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TOWARD A CONCEPTUALIZATION OF EMETOPHOBIA: EXAMINING INTOLERANCE
OF UNCERTAINTY AS A UNIQUE PREDICTOR OF SYMPTOMS

A Thesis
presented in partial fulfillment of requirements
for the degree of Master of Arts
in the Department of Psychology
The University of Mississippi

by

MIMI S. ZHAO

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ABSTRACT

Emetophobia, a poorly understood disorder, is a specific phobia characterized by an irrational and persistent fear of oneself vomiting or others vomiting. Though research on the disorder is sparse, previous investigations have reported interference in social, occupational, and health domains in the lives of individuals with emetophobia (Lipsitz et al., 2001; McFayden & Wyness, 1983; Veale & Lambrou, 2006). To this end, the current study examined whether individual differences in Anxiety Sensitivity (AS), Disgust Sensitivity (DS), and Intolerance of Uncertainty (IU) are associated with symptoms of emetophobia, whether AS predicts symptoms of emetophobia above and beyond DS, IU, and expected covariates of anxiety and depressive symptoms, and whether DS predicts symptoms of emetophobia above and beyond IU and expected covariates of anxiety and depressive symptoms. An archival data set from a larger study consisting of undergraduate volunteers ($N = 193$) was used in the analyses of the present study. Individuals completed a diagnostic interview and self-report measures. AS, DS, IU, anxiety, and depression were found to be significantly positively associated with symptoms of emetophobia. IU significantly predicted emetophobia symptoms above and beyond covariates of anxiety and depression. However, DS did not predict symptoms of emetophobia above and beyond IU and covariates of anxiety and depression, nor did AS predict symptoms of emetophobia above and beyond IU, DS, and covariates of anxiety and depression. The present findings demonstrate that emetophobia is indeed a distinct specific phobia with associated anxiety related cognitive vulnerabilities, thereby highlighting the need for further research for a comprehensive conceptualization emetophobia.

LIST OF ABBREVIATIONS AND SYMBOLS

AS	Anxiety Sensitivity
ASI-III	Anxiety Sensitivity Index-III
DASS-21	Depression, Anxiety and Stress Scales-21
DS	Disgust Sensitivity
DS-R	Disgust Scale-Revised
IU	Intolerance of Uncertainty
IUS	Intolerance of Uncertainty Scale
OCD	Obsessive-Compulsive Disorder
PTSD	Post-Traumatic Stress Disorder
SPOVI	Specific Phobia of Vomiting Inventory

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I. INTRODUCTION

Emetophobia is an anxiety disorder characterized by an irrational and persistent fear of vomiting that can be triggered by relevant internal and external cues. Estimated prevalence rates range from 1.7%-3.1% in males and 6%-7% in females (Philips, 1985). Little is known about the nature of emetophobia as it has been largely ignored in the current body of anxiety research. Commonly grouped under “Specific Phobia: Other Type” in the DSM-IV TR (APA, 2000), emetophobia has been found to be ranked higher in terms of intensity of fear than the well-recognized spider phobia (Boschen, 2007). Diagnostic requirements for emetophobia include meeting full criteria for a specific phobia along with endorsement of unique symptoms associated with a fear of vomiting. According to the DSM-IV, a diagnosis of specific phobia requires a marked and persistent fear, usually excessive or unreasonable, which is triggered by the presence or anticipation of a specific object or situation. In the case of emetophobia, the cue is vomiting or possibility of impending vomiting. Exposure to the phobic stimulus must provoke an immediate anxiety response along with recognition that the fear is excessive or unreasonable. Additionally, avoidance, anxious anticipation or distress of the feared situation occurs and interferes significantly with the individual’s normal routine, occupational functioning, social activities or relationships.

Although current knowledge of the characteristics of emetophobia is limited, some preliminary exploratory studies have been conducted, highlighting important clinical features of the disorder (Lipsitz, Fryer, Paterniti, & Klein, 2001, Veale & Lambrou, 2006). The most comprehensive examination of emetophobia, thus far, has been an internet survey of individuals

who were members of an online emetophobia support group. Conducted by Lipsitz et al. (2001), 56 respondents (89% female) were contacted via email and asked to complete the online survey. Respondents' ages ranged from 14 to 59 years. Results suggested that emetophobia symptoms were found to have an early onset (mean= 9.2 years; range= 4-32 years), and tended to be chronic in nature with persistent symptoms and low rates of remission (only 12% described period of full remission). Mean duration of symptoms was 22 years (range= 2-54). To demonstrate the functional impact of this disorder, 90% of respondents reported experiencing significant distress from emetophobia symptoms 52 weeks a year (Lipsitz et al. 2001). Additionally, impairment was reported in social (e.g., avoiding parties where drinking might be involved), occupational (e.g., leaving work frequently for fear of vomiting), and educational (e.g., skipping class) domains. Some participants endorsed symptoms of other anxiety and mood disorders such as Panic Disorder or Agoraphobia (40%), Social anxiety (21%), OCD (18%), and Depression (46%), which has also been reported in other investigations (Hunter & Antony, 2009; Price, Veale, & Brewin, 2012). Similar to other anxiety disorders, 89% of participants were female, suggesting a gender difference for this phobia. The primary fears that respondents provided were fear of themselves vomiting, as well as being in the presence of others vomiting (Lipsitz et al., 2001), which has been highlighted in a more recent online survey (Veale & Lambrou 2006). Although this study provided an initial insight into emetophobia, it was cursory in nature. The individuals were self-referred to the online group and no definitive diagnosis of emetophobia was made. With this basic understanding of the disorder, it is evident that emetophobia is a debilitating condition warranting further study.

