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FACTORS RELATED TO OBSESSIVE-COMPULSIVE SYMPTOMS: UNDERSTANDING  
THE CONTRIBUTION OF DISGUST, COMTAMINATION FEAR AND EMOTION  
REGULATION

A Thesis

presented in partial fulfillment of requirements

for the degree of Master of Arts

in Clinical Psychology

The University of Mississippi

Alexandra M. Gilbert

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## ABSTRACT

Lifetime prevalence rates for Obsessive-Compulsive Disorder (OCD) are estimated to be 2-3% in the general population. Recently, research has demonstrated that the emotion of disgust plays an important role in the elicitation of contamination fear in contamination-based OCD. Further, associations between obsessive-compulsive (OC) symptoms and emotion regulation have been identified. The purpose of the current study was to contribute to a broader understanding of the unique and combined affects that contamination fear, disgust, and emotion dysregulation have on the endorsement of OC symptoms. Specifically, the current study aimed to explore disgust in the prediction of OC symptoms as well as to examine the role of emotion regulation in the relationship between disgust and OC symptoms.

The current study included 149 students from the University of Mississippi as apart of an archival dataset from a larger lab study. Results from the primary analyses indicate that all variables of interest (i.e. contamination fear, disgust sensitivity, and emotion regulation) were significantly correlated with OC symptoms. However, despite disgust's associations with OC symptoms, results from regression analysis suggest that neither general disgust nor individual domains of disgust were predictive of contamination-based OC symptoms above and beyond contamination fear. Results from the hierarchical regression analysis emphasize the prominent role that contamination fear has on contamination-based OC symptoms.

Further, sex differences were observed in contamination fear and disgust sensitivity such that females endorsed higher levels of each whereas no differences in general emotion regulation were observed between males and females. The observed lack of sex differences in emotion regulation supports the transdiagnostic nature of emotion regulation and shows that it occurs similarly among males and females. Moderation analysis suggests that while both emotion regulation and disgust sensitivity were independently related to OC symptoms, there did not appear to be a particular level of each that strengthened disgust's impact on symptoms. Thus, contrary to study predictions, increased emotion dysregulation did not appear to moderate disgust's relationship to contamination-based OC symptoms. Overall, results from the current study suggest that contamination fear, disgust, and emotion regulation are not uniformly related to contamination-based OC symptoms. These findings underscore the need for continued research on factors impacting contamination-based symptoms to properly conceptualize and treat contamination-based OCD.

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## I. INTRODUCTION

### 1.1 Obsessive-Compulsive Disorder

Obsessive-Compulsive Disorder (OCD) is a serious psychiatric illness characterized by recurrent, intrusive thoughts or mental obsessions that are typically followed by compensatory behaviors or compulsions to alleviate anxiety. Common obsessive symptoms of OCD may include excessive fear of contamination, preoccupation with order and symmetry, unwanted thoughts related violation of social norms or taboo, and/or repetitive checking (Brakoulias et al., 2013). This disorder is estimated to affect 0.8-2% of the population (Ruscio, Stein, Chiu, & Kessler, 2010). The lifetime prevalence of OCD is estimated to be 2-3% (Ruscio et al., 2010) with OCD ranking as the fourth most common mental health concern (Bebbington, 1998). Recurrent avoidant and neutralizing behaviors are often time consuming and are associated with considerable disruption to daily life activities, contributing to a reduced quality of life for individuals with OCD (Koran, Thienemann, & Davenport, 1996; Macy et al., 2013). For example, OCD is associated with significant impairment across several domains, including interference with interpersonal and personal functioning (Grabe et al., 2000), occupational and household responsibilities, social relationships, subjective well-being, and ability to enjoy leisure activities (Eisen et al., 2006). Symptoms of OCD can present across a broad range of experiences or contexts.



For instance, some may experience symptoms related to order or maintaining a “just right” feeling while others may experience excessive concerns related to scrupulosity, such as violating religious or moral norms.

Previous research has identified several potential risk factors associated with the onset of OCD. For example, the experience of stressful life events such as pregnancy or childbirth, significant losses, occupational changes, sexual dysfunctions and severe physical illness have been implicated in the onset of OCD, according to retrospective patient reports (Abramowitz, Moore, Carmin, Wiegartz, & Purdon, 2001; Albert, Maina, & Bogetto, 2000; Fairbrother & Abramowitz, 2007; Maina, Albert, Bogetto, Vaschetto, & Ravizza, 1999). Adult patients with OCD have also reported experiencing overprotection from caregivers during childhood (Coles & Schofield, 2008). Other risk factors may include maladaptive beliefs, such as an overestimation of personal responsibility, increased perceived likelihood of threat, and/or perfectionistic tendencies, and/or intolerance of uncertainty (Obsessive-Compulsive Cognitions Working Group [OCCWG], 1997, 2001, 2003).

A common theme of OCD is the experience of obsessions and compulsions related to contamination (Ruscio et al., 2010). Contamination-based obsessions are typically associated with intrusive, unwanted thoughts related to cleanliness after being exposed to germs. Individuals with contamination-based obsessions will often engage in a cleaning ritual or other sanitizing compulsions to reduce anxiety. For instance, typical compulsions of this nature include excessive hand washing, cleaning, and showering. These behaviors function as a way to neutralize distress and reduce the perceived threat of transmitting a disease from contaminated stimuli. Previous research also suggests that those with contamination-based OCD typically engage in avoidant and escape behaviors (Olatunji, Wolitzky-Taylor, Willems, Lohr, & Armstrong, 2009). For example, these individuals have a tendency to avoid public restrooms/ restaurants or leave an environment perceived to be dirty to reduce their risk of coming into contact with contaminated stimuli. Not surprisingly, another identified vulnerability and maintenance factor for the experience of OCD is contamination fear.

## **1.2 Contamination Fear**

Contamination fear is defined as the emotion that occurs in response to concerns of becoming contaminated in some way. For example, one may experience fear of catching a cold or disease when exposed to a contaminated object or person. Consistent with all basic emotions, the emotion of fear has three main components; physiological, behavioral, and cognitive. As with fear in general, the physiological aspects of contamination fear include an accelerated heart rate, sweating, dry mouth, trembling or shaking, and shortness of breath (Rachman, 2004). The behavioral components of contamination fear among those with OCD include escape or avoidant behaviors that function to protect oneself from objects that are perceived to be harmful (i.e. harm avoidance; Melli, Chiorri, Carraresi, Stopani, & Bulli, 2015a). Finally, the cognitive component of contamination fear corresponds to thoughts of escape or thoughts to behave in a way that will reduce distress. For example, when using a public restroom or visiting a restaurant, individuals with contamination-based OCD may begin thinking of ways to avoid use of public facilities or how to assure utensils or food is non-contaminated. Furthermore, if the individual is not able to easily escape or avoid a perceived contaminated environment, this may elicit considerable distress and reinforce avoidance of these places in the future.

Fear of contamination is estimated to account for 55-65% obsessional concerns reported by patients with OCD and is among the most common obsessional theme associated with OCD (Ruscio et al., 2010). Further, a clinical outpatient study assessing symptom dimensions among adults with OCD over the course of two years found that 56% of the sample reported contamination concerns and 58% reported cleaning compulsions (Mataix-Clos et al., 2002). Additional research findings indicate that females generally report increased levels of contamination fear compared to males (Sanavio, 1988; van Oppen, 1992; Mancini, Gragnani, & D'Olimpio, 2001). Specifically, results from a study assessing the connection between disgust and OC symptoms in a non-clinical sample demonstrated that correcting for age, females reported higher scores on the Padua Inventory-Revised ( $F(1,275)=13.43, P<0.001$ ; Mancini et al., 2001). Similarly, a study by Sawchuk, Olatunji, & de Jong (2005) assessed contamination fear among adult community samples and found that females endorsed higher levels of contamination fear measured by the Padua Inventory. Other researchers have explored gender differences in the context of OCD. For example, one study assessed gender differences among outpatients with OCD using the Yale-Brown Obsessive-Compulsive Scale (Labad et al., 2007). Results from logistic regression found that the contamination/cleaning domain of OCD, a domain associated with contamination fear, was higher among females compared to males (i.e. female: male OR = 2.02,  $p < .05$  Labad et al., 2007). The collective results from these studies suggest that gender plays a role in the experience of contamination fear and the expression of contamination-based OCD.

Another characteristic of contamination fear in OCD is that this fear is precipitated by proximal contact with stimuli that are perceived to be contaminated with or without actual contact (Rachman, 2004). This characteristic of contamination fear is thought to be related to a dysfunctional appraisal process that occurs when interacting with or thinking of contamination objects (Bhikram, Abi-Jaoude, & Sandor, 2017). For instance, those with OCD often experience an overestimation of contamination threat, consequently resulting in a perceived heightened vulnerability to getting sick from contaminating agents.

These exaggerated judgements of perceived contamination threat contribute to the elicitation of sanitization behaviors or compulsions common in those with OCD (e.g. washing, cleaning, disinfecting; Bhikram et al., 2017). Given that these compulsions temporarily alleviate the anxiety and distress associated with contamination fear, they become negatively reinforced and continue to occur (Abramowitz, Taylor, & McKay, 2009).

Excessive contamination fear follows the same maladaptive response cycle as other emotional disorders, resulting in perpetually exacerbated symptomatology. For instance, inaccurate perceptions and judgments of contaminated stimuli may lead to a cascade of cognitive (i.e. obsessions) and emotional (i.e. fear) distress, resulting in maladaptive behavioral (i.e. compulsions) responses (Rachman et al., 2004). Examples of contamination fear related compulsions in OCD include always wearing gloves, keeping hand sanitizer available at all times, and using napkins/sanitizing wipes when touching potentially contaminated objects (e.g. doorknobs, public tables/chairs, restroom sinks/toilets, etc.).

