

# Reconceptualizing emetophobia: A cognitive–behavioral formulation and research agenda

Mark J. Boschen\*

*School of Psychology, Griffith University, PMB50 Gold Coast Mail Centre, Queensland 9726, Australia*

Received 3 January 2006; received in revised form 2 June 2006; accepted 15 June 2006

---

## Abstract

Fear of vomiting (emetophobia) is a poorly understood anxiety disorder, with little research published into its conceptualization or treatment. The current article uses established cognitive and behavioral models of other anxiety disorders as a basis from which to propose a detailed model of emetophobia. The model proposes that emetophobia results from a constellation of factors including a general anxiety-vulnerability factor, a tendency to somatize anxiety as gastrointestinal distress, a tendency to catastrophically misappraise nausea and other gastrointestinal symptoms, hypervigilance to gastrointestinal cues, beliefs about the unacceptability of vomiting, negatively reinforced avoidance behavior, and selective confirmation biases. A formulation-based treatment package for emetophobia is outlined, including arousal management skills, distraction/attention training, exposure and cognitive restructuring.

© 2006 Elsevier Ltd. All rights reserved.

*Keywords:* Emetophobia; Phobia; Vomiting

---

Conceptual models of the anxiety disorders have evolved considerably since the introduction of behavioral techniques in the 1950s and the incorporation of cognitive theory in the last decades of the twentieth century. Early behavioral associative learning theories have changed to recognize the importance of non-associative learning mechanisms (e.g., Rachman, 1991, 1990, 1977) in fear acquisition. While other anxiety disorders, for example, Panic Disorder and Social Phobia, have experienced a thorough cognitive reformulation (e.g., Clark, 1986; Rapee & Heimberg, 1997), others are yet to fully benefit from developments in conceptualization and treatment that incorporates cognitive factors.

One example of such a specific phobia that is overdue for reconceptualization is fear of vomiting (emetophobia). Knowledge about specific prevalence rates for fear of vomiting is

---

\* Tel.: +61 7 55528283; fax: +61 7 55528291.

E-mail address: [m.boschen@griffith.edu.au](mailto:m.boschen@griffith.edu.au).

limited, with no studies looking specifically at this fear (Lipsitz, Fyer, Paterniti, & Klein, 2001). Kartsounis, Mervyn-Smith, and Pickersgill (1983), in a sample of 547 students, found fear of becoming nauseous as the 16th most intense fear among a selection of 88 fears from the Fear Survey Schedule III (Wolpe, 1973)—higher than recognized and researched phobias such as spider phobia, and fear of heights. Not only in prevalence studies, but across the literature, fear of vomiting has received little attention from researchers, and has been placed in the mixed-bag category of “Specific Phobia (Other Type)” by the authors of the current edition of the Diagnostic and Statistical Manual of Mental Disorders (APA, 2000). This has had the unfortunate effect of minimizing research into emetophobia as a specific distinct disorder. Studies which look at the classification of phobias, and the characteristics of phobias make scarce mention of this Other category, if at all, and no direct mention of fear of vomiting (e.g., Antony, Brown, & Barlow, 1997; Cox, McWilliams, Clara, & Stein, 2003).

This lack of knowledge of the nature of emetophobia is surprising given recently published data on the impact of the illness. In a sample of 56 emetophobics, Lipsitz et al. (2001) reported that emetophobia was associated with an early onset, chronic course (with a large subgroup reporting no periods of remission), and marked impairment for a large proportion of sufferers. Despite this, treatment–outcome studies are scarce (with no controlled outcome data), and there has been little specific examination of the cognitive factors involved in fear of vomiting, and consequently no incorporation of cognitive techniques into treatment packages specifically tailored to emetophobia.

The current article aims to briefly review the current conceptualization of fear of vomiting, and proposes a novel, detailed account of the etiological and maintaining factors associated with the illness. Previous treatment research is reviewed and used to propose a formulation-based cognitive–behavioral intervention for emetophobia. Methods for validation of the proposed model and treatment approach are discussed.

## 1. Clinical presentation of emetophobia

The nature of emetophobia symptoms remains poorly understood, as does the exact nature of emetophobia presentations clinical practice. The most comprehensive review of emetophobia symptoms to date was presented by Lipsitz et al. (2001) in which the authors reported on the results of an internet-based survey of 56 self-selected individuals with fear of vomiting. Although the non-random sample used by the authors did not have their diagnoses verified by mental health professionals, the data presented by these authors serve as a good initial starting point in a more thorough understanding of the phenomenology of the disorder.

In their sample of emetophobic individuals, Lipsitz et al. (2001) reported that sufferers were characterized by a very early illness onset, and a persistent, chronic course with little or no periods of remission. The illness caused considerable distress and impairment. The vast majority of respondents were females, suggesting a similar gender-imbalance as seen in most other anxiety disorders. Most were more concerned with vomiting themselves, rather than others vomiting in their presence, and most were more concerned about vomiting in public.

