b) exist. Further, when the emotional experience of disgust becomes excessively frequent and/or intense, individuals may be at a heightened risk to develop disordered symptomology (Power & Dalgleish, 1997). Specifically in anxiety disorders, intense and frequent disgust experiences are proposed to play a similar (negative evaluative/avoidance) function as with excessive fear-experiences, subsequently resulting in interference with daily functioning (Olatunji & Sawchuk, 2005). For example, overestimation of the contamination properties of a stimulus as well as one's vulnerability to acquiring such properties can manifest in active (e.g., refusing to use a public restroom) and/or passive (e.g., disposing of an article of clothing that has come into contact with a seemingly contaminated substance) avoidance strategies. Much of the literature has focused on the role of disgust in anxiety disorders, more specifically, obsessive-compulsive disorder (OCD; contamination-obsession/washing-compulsion type), spider phobia, blood injection-injury (BII) phobia, and to a lesser degree, PTSD (Olatunji et al., 2010). Several studies have also looked at the role of disgust in eating disorders, and while the results are mixed, there exists evidence to suggest that disgust is related to eating disordered pathology.

1.5 Eating Disorders

Eating disorders constitute a preoccupation with the body eliciting extreme behaviors to avoid weight gain, such as purging of food already consumed and/or restricting caloric intake (American Psychiatric Association [APA], 2000). Based on the *Diagnostic and Statistical Manual of Mental Disorders (DSM) IV-TR* (APA, 2000), a diagnosis of anorexia nervosa (AN) necessitates an intense fear of weight gain, distorted perceptions of one's own body, amenorrhea (i.e., discontinuation of menstruation resulting from decreased body weight), and body weight

that does not meet at least 85 percent of the normal criteria based on age and height). Of the aforementioned criteria for AN, amenorrhea has been a topic of controversy based on evidence that it occurs in a minority of women, even before extreme loss of weight, and sometimes persists upon weight gain (Garfinkel, 2002). Many women do not experience amenorrhea while meeting all other criteria for AN, and there is support for its exclusion as a diagnostic criterion in the DSM-V (Attia & Roberto, 2009).

Bulimia nervosa (BN), another subcategory of eating disorders, is characterized by repeated episodes of bingeing (i.e., consuming large quantities of calories in a short period of time) as well as behaviors elicited to counter the effects of bingeing (e.g., purging, vomiting, starving), a preoccupation with food, and dissatisfaction with one's body size (APA, 2000). Research highlighting the association of eating disorders with life-threatening medical (Mehler, Crews, & Weiner, 2004) and psychological (e.g., suicidality; Crow, Peterson, Swanson, Raymond, Specker, Eckert et al., 2009) complications promotes further study of its causal mechanisms in efforts to discover promising prevention and treatment interventions.

Studies suggest that most individuals in outpatient settings do not meet criteria for either AN or BN but rather present atypical symptoms that constitute diagnosis of an Eating Disorder Not Otherwise Specified (i.e., ED-NOS; Fairburn & Bohn, 2005). ED-NOS is a residual category and includes individuals who meet sub-threshold levels of (AN or BN) criteria and/or present symptoms that are mixed between AN and BN. The ED-NOS category also includes those with binge-eating disorder, in which the individual engages in repeated binge episodes without engaging in compensatory methods (e.g., purging) that would constitute a BN diagnosis (APA, 2000).

Epidemiological studies report lifetime prevalence rates of .6%, 1.0%, and 2.8% for AN,

BN, and binge eating disorder, respectively, and rates are consistently higher for females (i.e., .9%, 1.5%, 3.5% for AN, BN, and binge eating disorder) than males (i.e., .3%, .5%, 2.0% for AN, BN, and binge eating disorder; Hudson, Hiripi, Pope, & Kessler, 2007). These prevalence rates and patterns are largely affected by the existing diagnostic criteria, and proposed revisions anticipated in the DSM – V include the clarification of cognitive symptoms pertaining to an eating disorder diagnosis (Becker, Eddy, & Perloe, 2009). Other revisions propose the inclusion of Binge Eating Disorder as a subtype of eating disorders (Wonderlich, Gordon, Mitchell, Crosby, & Engel, 2009), and evidence exists to suggest that the required frequency of binge episodes for BN and binge eating disorder be reduced from twice to once a week (Wilson & Sysko, 2009). The aforementioned revisions are based upon empirical studies highlighting the existing knowledge of eating disorders.

Studies on the etiological mechanisms of eating disorders have looked at family characteristics (e.g., expressed emotion, van Furth et al., 1996), affectivity (e.g., Shapira & Courbasson, 2010), and personality (e.g., perfectionism, Sassaroli et al., 2008; impulsivity, Conason, Klomek, & Sher, 2006) among other variables that may contribute to the development and maintenance of eating disorders. In light of the similarities, some have conceptualized eating disorders as being on a spectrum of anxiety disorders (e.g., “obsessive-compulsive spectrum,” Bienvenu et al., 2000; “social anxiety disorder spectrum,” Schneider, Blanco, Antia, & Liebowitz, 2002), and the role of anxiety sensitivity has been found to play a significant role in eating pathology (Anestis, Holm-Denoma, Gordon, Schmidt, & Joiner, 2008). More recent research, however, has focused more on the role of disgust sensitivity in the development of eating disorders.