These types of behaviors are termed “safety behaviors”, which are described as learned strategies that anxious individuals use to detect, avoid, or escape a feared outcome (Deacon & Maack, 2008). Individuals with OCD can become dependent on these safety behaviors to reduce distress from perceived threat (i.e. decrease concern or contact with contamination items or places). These safety behaviors correspond to items that cue a sense of safety when presented with feared stimuli. For example, carrying around one’s anxiety medication, cell-phone, water bottle etc. at all times. While these safety behaviors help to make the individual feel more comfortable, they also reduce new learning by preventing the disconfirmation of inaccurate beliefs (Salkovskis, Clark, Hackmann, Wells, & Gelder, 1999). The prevention of new learning contributes to the potential maladaptive function of safety behaviors.

A study by Deacon and Maack (2008) experimentally tested whether safety behaviors contribute to the development and exacerbation of contamination fear using a within-subjects design. Following a week-long baseline period, participants were instructed to engage in a clinically representative array of contamination-related safety behaviors on a daily basis for one week. Subsequent to the week of engagement in safety behaviors, the time two measures indicated that participants did experience significant increases in contamination fear. These results help elucidate the important role that safety behaviors play in the maintenance and exacerbation of contamination fear and may therefore provide further insight into the conceptualization of fear-related symptoms among those with contamination-based OCD.

Avoidance is also a common response to contamination fear among those with OCD that occurs across contexts (Tsao & McKay, 2004), and can lead to consequential social isolation.

Contamination fear driven avoidance can be either subtle or overt and contributes to diminished social functioning among those with contamination-based OCD (Kugler, Lewin, Phares, Geffken, Murphy, & Storch, 2013). For example, it is common for individuals with contamination fear OCD to engage in little to no social interactions given that the obsessive nature of contamination cognitions and subsequent compulsions require considerable time and often result in the individual becoming confined to the perceived safety of their own home. Consequences of this avoidance often results in limited behavioral activation and social engagements, which reduces social support and life satisfaction. In fact, a common comorbidity of OCD is depression, which is associated with increased suicidality and reduced treatment outcomes (Overbeek, Schruers, Vermetten, & Griez, 2002). Overall, contamination fear contributes to dysfunctional behavioral responses, resulting in restricted life domains and limited fulfillment among those with contamination-based OCD.

Contamination fear has evolved to protect the human species from hazardously contaminated agents and therefore can be viewed as a protective emotional response (Rachman, 2004). However, the evolutionarily adaptive function of contamination fear can become pathological when it manifests in ways that correspond with irrational beliefs such as sympathetic magic, which can exacerbate symptoms for those with OCD. Sympathetic magic is defined as an irrational understanding of how contagion is transmitted (Tolin, Worhunsky, & Maltby, 2004). This construct has been conceptualized to be related to contamination fear in that it refers to a subjective sense of contamination from objects for which no objective contamination qualities are present (Rozin & Fallon, 1987).

Sympathetic magic has been identified as an important component in development and maintenance of OCD given that it refers to the irrational beliefs an individual has towards contagion transmission (Nemeroff & Rozin, 1994). Within sympathetic magic is the belief that contaminated objects sustain their contagion indefinitely and have the ability to transmit contamination regardless of any sanitization methods. An example of sympathetic magic is an aversion to eating a bowl of soup that has been stirred by a used but sterilized fly swatter, for fear the soup would still be contaminated. Sympathetic magic is thought to be the mechanism by which fear of contamination transcends beyond physical contact with perceived contaminated stimuli.

A study by Tolin, Worhunsky, and Maltby (2004) assessed the concept of sympathetic magic and contagion among those with contamination-based OCD. To do this, participants were asked to identify a “contamination” object and rate its degree of perceived contamination on a scale from 0-100. Next, researchers touched a neutral stimulus (i.e. clean pencil) to the contaminated object and participants were asked to rate how contaminated it was using the same scale. A second pencil was touched to the first pencil and rated.

This process was repeated for up to 12 pencils (i.e. 12 degrees of removal from the originally contaminated object). Results demonstrated that OCD participants experienced higher perceived levels of contagion both initially and overall to contaminated items compared to anxious (without OCD) and non-anxious controls. For instance, successive degrees of removal of a neutral stimulus from a contaminated object did not reduce perceived contamination of the neutral stimuli among those with OCD. This finding elucidates the construct of sympathetic magic and how contamination obsessions can manifest from seemingly benign stimuli for those with OCD.



Contamination related fears are prevalent among those with OCD (Ruscio et al., 2010). Since initial studies in the area, the research has developed a more thorough and comprehensive conceptualization of this OCD subtype. However, more recent research has begun to focus on understanding the underlying components responsible for the immediate thoughts of becoming contaminated. While the emotion of fear may be a result of such contamination-related thoughts, the question of what internal mechanisms provoke these thoughts remains. Parsing out the different components of contamination-based OCD has important implications for understanding this seemingly complex disorder.

### **1.3 Disgust**

In addition to contamination fear, more recent research has found substantial evidence for the role of disgust in the symptom presentation of contamination-based OCD (Bhikram et al., 2017; Brady, Adams, & Lohr, 2010, Deacon & Olatunji, 2007, Mancini et al., 2001, Melli, Chiorri, Carraresi, Stopani, & Bulli, 2015b; Rachman, 2004; Tolin et al., 2004; Woody & Teachman, 2000; Woody & Tolin, 2002).

Disgust is a universal emotion that is characterized by feelings of being repulsed by stimuli that is perceived to be considerably unpleasant or offensive (Angyal 1941; Darwin, 1872; Darwin, 2013). The evolution of disgust has been described as a dynamically adaptive system that functions to protect the individual from infection or disease, which contributes to disease avoidant behavior (Curtis & Biran, 2001).

Others have conceptualized disgust as a psychological mechanism for which pathogen avoidant behavior emerges (Curtis, Aunger, & Rabie, 2004; Curtis & Biran, 2001; Oaten, Stevenson, & Case, 2009). Research has indicated that females endorse higher levels of disgust, controlling for age, in comparison to males as measured by the Disgust Scale [ $F(1, 275)=36.38, p < .001$ ] (Mancini et al., 2001). Moreover, several research studies have determined that disgust is not a unitary or homogeneous construct (Rozin & Fallon, 1987; Olatunji, Ebesutani, Haidt, & Sawchuk, 2014; Olatunji & Sawchuk, 2005; Rozin, Haidt, & McCauley, 2008). Rozin, Haidt, and McCauley (2000) developed a classification system of disgust identifying three primary categories: core, animal reminder, and contamination. The core disgust domain is described as the reactive emotion of disgust that occurs in response to potentially harmful stimuli such as bodily substances, rotten food, or waste material (feces or garbage). Reactivity to core disgust elicitors has been identified as a risk factor for the development of contamination-based OCD due to its relation to contamination fear (Olatunji, Haidt, McKay, & David, 2008). Additionally, research has indicated that contamination fear, which is present in contamination-based OCD, is best predicted by the core disgust domain (Sawchuk et al., 2005). Further, among an OCD sample, symptoms corresponding to cleaning dimensions of the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) have been positively associated with core disgust scores measured by the Disgust Scale (Jhung et al., 2010).

Animal reminder disgust is related to reminders of death or our inherent animalistic nature (Olatunji et al., 2008; Rozin et al., 2008).

This disgust reaction is elicited by exposure to stimuli that violates the body envelope such as animal tissue or bodily organs (Sawchuk, Lohr, Tolin, Lee, & Kleinknecht, 2000). The animal reminder disgust domain was previously thought to contribute to obsessive-compulsive symptoms given that hygienic standards of the human body are maintained by cleaning and grooming behaviors (Rozin et al., 2008); however, a study by Olatunji, Williams, Lohr, & Sawchuk (2005) found that animal reminder disgust was not significantly related to contamination ideation or excessive washing behaviors. Another study assessing perception bias of disgust in facial expressions among those with OCD found that animal reminder disgust did not correlate with symptoms on the cleaning dimension of the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) among those with OCD (Jhung et al., 2010). The relative association between the animal reminder disgust domain and OCD symptoms are equivocal at best, as another study found evidence to support that the relationship between contamination fear and disgust has stronger associations to animal reminder disgust compared to core disgust (Olatunji, Sawchuk, Lohr, & de Jong, 2004). Contamination disgust is related to the transmission of disease and is a function of the disease-avoidance model, whereas fear serves to reduce the risk of coming into contact with contaminated or disease-ridden objects (Matchet & Davey, 1991; Rozin et al., 2008; Ware, Jain, Burgess, & Davey, 1994). Contamination disgust is differentiated from contamination fear in that it is associated with feeling revolted and refers to the behavioral and physiological reactions that occur in response to contaminated stimuli while contamination fear is related to the worry of becoming infected by a stimulus in some way.

Researchers have found evidence to support that contamination disgust plays an important role in the maintenance of contamination-based OCD (Berle & Phillips, 2006).

Further, symptoms associated with cleaning dimensions of OCD measured by the Y-BOCS among those with OCD have been found to be significantly positively related to core disgust ( $r = .32, p < .05$ ) and contamination disgust ( $r = .46, p < .01$ ) but not animal reminder disgust ( $r = .02, p = .90$ ; Jhung et al., 2010). This finding preliminarily suggests that contamination-based OCD is most closely associated with the contamination domain of disgust in comparison to core and animal reminder domains.

#### **1.4 Differentiating Disgust from Other Emotions**

From a physiological perspective, disgust is associated with a parasympathetic autonomic response (Levenson, 1992; Rozin et al., 2008; de Jong, van Overveld, & Peters, 2011). This differentiates the emotion of disgust from anger and fear, as these emotions are predominately associated with sympathetic responses (Levenson, Ekman, & Friesen, 1990; Levenson, 1992). More specific physiological components of disgust include decreased blood pressure, slowed heart rate and digestive activity (de Jong et al., 2011), galvanic skin response (i.e. changes in electrical resistance of the skin induced from emotional distress), activation of serotonin pathways, and nausea (Curtis, De Barra, & Auger, 2011; Rozin et al., 2008).

When one experiences the emotion of disgust, unique facial expressions are displayed, often described as the “disgust face”.