A large proportion of individuals also reported panic attacks unrelated to their emetophobia. In these cases, the vast majority (over 80%) experienced significant gastrointestinal symptoms as part of these panic attacks. Many individuals with emetophobia from the Lipsitz et al. (2001) study also reported other comorbid psychological (especially anxiety) disorders.

## 2. Emetophobia and other anxiety disorders

Anxiety disorders have characteristics in common, as well as differentiating features. The diagnostic category of “anxiety disorders” is made coherent and meaningful by the fact that these disorders share certain core characteristics. All of the illnesses currently classified as anxiety disorders present with elevated levels of physiological arousal (either generalized or episodic), avoidance behavior (overt or covert), safety/neutralizing behaviors (again, overt or covert), attentional disruption, and characteristic self-efficacy beliefs and expectancies. These anxiety symptoms typically occur in response to a particular stimuli, cognition, interoceptive cue, or situation (Andrews et al., 2003). For example, in social phobia, entry into a performance situation is accompanied by somatic anxiety symptoms, a desire to leave the situation, safety behaviors such as having a friend present or consuming alcohol, attentional biases towards indications of negative evaluation from the audience, beliefs about ability to tolerate negative evaluation, and expectancies that others will be critical judges of performance (e.g., Rapee & Heimberg, 1997). Alternatively, however, part of the justification for maintaining a taxonomy of separate anxiety disorders, is that for each of the disorders different stimuli are the focus of fear, and different safety, avoidance, and/or anxiolytic behaviors are performed. Social phobia is differentiated from agoraphobia, for instance, on the basis that the social phobic’s fear is one of negative evaluation by others, while the agoraphobic’s concerns center around the fear of panic symptoms. In emetophobia, examination of the anxiogenic stimuli and subsequent acts used to manage anxiety are important in understanding its conceptualization, and planning treatment targets.

Of the characteristic pattern of anxiety features listed above, physiological arousal warrants further mention as a prelude to defining its key role in emetophobia. Somatic symptoms of arousal seen in anxiety disorders may occur in a chronic (as in generalized anxiety disorder or post-traumatic stress disorder) or acute-episodic presentation (as in specific phobia and panic disorder). Some authors (e.g., Watson, Clark, & Carey, 1988) have conceptualized physiological arousal as the hallmark symptom of anxiety, highlighting its importance in differentiating anxiety from other related disorders such as depression (Watson et al., 1995). Several of the somatic symptoms of anxiety are experienced as gastrointestinal symptoms. These include nausea, bloating, constipation, dihorrea, and “butterflies.” Other psychosomatic ailments such as irritable bowel syndrome, where symptoms are predominantly gastrointestinal, are known to show high comorbidity with anxiety disorders (e.g., Blanchard, Scharff, Schwartz, Suls, & Barlow, 1990) with physiological mechanisms being proposed for this (e.g., Blomhoff, Spetalen, Jacobsen, & Malt, 2001), further underscoring the link between anxiety and its expression in gastrointestinal symptoms.

## 3. Previous treatment research

There are few reports in the treatment literature of interventions specifically designed for emetophobia. A review of articles published on “vomiting phobia” and “emetophobia” from the current Medline and PsycInfo databases yielded no controlled trials, one uncontrolled group treatment program, and a small number of case study reports. The most sophisticated treatment–outcome study to date was published in 1985 by Philips, who used a group of seven patients described as having “. . . specific fears of themselves or others vomiting . . .” (p. 46). This cohort was treated as a group using videotape-based exposure procedures in which they saw footage of people vomiting, with and without auditory stimuli. After behavioral approach tests of

approaching simulated vomitus and watching video footage of a person vomiting, up to 13 single-hour sessions were conducted, in which the participants were asked to repeatedly view the current 4-min video sequence repeatedly. Philips reports successful effective within and across session habituation, but notes that a subgroup of patients required a greater number of exposure sessions, and were characterized by a return of fear between exposure sessions. Of note is that in this treatment procedure, the exposure to *others* vomiting was used uniformly with those with fear of themselves and others vomiting. It may be hypothesized that exposure to another person vomiting may be enough to elicit the strong interoceptive cues in emetophobics that are suggested to be crucial in the current model.

Single-case designs have demonstrated effectiveness of certain interventions. In the first of these Wijesinghe (1974) treated a 24-year-old woman with a combination of exposure and hypnotherapy. Flooding rather than graduated exposure was used, and the patient was reported as being free of her phobia post-treatment, and also at 12-month follow-up. Interestingly, some authors (e.g., Andrews et al., 2003) recommend such flooding for panic and agoraphobia patients, but not for specific phobias. A second study, also in a young female patient was also successfully treated with hypnosis (Ritow, 1979). McKenzie (1994) reported on what was described as a “vomiting phobia,” but in this report, the author appeared to equate a fear of vomiting, with a fear of being vomited on (e.g., by a baby being held). As such, its relevance to the current conceptualization of emetophobia is limited.

Another example of successful behavioral treatment of an individual with emetophobia was presented by McFadyen and Wyness (1983). In this single-case study, a “professional woman in her late twenties” (p. 174) worked her way through an exposure hierarchy that began with audio recordings of people vomiting and extended up to simulations of others vomiting in her presence. The authors reported considerable treatment success, after a relatively short program of exposure (five sessions). Furthermore, the gains made by the patient were maintained at an 18-month follow-up.