1.6 Disgust and Eating Disorders

Several studies have found significant correlations between disgust sensitivity and eating disordered symptomology even upon controlling for external factors (e.g., depression and/or anxiety; Davey, Buckland, Tantow, & Dallos, 1998; Griffiths & Troop, 2006; Harvey, Troop, Treasure, & Murphy, 2002). Recently, Davey and Chapman (2009) found disgust sensitivity and propensity (i.e., a general tendency to experience disgust across situations; Olatunji et al., 2011b) to be significantly correlated with a drive for thinness, symptoms of bulimia, as well as other dimensions associated with eating disorders as assessed by the Eating Disorder Inventory (Garner, Olmstead, & Polivy, 1983). Further, participants with eating disordered symptomology have demonstrated heightened ability to recognize the disgust facial expression compared to their non-eating-disordered counterparts (Murray, Murphy, Perrett, & Treasure, unpublished manuscript as cited in Troop & Baker, 2009). This is interesting, and potentially etiologically relevant, considering research highlighting challenges among individuals with eating pathology in recognizing facial expressions in general (e.g., alexithymia; Troop, Schmidt, & Treasure, 1995).

Despite some studies indicating significant associations between eating pathology and disgust, other studies assessing general sensitivity to disgust (as opposed to specific domains) have found no correlation between these constructs in either nonclinical or eating disordered samples (e.g., Muris et al., 2000; Schienle et al., 2002; Troop, Murphy, Bramon, & Treasure, 2000). Other studies have demonstrated that associations disappear upon controlling for trait anxiety or anxiety sensitivity (Davey & Chapman, 2009). Likewise, differences in disgust sensitivity between those with and without eating pathology have been found to be nonsignificant in some examinations (e.g., Schienle et al., 2004). Utilizing a non-clinical sample, Mayer and colleagues (2008a) demonstrated the absence of an association of disgust induced by

a foul-smelling odor and eating disorder symptoms (i.e., body esteem, restrained eating, decreased preference for high-caloric foods). These equivocal results may be due to the use of different measures of disgust sensitivity across studies and an emphasis on disgust in the general sense, as opposed to its specific domains (Troop & Baker, 2009). Following is a review of the few studies that could be located examining specific domains of disgust in relation to eating pathology.

1.7 Core Disgust and Eating Pathology

One of the earliest systematic investigations of eating pathology and disgust was conducted by Davey and colleagues (1998), who found significant correlations between measures of eating symptomology, disgust sensitivity to foods of animal origin, and sexual acts in normal (non-clinical) females (controlling for symptoms of anxiety and depression). In a second study, utilizing a clinical sample, researchers found that eating disordered individuals showed elevated disgust toward foods of animal origin, the human body and body products, as well as gastroenteric products (e.g., vomit, diarrhea; Davey et al., 1998). As opposed to disgust correlates found in the non-clinical sample, eating disordered females presented elevations on disgust domains specific to foods and the human body, while failing to show elevations pertaining to disgust in general or specific to other domains.

Other studies have replicated such findings. For instance, Troop et al. (2002) found that females with current symptoms of eating disorders (as well as those in remission) presented elevated disgust sensitivity related to foods of animal origin and body products in comparison to their non-eating-disordered counterparts. Further analyses revealed that those in remission displayed less disgust to body products than those currently experiencing eating disordered symptoms; however, the two groups did not differ on disgust sensitivity to foods of animal

origin. Likewise, Mayer and colleagues (2008b) found that disturbed eating behaviors (e.g., those externally stimulated by the presence of food) were positively correlated with disgust sensitivity and in particular body products (i.e., core disgust). Relationships between disgust and eating pathology were also found in males, whereby restrained eating behavior and eating concerns were correlated with overall disgust sensitivity and disgust to food items, respectively (Mayer, Muris, Bos, & Suijkerbuijk, 2008b). The same study also found associations (in both men and women) with the disgust domain of death (Mayer et al., 2008b), and these findings are in contrast to Davey et al.'s (1998) study, which found no relationship between eating disorders and disgust in men (Mayer et al., 2008b). However, in a subsequent study, Mayer and colleagues (2008b) found no significant differences between individuals displaying high and low external eating behaviors on avoidance (e.g., measured by time viewing disgusting images) and subjective ratings of disgusting pictures. Perhaps differences in methodology (e.g., use of more disgusting pictures, use of a clinical sample; Mayer et al., 2008b) contributed to significant results in one study but not the other. Regardless, burgeoning evidence concerning the relationship between disgust and eating pathology remains mixed. The most recently published study assessing disgust sensitivity in a sample of individuals with AN found elevated disgust sensitivity compared to controls (Aharoni & Hertz, 2011). Further analyses revealed elevations on six out of eight domains of disgust (i.e., food, magical thinking, body products, hygiene, animals, sex; but not death or body envelope violations) with the highest elevation found in the domain of food followed by magical thinking. Comparisons between AN patients of purging and restrictive types revealed no significant differences in overall sensitivity to disgust, but significantly elevated disgust to body products (specifically vomit and the smell of urine) in individuals with AN of the restrictive type. The authors concluded that perhaps continuous