These expressions include wrinkling of the nose to communicate or reduce a bad smell, as well as a combination of tongue and gape expression, which are associated with oral irritation (e.g. bad taste), upper lip retraction and furrowed eye brows (Darwin, 1872; Izard, 1971; Ekman, 1971; Ekman & Friesen, 1975; Rozin, Lowery, & Ebert, 1994). The expressional components of disgust are thought to decrease the risk of contaminating agents entering the body and facilitate communication of repulsion (Angyal, 1941; Rozin & Fallon, 1987).

Another area of research, such as facial processing studies, also differentiate the emotion of disgust from other basic emotions. Specifically, in the realm of OCD, results from facial processing studies reveal that patients with OCD inaccurately interpret a variety of ambiguous facial expressions as disgust but display normal recognition of other non-ambiguous emotional facial expressions (Corcoran, Woody, & Tolin, 2008; Daros, Zakzanis, & Rector, 2014; Sprengelmeyer et al., 1997). Further, it has been hypothesized that only a subset of those with OCD may have altered disgust perception, particularly those experiencing symptoms related to contamination (Jhung et al., 2010). Early facial processing studies involved procedures that presented participants with non-ambiguous facial expressions of basic emotions (i.e. anger, happiness, sadness, etc.) and then tested their ability to accurately interpret each expression. More recently though, Jhung and colleagues (2010) aimed to compare the perception of negative emotions among a sample of OCD patients to that of normal controls. The overall sample of OCD patients included OCD subtypes related to symmetry, forbidden thoughts, cleaning, and hoarding. For the procedure, the OCD patient sample and control group were presented with ambiguous facial expressions to more adequately represent everyday occurrences and asked for emotional interpretations.

Results from this study were meaningful as results demonstrated that compared to normal controls, patients with OCD demonstrated a perception bias towards a disgust over anger in ambiguous expressions. Specifically, among OCD patients, higher scores on the cleaning dimensions (i.e. hand washing) was a predictor of greater perception of disgust in ambiguous facial expressions controlling for age, gender, and depression (Jhung et al., 2010). However, there were no differences between the two groups for identifying non-ambiguous facial expressions. These findings preliminarily suggest that OCD patients, particularly those with washing/contamination symptoms, are more likely to perceive disgust in ambiguous facial expressions.

Since individuals with OCD are more reactive to disgust related stimuli, it has been proposed that these individuals may learn to associate feelings of disgust with a broad range of emotional facial expressions (Bhikram et al., 2017). The disrupted appraisal process of disgust observed in those with contamination-based OCD may contribute to an impaired ability to accurately appraise disgust facial expressions (Bhikram et al., 2017). This hypervigilant, yet inaccurate, detection of disgust expressions may in turn lead an individual with contamination-based OCD to generalize disgust responses to many other ambiguous facial expressions. For instance, they may misinterpret a confused or quizzical facial expression as a disgust response, which could potentially lead to associated cognitive and behavioral responses, such as contamination obsessions and cleaning compulsions/rituals (Jhung et al., 2010).

While these facial misjudgments can be problematic in the sense that they lead to inaccurate perceptions of disgust among ambiguous external stimuli, there is research to suggest that these deficits are malleable and more accurate perceptions of disgust can be attained (Rector, Daros, Bradbury, & Richter, 2012).

Interestingly, Rector and colleagues (2012), found evidence to support that deficits in disgust recognitions among those with OCD can be improved following cognitive-behavioral therapy (CBT) for OCD suggesting that disgust recognition impairments can be modified through OCD treatment. While this study did not directly test the mechanisms that accounted for the observed improvements in disgust recognition, authors hypothesized that it may have been a result of acute symptom reduction and/or normalization of cognitive patterns associated with disgust responses. For example, it has been proposed that more accurate cognitive appraisals of disgust may in turn lead to more accurate identification of facial expressions of disgust (Rector et al., 2012). It has also been proposed that there is a possible state-dependent link between disgust recognition impairment and OCD symptom severity given that an association between the degree of disgust recognition impairment and severity of OCD has been observed (Corcoran et al., 2008). Collective findings from these facial recognition and intervention studies provide further evidence for the role of disgust in the presentation of OCD.

### **1.5 Disgust's Contribution to OCD**

Related to the experience of disgust, patients with OCD often describe OCD symptom-relevant stimuli as “disgusting” rather than “frightening” (Tolin et al., 2004). Significant, positive correlations between contamination fear and disgust have been identified among those with OCD (Olatunji et al., 2004).

Specifically, Olatunji and colleagues (2004) examined contamination fear across various domains of disgust and found that individuals high in contamination fear scored significantly higher across disgust domains (i.e. animals, injections and blood draws, mutilation and death, rotting foods, and smells) than those low in contamination fear. Further, a study by Melli and colleagues (2015a) aimed to test the validity of a bi-dimensional model of contamination fear to provide evidence for the hypothesized heterogeneity of contamination-based OCD. The bi-dimensional model proposed that OCD patients whom experience a fear of harm from contamination (i.e. harm avoidance) could be distinguished from OCD patients experiencing fear of disgusting substances/persons (i.e. disgust avoidance). To do this, authors developed and validated a measure of contamination fear that distinguished whether OCD patients' symptoms (i.e. washing/cleaning compulsions) are motivated by harm avoidance or disgust avoidance. Results suggested that those with contamination-based OCD engaged in compensatory cleaning and avoidance behaviors motivated by disgust avoidance rather than harm avoidance (Melli et al., 2015b). These findings provide support for the distinctive nature of disgust and its distinguishability from other motivational dimensions (i.e. harm avoidance) among those with contamination-based OCD. Contamination-based OCD symptoms may be motivated by feelings of distress (i.e. disgust) that do not necessarily correspond to a perceived harmful outcome.

Additionally, convergent evidence from brain and animal neuroimaging research suggests that shared brain regions are activated with both disgust and OCD reactions (Bhikram et al., 2017).



The following brain regions have been found to be hyperactive in OCD pathophysiology: the orbital frontal cortex (OFC), anterior cingulate cortex (ACC), basal ganglia, and the insula (Del Casale et al., 2011; Kwon, Jang, Choi, & Kang, 2009). More recently, evidence has shown that some of these same regions (i.e. OFC, basal ganglia, insula) are also activated during disgust processing (Husted, Shapira, & Goodman, 2006; Jung, Ku, Kim, Lee, Kim, An, Kim, Yoon, & Lee, 2014). Another notable finding has shown that the amygdala, which is associated with fear and anxiety responding, was not commonly activated during the provocation of OCD symptomatology, suggesting a response to a different emotional process (Friedlander & Desrocher, 2006; Del Casale et al., 2011). Similar findings have indicated that in comparison to healthy controls, patients with OCD display normal neural activations when provoked with threatening or fearful stimuli (Shapira et al., 2003). Implications of this research provide further evidence to support that fear and anxiety may not be the principal emotions contributing to the endorsement of OC symptomatology.

### **1.6 Conceptualization of OCD**

The current conceptualization of OCD includes a combination of cognitive, emotional, and mood components (Yap et al., 2018). Specifically, the cognitive component of OCD corresponds to intrusive thoughts and dysfunctional appraisals of various stimuli, both of which contribute to mental obsessions/rumination. Disgust and fear are the affective emotional states associated with the cognitive and corresponding behavioral components. These emotional states are linked to the compensatory actions of those with OCD (i.e. compulsive rituals/acts are performed to alleviate the distressing emotion).

The associated mood states of OCD are typically negative, longer in duration, and more stable across contexts. Negative mood states are thought contribute to the cycle of OCD in which negative appraisals lead to negative emotions and result in counterproductive compulsions or safety-seeking behaviors. Given that mood and emotions impact many psychological disorders, it follows that the ability to effectively regulate emotions may impact OCD (Yap et al., 2018). In fact, difficulty regulating emotions has been closely associated with the maintenance of compulsions in OCD (Calkins, Berman, & Wilhelm, 2013).

### *1.7 Emotion Regulation*

Emotion regulation (ER) is defined as “the processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions” (Gross, 1998, p. 275). Further, emotion regulation corresponds to the ability to control or mitigate strong emotions through flexible regulation strategies for appropriately modulating emotional experiences. Adaptive regulation strategies involve monitoring and evaluating emotional experiences, which highlights the importance of awareness and understanding of emotions (Thompson & Calkins, 1996).

Accepting emotions and behaving in accordance with desired goals and situational demands are also associated with effective emotion regulation (Gratz & Roemer, 2004). Previous research has identified emotion *dysregulation*, an ineffective regulation of emotions, as a transdiagnostic vulnerability across various psychological disorders and maladaptive behaviors (Gross & Munoz, 1995).

Emotion dysregulation has been found to moderate the relationship between disgust and disordered anxiety, as well as factors related to contamination-based OCD (Cisler, Olatunji, & Lohr, 2009).

### **1.8 Emotion Regulation and OCD**

More specifically, a study by Stern, Nota, Heimberg, Holaway, and Coles (2014) assessed facets of emotion regulation and OC symptoms. In this study, emotion regulation was collectively assessed via the Affective Control Scale (i.e. assessing fear of emotions), the Alexithymia Scale (i.e. assessing comprehension and understanding of emotions), and the Trait Meta-Mood Scale (i.e. assessing capacities to attend to, understand, and regulate emotions). Using undergraduate self-report data, findings demonstrated that OC symptoms (assessed by the OCI; washing, checking, doubting, ordering, hoarding, and neutralizing behaviors) were associated with a poor understanding of emotions, as assessed by the Alexithymia Scale, and a fear of emotions (a component of emotion dysregulation) as measured by the Affective Control Scale. Specifically, participants demonstrated a fear to both negative emotions (i.e. anxiety, anger, and depressed mood) and unexpectedly, positive emotions. OC symptoms were not found to be significantly related to one's attention to feelings or one's ability to repair their mood as assessed by the Trait Meta-Mood Scale. Findings from this study suggest that emotion dysregulation may be more central to the presentation of OC symptoms (i.e. poor understanding of emotion and negative reactivity to emotions) rather than maladaptive attention to deficits in mood repair.