Lipsitz et al. (2001) investigated treatment experiences in their internet survey of emetophobic individuals. A variety of treatment approaches had been applied with limited success. Around one-third reported benefit from pharmacological interventions, including both psychotropic and gastrointestinal agents. A small percentage reported successful trials of psychotherapy, behavior therapy and hypnotherapy. Unfortunately, the authors present only the data on how many participants derived benefit from treatments, but not data on how many had experienced such treatments, making conclusions about the effectiveness of interventions impossible to draw.

It is noteworthy, that many of the published treatment cases to date have used hypnotherapy, with or without additional components. In contrast, fewer have used any form of exposure, the apparently obvious intervention of choice based on the treatment–outcome literature for both panic and specific phobias. From this brief review, it is apparent that a reconceptualization, and a more focused plan for evaluation of evidence-based treatment techniques for emetophobia is timely and worthwhile. Treatment studies to date have all used young female patients, with no published treatment case-reports of males with emetophobia.

#### **4. A cognitive behavioral model of emetophobia**

##### *4.1. Panic disorder-like factors in emetophobia*

The panic attacks experienced by people with specific phobia and panic attacks are typically delineated as “cued” and “uncued,” respectively (APA, 2000). Notwithstanding differences in

the hypothesized trigger, the nature of these panic episodes appears to show many similarities. In a large review of the literature, [Craske \(1991\)](#) examined similarities in physiological symptoms and subjective experience during panic attacks experienced by patients with specific phobia (predominantly claustrophobics) and panic disorder. Despite supporting the distinction between cued and uncued attacks, the author asserted that the actual symptoms of the panic attacks in each disorder were identical.

Factors demonstrated to be important in etiology and maintenance of panic disorder have also been hypothesized as important in specific phobias other than emetophobia. Alongside traditional behavioral acquisition and maintenance models involving classical and operant conditioning paradigms, both cognitive factors and interoceptive stimuli have been investigated to ascertain their role in phobic fear.

Increasing dissatisfaction with classical behavioral models and preparedness concepts ([Seligman, 1971](#)) have led to increasing investigation of the role of cognitions in specific phobias. Cognitions are now recognized in acquisition and maintenance of specific phobias, and their similarity to the cognitions in panic has also been examined. [Rachman's \(1977, 1990, 1991\)](#) proposal that phobias may be acquired through not only contiguous presentation of the phobic stimulus with anxiety (as in classical behavioral models), but also vicariously or even verbally, highlights the role of cognition at this early stage. **Once a person has acquired a specific phobia, cognitions can serve to maintain this fear. Thorpe and Salkovskis (1995) reported on the content of phobic individuals' cognitions and their relationship to the phobia itself. Using a sample of 25 phobic individuals (including one with a phobia of vomit), the researchers used self-report instruments to assess the cognitions present in phobic patients when they are confronted with the feared object or situation. In this study, Thorpe and Salkovskis found that the frequency of "catastrophic cognitions" usually associated with panic disorder such as "I would go mad" was surprisingly high (32%). Interestingly, loss of control of excretory bodily functions was also investigated, with 8% signaling that this cognition was present. The authors also demonstrated that the intensity of phobic fear was related to their conviction in the accuracy of these cognitions, especially those related to harm and ability to cope. The conclusion drawn by the authors are that cognitive factors, especially those related to self-efficacy and harm from the phobic stimulus are important maintaining factors in specific phobia, similarly to other diagnoses like panic disorder.**

Related findings have also been reported where phobic patients, in addition to cognitions about harm from the phobic object itself, also report fear of the actual panic attack that may result on presentation of the feared object ([Craske, 1991](#)). This pattern is akin to that seen in panic disorder, where the primary fear becomes of the sensations of panic. Cognitions in panic disorder and specific phobia appear then, to share some similar catastrophic content, and in both disorders, may shift towards fear of the anxiety symptoms themselves.

Interoceptive cues have been found to be important not only in panic disorder, but increasingly in some examples of the specific phobias. [Davey, Menzies, and Gallardo \(1997\)](#) examined a group of 100 undergraduate students using several measures of acrophobia as well as instruments chosen to evaluate the participants' concern about somatic symptoms of anxiety. In this study, the authors found that symptoms of acrophobia (especially acrophobic avoidance) were strongly associated with high scores on measures of sensitivity to body sensations, while symptoms of spider phobia were not. In their paper, Davey et al. argue that acrophobia is somewhat distinct from other specific phobias, and that the high comorbidity seen between this specific phobia and agoraphobia results from common underlying "cognitive biases in the discrimination and interpretation of bodily sensations" (p. 1000). This common underlying pathway of sensitivity to

interoceptive cues is similarly drawn on here as a key feature that supports differentiation of emetophobia from the specific phobias.