exposure to vomit and urine, stemming from disordered behaviors specific to AN of the purging type (e.g., vomiting in a toilet) may have resulted in a reduced sensitivity to the disgust of this particular domain (Aharoni & Hertz, 2011). In an earlier study comparing individuals with AN and BN, Murphy and Troop et al. (unpublished manuscript as cited in Troop & Baker, 2009) found that only females with AN reported elevated fear and disgust to food compared to nonfood stimuli. No differences were found in non-eating disordered and bulimic females. In contrast, the same study found that females with both disorders presented elevated fear and disgust to overweight body shapes compared to underweight and normal bodies. Further, their fear and disgust ratings of body shapes were significantly elevated compared to their non-eating-disordered counterparts while no differences between groups were found on ratings of other emotional stimuli, suggesting the significance of domain specificity and disorder-relevant stimuli in assessing the role of disgust in eating disorders (Troop & Baker, 2009).

1.8 Other Evidence for the Role of Disgust in Eating Pathology

Other studies have demonstrated both disgust and fear are elevated in individuals with strict dietary practices (Griffiths & Troop, 2006) and eating disordered symptomology (Harvey et al., 2002; Uher et al., 2005) compared to those without symptoms. Factor analyses of eating disordered symptomology (Harvey et al., 2002) and dietary restraint (Griffiths & Troop, 2006) demonstrate that fear and disgust load onto threatening eating disorder-relevant stimuli (i.e., those that were subjectively harmful or presenting as an obstacle to maintaining or achieving an ideal body size such as high calorie foods or overweight body shapes), non-threatening eating disorder-relevant stimuli (i.e., those that were subjectively helpful to maintaining or achieving an ideal body size such as low calorie foods or slim body shapes) and eating disorder-irrelevant stimuli (i.e., absence of an association with eating behavior, such as stimuli designed to frighten

and or elicit disgust in domains other than food and the human body) as three distinct factors (Troop & Baker, 2009). However, Griffiths and Troop (2006) also found that fear and disgust ratings of threatening eating disorder-relevant stimuli did not correlate with the amount of calories individuals consumed. It is possible that eating disordered individuals are fearful and disgusted by the long-term consequences of engaging in threatening behavior, which works directly against the immediate gratification of consuming high calorie foods (Griffiths & Troop, 2006).

Other studies have found similar associations. For example, Mayer and colleagues (2011) measured the extent to which participants estimated the likelihood of pictures (e.g., obese bodies, slim bodies, sceneries) to be followed by a disgust-relevant (e.g., receiving a disgusting fluid in their mouth via a catheter), fear-relevant (e.g., electric shock), or no outcome and found that eating disordered individuals presented an a priori covariation bias and tendency to overestimate the association between pictures of slim body types and the disgust-relevant outcome. This cognitive component of eating disorders (i.e., dietary restraint in efforts to prevent a negative outcome) not only accounts for the role of negative affect (Clark & Watson, 1991) in the maintenance of eating disorders, it suggests that disgust in eating disorders may not be related to foods or the human body per se, but related to the failure to live up to an internalized set of societal standards (i.e., feelings of inadequacy or internal shame; Gilbert, 1998). Indeed, eating disordered individuals have been linked to a high rate of religiosity (e.g., Rozin, Lowery, Imada, & Haidt, 1999), suggesting a connection to the moral disgust domain (Troop & Baker, 2009). However, Griffiths and Troops' (2006) study may suggest dietary restraint is due to disgust, which is in itself related to feelings of inferiority when comparing oneself to others (i.e., external shame; Gilbert, 1998). Thus conceptualization would suggest the role of self-disgust in the

development and maintenance of eating pathology (e.g., Goss & Allan, 2009; Moradi, Dirks, & Matteson, 2005; Roberts & Gettman, 2004).

1.9 The Current Study

The study of disgust in eating disorders is a relatively new area of research, and researchers are making efforts to parse out meaningful patterns. Existing studies suggest the role of core disgust, more specifically, food and body products, in eating pathology. Yet, the literature is not all conclusive, with some studies suggesting significant associations with other subdomains such as sex and animals (Troop et al., 2000) as well as moral and self-disgust (e.g., Troop et al., 2008). The current study seeks to assess the role of three traditionally-defined domains of disgust (e.g., core, animal-reminder, contamination) as assessed by a widely used measure of disgust sensitivity (i.e., DS-R; Olatunji et al., 2007) in predicting three specific domains of eating pathology (e.g., dieting and food preoccupation, bulimia, oral control) measured by the Eating Attitudes Test – 26 (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982).

CHAPTER II

METHODOLOGY

2.1 Participants

The sample included 156 undergraduate females attending a large, public university in the Deep South. The mean age of the sample was 19.82 (SD = 3.24), and the ethnic/racial makeup of the sample was as follows: 61% White, 33% Black, 1% Asian, and 4% multiracial, and 1% unreported. After providing informed consent, participants completed the EAT-26, DASS-21 (a measure of depression, anxiety, and stress; Lovibond & Lovibond, 1995), and DS-R as a part of a larger study (detailed explanation of the measures follows). Participants completed the measures individually in the presence of a trained research participant and were given research credit for their participation. The order of the measures was not counterbalanced based upon careful attention to these details in previous surveys, suggesting counterbalancing does not have an effect on either the observed reliability of the instruments or respondents' mean levels of endorsement. The University of Mississippi Institutional Review Board approved all procedures.