Similarly, a study using a community sample of adults also assessed potential associations between the emotion regulation and OC variables (Fergus & Bardeen, 2014). Using the Dimensional Obsessive-Compulsive Scale, to assess OC symptoms and both the Emotion Regulation Questionnaire and Difficulties in Emotion Regulation Scale, to assess ER, results suggested that the facets of emotional regulation uniquely related to OC symptoms include expressive suppression, difficulties in impulse control, and lack of emotional clarity (Fergus & Bardeen, 2014). Another study examining the relationship between emotion regulation skills and OC symptoms among a clinical OCD sample showed that improvements in emotional regulation were associated with decreases in OCD severity (Allen & Barlow, 2009). Together, these studies provide support for the relationship between OC symptoms and emotion regulation difficulties.

More recently, Yap and colleagues (2018) conducted a study comparing emotion regulation difficulties in a clinical OCD sample to those in a community sample. Results indicated that overall, emotion regulation was positively correlated with OCD symptoms (in both the community and OCD sample). Further, when direct comparisons between the two groups were made related to ER, the OCD group demonstrated higher emotion regulation difficulties. Specifically, two facets of the DERS emotion regulation difficulties (i.e. nonacceptance of emotions and difficulties in engaging in goal-directed behavior when distressed) uniquely impacted OCD severity while controlling for covariates (i.e. age, gender, anxiety, and depression).

Findings from this study along with several others (Fergus & Bardeen, 2014; Robinson & Freeston, 2014; Smith, Wetterneck, Hart, Short, & Björgvinsson, 2012; & Stern, Nota, Heimberg, Holaway, & Coles, 2014) highlight a general difficulty in accepting and tolerating negative emotions among those with OCD.

### **1.9 Gaps in Current Literature**

The studies discussed thus far have explored emotion regulation and OCD symptoms in general, but few have specifically investigated this relationship in the context on the contamination-based OCD subtype alone. A clinical study using participants from residential and intensive outpatient facilities and private practices specializing in OCD treatment, aimed to assess differences in obsessional beliefs and emotion cognitions/appraisals among various subtypes of OCD presentations. These emotion cognitions/appraisals refer to an individual's beliefs about emotions, measured by the Perceived Threat from Emotions Questionnaire-Revised. When comparing differences of these factors across various subtypes of OCD, results suggested that only patients with contamination-based OCD experienced difficulty regulating distress associated with an overestimation of threat perception (Smith et al., 2012). These findings were specific to those with contamination-based OCD and could be differentiated from those individuals with other subtypes of OCD. Further, Stern and colleagues (2014) found that fear of anxiety, depression, anger, and positive emotions was ubiquitous across OCD domains (including the contamination-based subtype). Both of these studies suggest that individuals with OCD, including contamination-based, experience difficulty interpreting and responding to their emotions.

While these studies have made considerable contributions to the understanding of how emotion regulation impacts OCD in general, research remains limited on studies emphasizing emotion regulation difficulties specific to contamination-based OC symptoms.

Several studies suggest that contamination fear, contamination disgust, and emotion dysregulation independently contribute to OC symptoms, however, there are no studies examining all three constructs together specifically targeting contamination-based OC symptoms. One study to date has explored all three of these constructs together in relation to contamination fear, however, it was not conducted in the context of contamination-based OC symptoms. This study was conducted by Cisler and colleagues (2009) and examined emotion regulation and disgust in relation to contamination fear among undergraduate students. The objective was to assess the degree to which disgust sensitivity (i.e. degree of distressed associated with the experience of disgust) and emotion regulation influenced the effect of disgust propensity (i.e. the frequency or tendency for which an individual experiences a disgust response) on contamination fear (Cisler et al., 2009). Results indicated that general emotion dysregulation (GED) was specifically found to strengthen the contribution of disgust propensity to contamination fears. Although this study provides information on how emotion regulation and disgust relate to contamination fear, it remains unclear on how these constructs relate to contamination-based OCD symptoms specifically.

Taken together, contamination fear, contamination-based disgust, and emotion regulation have all been found to contribute to symptoms of OCD. Prior to advances in disgust research, OCD was conceptualized to operate on the basis of fear and/or anxiety.

The current literature supports the conclusion that disgust plays a more significant role in eliciting and maintaining symptoms related to OCD compared to fear alone (Bhikram et al., 2017). As discussed, there is evidence that the contamination-based domain of disgust is predictive of contamination fear in those with OCD (Olatunji, Cisler, McKay, & Phillips, 2010). Collectively, these findings carry important potential implications for properly conceptualizing contamination-based OCD.

### The Present Study

Thus, the purpose of the present study was to contribute to a broader understanding of the unique and combined variance that each of these constructs (i.e. contamination fear, disgust, and emotion regulation) has on the experience of contamination-based obsessive-compulsive (OC) symptoms. This study aimed to explore disgust in the prediction of OC symptoms above and beyond contamination fear, as well as to examine the role of emotion regulation in the relationship between disgust and OC symptoms. More specifically, the following were hypothesized:

- 1) All primary variables of interest will be positively and significantly related to obsessive-compulsive symptoms (i.e., disgust sensitivity, contamination fear, emotion regulation).
- 2) Sex differences will be seen in the experience of contamination fear, disgust, and emotion regulation with women endorsing higher sensitivity in contamination fear and disgust and increased emotion regulation difficulties.

- 3) Controlling for contamination fear, disgust will uniquely predict the endorsement of OC symptoms.
- 4) Emotion Regulation will moderate the relation between disgust and OC symptoms.



## 2. METHODS

### 2.1 Participants

The current study used an archival data set from an IRB approved lab study at the University of Mississippi. The sample included college students at a large southeastern university. An a priori power analysis was conducted using G\* Power 3 to determine the sample size needed to adequately detect a medium effect for the primary hypothesis (i.e. hypothesis 2). According to the results, a sample size of  $N= 107$  is adequate to find a medium effect size of 0.15 with 0.95 power and alpha of  $p < .05$  (the analysis requiring the greatest sample). Therefore, the archival data set of 159 participants was sufficiently powered to test the proposed hypotheses.

### 2.2 Measures

The *Demographic Questionnaire* included questions that assess basic demographic information, including age, sex, marital status, education level, employment status, household income, race, ethnicity, and religious affiliation.

The *Obsessive–Compulsive Inventory- Revised* (OCI-R; Foa et. al., 2002) is an 18-item self-report measure of obsessive-compulsive symptoms that is modeled after the 42-item Obsessive-Compulsive Inventory (OCI; Foa, Kozak, Salkovskis, Coles, & Amir, 1998). The OCI-R assesses distress associated with obsessive-compulsive symptoms across six domains.

Participants are asked to rate the degree to which they are bothered or distressed by each presented symptom over the past month. The scale is measured on a 5-point Likert scale (i.e. 0=not at all, 4=extremely), with higher scores indicating more severe symptoms of OCD (Foa et al., 2002). The OCI-R has demonstrated strong psychometric properties in which it has been reported to have good to excellent internal consistency, test-retest reliability, and convergent validity (Foa et al., 2002). Only the washing subscale (related to contamination symptoms) was used in this study to assess the endorsement of obsessive-compulsive symptoms associated with contamination (Foa et al., 2002). In the current study, the total scale demonstrated excellent internal consistency ( $\alpha = .91$ ).

The *Padua Inventory Contamination Fear Subscale* (PI; Burns, Keortge, Formea, & Sternberger, 1996) is a 10-item self-report scale designed to assess an individual's aversion towards contamination. This subscale of the PI measures contamination-related obsessions and washing compulsions. Items are rated on a 5-point Likert scale with higher scores indicating increased levels of impairment. The PI contamination fear subscale has demonstrated adequate internal consistency ( $\alpha = .85$ ) and test-retest reliability ( $\alpha=.72$ ) for this subscale (Burns et al., 1996). The total scale demonstrated good internal consistency ( $\alpha = .89$ ) in the current study. The PI contamination fear subscale was used to assess the role of contamination fear in the endorsement of OC symptoms among the study participants.

The *Disgust Scale-Revised* (DS-R; Olatunji et al., 2007a) is a 25-item inventory that measures the emotion of disgust across three different dimensions (i.e. core disgust, animal-reminder disgust, and contamination-based disgust; Olatunji et al., 2007a). The DS-R is a condensed version of the 32-item Disgust Scale (DS; Haidt, McCauley, & Rozin, 1994). The DS-R is context dependent in that participants are presented with several statements describing different experiences and then asked to rate level of disgust. Items 1-14 are rated on a 5-point scale (i.e. 0= *strongly disagree or very untrue about me*, 4= *strongly agree or very true about me*) as well as items 15-27 (0= *not disgusting at all*, 4= *extremely disgusting*) with higher scores indicating increased rates of disgust. The DS-R has demonstrated good convergent and construct validity (Olatunji et al., 2007a). The overall scale ( $\alpha=.88$ ) as well as the core ( $\alpha=.82$ ) and animal-reminder ( $\alpha=.73$ ) disgust subscales demonstrated good internal consistency (Olatunji et al., 2007a). The contamination-based disgust subscale evidenced adequate internal consistency ( $\alpha=.71$ ; Olatunji et al., 2007a). The total scale demonstrated good internal consistency ( $\alpha=.83$ ) in the current study. The overall DS-R was used to assess the role of disgust sensitivity as a predictor of OC symptoms among the study sample.

The *Difficulties in Emotion Regulation Scale* (DERS; Gratz & Roemer, 2004) is a 36-item self-report measure of the complex, clinically relevant difficulties in emotion regulation. Participants provide ratings on a 5-point Likert scale of how often a statement applies to them (i.e. 1=*almost never* and 5=*almost always*). Total scores range from 36-180 in which higher scores are indicative of increased difficulty in emotion regulation, which is commonly referred to as emotion dysregulation (Gratz & Roemer, 2004). The DERS has demonstrated high overall internal consistency ( $\alpha=.93$ ), good test-retest reliability, and adequate construct and predictive validity (Gratz & Roemer, 2004). In the current study, the total scale evidenced good internal consistency ( $\alpha = .89$ ). The DERS was used to assess the role of emotion regulation as a potential mediator of disgust and OC symptoms.