Anxious Cognitions

Similar to other anxiety disorders, distinct features of anxiety symptomatology have been observed in emetophobia. Anxious cognitions, oftentimes described as catastrophic beliefs about emetophobic symptoms, increased physiological arousal, hypervigilance towards internal gastrointestinal sensations, safety behaviors, and avoidance have been reported to be associated features of emetophobia (Hunter & Antony 2009; Lipsitz et al., 2001). In an exploratory study, Veale and Lambrou (2006) surveyed 100 (97% female) self-diagnosed emetophobics who reported increased estimates of likelihood of feared consequences as a result of vomiting. The study also included 28 individuals diagnosed with Panic Disorder (using criteria from the DSM-IV) and 81 non-clinical controls as comparison groups. Results indicated that emetophobics reported significantly higher beliefs of the likelihood of choking, dying, losing control, and/or becoming extremely ill as a result of vomiting as compared with individuals surveyed with panic disorder and nonclinical controls. Not surprisingly, emetophobics were also significantly more likely to believe the catastrophic cognitions specifically relating to vomiting to be true. No significant differences were found when participants were asked to rate the strength of their belief about the causes of nausea from a list of seven causes (e.g., anxiety, migraine, brain tumor, etc.) suggesting perhaps that emetophobia also has some overlapping symptoms with Health Anxiety (Veale & Lambrou, 2006). According to other studies of specific phobias, anxious cognitions in the presence of the feared stimuli are considered to be maladaptive and serve as a maintaining factor (Thorpe & Salkovskis, 1999). Assessing these anxious cognitions in individuals with emetophobia might then provide a better way to conceptualize and subsequently treat emetophobia.

Physiological Arousal

Physiological arousal is also important in the conceptualization of emetophobia as it is a core characteristic of anxiety disorders (e.g., a student with social phobia experiencing “butterflies” in the stomach before giving a presentation). Physiological arousal has been found to be a discriminating feature in Panic Disorder (Brown & McNiff, 2009). Individuals with emetophobia exhibit gastrointestinal somatic symptoms such as nausea and “butterflies” (Boschen, 2007; Veale & Lambrou, 2006). External cues such as watching someone else vomit and internal sensations such as feelings of nausea or gastrointestinal discomfort can often trigger feelings of fear in people with emetophobia (Lipsitz et al., 2001). Theoretically, this suggests that heightened sensitivity to interoceptive cues may be a key feature of emetophobia. Veale and Lambrou (2006) reported that emetophobics endorsed feeling nauseous significantly more often than individuals with Panic Disorder and non-clinical controls, with 51% feeling nauseas almost every day, lasting an hour or more. Moreover, the study demonstrated an overlap in the cognitive processes and behaviors of emetophobia with Panic Disorder, such as selective attention to and catastrophic misinterpretation of, physical sensations (Veale & Lambrou, 2006). Indeed, heightened sensitivity to bodily sensations is likely to be associated with aversive experiences with vomiting which can subsequently be an identified trigger of the onset of emetophobia (Boschen, 2007). Hunter and Antony (2009), in a case study, demonstrated the possible etiology of a female patient whom, at the age of 7, received highly negative feedback from her parents after vomiting in a grocery store. This negative learning experience paired with the memory of bodily sensations related to the vomiting was posited to contribute to the development of her emetophobia. The patient, who presented for treatment in her early forties, subsequently endorsed heightened awareness of bodily sensations such as those from premenstrual symptoms.

Furthermore, the patient reported experiencing uncertainty, questioning whether these sensations meant impending vomiting, which on occasion created anxiety that evolved into a full panic attack. Evidence from recent research suggests the need for further examination of the role physiological arousal in emetophobia (Boschen, 2007; Price et al., 2012; Veale & Lambrou, 2006).

Avoidance and Safety Behaviors

Avoidance and safety behaviors are also quite common in emetophobia, often interfering with social, occupational, and health domains of individuals with the disorder (Lipsitz et al. 2001; McFadyen & Wyness, 1983, Veale & Lambrou, 2006). Individuals with emetophobia tend to avoid situations that might be associated with risk of vomiting. Examples include abstaining from recreational and social activities, avoiding specific foods, and even avoiding pregnancy. Emetophobics report avoidance of parties where alcohol and intoxicated individuals might be present for fear that seeing someone else vomit or being pressured into a situation where they might drink too much would lead to increased risk for vomiting (Hunter & Antony, 2009; Maack, Deacon, & Zhao, under review). Other recreational activities such as fairground rides and traveling abroad are also avoided due the possibility of experiencing nausea sensations. For example, individuals may limit trips abroad due to the concern that consuming foreign food or water could lead to gastrointestinal issues. Specific foods such as meat, seafood, and dairy products are often avoided because they could spoil easily and cause food poisoning or other gastrointestinal problems which could subsequently lead to vomiting. Additionally, a majority of individuals with emetophobia exhibit rituals around eating, such as checking for freshness, excessive washing of foods as well as restricting their diet to a list of “safe foods” (Lipsitz et al., 2001). Safe foods might include food that is thoroughly cooked, clear soda, crackers, etc. The

diet related safety and avoidance behaviors have been reported to result in poor nutrition and being severely underweight (Hunter & Antony 2009; Lipsitz et al., 2001). The fear of vomiting can be so pronounced as to lead females to delay pregnancy due to the concern of the inevitability of morning sickness (Maack, Deacon, Zhao, under review; Veale & Lambrou 2006). Such avoidance behaviors are maladaptive because they prevent the individual from habituating to occurrence of gastrointestinal sensations and therefore serve as a maintaining factor of the disorder. Emetophobics also endorse safety behaviors such as looking for an escape route, trying to keep tight control of their behavior, repeatedly checking freshness of food, checking own health, washing hands and brushing teeth excessively, cleaning excessively (Hunter & Antony, 2009; Veale & Lambrou, 2006). These clinical features indicate that emetophobia is not only evolutionarily maladaptive (e.g., reduces reproductive fitness), but it can also lead to harmful health consequences (e.g., malnutrition and underweight).

Emetophobia and Anxiety Sensitivity

Current conceptualizations of emetophobia highlight the importance of further research of emetophobia as a distinct specific phobia. There is little research assessing the potentially unique anxiety constructs associated with the disorder. Evidence of hypervigilance toward increased physiological arousal believed to result in vomiting suggests that emetophobics might evidence increased anxiety sensitivity (Hunter & Antony, 2009). Anxiety sensitivity (AS), defined, is the tendency to fear anxiety-related bodily sensations due to perceived harm (Reiss & McNally, 1985). In other words, AS is the fear of anxiety itself, which serves as an amplification factor for the fear (Reiss, 1991), and manifests as an anxious preoccupation with anxiety related bodily sensations (e.g., upset stomach, rapid heart rate, etc.). Taylor, Koch, McNally & Crockett (1992) further explain this phenomenon in individuals with high AS. Essentially, the experience