2.2 Measures

The *Disgust Scale – Revised (DS-R)*; Olatunji et al., 2007) is a 27-item self-report measure assessing disgust sensitivity across three domains, including core (i.e., foods, small animals, body products), animal-reminder (i.e., death, body envelope violations), and contamination (i.e., perceived threat of contagion) disgust. Items are rated using a 5-point Likert-type scale ranging from 0 (“Not disgusting at all”) to 4 (“Extremely disgusting”). Two items are used to identify poor responders and are therefore not included in the scoring of the items. The DS-R has

demonstrated strong psychometric properties, including internal consistency ($\alpha = .87$), as well as convergent and divergent validity (e.g., core and contamination disgust significantly predicted contamination fears and obsessive compulsive symptoms, as assessed by the Vancouver Obsessive Compulsive Inventory, but animal-reminder disgust did not) across a number of studies conducted in a number of different contexts (Olatunji et al., 2007).

The *Eating Attitudes Test – 26* (EAT-26; Garner et al., 1982) is a 26-item self-report measure assessing eating disorder symptoms across three subscales. The bulimia and food preoccupation subscale measures symptoms of bulimia (e.g., “vomit after I have eaten”) including an obsession with food (e.g., “give too much time and thought to food”). The oral control subscale measures self-control around food (e.g., “cut my food into small pieces”) and behaviors reflecting an awareness of social pressures to gain weight (e.g., “feel that others pressure me to eat”). The dieting subscale measures body size dissatisfaction (e.g., “am preoccupied with a desire to be thinner”) and behaviors aimed at reducing one’s body size (e.g., “avoid foods with sugar in them”). Items are rated on a 6-point Likert-type scale ranging from “Always” to “Never.” The EAT-26 is a standardized measure of eating pathology (Garner et al., 1982), has demonstrated high internal consistency (e.g., $\alpha = .90$ to $.94$; Garner et al., 1982; Rivas, Bersabe, Jimenez, & Berrocal, 2010), and has been shown to differentially diagnose eating disordered and healthy individuals with at least 90 percent accuracy (Mintz & O’Halloran, 2000).

The *Depression Anxiety and Stress Scales – 21* (DASS-21; Lovibond & Lovibond, 1995) is a 21-item self-report measure assessing experiences of depression, anxiety, and stress over the past week. Items are rated on a 4-point Likert-type scale ranging from 0 (“Did not apply to me at all”) to 3 (“Applied to me very much, or most of the time”). The DASS-21 has demonstrated

strong psychometric properties, including high internal consistency across the three scales ($\alpha = .87$ to $.94$; Antony, Bieling, Cox, Enns, & Swinson, 1998). High correlations between the depression subscale and the Beck Depression Inventory (i.e., BDI, $r = .79$), the anxiety subscale and the Beck Anxiety Inventory (i.e., BAI, $r = .85$) as well as the stress subscale and measures of anxiety and depression (e.g., BAI, BDI, State-Trait Anxiety Inventory – Trait version; $r = .68$ to $.70$) also provide support for strong concurrent validity (Antony et al., 1998).

2.3 Statistical Analyses

Given previous findings that have demonstrated the role of disgust in eating disorders beyond known associations between eating pathology, anxiety, and depression (e.g., Davey et al., 1998), the current study controlled for anxiety and depression, as measured by the DASS-21 (Lovibond & Lovibond, 1995). Additionally, given that eating disorders primarily occur in females (e.g., Hudson et al., 2007) the current study limited the examination of relevant variables to female participants. Further, based on differences previously reported between ethnicity/race (e.g., White, Kohlmaier, Varnado-Sullivan, & Williamson, 2003), the current study also controlled for ethnicity/race in terms of its main analyses.

Exploratory correlations were conducted to allow for observation of significant relationships between variables (see below). Multicollinearity was not apparent, thus, several hierarchical multiple regressions were conducted to predict scores on the EAT-26 from various domains of disgust above and beyond the aforementioned relevant covariates. The first step of these analyses included race/ethnicity; the second the anxiety and depression subscales of the DASS-21; and the third the three subscales of the DS-R. Due to the majority of the disgust-relevant eating disorder literature supporting the role of core disgust, it was predicted that core disgust, compared to animal-reminder and contamination disgust, would emerge as a significant

predictor of eating disordered symptoms as assessed by the EAT-26 above and beyond established predictors of eating pathology and/or demographic variables factored out in the preceding steps.

CHAPTER III

RESULTS

3.1 Exploratory Correlations

The average body mass index of the sample was 26.08 (SD = 17.19) as calculated by self-reported height and weight on the EAT-26. Other descriptive statistics regarding participant scores on the EAT-26 and DS-R are presented in Table¹ 1 (Appendix). Total and subscale scores of the measures correspond to those previously assessed using non-clinical samples (e.g., Garner et al., 1982). Among the notable correlations, it was found that total scores on the DS-R and EAT-26 were significantly correlated ($r = .17, p < 0.05$). Further, scores on the core disgust subscale of the DS-R were significantly correlated with total score on the EAT-26 ($r = .20, p < 0.05$) and the dieting subscale of the EAT-26 ($r = .17, p < 0.05$). Likewise, significant correlations were found between the contamination subscale of the DS-R and total score on the EAT-26 ($r = .16, p < 0.05$), the bulimia and food preoccupation subscale ($r = .18, p < 0.05$), and the oral control subscale ($r = .18, p < 0.05$) of the EAT-26.