### **2.3 Procedures**

The current study used archival data from a previously completed IRB approved lab study. The overall study recruited university students from the psychology research pool using the SONA systems. Participants presented to the ADEPT lab where written informed consent was obtained. Following the consent process, participants completed a packet of questionnaires, followed by administration of a semi-structured clinical interview (Anxiety Disorders Interview Schedule for DSM-IV, ADIS- IV). Following completion of the interview, participants were asked to engage in eight Behavioral Avoidance Tasks (BATs). Only the aforementioned questionnaires were included in the analysis for the proposed study. Extra course credit or research credit was granted to participants for their participation.

## **3. RESULTS**

### **3.1 Preliminary Analyses**

All analyses for the present study were performed using SPSS Version 24 (IBM Corp., 2016). Data were collected from 159 participants. Upon initial data screening, 8 participants were found to have more than 10% missing data and were excluded from further analysis. Specifically, 7 participants were found to have 100% missing data and 1 participant had 10.4% missing data. After excluding cases entirely missing 10% or more of data, linear trend at point imputation was implemented for participants with less than 10% missing data. An additional 2 participants were removed following testing for outliers using Mahalanobis distance. The final sample resulted in 149 participants to be included in the analyses (N=149). Further, the final sample was predominantly female (76.7%) with ages ranging from 18-36 (M= 19). Participants were 70.7% White, 22.4% Black, 2.0% Asian, 0.7% Native American, Alaskan Native, 4.0% Multiracial.

### **3.2 Primary Analyses**

#### *3.21 Correlation Analysis*

Correlation analyses were run to identify any relations between the constructs of interest (i.e. disgust sensitivity, contamination fear, emotion regulation, and OC symptoms). A summary of these correlational results can be found in Table 1.

As expected, OC symptoms (as measured by higher scores on the OCI-R) and emotion regulation (as measured by higher scores on the DERS-total score) were significantly correlated ( $r = .41; p < .001$ ), suggesting that higher levels of OC symptoms were related to greater ER difficulties. Additionally, OC symptoms were significantly correlated with contamination fear (as measured by higher scores on the Padua Inventory Contamination Fear Subscale) ( $r = .55; p < .001$ ), indicating that higher levels of OC symptoms are also associated with higher levels in contamination fear among participants. Finally, OC symptoms were significantly and positively correlated with disgust sensitivity (assessed by higher levels of scores on the Disgust Scale-Revised) ( $r = .31; p < .001$ ), which suggests that higher levels of OC symptoms are associated with higher levels of disgust sensitivity.

### *3.22 Sex Differences in Disgust Sensitivity, Contamination Fear, and Emotion Regulation*

Next, an ANOVA was conducted to compare the effect of sex (i.e. males and females) on disgust sensitivity, contamination fear, and ER difficulties. Specifically, it was hypothesized that females would endorse higher sensitivity to disgust and contamination fear and increased emotion regulation difficulties compared with males. Results from the ANOVA found a significant effect of sex on disgust sensitivity and contamination fear for the two groups [ $F(1, 144) = 38.44, p < .001$ ] and [ $F(1, 144) = 7.57, p < .01$ ], respectively. Specifically, females were shown to endorse higher disgust sensitivity and contamination fear compared to males. However, no significant effect of sex on ER difficulties was seen [ $F(1, 134) = .001, p = .971$ ]. Table 2 includes a summary of these findings.

### 3.23 Hierarchical Regression Analysis

A hierarchical regression analysis was conducted to assess the hypothesis that disgust will predict OC symptoms controlling for contamination fear.

A summary of this analysis can be found in Table 3. In this regression analysis, the dependent variable was OC symptoms and the independent variable was disgust, controlling contamination fear. Specifically, Step 1 included contamination fear while Step 2 included disgust. The outcome variable in this analysis was OC symptoms. Results from hierarchical regression suggested that the first step including contamination fear predicting OC symptoms was significant [(Model 1 ( $F[1, 147] = 62.83, p < .001$ ) and accounted for 29.5% of the variance in OC symptoms. However, Model 2 (disgust contributing unique variance to OC symptoms) was not significant ( $F[1, 146] = .177; p = .67, \Delta R^2 = .001$ ) suggesting that disgust did not significantly predict OC symptoms controlling for contamination fear.

### 3.24 Emotion Regulation as a Moderator of Disgust and OC Symptoms

A moderation analysis was used to test the hypothesis that ER would moderate the effect of disgust on OC symptoms. The PROCESS plug-in (Hayes, 2018) was used to center variables for analyses. Findings are included in Figure 1. The overall model with the interaction was significant [ $F(3, 147) = 13.03, p < .001, R^2 = .21$ ], and a significant main effect of disgust on OC symptoms [ $b = .16, t(147) = 3.43, p < .001$ ] indicated that as disgust levels increase, OC levels increase. There was also a significant main effect of ER on OC symptoms [ $b = .17, t(147) = 4.50, p < .001$ ] suggesting that as ER difficulties increase, OC levels increase.

However, the interaction between these variables on OC symptoms was not significant [ $b = .00$ ,  $t(147) = .97$ ,  $p = .34$ ]. This suggest that while ER and disgust both independently positively predict OC symptoms, the level of each of these variables (i.e. low, average, high) did not significantly impact OC symptoms. Thus, ER did not moderate the relationship between disgust and OC symptoms.

### *3.25 Post-hoc analyses*

Considering that the hierarchical regression analysis was conducted using the total score from the DS-R, the individual domains of disgust were not explored. Therefore, a series of post-hoc analyses were conducted to test the relations between the DS-R subscales (i.e. core disgust, animal reminder disgust, and contamination disgust) and OC symptoms. First, a post-hoc correlational analysis was conducted and results suggested that the core disgust domain ( $r = .24$ ;  $p < .05$ ), the animal reminder disgust domain ( $r = .27$ ;  $p < .01$ ), and contamination disgust domain ( $r = .27$ ;  $p < .01$ ) of the DS-R were all significantly positively related to OC symptoms (as measured by higher scores on the OCI-R).

Second, a post-hoc hierarchical regression analysis was conducted to assess whether any of the individual domains of disgust, the contamination domain of disgust in particular, were predictive of OC symptoms controlling for contamination fear. The outcome variable was OC symptoms for each analysis. Specifically, Step 1 of the first regression analysis included contamination fear and Step 2 included core, animal reminder, and contamination disgust (as measured by the disgust subscales of the DS-R).



Results suggested that the first step including contamination fear predicting OC symptoms was significant [(Model 1 ( $F[1, 149] = 38.08, p < .001$ ) and accounted for 19.8% of the variance in OC symptoms. However, Model 2 (individual disgust domains contributing unique variance to OC symptoms) was not significant ( $F[3, 146] = .613; p = .61, \Delta R^2 = .010$ ) suggesting that none of the individual domains of disgust did not significantly predict OC symptoms controlling for contamination fear.

## **4. DISCUSSION**

The current body of literature on contamination-based OCD suggests that contamination fear, disgust sensitivity, and emotion regulation (ER) all play a significant role in the development and maintenance of the disorder (Rachman, 2004, Bhikram et al., 2017, Mancini et al., 2001, Melli et al., 2015b, Calkins et al., 2013, Smith et al., 2012, Stern et al., 2014). While previous studies have assessed these factors and their relation to a variety of OCD subtypes, no studies to date have investigated these factors together solely in the context of contamination-based OCD. Thus, the purpose of the current study was to explore the unique and combined affects that contamination fear, disgust, and emotion dysregulation have on the endorsement of contamination-based OC symptoms.

### **4.1 Study Constructs' Relations to OC Symptoms**

Relations between study variables (i.e. contamination fear, disgust sensitivity, emotion regulation, and OC symptoms) were first examined. Results from the correlational analysis supported the study's hypothesis revealing that contamination fear, disgust sensitivity, and ER were all positively associated with OC symptoms. These results are not surprising given that extensive prior research supports these factors' associations with various subtypes of OCD, including the contamination-based subtype. First, there has been substantial support for the role that contamination fear plays in the elicitation of contamination-based OC symptoms (Bhikram et al., 2017, Deacon & Maack, 2008, Ruscio et al., 2010, Tolin et al., 2004).

Second, relative to contamination fear and emotion regulation, disgust sensitivity has recently gained much more attention in various anxiety-related psychopathology literature (Troop, Treasure, & Serpell, 2002, Troop, Murphy, Bramon, & Treasure, 2000, Fox & Froom, 2009, de Jong & Merckelbach, 1998; Olatunji et al., 2008, Sawchuk et al., 2000; Tolin, Lohr, Sawchuk, & Lee, 1997, Salkovskis, Rimes, Warwick, & Clark, 2002, Rusch et al., 2011, Schienle, Haas-Krammer, Schoggl, Kapfhammer, & Ille, 2013). As a result, the emotion of disgust has been further studied in OCD and has been subsequently included in the conceptualization of various OCD presentations (Melli et al., 2015b, Mancini et al., 2001, Olatunji, Lohr, Sawchuk, & Tolin, 2007b; Olatunji, Sawchuk, Lohr, & de Jong, 2004). Third, emotion regulation has also been implicated in various psychological disorders (Amstadter, 2008; Cicchetti, Ackerman, & Izard, 1995; Cisler & Olatunji, 2012) and is thus considered a transdiagnostic vulnerability (Gross & Munoz, 1995) implicated in OCD (Mancini et al., 2001). Therefore, the current study's correlational analysis corroborated results from previous research suggesting that OC symptoms are associated with increases in the following: disgust sensitivity as measured by the higher scores on the DS-R, contamination fear as measured by higher scores on the PI, and emotion dysregulation as measured by higher scores on the DERS. Further, given that this study was conducted among a non-clinical sample, these findings underscore how strongly these factors impact even subclinical levels of contamination-based OCD.

Sex differences were seen in two of the three study variables. Supporting hypothesis 2, sex differences were seen in endorsement of disgust sensitivity and contamination fear; however, no differences were seen in sensitivities in emotion regulation.