of anxiety in response to a feared stimulus is likely to cause further worry about the harmful consequences of the anxiety, thereby introducing more anxiety (Taylor et al., 1992). AS is explicated as a relatively stable dimensional trait. Studies on AS have demonstrated significantly higher levels in individuals with Panic Disorder, Obsessive-Compulsive Disorder, Social Phobia, Generalized Anxiety Disorder and Hypochondriasis (Deacon & Abramowitz, 2006; Ehlers & Breuer, 1992; Wheaton, Deacon, McGrath, Berman, & Abramowitz, 2012) compared with non-clinical controls. A meta-analysis conducted by Naragon-Gainy (2010) indicated that AS was strongly associated with GAD, panic, agoraphobia, and PTSD. Additionally, particular presentations of specific phobias, such as claustrophobia, have been found to be associated with elevated AS (Ost & Csatlos, 2000). Veale & Lambrou (2006) demonstrated an overlap in the cognitive processes and behaviors of emetophobia with Panic Disorder. Similar to panic, emetophobics exhibit selective attention to and catastrophic misinterpretation of physical sensations (e.g., nausea) followed by fear and worry of experiencing such physical sensations in the future. Given that emetophobia has similarities with Panic Disorder, it would be beneficial to examine the role of AS in the conceptualization of emetophobia. In the limited number of case studies on emetophobia, individuals reported being hypervigilant to cues or stomach sensations that could be related to vomiting which subsequently led to increased anxiety (Hunter & Antony, 2009; Maack, Deacon, and Zhao, under review). Heightened sensitivity towards and fear of gastrointestinal issues in emetophobia leading to worrying about vomiting, suggest that AS may be a characteristic highly associated with emetophobia.

Emetophobia and Intolerance of Uncertainty

Similarly to AS, Intolerance of Uncertainty (IU) is a characteristic of anxiety disorders in general that maybe relevant to the conceptualization of emetophobia. IU is the tendency for an

individual to consider the possibility of a negative event occurring as unacceptable and threatening despite the probability of its occurrence (Freeston, Rheaume, Letarte, Dugas, & Ladouceur, 1994). Furthermore, IU has been found to be related to worry even when controlling for other mood variables such as depression (Dugas, Schwartz, & Francis, 2004). Previous research has presented IU as a cognitive vulnerability that is transdiagnostic across various anxiety disorders such as Generalized Anxiety Disorder, Obsessive-Compulsive Disorder, and Panic Disorder (Carleton et al., 2012). Individuals who are intolerant of uncertainty may interpret ambiguous information as threatening (Dugas et al., 2005). The fear response to gastrointestinal sensations (i.e., ambiguous information) in emetophobia might be a result of the perception that the sensations are threatening as well as uncertainty about whether vomiting would occur. Additionally, the reported avoidance behaviors present in emetophobia could be due to an inability to accept the possibility of the negative event occurring. According to Dugas et al. (2005), for persons who are intolerant of uncertainty, engaging in situations with uncertain outcomes is likely to induce and perpetuate heightened level of anxiety. High IU may impair problem solving skills, leading to inaction and avoidance of ambiguous situations (Dugas, Freeston, & Ladoucer, 1997). Individuals with emetophobia often engage in avoidance and safety seeking behaviors, which suggest that IU may play a role in emetophobia (Lipsitz et al., 2001; Veale & Lambrou, 2006). For example, activities such as fairground rides or certain foods such as dairy are avoided because of the uncertainty of whether they might cause the individual to vomit. Safety behaviors in emetophobia appear to serve the same purpose. For example, emetophobics report taking special precautions like looking for an escape route, monitoring their health, as well as ritualistic behaviors like repeatedly checking for freshness of food, washing hands, brushing teeth excessively, and cleaning excessively (Hunter & Antony, 2009, Lipsitz et

al. 2001; Veale & Lambrou 2006). As such, the presence of avoidance and safety seeking behaviors in individuals with emetophobia might indicate an underlying mechanism of IU in emetophobia.

Emetophobia and Disgust Sensitivity

Elevated levels of Disgust Sensitivity (DS) have been reported to play a unique role in the acquisition and maintenance in anxiety disorders, especially in specific phobias and OCD (Olatunji & Sawchuk, 2005). DS is defined as the predisposition to experience disgust in response to a wide array of aversive stimuli (De Jong & Merckelbach, 1998). Boschen (2007) theorized emetophobia to be related to OCD, supported by reported symptoms of preoccupation with own gastrointestinal state, checking, and use of washing rituals (e.g., hands, food) (Lipsitz et al., 2001). Additionally, Lipsitz et al. (2001) described that 30% of respondents indicated they were fearful of other specific things (e.g., insects) to which they reacted with disgust. Furthermore, vomit itself is commonly perceived as disgusting (Rozin, Haidt, & McCauley, 2000). As such, it is plausible to anticipate a relationship between DS and emetophobia. Currently there is only one study assessing the construct of disgust in emetophobia. Van Overveld, De Jong, Peters, Van Hout, and Bouman (2008) conducted an internet-based study to examine the relationship between disgust and emetophobia. One hundred thirty-eight participants from a website for individuals with emetophobia complaints as well as forty-three controls participated in the study. Participants were asked to fill out a packet of questionnaires including several measures of DS and the emetophobia questionnaire. Results of the study indicated that the emetophobia group demonstrated elevated levels of both disgust propensity and sensitivity compared to the control group, and DS was the single best predictor of the variance in scores on the emetophobia questionnaire. Furthermore, a strong interrelationship existed between the

intensity of emetophobic complaints and levels of disgust propensity and sensitivity. Participants reported emetophobic complaints such as worry about vomiting or seeing others vomit, and avoiding vomit related stimuli (use of the word vomit or standing near a drunken person). This study suggested that DS may be a unique predictor of emetophobic symptoms. DS may influence the initial acquisition of fear learning in the disorder, as disgust is a “sticky” trait that is difficult to extinguish (Olatunji, Forsyth, and Cherian, 2007). Furthermore, disgust has been found to play a central role in the maintenance of certain disorders such as spider phobia as well as other specific phobias (Thorpe and Salkovskis, 1998). In emetophobia, high DS may be related to the maintenance of avoidance and safety behaviors. Support from this study, examining the relationship between disgust and anxiety disorders, suggest that DS should also be included in the conceptualization of emetophobia.