#### 4.2. *Social phobia-like factors in emetophobia*

Individuals with emetophobia may show a heightened sense of sensitivity to the opinions of others around them, as is seen in social phobia. In individuals who hold beliefs that others will negatively evaluate them if they are sick, and that such negative evaluation is catastrophic, a risk of being sick becomes an extremely anxiety-provoking event. Most emetophobic individuals are more concerned about vomiting in the presence of others than doing so alone (Lipsitz et al., 2001).

#### 4.3. *Obsessive compulsive disorder-like factors in emetophobia*

Emetophobia also commonly presents with features that are more commonly attributed to Obsessive Compulsive Disorder (OCD). The obsessive preoccupation with their own gastrointestinal state resembles the bowel obsessions seen in some OCD cases. The recurrent checking (e.g., of whether food contains certain ingredients) and use of other rituals (e.g., in cooking) are hallmark symptoms of OCD that are sometimes observed in emetophobic individuals (Lipsitz et al., 2001).

#### 4.4. *The cognitive behavioral model of emetophobia*

The model proposed here draws on the earlier published work on anxiety disorders of several authors (e.g., Barlow, 1988; Clark, 1986; Ehlers, 1991; Ehlers & Breuer, 1992; Rapee & Heimberg, 1997), incorporating both cognitive and behavioral components to arrive at conceptualization of early attacks, acute nausea periods, and maintenance of fear and avoidance outside this acute phase.

Fig. 1 presents a visual conceptualization of the proposed model for emetophobia. The model is conceptualized as occurring in a series of three phases: the predisposing factors, the acute phase, and the maintenance phase. Two factors are proposed here as being particularly relevant to a vulnerability or predisposition to develop emetophobia. Similarly to the other anxiety disorders, emetophobia would be expected to show a strong association with a general anxiety-vulnerability factor. This *General anxiety vulnerability* (see Table 1) is manifest in a similar way to other anxiety and mood disorders, and goes some way to explaining known comorbidity between emetophobia and other anxiety disorders (Lipsitz et al., 2001).

In addition to this general vulnerability factor, it is proposed that people with emetophobia are particularly vulnerable to expressing anxiety through somatic symptoms, and specifically to gastrointestinal somatic symptoms such as nausea and “butterflies” (*Somatization vulnerability*; see Table 1).

Individuals who are vomit phobic have commonly had aversive experiences of themselves or others vomiting, and the onset of emetophobia may commonly follow medical illness (Lipsitz et al., 2001). Such situations may contribute to the hypervigilance to gastrointestinal cues, and may also act as components in an associative learning process.

When such vulnerable people are placed under circumstances of increased stress, or other situations where gastrointestinal somatic symptoms may occur, their tendency to interpret ambiguous stimuli as threatening (*Catastrophic misappraisal*; see Table 1) leaves them ready to

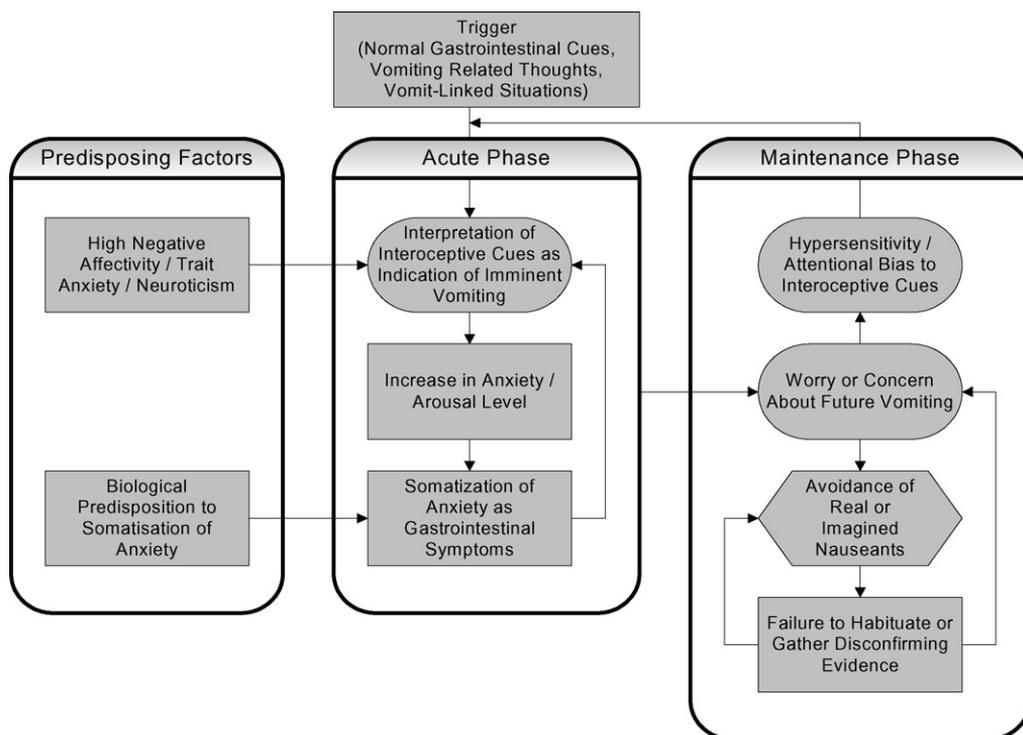


Fig. 1. Visual cognitive-behavioral formulation of emetophobia.