3.2 Hierarchical Multiple Regressions

Three hierarchical multiple regressions were conducted in order to predict eating disordered behaviors from the core, animal-reminder, and contamination domains of disgust sensitivity (see Table 2, Appendix). All models controlled for ethnicity/race and anxiety and depression as assessed by the DASS-21 in the first and second step, respectively. In the first model, the dieting subscale was predicted from the three subscales of the DS-R, and this model

¹ Tables can be found in the Appendix.

was not significant ($R^2 = .047, p = 0.29$). The second model predicting the bulimia and food preoccupation subscale from the three subscales of the DS-R was found to be significant ($R^2 = .146, p = .001$), with disgust accounting for 4.7% ($p = .047$) of the unique variance. The third model predicting the oral control subscale from the three subscales of the DS-R was found to be significant ($R^2 = .185, p = .000$), but the unique variance accounted for by disgust (2.6%) was not significant ($p = .191$). Thus, two out of three models predicting eating pathology (i.e., bulimia and food preoccupation, oral control) from disgust sensitivity (i.e., core, animal-reminder, contamination) were found to be significant.

CHAPTER IV

DISCUSSION

4.1 Implications

The role of disgust in pathological eating behaviors is a recently burgeoning area of research, and the current study sought to explore relationships among these constructs. Contrary to several prior studies, which failed to find significant associations between eating pathology and a general sensitivity to disgust (e.g., Muris et al., 2000), the current results revealed a small, but significant correlation between the total scores on the DS-R and EAT-26. It is important to note that this finding was unique after factoring out known predictors of pathological eating behavior (i.e., anxiety and depression).

Significant associations between the subscales of the DS-R and EAT-26 were also found. Of particular interest, core disgust was significantly correlated with the dieting subscale of the EAT-26, which measures avoidance of high caloric foods associated with a preoccupation with one's body shape (e.g., "feel uncomfortable after eating sweets"). The currently ascertained association between scores on this subscale with the core disgust corroborates previous demonstrations that suggest individuals who engage in strict dietary practices may be more sensitive to foods and body products deemed to be disgusting (e.g., Aharoni & Hertz, 2011). This is not at all surprising because sensitivity to disgust promotes avoidance behaviors (Rozin et al., 2008). To the extent that avoidance of high caloric foods facilitates efforts to regulate body weight, elevated disgust toward the core domain inadvertently promotes maladaptive eating patterns.

In addition to the core disgust domain, significant associations between contamination disgust and the bulimia and food preoccupation and oral control subscales were found. Prior research has demonstrated that these two eating pathology subscales can distinguish individuals who primarily engage in bulimic behaviors versus those engaging in more restrictive behaviors (Garner et al., 1982). Specifically, bulimics scored significantly higher on the bulimia and food preoccupation scale compared to purely restricting individuals. The opposite pattern was evident concerning scores on the oral control scale, wherein bulimics scored significantly lower than restrictors. Perhaps this speaks to the specificity of disgust in playing different roles in the various types of eating disordered behaviors. In comparison to core disgust, which may play a more significant role in eating disordered behaviors of the non-purging type (e.g., dietary restriction), contamination disgust may present a propensity to various eating disordered subtypes but via different pathways. For example, level of impulsivity may be one determinant through which those presenting with high contamination disgust may be more likely to develop binge-purge type symptoms. However, the correlational nature of the current findings is not adequate in addressing the intricate nature of the aforementioned relationships. Future studies employing more sophisticated statistical measures could delineate such a pattern of specificity as relevant.

The main findings of the current study revealed significant predictions for two of the three models examined. Upon controlling for ethnicity, anxiety, and depression, three domains of disgust (core, animal-reminder, contamination) significantly predicted bulimic behaviors (i.e., bulimia and food preoccupation subscale) and excessive control around food (i.e., oral control subscale). However, disgust failed to predict dieting behaviors in the current sample. This is in contrast to previous studies that have reported elevated disgust sensitivity in individuals with

strict dietary practices (e.g., Griffiths & Troop, 2006). Yet, a closer examination of the standardized beta coefficients revealed core disgust to contribute the most weight in predicting dieting behaviors, with the other disgust domains contributing very little in prediction. In addition, core disgust was also the most highly correlated domain with dieting behaviors. Yet, the aforementioned association in the current study was not significant.