Present Study

Recent case studies presenting emetophobia as a primary specific phobia, rather than an “other” characterization, suggests the importance of further research and understanding of this disorder (Maack, Deacon, & Zhao, under review; Hunter & Antony, 2009). Given the limited knowledge of the disorder, additional research is needed to investigate the etiology and maintenance, and subsequent treatment of emetophobia. The present study aimed to examine the relation of emetophobia symptoms with AS, IU, and DS constructs which have been found to play a central role in the etiology and maintenance of related disorders such as OCD, Panic Disorder, and specific phobias (Boelen & Reijntjes 2008; Holaway, Heimberg, & Cole, 2006; Olatunji & Sawchuck 2005; Tolin, Abramowitz, Brigidi, & Foa, 2003; Woody & Teachman 2000). Specifically, the following hypotheses were tested: 1) AS, IU, and DS would be positively correlated with symptoms of emetophobia; 2) AS would predict symptoms of emetophobia

above and beyond DS and IU; 3) DS would predict symptoms of emetophobia above and beyond IU; 4) these relationships would hold when controlling for other symptoms of anxiety and depression.

II. METHODS

Participants

Participants were 193 undergraduate students (71% female) from a large Southeastern University who participated in exchange for course credit. The sample consisted of 65.8% Caucasian, 29% African-American, 3.1% Asian, 1.6% Hispanic, and 1.6% Multi-racial individuals. Age of the sample ranged from 18-53 years ($M = 20.21$; $SD = 4.10$).

Measures

The *Specific Phobia of Vomiting Inventory* (SPOVI; Veale et al. 2012) is a 14-item measure assessing symptoms of emetophobia such as fear, worry, and avoidance of vomiting. Each item is rated in terms of frequency on a scale ranging from 0 (not at all) to 4 (all the time). From the preliminary psychometric study, alpha internal consistency of the SPOVI was $\alpha = .91$ in the emetophobia group and $\alpha = .81$ in the community group. The scale demonstrated good one week test-retest reliability of .85 as well as good concurrent and convergent validity (Veale et al., 2012). Factor analysis yielded two factors: avoidance and threat monitoring, which can be used as subscales (Veale et al. 2012). Internal consistency of the SPOVI in the present study was good ($\alpha = .88$).

The *Anxiety Sensitivity Index – 3* (ASI-3; Taylor et al., 2007) is an 18-item measure assessing fear of arousal-related sensations on the basis of the belief that these sensations could have harmful physiological, cognitive, or social consequences. Items are rated on a five-point scale ranging from 0 (very little) to 4 (very much) in terms of how much one agrees with each item. Total scores range from 0-72. The ASI-3 has been found to demonstrate criterion,

convergent, and discriminant validity (Taylor et al., 2007). The total ASI-3 score was used in the analysis as it has been found to be a better predictor (accounting for 50% of the variance) of anxiety sensitivity data (Osman et al., 2010). The ASI-3 demonstrated good internal consistency in the present study ($\alpha = .88$)

The *Disgust Scale-Revised* (DS-R; Haidt, McCauley, & Rozin, 1994, modified by Olatunji et al. 2007) is a 25-item measure assessing propensity to various domains of potential disgust-eliciting stimuli (e.g., Food, Small Animals, Body Products, etc. Items are rated on a 5-point scale ranging from 0 (strongly disagree/not disgusting at all) to 4 (strongly agree/extremely disgusting). The measure demonstrated good internal consistency ($\alpha = .84$) overall, and has been found to have construct and convergent validity (Olatunji et al., 2007). The DS-R demonstrated good internal consistency in the present study ($\alpha = .89$).

The *Intolerance of Uncertainty Scale* (IUS; Buhr & Dugas, 2002) is a 27-item measure of an individual's tendency to tolerate uncertain situations. The items address the idea that uncertainty is unacceptable reflects poorly on a person, and leads to frustration, stress, and the inability to take action. Items are rated on a five-point scale ranging from 1 = "not at all characteristic of me" to 5 = "entirely characteristic of me." The scale had excellent internal consistency reliability ($\alpha = .94$) and adequate test-retest reliability ($\alpha = .74$) over a five-week period, as well as convergent and divergent validity (Buhr & Dugas, 2002). Internal consistency of the IUS in the present study was excellent ($\alpha = .94$).

The *Depression and Anxiety Stress Scales-21* (DASS-21; Lovibond & Lovibond, 1995) is a 21-item measure of depression, anxiety, and stress. The items are scored on a 4-point scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). The measure demonstrates good to excellent internal consistency for the Depression ($\alpha = .94$),

Anxiety ($\alpha = .87$), and Stress ($\alpha = .91$) subscales. For the purposes of the present study, only the anxiety and depression subscales were used to act as covariates. The internal consistency was adequate for the Anxiety subscale ($\alpha = .72$), and good for the Depression subscale ($\alpha = .83$) in the present sample.

Procedures

Individuals presented to a lab and provided written informed consent. Participants completed a structured clinical interview, a series of behavioral avoidance tasks, and completed a questionnaire packet. All questionnaires were self-report, paper pencil measures which the participants completed in front of a trained research assistant. Only the aforementioned measures were used for analyses in the current study. An a priori power analysis was conducted using G-Power (a power analysis program) to determine the required sample size necessary for correlation and regression analyses. Results indicated that the minimum sample size needed to detect a medium effect size was 111 for the correlation analysis and 74 for the regression analysis. The current sample size was adequate to detect a main effect to the extent that it exists.

Data cleaning procedures included outlier removal and replacement of missing data values using SPSS. Outliers were identified by calculating Mahalanobis distance for each case and comparing it to the critical value ($\chi^2 = 22.46$) of the χ^2 distribution at $\alpha < .001$ ($df = 6$). Cases with a χ^2 value greater than 22.46 were removed. Furthermore, multiple imputation was used to replace missing data values. Following data cleaning, preliminary analyses were run using SPSS assessing potential relations to all variables of interest (i.e., DS-R, ASI-3, SPOVI, and IUS) via correlational analyses. For the primary analyses, a hierarchical regression was conducted to test whether AS predicted emetophobia above and beyond DS, IUS, and the anxiety and depression

subscales of the DASS. Step 1 included the anxiety and depression subscales of the DASS; Step 2 included IUS; Step 3 included DS, and Step 4 included AS.