Table 1  
Formulation and treatment components for emetophobia

Formulation component	Formulation-based treatment
<b>1. General anxiety vulnerability</b> An inherited vulnerability to anxiety and related disorders	Arousal management skills
<b>2. Somatization vulnerability</b> A tendency to somatize anxiety symptoms as gastrointestinal distress	Arousal management skills
<b>3. Catastrophic misappraisal</b> A tendency to misinterpret internal gastrointestinal cues as indicators of imminent vomiting	Cognitive restructuring
<b>4. Hypervigilance</b> A tendency for attention to be drawn towards the occurrence of gastrointestinal cues	Distraction, attention training
<b>5. Vomit attributions</b> Cognitions and beliefs about the meaning and unacceptability of vomiting	Cognitive restructuring
<b>6. Nausea avoidance</b> Negatively reinforced avoidance behavior through reduced arousal/nausea	Exposure
<b>7. Selective confirmation</b> Failure to obtain disconfirming evidence for vomit expectancies	Exposure

interpret such sensations as indicators of imminent danger. In emetophobia, the primary concern is that these interoceptive cues are indications that vomiting may be likely or imminent. Normal associative learning experiences of actual or observed vomiting (as observed in 29 and 59% of the Lipsitz et al., 2001 sample, respectively) may further strengthen this belief, and may be particularly common in emetophobic individuals due to the tendency to somatize mentioned above (Lipsitz et al., 2001). This is akin to the common fear in panic disorder of “losing control” (APA, 2000). The perception that the person may be sick leads to a further increase in anxiety, and an associated escalation in gastrointestinal somatic symptoms. This escalation in symptoms then completes a positive feedback loop (see Fig. 1), where the increase in these interoceptive cues is appraised as further evidence that the individual may vomit.

In many cases, onset of the emetophobia is contemporary to an actual experience of vomiting following acute nausea. Unlike panic, where the feared consequences (such as heart attack, being unable to breathe, going crazy) do not occur or are at least extremely unlikely, in emetophobia the feared consequences may actually result as a consequence of the anxiety. This increased chance that the catastrophic outcome may result, allows a greater chance that actual associative learning experiences may occur where the individual *does* in fact vomit. Presumably, these increased probabilities (both real and perceived) may result in an association between normal gastrointestinal cues and vomiting anxiety that is especially difficult to counteract.

Two further feedback loops are hypothesized as being crucial in the maintenance phase of the disorder (i.e., between periods of acute fear of vomiting). Similarly to how panic disorder is formulated as periods of discrete heightened anxiety, followed by changes in behavior and cognition between these periods, emetophobia is conceptualized here as having an acute phase, as described above, followed by a period of worry and changes in behavior related to future attacks. The first feedback loop in maintenance is depicted in Fig. 1. In this section of the model, the worry that results from the occurrence of a previous attack or associative learning experience, leaves the individual in a state of heightened sensitivity to the presence of interoceptive cues (*Hypervigilance*; see Table 1). This sensitivity acts to predispose the emetophobic individual to noticing any future occurrence of gastrointestinal symptoms. This sensitivity, coupled with the actual occurrence of such symptoms (and their everyday occurrence in normal digestion) is enough to elicit the catastrophic interpretation of these symptoms, bringing the individual back into the acute phase where they fear vomiting may occur.

The second feedback loop depicted in the maintenance of the disorder, is that related to avoidant behavior (*Nausea avoidance*, see Table 1). This is theoretically close to the development of agoraphobic avoidance following the experience of panic attacks. In this component of the model, the concern over experiencing nausea attacks (or the actual experience of vomiting) leads the individual to avoid certain stimuli that they fear may place them at risk of experiencing future attacks. This may be manifest in avoidance of left-over food, pregnancy and associated morning sickness, sea travel or other similar experiences that may lead to sensations of nausea or gastrointestinal upset. This avoidance has several effects, as seen in other disorders. Firstly, the individual fails to habituate to the occurrence of gastrointestinal symptoms of anxiety, meaning that such cues are similarly likely to elicit anxiety in future. Secondly, the individual fails to gain from the learning in new experiences where mild nausea does not lead to subsequent vomiting (*Selective confirmation*; see Table 1). The individual's sense of self-efficacy in the face of gastrointestinal symptoms is reduced, further strengthening avoidance behavior.

The components of the proposed formulation model of emetophobia are summarized in Table 1, along with the treatment components hypothesized to address each component.