The finding related to disgust sensitivity and contamination fear indicate that females endorse increased sensitivity in both these constructs relative to their male counterparts, which is consistent with previous studies (Sanavio, 1988; Sawchuk et al., 2005, van Oppen, 1992; Mancini et al., 2001). The ANOVA analysis results are also supported by prior research on sex differences in the prevalence of the contamination-based subtype of OCD, such that females are more likely to endorse this presentation compared to males (Labad et al., 2007). Therefore, findings from the current study's ANOVA analysis are not surprising given that contamination fear and disgust sensitivity have been shown to contribute to contamination-based OCD. Based on this information, it is expected that these factors would be more salient among females.

While the ANOVA results related to emotion regulation were not expected, this finding is not particularly surprising considering that the literature on sex differences in emotion regulation is relatively mixed. For example, pediatric literature suggests that compared to boys, girls demonstrate increased difficulty regulating negative emotions, which is suggestive of sex differences in the development of general emotion regulation (Bender, Reinholdt-Dunne, Esbjorn, & Pons, 2012, Suveg & Zeman, 2004) whereas research on adults suggests that sex differences exist in emotion regulation *strategies* (Zlomke & Hahn, 2010). As previous adult literature suggests, it may be that women engage in different cognitive emotion regulation strategies relative to males rather than being more emotionally dysregulated in comparison (Zlomke & Hahn, 2010). While the current study did not directly assess emotion regulation strategies, its findings suggest that the ability to regulate general emotions was not significantly differentiated among males and females.

Thus, contamination fear and disgust sensitivity, as opposed to the ability to regulate emotions, appears to be more salient in OC presentations among women. This finding adds to extant literature providing additional evidence that emotion regulation appears to be a transdiagnostic vulnerability occurring similarly among males and females (Zimmerman & Iwanski, 2014). However, future research is needed to further elucidate emotion regulation's role in OC symptom severity. For example, perhaps emotion regulation plays a role in more severe OC symptom presentations or among clinical cases of OCD. Alternatively, perhaps as ER is further studied, overall sex differences may not be relevant.

Contrary to the study's third hypothesis, disgust did not uniquely impact the experience of OC symptoms above and beyond contamination fear. One potential reason for this finding might be that contamination fear already contributed to a large proportion of the variance in OC symptoms (29.5%) therefore, disgust might not have been as impactful on symptoms, relatively speaking. Another possible explanation for this finding is that participants were not formally assessed or diagnosed with OCD and may in turn not have been fully representative of an OCD population. For example, more severe presentations of OC symptomatology or clinical levels of OCD might be increasingly impacted by disgust sensitivity. In fact, a prior research study assessing disgust recognition deficits among patients with OCD indicated that severe OCD was shown to be susceptible to disgust recognition impairments while less severe cases were not (Parker, McNally, Nakayama, & Wilhelm, 2004). Additionally, it could be that disgust propensity (DP) and disgust sensitivity (DS) might differentially impact OC symptoms, which was not explicitly assessed in the current study.

The negative reactions one experiences during a disgust response or a specific difficulty regulating disgust is considered DS whereas DP refers to ease or frequency with which one engages in a disgust response (Olatunji & Cisler, 2008, Olatunji et al., 2007b, and van Overveld, de Jong, Peters, Cavanagh, & Davey, 2006). Interestingly, a study by Cisler and colleagues (2009) found that DP (as measured by the Disgust Sensitivity and Propensity Scale-revised [DPPS-R]) significantly predicted contamination fear, a factor that is strongly implicated in contamination-based OC symptoms.

Results corresponding to the study's primary hypotheses suggest that general disgust sensitivity is correlated to, but not predictive of, OC symptoms above and beyond contamination fear. To further explore potential relations between the domains of disgust (core disgust, animal reminder disgust, and contamination disgust) and OC symptoms, a series of post-hoc analyses were conducted. Results from the post-hoc correlational analysis suggest that each independent domain of disgust (i.e. core disgust, animal reminder disgust, and contamination disgust) are positively associated with OC symptoms. This finding indicates that elevations in any of the domains of disgust corresponds to increases in OC symptoms. This finding is consistent with previous studies indicating that core disgust, animal reminder disgust, and contamination disgust have all been shown to be associated with contamination fear (Olatunji et al., 2004) and contamination-based OCD (Jhung et al., 2010 and Berle & Phillips, 2006).

Furthermore, based on the significant post-hoc correlational results, a post-hoc hierarchical regression analysis was conducted.

This analysis intended to assess whether any of the individual domains of disgust (i.e. core disgust, animal reminder disgust, and contamination disgust) were predictive of OC symptoms above and beyond contamination fear. Somewhat surprisingly, results indicated that none of the individual disgust domains significantly predicted OC symptoms controlling for contamination fear. This finding is most surprising in regarding the contamination domain of disgust. For instance, given that the current study, as well as previous research (Jhung et al., 2010 and Berle & Phillips, 2006) is supportive of the associations between the contamination disgust and contamination-based OC symptoms, one might expect for contamination disgust to be predictive of contamination-based OC symptoms. However, consistent with previous discussion speculations, this finding might have occurred because contamination fear already explained a large proportion of the variance (19.8%) in OC symptoms. Additionally, the current non-clinical sample might not have been fully representative of an OCD population, which have been used in previous studies assessing individual domains of disgust (Jhung et al., 2010). Further, perhaps DP or DS (which were not assessed in the current study) might be differentially predictive of contamination-based OC symptoms rather than general disgust sensitivity. In fact, as previously mentioned, prior research found DP to be predictive of contamination fear, a factor strongly implicated in contamination-based OCD (Cisler et al., 2009).

Finally, contrary to the study's fourth hypothesis, emotion regulation did not moderate the effects of disgust sensitivity on OC symptoms. In the overall model, significant main effects of disgust and emotion regulation were observed in relation to OC symptoms.

This finding provides additional support for the impact that disgust sensitivity and emotion regulation have on OC symptoms among the current sample. However, the interaction between disgust sensitivity and emotion regulation on OC symptoms was not significant. This suggests that while ER and disgust both independently positively predict OC symptoms, the level of each of these factors (i.e. low, average, high) did not significantly impact OC symptoms. In other words, there was not a specific combination of emotion dysregulation and disgust sensitivity that best predicted increases in OC symptoms. Rather, results suggest more global effects on these factors on OC symptom endorsement. This finding was somewhat surprising given that a previous study conducted by Cisler and colleagues (2009) found that emotion dysregulation moderated the relationship between disgust sensitivity and contamination fear. Considering that contamination fear is strongly indicated in contamination-based OCD, one would have expected emotion dysregulation to have also moderated the relationship between disgust and OC symptoms among the current sample.

However, it should be noted that there were several differences between the current study and the study conducted by Cisler and colleagues (2009). First, the Cisler et al., 2009 study included a measure of disgust propensity (DP) and disgust sensitivity (DS) via the Disgust Sensitivity and Propensity Scale-revised [DPPS-R]. Thus, perhaps capturing a differential aspect of the disgust experience (i.e. DP vs. DS) might provide a more nuanced assessment of disgust and its relation to emotion regulation. Secondly, the current study assessed contamination-based OC symptoms whereas the Cisler et al., 2009 study assessed contamination fear.



Therefore, while emotion regulation difficulties appeared to strengthen the impact of disgust on contamination fear, it did not appear to change or strengthen the impact of disgust on contamination-based OC symptoms. According to the current study, high emotion dysregulation paired with high levels of disgust sensitivity, for example, did not lead to increased severity of OC symptoms. Thus, a particular combination of each factor was not evidenced to explain how or when the relationship between disgust and OC symptoms will emerge.

Of note, findings from Cisler et al., 2009 showed that DP significantly predicted contamination fears even at low levels of general emotion dysregulation. Therefore, authors conclude that general emotion dysregulation does not seem to be necessary mechanism by which DP contributes to contamination fears. Further, given that DP predicted contamination fear regardless of the level of general emotion dysregulation, authors' interpreted this finding as evidence for DP's direct influence on contamination fear. This is consistent with the current study's finding, providing additional evidence that disgust is relevant to the endorsement of contamination-based OC symptoms apart from specific levels of emotion regulation.

Overall, the findings from the present study have important implications for the current conceptualization of contamination-based OCD. While emotion regulation is a transdiagnostic vulnerability, it did not moderate the relationship between the emotion of disgust and contamination-based OC symptomatology. This finding sheds important light on how contamination-based symptoms are maintained (e.g. factors beyond difficulty regulating emotions). Further, findings from the current study are also strongly supportive of the role of contamination fears in the contamination-based OC presentation.

As research in this area continues, these findings might serve to improve the treatment of contamination-based OCD. For instance, previous research indicates that following treatment for OCD, many patients continue to experience residual symptoms (Abramowitz, Blakey, Reuman, & Buchholz, 2018) and that 50% of patients continue to experience significant impairment even after a full course of treatment (Loerinc et al., 2015; Springer, Levy, & Tolin, 2018). Further, while contamination-related obsessions and compulsions are shown to be generally responsive to the OCD treatments (Abramowitz, Franklin, Schwartz, & Furr, 2003), a recent study found that contamination-based OCD patients demonstrated symptom reduction at posttreatment but did not maintain these reductions at follow-up compared to other subtypes (Buchholz, Abramowitz, Blakey, Reuman, & Twohig, 2019). It is hypothesized that the apparent lack of long-term clinical gains might be due in part to contamination symptoms' basic relations to disgust. In fact, prior research indicates that disgust's rate of habituation is slower compared to anxiety (Smits, Telch, & Randall, 2002). Additionally, research shows that OCD patients with symptoms related to disgust and contamination fears do not respond as quickly or as well to intervention compared to those with symptoms of other OCD subtypes such as checking, harm/sexual obsession, and symmetry/'not just right' obsessions (McKay, 2006). Thus, perhaps targeting an individual's disgust response might be a more effective approach strategy compared to treating contamination fears and improving emotion regulation alone.

## **4.2 Limitations and Future Directions**

While the current study included strengths such as a fully powered, large sample size and extension of previous literature, some limitations are worth considering regarding the generalizability of its findings. For example, the current study utilized a nonclinical sample to assess OCD symptoms. Additionally, racial and ethnic diversity were limited, although in line with university demographics. Assessing these constructs in a clinical sample of patients with OCD might have yielded different results, particularly among findings that were inconsistent with previous literature. Further, given that the majority of participants were White, female, and non-Hispanic, results from the current study might not be applicable to other more diverse populations. Finally, the cross-sectional design and self-report methodology of the study limits the ecological validity of the current study's findings.