III. RESULTS

Correlations between predictor variables and emetophobia symptoms

Descriptive statistics as well as a correlation matrix between symptoms of anxiety, depression, disgust sensitivity, intolerance of uncertainty, anxiety sensitivity and emetophobia are presented in Table 1. Two-tailed Pearson’s correlations were conducted for all variables in the study. Significant positive correlations were found between all variables of interest.

Table 1. Correlations between predictors and Emetophobia

	M	SD	(2)	(3)	(4)	(5)	(6)
(1) SPOVI	2.40	5.06	.26*	.15*	.32**	.36**	.25**
(2) ASI-III	12.76	10.28	-	.25**	.59**	.48**	.51**
(3) DS-R	57.62	18.75		-	.32**	.22**	.15*
(4) IUS	52.37	17.62			-	.40**	.46**
(5) DASS-Anxiety	2.51	2.90				-	.61**
(6) DASS-Depression	2.67	3.26					-

Note: N = 193, * $p < .05$, ** $p < .01$

Hierarchical Regression

A hierarchical regression was conducted to examine the potential predictive effects of the ASI-III, DS-R, IUS, DASS-Anxiety, and DASS-depression subscale scores on experiencing symptoms of Emetophobia (See Table 2). In the regression analysis, ASI-III, DS-R, IUS, DASS-Anxiety, and DASS-Depression scores were the predictor variables and SPOVI scores were examined as the dependent variable. First, regression analysis was conducted to test the predictive ability of the anxiety and depression subscales of the DASS in determining SPOVI scores. Results indicated that symptoms of anxiety, but not depression, accounted for significant variability on SPOVI scores ($R^2 = .13$, $F(2, 187) = 13.95$, $p < .001$), evidencing that individuals

high in anxiety tended to have higher scores on the SPOVI. Anxiety uniquely accounted for 6.8% ($p < .001$) of variability in SPOVI scores. A second analysis was conducted to evaluate whether IU predicted SPOVI scores above and beyond anxiety and depression. IU accounted for 3.53% of the variance in SPOVI scores after controlling for anxiety and depression ($R^2 \Delta = .03$, $F(1, 186) = 7.45$, $p < .01$). To assess the predictive utility of DS in SPOVI scores, a third regression was conducted. DS did not evidence significant predictive utility ($R^2 \Delta = .00$, $F(1, 185) = .09$, $p = .76$). Finally, a fourth analysis was conducted to assess whether symptoms of AS predicted variability in SPOVI scores above and beyond symptoms of anxiety, depression, IU, and DS. No significant results were found for this analysis ($R^2 \Delta = .00$, $F(1, 184) = .04$, $p = .85$).

Table 2. Summary of Hierarchical Regression Analysis for Variables Predicting Symptoms of Emetophobia

Variable	B	SE B	β	p
Step 1				
DASS-Anxiety	.57	.15	.329	<.01**
DASS-Depression	.076	.13	.049	.57
Step 2				
IUS	.06	.02	.21	<.01**
Step 3				
DS-R	.006	.02	.022	.76
Step 4				
ASI	.009	.04	.018	.85

Note: (N = 190); $R^2 = .13$ for Step 1; $\Delta R^2 = .034$ for Step 2 ($ps < .05$); $R^2 = .000$ for Step 3 ($ps < .764$); $\Delta R^2 = .000$ for Step 3 ($ps < .845$); * $p < .05$; ** $p < .01$; DASS-Anx = Depression and Anxiety Stress Scales- 21; IUS = Intolerance of Uncertainty Scale; DS-R = Disgust Sensitivity Scale- Revised; ASI = Anxiety Sensitivity Inventory

IV. DISCUSSION

Emetophobia is a distinct but poorly understood specific phobia that warrants further research. The present study aimed to examine the relation between symptoms of emetophobia and anxiety related constructs such as AS, IU, and DS. The main findings were: 1) symptoms of emetophobia were significantly positively correlated with symptoms of IU, AS, DS, depression and anxiety; 2) symptoms of anxiety but not depression significantly predicted emetophobia symptoms; 3) IU significantly predicted emetophobia above and beyond covariates of anxiety and depression; and 4) DS and AS did not add additional predictive variance compared to IU, anxiety, and depression, which was contrary to the hypothesis.

The findings that, IU, AS, and DS were positively correlated with symptoms of emetophobia suggest these cognitive vulnerabilities may be important in further understanding and conceptualizing emetophobia. Specifically, higher IUS scores were found to be the single best predictor of variance in emetophobia symptoms, above and beyond covariates of anxiety and depressive symptoms. Consistent with reported clinical features of emetophobia (Lipsitz et al., 2001; Veale & Lambrou, 2006; Hunter & Antony, 2009), this finding suggests that IU may play a role in the maintenance and/or expression of emetophobic symptoms. As IU is the tendency for an individual fear the possibility of a negative event occurring despite the likelihood of that event actually happening, individual differences in the tolerance of uncertainty has a demonstrated direct impact on levels of anxiety (Greco & Roger, 2001). In the conceptualization of emetophobia, IU may play a role in perpetuating and exacerbating anxious symptomology such as hypervigilance towards internal sensations, increased worry about the possibility of

vomiting, and avoidance of activities that may result in vomiting. Additionally, higher IU may cause impairment in problem solving when emetophobics are faced with ambiguous situations, which would lead to avoidance behaviors. This significant relationship between IU and symptoms of emetophobia further supports prior research evidencing that IU is not only relevant in Generalized Anxiety Disorder (Carleton et al., 2012), but may be a cognitive vulnerability related to anxiety disorders more generally.

Similar to previous research (e.g. Van Overveld et al., 2008), individuals who demonstrated increased symptoms of emetophobia were also more likely to endorse a higher sensitivity to disgust. Although this relation was supported in correlational analyses, contrary to hypothesis, DS-R scores did not evidence unique predictive utility of emetophobic symptoms above and beyond IU and covariates of depression and anxiety. This may be due to the lack of variability in SPOVI scores. Since emetophobia is a relatively low base-rate phenomenon in the general population, many participants reported little to no symptoms on their SPOVI scores. Moreover, items on the SPOVI mainly assess avoidance behaviors and threat monitoring and control of symptoms (Veale et al. 2012), which may be predicted better by IU rather than DS. Primary concerns of individuals with emetophobia (e.g. fear of possibly choking, dying, or becoming extremely ill) appear to be driven by this “what if” fear rather than a disgust reaction. Despite certain features of emetophobia (e.g., vomit, anxiety) being associated with disgust, this finding suggests that in emetophobia, symptoms might not be as functionally related to disgust as other anxiety disorders (such as contamination based OCD, Blood-Injection-Injury phobia, and spider phobia). Furthermore, the stimuli eliciting anxiety or worry about vomiting concerns internal sensations rather than a disgust object. Although van Overveld et al. (2008) did find DS

to be predictive of emetophobia, the study did not include IU, which seems to account for a significantly larger portion of the variance in SPOVI scores.