The model presented above has several strengths worth highlighting to the reader. Firstly, the proposed model of emetophobia draws from established, validated models of other anxiety disorders. The occurrence of hypervigilance to interoceptive cues, and catastrophic misinterpretation of these internal stimuli has already been established for other anxiety disorders such as panic disorder. The excessive importance placed in the evaluation of one's behavior by others is also an established observation in the phenomenology of social phobia. As such there is less investigation required to establish that these effects are also seen in emetophobia, and research methodologies used for their assessment in other anxiety disorders may be adapted to the current disorder. Secondly, the current model contains three key feedback loops, clearly illustrating how both the acute nausea phase escalates, and also how the avoidant behavior and vulnerability to future attacks are maintained. Thirdly, the model is proposed as a series of interconnected relationships between key components, each of which is testable and falsifiable. Suggestions for further assessment of the model are presented below.

## 5. Formulation-based treatment of emetophobia

### 5.1. Formulation-treatment matching

The case formulation is a precursor to any individualized approach to cognitive behavioral treatment. A suite of interventions are proposed for the treatment of emetophobia, with a focus on matching treatment components with formulation factors. This matching between formulation and treatment can be readily seen in Table 1.

### 5.2. Exposure

The conceptualization of emetophobia presented above highlights several potential targets for exposure-based interventions. The obvious (although unpleasant) exposure suggestion is to the experience of vomiting itself. Vomiting can be induced easily, but deliberate repeated vomiting carries potential side-effects (e.g., dental problems). Furthermore, it is unlikely to be seen by many patients as an acceptable intervention. The clinician should weigh up the potential benefits and risks, and discuss these fully with the patient before embarking on any such exposure exercise.

A milder form of exposure would be the sensations of nausea. Such sensations can be generated chemically or behaviorally (e.g., through dizziness or exposure to disliked foods). This exposure would allow the individual to experience nausea as unpleasant, but not catastrophically so. They would also experience nausea without the catastrophic outcome of vomiting, and the side-effects which accompany this.

Other targets for exposure include anything that is part of the patient's illness-related avoidance behavior. This may include foods (e.g., poultry, seafood, left-overs) or situations that are avoided (e.g., hospitals, bars, etc.). Exposure to simulated vomit, and the simulated act of others vomiting has also been successfully employed, as have audio and video recordings (McFadyen & Wyness, 1983).

One potential pitfall for the clinician seeking to employ cognitive-behavioral interventions with emetophobic patients is the general reluctance of this group to engage in exposure-based procedures. In their internet survey, Lipsitz et al. (2001, p. 150) reported that over half of their respondents would "definitely not" try treatment that involved exposure to vomiting sensations. This is likely to be related to the aforementioned concept of *Nausea avoidance*, and may be best

addressed in treatment through the same strategies used to motivate patients with other anxiety disorders such as motivational interviewing and psychoeducation/information sharing.

### 5.3. Cognitive restructuring

Modification of cognitions is a core component of successful treatments for panic (Barlow, Raffa, & Cohen, 2002; Clark et al., 1994), although there remains debate about whether or not this cognitive restructuring needs to be focused specifically on the catastrophic cognitions themselves (e.g., Brown, Beck, Newman, Beck, & Tran, 1997). Treatment for emetophobia based on the suggested model, would incorporate cognitive procedures such as training and assisting patients to identify, evaluate and modify problematic automatic thoughts. Specifically, cognitions that minor normal gastrointestinal stimuli are indicators of immediate vomiting would need to be addressed.

### 5.4. Distraction

Distraction has fallen out of fashion after advances in the thought suppression literature since 1987 (Wegner, Schneider, Carter, & White, 1987; Wenzlaff & Wegner, 1987). There has also been considerable debate on the impact of distraction during exposure (e.g., Rodriguez & Craske, 1993). Despite this, it has formed a component of several successful cognitive behavioral treatment packages. While caution may be appropriate when considering the use of distraction techniques during exposure, such techniques may be useful to the patient in the short term if they find their attention drawn to gastrointestinal cues.

### 5.5. Arousal management

Arousal management skills such as applied relaxation training, are a mainstay of the cognitive behavioral treatment of anxiety disorders (Öst, 1987). In the model proposed here, emetophobic individuals are postulated as being particularly likely to experience anxiety as unpleasant gastrointestinal cues. If the individual can be taught to reduce their overall anxious arousal, then the occurrence of such distressing symptoms could also be lessened.

### 5.6. Psychopharmacology

If the conceptualization of the etiology and maintenance of emetophobia shares many components with other anxiety disorders, then it is reasonable to assume that not only would psychological treatments adapted other conditions be effective, but that pharmacological interventions may also be a potential treatment option. Medications are generally acknowledged as ineffective in treatment of specific phobias, with exposure therapies assuming the role of front line treatments (Barlow & Craske, 2000). In contrast, the serotonin specific reuptake inhibitors (SSRIs) have repeatedly demonstrated their efficacy in treatment of other anxiety disorders such as panic and social phobia (Roy-Byrne & Cowley, 2002).