There are several directions that might be taken in future studies to further elucidate the current study's findings, particularly among those that were not significant. First, including an assessment of DP and DS might provide additional insight into the specific ways that the experience of disgust is implicated in contamination-based OCD. Additionally, future research on how OC symptoms vary in relation to sex and specific emotion regulation strategies is warranted. Further, assessing contamination fear, disgust sensitivity, and emotion regulation among other subtypes of OCD might prove interesting to explore. For example, perhaps the factors included in the current study interact differently among other subtypes of OCD.

### **4.3 Conclusion**

The current study aimed to explore the potential unique and combined affects that contamination fear, disgust, and emotion dysregulation have on the endorsement of contamination-based OC symptoms. Although all constructs were significantly correlated, overall analyses suggest that contamination fear is the most salient factor related to contamination-based OC symptoms compared to disgust sensitivity. Further, while disgust sensitivity and emotion regulation were independently implicated in OC presentations, disgust's relationship to symptoms were not dependent on particular levels of emotion dysregulation. For optimal conceptualization of OCD, future researchers are encouraged to continue differentiating factors underlying the development and maintenance of contamination-based symptoms (e.g. disgust sensitivity vs. disgust propensity). An elucidated conceptualization of this disorder is the foundation to developing targeted treatments, which could lead to enhanced long-term outcomes for those suffering with contamination-based OCD.

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## APPENDIX

Table 1. *Summary of Correlational Analysis*

	<i>M</i>	<i>SD</i>	<i>OC</i> <i>Symptoms</i>	<i>Contamination</i> <i>Fear</i>	<i>Emotion</i> <i>Regulation</i>
<b>Contamination Fear (PI)</b>	10.12	8.97	.55***	---	---
<b>Emotion Regulation (DERS)</b>	80.14	22.66	.41***	.20*	---
<b>Disgust Sensitivity (DS-R)</b>	63.20	18.70	.31***	.52***	.17*
<b>OC Symptoms (OCI-R)</b>	12.08	11.48	---	---	---

*Note.*  $p < .001^{**}$ ;  $p < .01^{**}$ ;  $p < .05^*$ ; *OC* = Obsessive-Compulsive

Table 2. *Summary of Analysis of Variance Results for Sex Differences in Disgust Sensitivity, Contamination Fear, and Emotion Regulation*

		<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
DERS	Between Groups	45.78	1	45.77	.07	.77
	Within Groups	76195.42	143	532.84		
	Total	76241.19	144			
DS-R	Between Groups	10877.48	1	10877.48	38.45	< .001
	Within Groups	40733.60	144	282.87		
	Total	51611.08	145			
PI	Between Groups	588.23	1	588.23	7.57	< .001
	Within Groups	11195.12	144	77.74		
	Total	11783.35	145			

*Note.* DERS = Difficulties in Emotion Regulation Scale; DS-R = Disgust Scale Revised, PI =

Padua Inventory

Table 3. *Summary of Hierarchical Regression Analysis for Variables Predicting Obsessive-Compulsive Symptoms*

	<i>B</i>	<i>SE B</i>	$\beta$	<i>R<sup>2</sup> Change</i>	<i>p</i>
<b>Step 1</b>				.30	<.001
Contamination Fear (PI)	.64	.08	.55		<.001
<b>Step 2</b>				.00	.67
Disgust Sensitivity (DS-R)	.02	.05	.03		.67

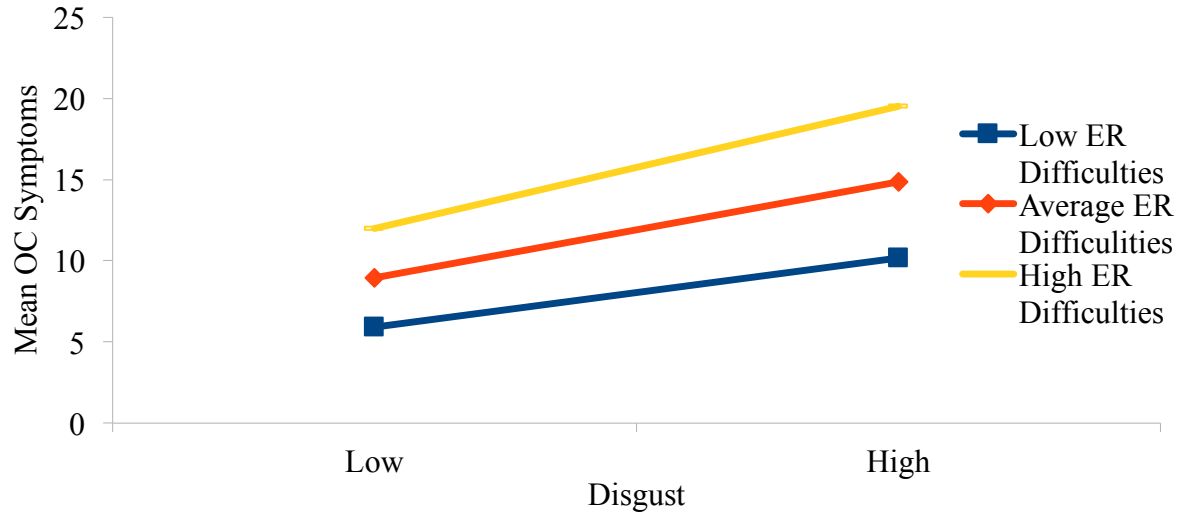
*Note.* *PI* = Padua Inventory: Contamination and Washing Subscale; *DS-R* = Disgust Scale

Revised



Figure 1. *Emotion Regulation as a Moderator of the Relationship between Disgust and OC Symptoms*

**Multiple Line Mean of OC Symptoms by Disgust by Emotion Regulation Difficulties**



*Note.* ER = Emotion Regulation; OC = Obsessive-Compulsive

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**PUBLICATIONS**

- Ramsey, W. A., Heidelberg, R. E., **Gilbert, A. G.**, Heneghan, M. B., Badawy, S. M., & Alberts, N. M. (in press). eHealth and mHealth interventions in pediatric cancer: A systematic review of interventions across the cancer continuum. *Psycho-Oncology*.
- Gilbert, A. G.**, Kang, G., Hodges, J., Klosky, J., Hankins, J., & Alberts, N. M. (in preparation). Pain rating concordance among youth with sickle cell disease and their caregivers.
- Zaboski, B. A., **Gilbert, A. G.**, Hamblin, R., Andrews, J., Ramos, A., Nadeau, J. M., & Storch, E. A. (2019). Quality of life in children and adolescents with obsessive-compulsive disorder: The Pediatric Quality of Life Enjoyment and Satisfaction Questionnaire (PQ-LES-Q). *Bulletin of the Menninger Clinic*, 1-21.
- Molinari, A. D., Andrews, J. L., Zaboski, B. A., Kay, B., Hamblin, R., **Gilbert, A. G.**, Ramos, A., Riemann, B. C., Eken, S., Nadeau, J. M., & Storch, E. A. (2019). Quality of life and anxiety in children and adolescents in residential treatment facilities. *Residential Treatment for Children & Youth*, 1-15.
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## PROFESSIONAL PRESENTATIONS

### *POSTERS/ORAL PRESENTATIONS*

**Gilbert, A. G. & Maack, D. J.** (November 2019). *Disgust and the Experience of Emetophobic Symptoms in Pregnancy*. Poster session presented at the 53<sup>rd</sup> Annual Association for Behavioral and Cognitive Therapies (ABCT) Convention, November 21-24, 2019 in Atlanta, GA.

**Gilbert, A. G. & Maack, D. J.** (September 2019). *Sex Differences in Factors Related to Contamination-Based Obsessive-Compulsive Symptoms*. Data blitz presented at the 70<sup>th</sup> Annual Convention of the Mississippi Psychological Association, September 25-27, 2019 in Biloxi, MS.

**Gilbert, A. G.** *Pain Rating Concordance among Youth with Sickle Cell Disease and Their Caregivers*. Oral presentation presented at the Psychology Rounds at St. Jude Children's Research Hospital, August 12, 2019 in Memphis, TN.

**Gilbert, A. G. & Maack, D. J.** (July 2019). *Factors Related to Obsessive-Compulsive Symptoms: Understanding the Contribution of Disgust, Contamination Fear and Emotion Regulation*. Poster session presented at the 26<sup>th</sup> Annual Obsessive-Compulsive Disorder Conference, July 19-22, 2019 in Austin, TX.

**Gilbert, A. G., Kang, G., Hodges, J., Klosky, J., Hankins, J., & Alberts, N. M.** (April 2019). *Pain Rating Concordance among Youth with Sickle Cell Disease and Their Caregivers*. Poster session presented at the 40<sup>th</sup> Annual Canadian Pain Society Scientific Meeting, April 2-5, 2019 in Toronto, ON.

**Gilbert, A. G. & Maack, D. J.** (April 2019). *Disgust's Unique Impact on Obsessive-Compulsive Symptoms Above and Beyond Contamination Fear*. Data blitz presented at the 6<sup>th</sup> Annual UM Conference on Psychological Science at the University of Mississippi in University, MS.

**Gilbert, A. G. & Maack, D. J.** (November 2018). *Emetophobia and Disgust Throughout the Pregnancy Period*. Presented at the Three Minute Thesis Competition and 3MT Final Round at the University of Mississippi in University, MS.

**Gilbert, A. G., Wickenhauser, M., & Maack, D. J.** (May 2018). *Behavioral Avoidance: The Contribution of Obsessive Compulsive Symptoms Above and Beyond Disgust and Emotion Regulation*. Poster session presented at the 44<sup>th</sup> annual convention of the Association for Behavior Analysis International, May 26-28, 2018 in San Diego, CA.

**Gilbert, A. G. & Maack, D. J.** (October 2017). *Contamination Fear, Disgust, and Emotion*. Presented at the Three Minute Thesis Competition at the University of Mississippi in University, MS.