In fact, despite previous findings supporting the prominent role of core disgust compared to other domains (e.g., Davey et al., 1998), the current study found contamination disgust to be more strongly associated with eating pathology. For instance, disgust predicted bulimia symptoms above and beyond the role of ethnicity, anxiety, and depression. While the aforementioned finding was marginally significant ($p = .047$), considering the amount of variance accounted for by anxiety and depression outlined in the literature (e.g., Pallister & Waller, 2008; Presnell, Stice, Seidel, & Madeley, 2009) and reflected in the current sample (9.7%), the role of disgust in predicting bulimia (4.7%) was quite substantial. A more intricate analysis of the standardized beta coefficients suggested contamination disgust had a greater effect on predicting bulimic behaviors compared to the other disgust domains. Contamination disgust was also more heavily weighted compared to the other disgust domains in predicting behaviors underlying oral control. These are unique findings, possibly because very few prior studies have examined the role of contamination disgust in predicting pathological eating behaviors. This is not surprising considering the historical development of disgust domains, with core disgust being an older and longer studied domain of disgust compared to other domains (e.g., contamination).

In contrast to the current results, the most recent examination that included contamination disgust as a variable found that magical thinking (i.e., laws of similarity and contagion) was

second to core disgust in distinguishing those with and without AN (Aharoni and Hertz, 2011). Yet, more recent research, such as the current study, may reveal an association between eating pathology and more cognitive manifestations of disgust (e.g., disgust toward failed efforts to maintain rules around eating) as opposed to the tangible stimulus itself (e.g., the food). Indeed, fear and disgust toward behaviors indicative of losing control over one's eating has been documented in those with eating pathology (McNamara, Chur-Hansen, & Hay, 2008). More studies examining the potential role of contamination disgust are needed to compare and delineate its specificity in pathological eating.

The significant role of contamination disgust also speaks to the high association between disordered eating and anxiety disorders. In particular, similarities between eating disorders and obsessive-compulsive disorder are frequently documented in the literature, the most consistent of which point to the high rate of comorbidity between the two disorders (e.g., Kaye, Bulik, Thornton, Barbarich, & Masters, 2004), shared symptom presentation (e.g., Bartz & Hollander, 2006), and overlapping personality traits (e.g., Egan, Wade, & Shafran, 2011). Further, the role of disgust sensitivity in anxiety disorders has been extensively studied and research to date suggests disgust may play a particularly significant role in the development and maintenance of obsessive-compulsive disorder among other anxiety disorders (e.g., Olatunji et al., 2010). Contamination disgust, in particular, has been implicated in obsessive-compulsive disorder of the washing type (Olatunji et al., 2007).

Limitations

The current study was conducted in efforts to add to the emerging research on the role of disgust in eating disorders. While a number of interesting findings were made, a number of limitations were present. Data were collected at a university in the Southern region of the United

States, and while the sample characteristically represented a number of risk factors for eating disorders (e.g., female, Caucasian, high socioeconomic class; Fairburn & Harrison, 2003), use of a non-clinical sample prevented observation of differences based on eating disorder diagnoses. However, use of a female-only sample may have facilitated the current findings by obviating any variability that would have been present with a more heterogeneous sample, thus, presenting a methodological advantage. Further, given that a higher percentage of residents in the South are obese compared to the percentage representative of the rest of the nation, the relationships of the current results may have potentially been biased. Replication of such findings in other context would provide directions for future study.

Other limitations concern the methodology employed in the current study. The DS-R is a widely-used, psychometrically well-supported instrument. Yet, other measures of disgust exist that provide the benefit of assessing domains that are not assessed by the DS-R (e.g., moral disgust; Olatunji et al., in press). Given the potential of these disgust elicitors in eating pathology, future studies should employ psychometrically-supported measures of moral and self-disgust in exploring the role of disgust in eating disorders. Likewise, the use of self-report measures is one way of assessment. However, a multi-modal method of assessment, including behavioral, cognitive, and physiological tasks, is a more ideal technique that is likely to lead to a more cogent set of findings and facilitate further research across domains. Specifically, bias in reporting BMI may be corrected for by an objective measure of height and weight.

Finally, the current study employed regression analyses to predict eating pathology from self-reported disgust sensitivity. While this method provides for an understanding of cross-sectional associations between variables, it does not impart knowledge concerning the causal determination of the observed relationships. A more accurate measure of a temporal relationship

between disgust and eating pathology would be determined via a longitudinally-designed study. Future studies employing such a design would provide a more valid assessment of the temporal trajectory underlying the relationship between disgust and eating pathology.

4.2 Conclusions and Future Directions

An exploration of three disgust domains (e.g., core, animal-reminder, contamination) in association with eating disordered behaviors revealed the significant roles of core and contamination disgust. In comparison with the other disgust domains, contamination disgust played a more prominent role in predicting bulimia symptoms and behaviors underlying control around food. In addition to adding to the literature concerning the potential role of cognitive biases underlying contamination fears, the current study, yet again, supported the significance of disgust toward basic stimuli (e.g., food) promoting avoidance of foods.

These results contribute to the literature on disgust and eating pathology, and more importantly provide directions in which future research can progress. Replicating the current results and exploring other domains of disgust, as well as possible mediators/moderators of such, outline some of the work that is yet to be conducted. Future studies will hopefully reveal more consistent and intricate patterns concerning the relationship between disgust and the promotion and maintenance of eating disorder symptoms.