In other specific phobias where interoceptive cues have been deemed to play a key role, there is some initial evidence that SSRIs may be worth subjecting to larger controlled trials. Abene and Hamilton (1998) reported on two single cases of patients with flying phobia treated with fluoxetine for a comorbid depression. In each case, the flying phobia was present prior to the onset of the major depression, and in each case the symptoms of the phobia resolved over the

course of the pharmacological treatment of the mood disorder. The authors do not specifically highlight the role of interoceptive cues in flight phobia, instead choosing to speculate that both the patients' depression and phobia may have been the product of a single underlying biochemical abnormality, but the specific action of fluoxetine in adjusting sensitivity to, and interpretation of, interoceptive stimuli may warrant further investigation. Examination of the efficacy of SSRIs in treatment of emetophobia should also be considered. Lipsitz et al. (2001) reported that up to one-third of their patients experienced some success from the use of psychiatric or gastrointestinal medications.

## 6. Future research agenda

### 6.1. Phenomenology, clinical presentation and measurement

Further research is clearly required into the nature and presentation of emetophobia. The most comprehensive report to date on emetophobia symptoms (Lipsitz et al., 1997) provides a good starting point for understanding of the phenomenology of the illness, but requires replication and elaboration. Specifically, a sample of emetophobic individuals with confirmed diagnoses and treatment histories, would allow a much more accurate picture of the disorder.

There currently exists no psychometrically validated measure for the severity of fear of vomiting. Such a measure would allow a more detailed evaluation of the relationship between emetophobia symptoms. A measure of emetophobia severity would also assist in validation of the cognitive behavioral model presented here, acting as the index of overall symptom severity. The relationship of other variables such as catastrophic cognitions, and anxiety symptoms to emetophobia could also be investigated. Possibly of most importance however, a reliable and valid measure of emetophobia would allow for the evaluation of the effectiveness of treatments for the condition.

### 6.2. Conceptualization

Further research into fear of vomiting is required to investigate whether the model presented here is accurate in describing emetophobic patients. Several assumptions have been made in the proposed formulation of emetophobia, many of which are extensions of known phenomena in other disorders (e.g., the role of interoceptive stimuli). For the model to be valid, the assumption that these factors are also present in fear of vomiting, would need to be assessed empirically.

A key component to the model suggested, is the tendency of certain anxiety-vulnerable individuals to somatize their anxiety in the form of gastrointestinal symptoms (indigestion, "butterflies," nausea, etc.). This component is crucial in the model as it is the hypothesized tendency of emetophobics to express increases in anxiety through increased gastrointestinal symptoms that completes the positive feedback loop in the acute phase. A study using a larger sample of emetophobics, investigating this somatization tendency is necessary to support this theory component.

A further supposition of the emetophobia model presented here is that those with a fear of vomiting would be oversensitive to gastrointestinal interoceptive cues. While this is sensitivity is known to be present in patients with panic disorder (Ehlers & Breuer, 1992), this would need to be replicated in a group of patients with fear of vomiting to support the present model.

The cognitions deemed important in emetophobia could also be assessed, similarly to how they have been investigated for other anxiety disorders such as panic disorder. Questionnaires assessing an individual's appraisals of nausea symptoms could be developed and evaluated.

### 6.3. Treatment approaches

There is strong need for a controlled clinical trial of a treatment for emetophobia. The grab-bag of case studies provides limited evidence for treatment approaches including behavioral interventions. The conceptual model presented here clearly suggests treatment components including cognitive and behavioral elements, and would be readily testable in a clinical sample. Furthermore, dismantling studies may help elucidate the specific intervention components which exert the greatest effect.

## 7. Conclusion

To date, most research into emetophobia has been limited and non-specific. The model presented here is hoped to further promote research into the understanding and treatment of emetophobia.

## References

- Abene, M. V., & Hamilton, J. D. (1998). Resolution of fear of flying with fluoxetine treatment. *Journal of Anxiety Disorders*, *12*, 599–603.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders (4th ed. text revision)*. Washington, DC: American Psychiatric Press.
- Andrews, G., Creamer, M., Crino, R., Hunt, C., Lampe, L., & Page, A. (2003). *The treatment of anxiety disorders: clinician guides and patient manuals (2nd ed.)*. Cambridge: Cambridge University Press.
- Antony, M. M., Brown, T. A., & Barlow, D. H. (1997). Heterogeneity among specific phobia types in DSM-IV. *Behaviour Research and Therapy*, *35*, 1089–1100.
- Barlow, D. H. (1988). *Anxiety and its disorders: the nature and treatment of anxiety and panic*. New York: Guilford Press.
- Barlow, D. H., & Craske, M. G. (2000). *Mastery of your anxiety and panic: client workbook for anxiety and panic (MAP-3)*. San Antonio: Graywind/Psychological Corporation.
- Blanchard, E. B., Scharff, L., Schwartz, S. P., Suls, J. M., & Barlow, D. H. (1990). The role of anxiety and depression in the irritable bowel syndrome. *Behaviour Research and Therapy*, *28*, 401–405.
- Blomhoff, S., Spetalen, S., Jacobsen, M. B., & Malt, U. F. (2001). Phobic anxiety changes the focus of brain–gut axis in irritable bowel syndrome. *Psychosomatic Medicine*, *63*, 959–965.
- Brown, G. K., Beck, A. T., Newman, C. E., Beck, J. S., & Tran, G. Q. (1997). A comparison of focused and standard cognitive therapy for panic disorder. *Journal of Anxiety Disorders*, *11*, 329–345.
- Clark, D. M. (1986). A cognitive approach to panic. *Behaviour Research and Therapy*, *24*, 461–470.
- Clark, D. M., Salkovskis, P. M., Hackmann, A., Middleton, H., Anastasiades, P., & Gelder, M. (1994). A comparison of cognitive therapy, applied relaxation and imipramine in the treatment of panic disorder. *British Journal of Psychiatry*, *104*, 759–769.
- Cox, B. J., McWilliams, L. A., Clara, I. P., & Stein, M. B. (2003). The structure of feared situations in a nationally representative sample. *Journal of Anxiety Disorders*, *17*, 89–101.
- Craske, M. G. (1991). Phobic fear and panic attacks: the same emotional states triggered by different cues? *Clinical Psychology Review*, *11*, 599–620.
- Davey, G. C. L., Menzies, R., & Gallardo, B. (1997). Height phobia and biases in the interpretation of bodily sensations: some links between acrophobia and agoraphobia. *Behaviour Research and Therapy*, *35*, 997–1001.
- Ehlers, A. (1991). Cognitive factors in panic attacks. Symptom probability and sensitivity. *Journal of Cognitive Psychotherapy*, *5*, 157–173.
- Elhers, A., & Breuer, P. (1992). Increased cardiac awareness in panic disorder. *Journal of Abnormal Psychology*, *101*, 371–382.
- Kartsounis, L. D., Mervyn-Smith, J., & Pickersgill, M. J. (1983). Factor analysis of the responses of British university students to the Fear Survey Schedule III (FSS-III). *Personality and Individual Differences*, *4*, 157–163.
- 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.