Similarly, AS scores did not predict symptoms of emetophobia above and beyond IU, DS, and covariates of anxiety and depression. Anxiety sensitivity was found to be positively correlated with symptoms of emetophobia, which is consistent with previous findings of emetophobics reporting hypervigilance to internal cues of stomach sensations (Maack, Deacon, and Zhao, under review; Hunter & Antony, 2009). However, the total ASI-III score did not account for unique variance in emetophobia symptoms above and beyond other vulnerability factors. The predictive value of AS was not found in this sample, which could be explained by the lack of variability in SPOVI scores (most participant endorsed little to no symptoms). Furthermore, fear of gastrointestinal sensations is clinically most pertinent in emetophobia. There is only one question related to gastrointestinal sensations on the ASI (e.g., “When my stomach is upset, I worry I might be seriously ill”), which could explain why anxiety sensitivity had no predictive influence on emetophobia symptoms in the present study.

Taken together, the overall study findings suggest that IU may be a stronger predictor of emetophobia symptoms than DS and AS. The fear of ambiguity as to whether vomiting could occur, and to what the potential consequences could be seems to lead to increased worry and promotes prevention through avoidance and safety behaviors. Although not all apriori hypotheses were supported, the present findings provide a further understanding of the individual difference and cognitive vulnerabilities important to the overall conceptualization of emetophobia.

Although the present study contributes to the sparse literature related to emetophobia, there are several limitations to note. One issue was a lack of variability in symptoms of

emetophobia. This is not surprising as emetophobia is a low base rate phenomenon and symptoms were assessed in a non-clinical college sample. Perhaps with more variability in symptom endorsement (i.e., more individuals endorsing any symptoms of emetophobia) in the current sample, relations with other cognitive vulnerabilities (namely AS and DS) and emetophobic symptoms would be evidenced. More robust findings would be likely with the use of a clinical sample as opposed to a college sample. Given that the present study was cross sectional and employed unimethod data collection relying on self-report measures, only relational inferences about emetophobia symptoms and symptoms of AS, DS, and IU could be made. The use of additional methodology such as physiological or behavioral measure could have provided more information in the understanding of cognitive and behavioral mechanisms of emetophobia.

The present findings provide additional evidence of emetophobia as a unique and distinct specific phobia that warrants further empirical research. Presently, there are only 17 published peer-reviewed manuscripts focused on emetophobia. The current study provides further information in the advancement of the conceptualization of emetophobia. It validates previous findings that DS is related to symptoms of emetophobia (e.g., van Overveld et al., 2008). The extent to which DS predicts emetophobia symptoms as found by van Overveld et al. (2008) can also be further examined. The current study sets the grounds for a variety of investigations that could be performed. More research could benefit the understanding the role of underlying mechanisms of IU in relation to emetophobia symptoms. The extent to which DS predicts emetophobia symptoms as found by van Overveld et al. (2008) can also be further examined. Most importantly, more research on the psychometrics of the SPOVI is necessary to ensure that it is a reliable and valid measure of symptoms of emetophobia. Although AS did not predict

symptoms of emetophobia, reported clinical features suggest AS may play an important role. Thus the use of different methodology (e.g., collecting psychophysiological data) or a clinical sample may yield important findings. Furthermore the incorporation of an emetophobia patient population would be ideal in delineating factors that contribute to the etiology and maintenance of emetophobia. Future studies could also benefit from the use of behavioral and psychophysiological measures to gain a better understanding of the disorder.

The present study aimed to explore associations between symptoms of emetophobia and cognitive vulnerabilities to anxiety. Results indicated positive associations between AS, DS, IU and symptoms of emetophobia. Furthermore, IU was found to be predictive of symptoms of emetophobia above and beyond covariates of anxiety and depression. These findings indicate that emetophobia is indeed a distinct specific phobia with disorder specific cognitive vulnerabilities that may contribute to the etiology and maintenance of symptoms. Furthermore, given the potential harmful consequences of the disorder (e.g., avoiding pregnancy, malnutrition), further research focusing on understanding of the pathogenesis of the disorder is of the utmost importance. Although the present study only provides a rudimentary understanding of the disorder, it sets the stage for many research opportunities that will benefit the understanding and treatment of not only emetophobia but also anxiety disorders in general.

LIST OF REFERENCES

- American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorders (4th Edition, TR)*. Arlington, VA: American Psychiatric Association.
- Antony, M. M., Bieling, P.J. Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric Properties of the 42-Item and 21-Item Versions of the Depression Anxiety Stress Scales in Clinical Groups and a Community Sample. *Psychological Assessment, 10*, 176-181.
- Boelen, P. A., & Reijntjes, A. (2008). Intolerance of uncertainty and social anxiety. *Journal of Anxiety Disorders, 23*, 130-135.
- Boschen, M. J. (2007). Reconceptualizing emetophobia: A cognitive-behavioral formulation and research agenda. *Journal of Anxiety Disorders, 21*, 407-419.
- Brown, T. A., & McNiff, J. (2009). Specificity of autonomic arousal to DSM-IV panic disorder and posttraumatic stress disorder. *Behaviour Research and Therapy, 47*, 487-493.
- Buhr, K. & Dugas, M. J. (2002). The intolerance of uncertainty scale: psychometric properties of the English version. *Behaviour Research and Therapy, 40*, 931-945.
- Carleton, R. N., Mulvogue, M. K., Thibodeau, M. A., McCabe, R. E., Antony, M. M., & Asmundson, G. J. G. (2012). Increasingly certain about uncertainty: Intolerance of uncertainty across anxiety and depression. *Journal of Anxiety Disorders, 26*, 468-479.
- De Jong, P. J., & Merckelbach, H. (1998). Blood-Injection-Injury Phobia and Fear of Spiders: Domain specific individual differences in disgust sensitivity. *Personality and Individual Differences, 24*, 153-158.
- Deacon, B. J., & Abramowitz, J. S. (2006). Anxiety Sensitivity and its dimensions across the anxiety disorders. *Anxiety Disorders, 20*, 837-857.