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List of Appendices

Appendix: A

Table 1. Descriptive Statistics

	1	2	3	4	5	6	7	8
1. EAT-26 Total	-							
2. Dieting	.91**	-						
3. Bulimia and Food Preoccupation	.56**	.38**	-					
4. Oral Control	.52**	.25**	.14	-				
5. DS-R Total	.17*	.15	.11	.13	-			
6. Core Disgust	.20*	.17*	.13	.13	.90**	-		
7. Animal-Reminder Disgust	.08	.10	-.00	.05	.81**	.59**	-	
8. Contamination Disgust	.16*	.09	.18*	.18*	.75**	.58**	.43**	-
Mean	9.22	6.06	0.78	2.24	2.49	2.68	2.52	1.95
(SD)	(8.63)	(6.65)	(1.83)	(2.53)	(0.62)	(0.63)	(0.80)	(0.91)
N	156	156	156	156	156	156	156	156

Note: * indicates significance at the $p = 0.05$ level, ** indicates significance at the $p = 0.01$ level

Appendix: B

Table 2. Standardized Beta Coefficients

a. Dieting		β	R ² Change
Step 1	Race	-0.019	0.000
Step 2	Anxiety (DASS-21)	0.083	0.025
	Depression (DASS-21)	0.070	
Step 3	Core	0.167	0.022
	Animal-Reminder	-0.013	
	Contamination	-0.014	

Note: R² = .047, *p* = 0.29

b. Bulimia and Food Preoccupation		β	R ² Change
Step 1	Race	-0.087	0.001
Step 2	Anxiety (DASS-21)	0.161	0.097
	Depression (DASS-21)	0.178	
Step 3	Core	0.096	0.047*
	Animal-reminder	-0.185	
	Contamination	0.187	

Note: R² = .146, *p* = .001; * *p* < 0.05

c. Oral Control		β	R ² Change
Step 1	Race	-0.023	0.001
Step 2	Anxiety (DASS-21)	0.102	0.158
	Depression (DASS-21)	0.320	
Step 3	Core	0.063	0.026
	Animal-Reminder	-0.105	
	Contamination	0.152	

Note: R² = .185, *p* = .000

VITA

EDUCATION

- Aug. '10 to Present **University of Mississippi** Oxford, MS
Pursuing Doctorate of Philosophy/Clinical Psychology
- Dissertation: The Role of Disgust in Eating Disorders
 - Advisor: John Young, Ph.D.
- Aug. '08 to Aug. '10 **University of Mississippi** Oxford, MS
Master of Arts/Clinical Psychology
- Thesis: The Effects of Environmental Enrichment on the Onset of Behavioral Despair in the Chick Anxiety-Depression Model
 - Advisor: Kenneth J. Sufka, Ph.D.
- Aug. '03 to Aug. '06 **Georgia State University** Atlanta, GA
Bachelor of Science/ Psychology
- Graduated Magna Cum Laude, August 2006
 - Major grade point average: 3.81
- Aug. '01 to April '03 **University of Iowa** Iowa City, IA
Undeclared/pre-medicine

CERTIFICATIONS/LICENSURE

- July '11 **Examination for Professional Practice of Psychology (EPPP)**
- Exam taken and passed on July 28, 2011

AFFILIATIONS

- Sept. '09 to Present **American Psychology Association**
Student Member
- Nov. '09 to Present **Association for Behavioral and Cognitive Therapies**
Student Member
- Dissemination and Implementation Science Special Interest Group

- Asian American Issues in Behavior Therapy and Research Special Interest Group
- Cognitive Therapy Special Interest Group

Jan. '08 to Dec. '08 **Asian American Psychological Association**
Student member

PRACTICA EXPERIENCE

July '10 to July '11 **Region IV Mental Health Commission** Hernando, MS
Intern

- Intake Interviews and individual therapy

July '09 to Jun. '10 **Desoto County Schools** Southaven, MS
Intern

- School consults and behavior plans

TEACHING EXPERIENCE

Aug. '11 to Present **University of Mississippi** Oxford, MS
Graduate Instructor

ASSESSMENT EXPERIENCE

Aug. '08 to Present **Clinical and Research Settings**
Therapist/Research Assistant

- Mini Mental State Examination – 2nd Edition (MMSE-2), Beck Youth Inventories – II (BYI-II), Beck Anxiety Inventory (BAI), Beck Depression Inventory - II (BDI-II), Outcome Questionnaire – 45.2 (OQ-45.2), Anxiety Disorders Inventory Schedule for DSM-IV (ADIS-IV), Revised Child Anxiety and Depression Scale (RCADS), Minnesota Multiphasic Personality Inventory – Adolescent (MMPI-A), Wechsler Individual Achievement Test – Second Edition (WIAT-II), Wechsler Intelligence Scale for Children – Fourth Edition (WISC-IV), Conner's Continuous Performance Test – II (CPT-II), Behavior Assessment System for Children – Second Edition (BASC-2), Adaptive Behavior Assessment System – Second Edition (ABAS-II)

Jan. '09 to May '09 **Personality Assessment**
 University of Mississippi, Stefan Schulenburg, Ph.D.

- Tests administered: Minnesota Multiphasic Personality Inventory – Second Edition (MMPI-2), Wechsler Memory Scale-Fourth Edition (WMS-IV), Personality Assessment Inventory (PAI), Behavior

Assessment System for Children – Second Edition (BASC-2)

Aug. '08 to Dec. '08 **Cognitive Assessment**

University of Mississippi, Stefan Schulenburg, Ph.D.