- McFadyen, M., & Wyness, J. (1983). You don't have to be sick to be a behavior therapist but it can help! Treatment of a "vomit" phobia *Behavioral Psychotherapy*, *11*, 173–176.
- McKenzie, S. (1994). Hypnotherapy for vomiting phobia in a 40-year-old woman. *Contemporary Hypnosis*, *11*, 37–40.
- Öst, L. G. (1987). Applied relaxation: description of a coping technique and review of controlled studies. *Behaviour Research and Therapy*, *25*, 397–409.
- Philips, H. C. (1985). Return of fear in the treatment of a fear of vomiting. *Behaviour Research and Therapy*, *23*, 45–52.
- Rachman, S. (1977). The conditioning theory of fear acquisition: a critical examination. *Behaviour Research and Therapy*, *15*, 375–387.
- Rachman, S. (1990). *Fear and courage* (2nd ed.). San Francisco: WH Freeman and Co.
- Rachman, S. (1991). Neo-conditioning and the classical theory of fear acquisition. *Clinical Psychology Review*, *11*, 155–173.
- Rapee, R. M., & Heimberg, R. G. (1997). A cognitive-behavioral model of anxiety in social phobia. *Behaviour Research and Therapy*, *35*, 741–756.
- Ritow, J. K. (1979). Brief treatment of a vomiting phobia. *American Journal of Clinical Hypnosis*, *21*, 293–296.
- Rodríguez, B. I., & Craske, M. G. (1993). The effects of distraction during exposure to phobic stimuli. *Behaviour Research and Therapy*, *31*, 549–558.
- Roy-Byrne, P. P., & Cowley, D. S. (2002). Pharmacological treatments for panic disorder, generalized anxiety disorder, specific phobia and social anxiety disorder. In: P. E. Nathan, & J. M. Gorman (Eds.), *A guide to treatments that work* (2nd ed.). New York: Oxford University Press.
- Seligman, M. E. P. (1971). Phobias and preparedness. *Behaviour Therapy*, *2*, 307–321.
- Thorpe, S. J., & Salkovskis, P. M. (1995). Phobic beliefs: do cognitive factors play a role in specific phobias? *Behaviour Research and Therapy*, *33*, 805–816.
- Watson, D., Clark, L. A., & Carey, G. (1988). Positive and negative affectivity and their relation to anxiety and depressive disorders. *Journal of Abnormal Psychology*, *97*, 346–353.
- Watson, D., Clark, L. A., Weber, K., Assenheimer, J. S., Strauss, M. E., & McCormick, R. A. (1995). Testing a Tripartite Model: II. Exploring the symptom structure of anxiety and depression in student, adult and patient samples. *Journal of Abnormal Psychology*, *104*, 15–25.
- Wegner, D. M., Schneider, D. J., Carter, S. R., & White, T. L. (1987). Paradoxical effects of thought suppression. *Journal of Personality and Social Psychology*, *53*, 5–13.
- Wenzlaff, R. M., & Wegner, D. M. (1987). Thought suppression. *Annual Review of Psychology*, *51*, 59–91.
- Wijesinghe, B. (1974). A vomiting phobia overcome by one session of flooding with hypnosis. *Journal of Behaviour Therapy and Experimental Psychiatry*, *5*, 169–170.
- Wolpe, J. (1973). *The practice of behaviour therapy* (2nd ed.). New York: Pergamon Press.