- Dugas, M. J., Freeston, M. H., & Ladouceur, R. (1997). Intolerance of uncertainty and problem orientation in worry. *Cognitive Therapy and Research*, 21(6), 596–606.
- Dugas, M. J., Schwartz, A., & Francis, K. (2004). Intolerance of Uncertainty, Worry, and Depression. *Cognitive Therapy and Research*, 28, 835–842
- Dugas, M. J., Hedayati, M., Karavidas, A., Buhr, K., Francis, K., & Phillips, N. A. (2005). Intolerance of Uncertainty and Information Processing Evidence of Biased Recall and Interpretations. *Cognitive Therapy and Research*, 29, 57-70.
- Ehlers, A., & Breuer, P. (1992). Increased Cardiac Awareness in Panic Disorder. *Journal of Abnormal Psychology*, 101, 371-382.
- Freeston, M. H., Rheaume, J., Letarte, H., Dugas, M. J., Ladouceur, R. (1994). Why do people worry? *Personality and Individual Differences*, 17, 791-802.
- Haidt, J., McCauley, C., & Rozin, P. (1994). Individual differences in sensitivity to disgust: A scale sampling seven domains of disgust elicitors. *Personality and Individual Differences*, 16, 701-713.
- Holaway, R. M., Heimberg, R. G., & Coles, M. E. (2006). A comparison of intolerance of uncertainty in analogue obsessive-compulsive disorder and generalized anxiety disorder. *Journal of Anxiety Disorders*, 20, 158-174.
- Hunter, P. V., & Antony, M. M. (2009). Cognitive-Behavioral Treatment of Emetophobia: The Role of Interoceptive Exposure. *Cognitive and Behavioral Practice*, 16, 84-91.
- Lipsitz, J. D., Fyer, A. J., Paterniti, A., & Klein, D. F. (2001). Emetophobia: Preliminary results of an internet survey. *Depression and Anxiety*, 14, 149-152.

- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, *33*, 335–343.
- Maack, D. J., Deacon, B., & Zhao, M. (under review). Exposure Therapy for Emetophobia: A Case study with Three-Year Follow-Up.
- McFadyen, M., & Wyness, J. (1983). You don't have to be sick to be a behaviour therapist but it can help! Treatment of a "Vomit Phobia." *Behavioural Psychotherapy*, *11*, 173-176.
- Naragon-Gainey, K. (2010). Meta-analysis of the relations of anxiety sensitivity to the depressive and anxiety disorders. *Psychological Bulletin*, *136*, 128–150
- Olatunji, B. O., Forsyth, J. P., & Cherian, A. (2007). Evaluative differential conditioning of disgust: A sticky form of relational learning that is resistant to extinction. *Journal of Anxiety Disorders*, *21*, 820-834.
- Olatunji, B. O., & Sawchuk, C.N. (2005). Disgust: Characteristic features, social manifestations, and clinical implications. *Journal of Social and Clinical Psychology*, *24*, 932-962.
- Olatunji, B. O., Williams, N. L., Tolin, D. F., Abramowitz, J. S., Sawchuk, C. N., Lohr, J. M., & Elwood, L. S. (2007). The Disgust Scale: Item analysis, factor structure, and suggestions for refinement. *Psychological Assessment*, *19*, 281-297.
- Ost, L. G., & Csatlos, P. (2000). Probability ratings in claustrophobic patients and normal controls. *Behaviour Research and Therapy*, *38*, 1107-1116.
- Osman, A., Gutierrez, P. M., Smith, K., Fang, Q., Lozano, G., & Devine, A. (2010). The Anxiety Sensitivity Index–3: Analyses of Dimensions, Reliability Estimates, and Correlates in Nonclinical Samples. *Journal of Personality Assessment*, *92*, 45–52.

- Price, K., Veale, D., Brewin, C. R. (2012). Intrusive imagery in people with a specific phobia of vomiting. *Journal of Behavior Therapy and Experimental Psychiatry*, 43, 672-678.
- Philips, H. C. (1985). Return of fear in the treatment of a fear of vomiting. *Behaviour Research and Therapy*, 23, 45-52.
- Reiss, S., & McNally, R. J. (1985). The expectancy model of fear. In S. Reiss & R. R. Bootzin (Eds.), *Theoretical issues in behavior therapy* (pp. 107-121). New York: Academic Press.
- Reiss, S. (1991). Expectancy theory of fear, anxiety, and panic. *Clinical Psychology Review*, 11, 141-153.
- Rozin, P., Haidt, J., & McCauley, C. R. (2000). Disgust. In: M. Lewis & J. M. Haviland Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 637-652). New York: Guilford Press.
- Taylor, S., Koch, W. J., McNally, R. J., & Crockett, D. J. (1992). Conceptualizations of Anxiety Sensitivity. *Psychological Assessment*, 4, 245-250.
- Taylor, S., Zvolensky, M. J., Cox, B. J., Deacon, B., Heimberg, R. G., Ledley, D. R., Abramowitz, J. S., Holaway, R. M., ... Cardenas, S. J. (2007). Robust dimensions of anxiety sensitivity: Development and initial validation of the Anxiety Sensitivity Index—3. *Psychological Assessment*, 19, 176-188.
- Thorpe, S. J., & Salkovskis, P. M. (1998). Studies on the role of disgust in the acquisition and maintenance of specific phobias. *Behaviour Research and Therapy*, 36, 877-893.
- Thorpe, S. J., & Salkovskis, P. M. (1999). Phobic Beliefs: Do cognitive factors play a role in specific phobias? *Behaviour Research and Therapy*, 33, 805-816.
- Tolin, D. F., Abramowitz, J. S., Brigidi, B. D., & Foa, E. B. (2003). Intolerance of uncertainty in obsessive-compulsive disorder. *Journal of Anxiety Disorders*, 17, 233–242.