- Tests administered: Wechsler Adult Intelligence Scale – Fourth Edition (WAIS-IV), Wechsler Individual Achievement Test – Second Edition (WIAT-II), Wechsler Intelligence Scale for Children – Fourth Edition (WISC-IV), Conner's Continuous Performance Test – II (CPT-II)

RESEARCH INTERESTS

My research interests encompass the underlying mechanisms (as well as related mediators and moderators) through which emotional and other psychological disorders develop and are maintained. More specifically:

- The role of disgust in the development and/or maintenance of anxiety and eating disorders
- Factors involved in the development and maintenance of maladaptive eating behaviors
- Environmental factors leading to the development of emotional and behavioral disorders
- The role of culture on the development and expression of psychopathology in youth

PUBLICATIONS

Kim, E., Ebesutani, C., & Young, J. (manuscript under preparation). The role of violence exposure and negative affect in understanding child and adolescent aggression.

Kim, E., Ebesutani, C., Wall, D., & Olatunji, B. O. (under review). Delineating factors that influence inpatient *treatment outcome for eating disorders*. *Journal of Clinical Psychology*.

Kim, E., Ebesutani, C., Wall, D., & Olatunji, B. O. (2011). Depression mediates the relationship between obsessive-compulsive symptoms and eating disorder symptoms in an inpatient sample. *Journal of Obsessive-Compulsive and Related Disorders*. Doi: 10.1016/j.jocrd.2011.11.006

Kim, E., Ebesutani, C., Young, J., & Olatunji, B. O. (2011). Factor structure of the disgust scale – revised in an adolescent sample. *Assessment*. Doi: 10.1177/1073191111434200

Johnson, L. R., Kim, E., Johnson-Pynn, J. S., Schulenburg, S. E., Balagaye, H., & Lugumya D. (2011). Ethnic identity, self-efficacy, and intercultural attitudes in East African and U.S. youth. *Journal of Adolescent Research*. doi: 10.1177/0743558411412955.

Kim, E., & Sufka, K. J. (2011). The effects of environmental enrichment in the chick anxiety-depression model. *Behavioural Brain Research*, 221, 276-281.

Hymel, K. A., Salmeto, A. L., Kim, E., & Sufka, K.J. (2009). Development and validation of the chick anxiety-depression continuum model. In J.E. Warnick & A.V. Kalueff (Eds.), *Translational Neuroscience in Animal Research: Advancement, Challenges and Research Ethics*. Commack, NY: Nova Science Publishers.

PRESENTATIONS

Sufka, K. J., & Kim, E. (December 2011). The effects of environmental enrichment in the chick anxiety-depression model. Poster presentation at the University of Mississippi Medical Center's Neuroscience and Behavioral Research Day. Jackson, MS.

Sufka, K. J., & Kim, E. (November 2011). The effects of environmental enrichment in the chick anxiety-depression model. Poster presentation at the Society for Neuroscience. Washington, DC.

Kim, E., Maack, D., & Young, J. (November 2011). The role of contamination disgust in eating disordered pathology. Symposium presentation at the annual meeting of the Association of Behavioral and Cognitive Therapies. Toronto, Canada.

Kim, E., Ebesutani, C., & Young, J. (November 2011). Exposure to violence and related aggression. Poster presentation at the annual meeting of the Association of Behavioral and Cognitive Therapies. Toronto, Canada.

Viar-Paxton, M., Kim, E., Young, J., Ciesielski, B. G., & Olatunji, B. O. (November 2011). Development and Initial Validation of the Child Disgust Scale (CDS). Poster presentation at the annual meeting of the Association of Behavioral and Cognitive Therapies. Toronto, Canada.

Kim, E., & Sufka, K. J. (April 2011). The effects of environmental enrichment in the chick anxiety-depression model. Poster presentation at the University of Mississippi's Graduate Student Council Symposium. Oxford, MS.

Berkout, O., Kim, E., Heiden, L., Hight, T. L., Damon, J. D., & Young, J. (November 2010). Relationship between suicidality and aggressive behavior in a large adolescent sample. Poster presentation at the annual meeting of the Association of Behavioral and Cognitive Therapies. San Francisco, CA.

RESEARCH

Aug. '10 to Present **SITH (Scientific Infusion That Helps) Laboratory, Department of Psychology**
University of Mississippi, John Young, Ph.D.
Graduate Student

- Exposure to trauma, negative affect, and related aggression in children
- Role of disgust in psychopathology

Jan. '09 to Present

Pharmacology Laboratory, Department of Psychology

University of Mississippi, Kenneth J. Sufka, Ph.D.

Graduate Student

- Role of the environment on anxiety and depression in an avian model

Aug. '08 to May '09

Multicultural Laboratory, Department of Psychology

University of Mississippi, Laura Johnson, Ph.D.

Graduate Research Assistant

- Application of positive youth development constructs to international samples

Sept. '06 to Jan. '08

The Child Health and Medical Pain Laboratory

Georgia State University, Lindsey Cohen, Ph.D.

Research Assistant

- Data entry and correction using SPSS, coding, data collection