Maack, D. J. (September 2017). *You Can Run but You Can't Hide (From Your Physiological Symptoms): Approaching Interoceptive Exposure*. Served as a facilitator to presentation given at the Annual Mississippi Psychological Association Convention in Biloxi, MS.

**Gilbert, A. G.**, Hamblin, R. J., Nadeau, J. M., Ramos, A., & Storch, E. A. (July 2017). *Examining Quality of Life in Children and Adolescents with Obsessive-Compulsive Disorder: The Pediatric Quality of Life Satisfaction and Enjoyment Questionnaire (PQ-LES-Q)*. Poster session presented at the Annual Obsessive-Compulsive Disorder Conference, July 7-9, 2017 in San Francisco, CA.

Nadeau, J. M., Hamblin, R. J., Storch, E. A., & **Gilbert, A. G.** (July 2017). *Enhancing Motivation and Engagement in Exposure-Based Treatments*. Symposium presentation given at the Annual Obsessive-Compulsive Disorder Conference in San Francisco, CA.

Barthle, M., Cooke, D.L., Munson, M., Massey, A., Kennedy, K., **Gilbert, A. G.**, McNamara, J. (July 2016). *Utilizing Exposure and Response Prevention for the Treatment of Food Related Anxiety in Eating Disorders: A Case Study*. Poster session presented at the Annual Obsessive-Compulsive Disorder Conference in Chicago, IL.

**Gilbert, A. G.** (May 2016). *Bridging the Gap in Coverage for Uninsured Children: An Examination into the Florida KidCare Application Process*. Paper presented to the Florida Contracts and Evaluation team at the University of Florida in Gainesville, FL.

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## RESEARCH EXPERIENCE

### Graduate Research Assistant, ADEPT Lab

University of Mississippi, University, MS

2017 – Present

Supervisor: Danielle Maack, Ph.D.

- **Pregnancy Initiative**
  - Recruiting pregnant women at a large OBGYN clinic for a research study examining levels of depression, anxiety, disgust, emetophobia, and disturbed sleep across pregnancy and postpartum
- **Emetophobia Study**
  - Assisted with running research participants through a series of Behavioral Avoidance Tasks (BATs) for a study assessing behavioral avoidance related to the fear of vomiting
- **Undergraduate Mentorship**
  - Mentoring undergraduate students on participant recruitment, thesis research and research presentations, and graduate school application preparation

### Master's Thesis Research

*Factors Related to Obsessive–Compulsive Symptoms: Understanding the Contribution of Disgust, Contamination Fear and Emotion Regulation*

ADEPT Lab, University of Mississippi, University, MS

2017 – Present

Committee: Danielle Maack (Chair), PhD, Laura Dixon, PhD, and Mervin Matthew, PhD

- Examined archival data to assess the unique and combined affects that contamination fear, disgust, and emotion dysregulation have on the endorsement of contamination-based obsessive-compulsive symptoms

### Clinical Research Assistant

*Graduate Research Lab Assistant*

St. Jude Children's Research Hospital, Department of Psychology, Memphis, TN

2018 – 2019

Supervisor: Nicole Alberts, Ph.D.

- Conducted research on the concordance of parent-child pain reports among youth with sickle cell disease
- Assisted in the preparation of a study examining respiration, emotional health, and pain among adult survivors of childhood cancer with chronic pain using a wearable *Spire Stone* device

**Research Assistant**

SITH Lab, University of Mississippi, University, MS  
Supervisor: John Young, Ph.D.

Summer 2018

- Recruiting patients at the Willow Pain and Wellness clinic in Oxford, MS for a research study assessing factors related to chronic pain

**Rogers Behavioral Health**

*Clinical Research Assistant*

*Examining subjective well-being in children and adolescents with obsessive-compulsive disorder using the pediatric quality of life satisfaction and enjoyment scale (PQ-LES-Q)*

Rogers Memorial Hospital, Tampa, FL

2016 – 2017

Supervisor: Eric Storch, Ph.D.

- Consented patients for research investigating caregiver burden experienced by parents of children with a primary or co-primary diagnosis of anxiety disorder
- Administered structured clinical interviews and facilitated group therapy sessions among children and adolescents with anxiety-based disorders

**Research Assistant**

*Bridging the gap in coverage for uninsured children: an examination into the Florida KidCare application process*

College of Medicine, Health Outcomes and Policy, Gainesville, FL

2015 – 2016

Supervisor: Melissa Bright, PhD.

- Organized KidCare data to produce the 2015 Florida Annual KidCare Report and completed a systematic assessment of the barriers to enrollment to Florida KidCare

## **CLINICAL EXPERIENCE & TRAINING**

### **Clinical Practicum**

#### *Graduate Therapist*

Psychological Services Center

University of Mississippi, University, MS

Summer 2017 – Present

Supervisors: Danielle Maack, Ph.D (Fall 2017-Spring 2019) and Laura Johnson, PhD (Fall 2019)

Additional supervisors: Scott Gustafson (Summer 2018)

- Conducting individual therapy among clients struggling with complex emotional disorders
- Administering structured clinical interviews and utilizing weekly clinical outcome measures
- Attending weekly supervision meetings to review the cases of students with clients
- Participating in didactics related to evidenced based therapy techniques

### **Psychological and Behavioral Services**

#### *Graduate Intern*

Northern Mississippi Regional Center (NMRC), Oxford, MS

September 2019 – Present

Supervisor: Melinda Redding, PhD and Stefan Schulenberg, PhD

- Providing individual therapy to residents with intellectual disabilities
- Assisting with active treatment planning and construction of behavior programs for residents utilizing a multidisciplinary treatment approach
- Administering assessment batteries in the Diagnostic and Evaluation Department utilizing the following measures: SB-5, WRAT-4, ICAP, BASC-3, Vineland-3, and CARS-2-ST/CARS-2-QPC
- Conducting Functional Assessments to ascertain the function of client problem behaviors
- Participating in weekly group supervision

### **LAMBDA Support Group**

University of Mississippi, University, MS

2019 – Present

Supervisor: Laura Johnson, Ph.D.

- Collaborating with other graduate student therapists to offer a safe and open environment for students in the LGBTQ+ community
- Facilitating weekly process-based discussions and helping the group to develop healthy and positive coping strategies

### **Division of Medical Psychology**

#### *Therapy Assistant*

University of Florida, Gainesville, FL

2015 – 2016

Supervisor: Joseph McNamara, Ph.D.

- Assisted with CBT and E/RP for children, adolescents and adults with various anxiety and/or eating disorders.
- Assisted with weekly meal exposures with adolescents diagnosed with eating disorders
- Acquired 75+ hours of clinical patient contact

**Alachua Country Crisis Center**

*Phone Counselor*

Gainesville, FL

2015 – 2016

Supervisor: Manuel Lopez, Ph.D.

- Completed a 60-hour Crisis Intervention Training Program to develop counseling skills required to effectively serve the community through a 24-hour Crisis and Suicide Hotline
- Facilitated role-plays in the Crisis Intervention Training Program for local law enforcement

**TEACHING EXPERIENCE**

**Teaching Assistant: Abnormal Psychology**

**University of Mississippi, University, MS**

Fall 2019

Supervisor: Danielle Maack, PhD

- Attended lectures and held weekly office hours to provide supplemental instruction
- Administered and scored examinations

**Guest Lecturer: Abnormal Psychology and Industrial and Organizational (IO) Psychology**

University of Mississippi, University, MS

Fall 2017 and Fall 2019

Supervisor: Danielle Maack, PhD

- Taught on the following abnormal psychology topics: eating disorders and obesity, and posttraumatic stress disorder (PTSD)
- Taught on the following IO psychology topics: organizational citizenship behavior (OCB), counterproductive work behavior (OWB), and the Hierarchical Model of Deviance

**Course Writing: Diseases of Eating**

University of Florida, Gainesville, FL

2016 – 2017

Supervisor: Joseph McNamara, Ph.D. & Czerne Reid, Ph.D.

- Conducted literature reviews on current research in the field of eating disorders and provided DSM-5 and ICD-10 diagnostic criteria for eating disorders
- Generated written material for 7 course modules, developed exam questions, and selected appropriate supplementary research material



**Teaching Assistant: Positive Psychology**

University of Florida, Gainesville, FL

Spring 2015

Supervisor: Ryan Duffy, Ph.D.

- Facilitated weekly discussions among a group of 7 students and graded weekly homework assignments.
- Created exam questions in multiple-choice format and planned and facilitated test review sessions

**Teaching Assistant: Introduction to Counseling Psychology**

Fall 2015

University of Florida, Gainesville, FL

Supervisors: Laurie Mintz, PhD.

- Assisted with and prepared discussion questions, weekly quizzes, and exams
- Communicated with students regarding lecture information and grades on written assignments

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**ASSOCIATIONS AND AWARDS**

Mississippi Psychological Association (MPA)

**Student Representative to the Executive Council**

2019 – Present

- Serving as a liaison between student members and the Executive Council on ideas, problems, concerns and suggestions
- Attending Executive Council meetings, conference calls, and annual conventions
- Writing student member report and column in the spring and fall issues of the MPA newsletter
- Assisting the Public Education Committee Chair and Communications Officer with MPA's social media presence

Graduate Student Council (GSC)

**Senator**

Fall 2018 – Spring 2019

*Communications Committee*

- Representing the Psychology Department during monthly meetings to facilitate the GSC's academic, professional, and social events

Mississippi Psychological Association (MPA) <b>Student Member</b>	2019 – 2020
Association for Behavioral and Cognitive Therapies Membership (ABCT) <b>Student Member</b>	2019 – 2020
International Obsessive-Compulsive Disorder Foundation (IOCDF) <b>Student Member</b>	2019 – 2020
Canadian Pain Society (CPS) <b>Trainee Member</b>	2018 – 2019
<b>Finalist at the Three Minute Thesis (3MT) Competition</b> University of Mississippi, University Mississippi	2018
<b>The Alachua County Crisis Center Award of Excellence</b> Gainesville, FL	2016