- Veale, D., & Lambrou, C. (2006). The Psychopathology of Vomit Phobia. *Behavioural and Cognitive Psychotherapy*, 34, 139-150.
- Veale, D., Murphy, P., Ellison, N., Kanakam, N., & Costa, A. (2012). Autobiographical memories of vomiting in people with a specific phobia of vomiting (emetophobia). *Journal of Behavior Therapy and Experimental Psychiatry*, 44, 14-20.
- Van Overveld, M., De Jong, P., Peters, M. K., Van Hout, W. J. P. J., & Bouman, T. K. (2008). An internet-based study on the relation between disgust sensitivity and emetophobia. *Journal of Anxiety Disorders*, 22, 524-531.
- Wheaton, M. G., Deacon, B. J., McGrath, P. B., Berman, N. C., & Abramowitz, J. S. (2012). Dimensions of anxiety sensitivity in the anxiety disorders: Evaluation of the ASI-3. *Journal Anxiety Disorders*, 26, 401-408.
- Wheaton, M. G., Mahaffey, B., Timpano, K. R., Berman, N. C., Abramowitz, J. S. (2012). The relationship between anxiety sensitivity and obsessive-compulsive symptoms dimensions. *Journal of Behavior Therapy and Experimental Psychiatry*, 43, 891-896.
- Woody, S. R., & Teachman, B. A. (2000). Intersection of disgust and fear: Normative and Pathological views. *Clinical Psychology: Science and Practice*, 7, 291-311.
- Zinbarg, R. E., Barlow, D. T., & Brown, T. A. (1997). Hierarchical structure and general factor saturation of the Anxiety Sensitivity Index: Evidence and implications. *Psychological Assessment*, 9, 277-284.

all active studies, screening and recruiting special student and community populations (*Post-Traumatic Stress Disorder, Obsessive-Compulsive Disorder, Blood-Injection-Injury phobia*), literature review, data transformation (visual basic script in Excel), data analysis (SPSS), programming experiments (E-Prime), writing IRB application proposal and consent forms, and running participants.

- Performed various administrative duties such as supply purchasing, coordinating and scheduling weekly meetings and activities, training Research Assistants, actively maintaining EARL website (HTML), and general laboratory maintenance.

Cognitive Vulnerability to Anxiety Lab; John Riskind, Ph.D. 09/2009 – 06/2010

George Mason University Department of Psychology, Fairfax VA

Research Assistant

- Studied the looming vulnerability model of anxiety and administered a cognitive therapy intervention to students with generalized anxiety disorder
- scheduled participants and collected data

Visual Cognitive Neuroscience Lab; Geoff Woodman, Ph.D. 08/2008 – 05/2009

Vanderbilt University Department of Psychology, Nashville TN

Research Assistant

- Directed Study contributing to research examining the role of eye movements in visual working memory maintenance and encoding of simple object representations
- Running and scheduling participants, data entry, literature review

USA Food and Drug Administration 05/2008 – 08/2008

Center for Biologics Evaluation & Research, Department of Viral Products, Bethesda, MD

Summer Intern

- Contributed to research examining characteristics and virility of the H5 influenza virus by producing pseudoviruses, performing virus infectivity, and neutralization assay using human anti-sera by using different molecular biology techniques
- Participated in the National Institutes of Health summer poster day

National Cancer Institute 05/2007– 08/2007

Laboratory of Immune Cell Biology, Bethesda MD

Summer Intern

- Performed independent research project investigating the role of nuclear transcription factor in regulation of apoptosis
- Learned and implemented techniques such as cloning, transformation, recombination, PCR, transfection, cell culture, Western Blots and etc.

Professional Memberships

- **ADAA** (Anxiety Disorders Association of America)
- **ABCT** (Association for Behavioral and Cognitive Therapies)

Honors and Awards

Dean's List: Fall 2008 & Spring 2009; Vanderbilt University, Nashville, TN.

Publications

Olatunji, B. O., Armstrong, T., Fan, Q., & Zhao, M. (2012). Risk and Resiliency in Posttraumatic Stress Disorder: Distinct Roles of Anxiety and Disgust Sensitivity. *Psychological Trauma: Theory, Research, Practice, and Policy*. Advance online publication

Olatunji, B.O., Ciesielski, B.G., Armstrong, T., Zhao, M., & Zald, D.H. (2011). Making something out of nothing: neutral content modulates attention in generalized anxiety disorder. *Depression and Anxiety, 28*, 427-434.

Conference Presentations

Zhao, M. S., Maack, D. J., & Smitherman, T. A. (November 2013). Conceptualizing emetophobia as a distinct specific phobia in a nonclinical sample: An investigation of anxiety sensitivity. Poster to be presented at the Association for Behavioral and Cognitive Therapies Meeting, Nashville, TN.

Zhao, M. S., Maack, D. J., & Young, J. (November 2013). Is moral disgust an appropriate measure of moral judgment? The clarifying role of Thought Action Fusion. Poster to be presented at the Association for Behavioral and Cognitive Therapies Meeting, Nashville, TN.

Zhao, M. S., Maack, D. J., & Deacon, B. J. (November 2013). The effects of exposure for the treatment of Emetophobia: A case study with three year follow-up. Poster to be presented at the Association for Behavioral and Cognitive Therapies Meeting, Nashville, TN.

Zhao, M. & Olatunji, B.O. (April 2012). Gender Differences Specific Phobias: Examination of the Mediating Role of Distinct Disgust Vulnerabilities. Poster presented at the Anxiety Disorders Association of America, Arlington, VA.

Schaefer, K., Kleiman, E.M., Riskind, J.H., Danvers, A., Jeanes, K., Stolz, M., & Zhao, M. (November 2010). The Role of Experiential Avoidance in Predicting High-Risk Sexual Behavior Among College Students. Poster presented at the Association for Behavioral and Cognitive Therapies Meeting, San Francisco, CA.

Psychological Test Administration and Scoring

- Mini International Neuropsychiatric Interview (MINI)
- Structured Clinical Interview for DSM-IV (OCD section)
- Yale-Brown Obsessive Compulsive Scale (Y-BOCS)
- Anxiety Disorders Interview Schedule for the DSM-IV (ADIS-IV)

Technical and Language Skills

- Comprehensive knowledge of Microsoft Word, PowerPoint, and Excel.
- Some experience with HTML language and Visual Basic code
- Programming in E-Prime
- Data transformation and analysis in SPSS, Excel, MatLab-(SPM-Statistical Parametric Mapping)
- Proficient in using eye-trackers iView X Red (Sensometric Instruments) and Eyelink II (SR Research), and BIOPAC's Acknowledge software for electrodermal activity and electrocardiogram analysis
- Proficient in Chinese