On Obsessions: A Phenomenology of Doubt, Images, and the Obsessive-Compulsive Chronological Structure in Obsessive-Compulsive Disorder

by

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A thesis

presented to the University of Waterloo

in fulfillment of the

thesis requirement for the degree of

Doctor of Philosophy

in

Psychology

Waterloo, Ontario, Canada, 2020

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Obsessive-compulsive disorder (OCD) is a debilitating disorder that is heterogeneous in presentation and difficult to treat. Nearly half of treatment-seeking individuals do not benefit fully from therapy, and success rates have changed little over decades despite ongoing research into obsessions. These outcomes suggest that aspects of the OCD experience are being overlooked and not addressed in therapy, highlighting a need to revisit core assumptions the cognitive behavior therapy (CBT) model makes about the disorder. Indeed, there are significant gaps in the literature, revealing a lack of phenomenological grounding to support key assumptions made about obsessions and how they interact with compulsions in the model. In fact, there are scant existing studies of the true chronological nature between obsessions and compulsions (none interviewing individuals themselves), few studies of intrusive images despite their prominent place in diagnostic criteria, and woefully scattered investigations of doubt making it difficult to know how doubt should be defined in this 'doubting disease.' This dissertation thus aimed to address these lacunae by interviewing 65 individuals (44 diagnosed with OCD and 21 with subthreshold OCD symptoms) on these three domains using a structured interview developed for this study.

Analyses of participant reports indicate that there is a significant need to revisit and possibly update the CBT model to highlight the interplay between obsessions and compulsions, and to underscore the complex relations between the ways in which obsessional content can appear (i.e., obsessional forms, such as verbal thoughts, mental images, or doubt, etc.). Specifically, obsessions were found to be more dynamic than we currently assume, typically appearing in three different forms at once and often taking place concurrently with and extending beyond compulsions. Moreover, the most distressing, noticeable, and powerful

forms in which obsessional content appeared were those not currently recognized: namely, doubt, an internal voice or narrative (which participants distinguished from general verbal thoughts), and sensory phenomena. For that matter, respondents defined obsessional doubt as capturing three categories of concerns: doubts about their safety status ('Am I clean?'), how properly they completed behaviours ('Did I clean well enough?), and their own senses or cognitive capability ('Am I remembering correctly that I cleaned?). Lastly, contrary to expectations, intrusive images were less prevalent, distressing, and personally significant than the few existing studies would suggest. These study findings have important implications for treatment and theory; applications of results and further areas of study are discussed.

Acknowledgements

I would like to acknowledge and thank the many people who have supported and encouraged me throughout my graduate studies and the dissertation writing process. First, a heartfelt note of gratitude to my advisor, Christine Purdon, for years of mentorship, guidance, support, and opportunities. Christine, you have my eternal thanks not only for the personal and professional growth you facilitated, but for your steadfast support when I have been in need. I am also profoundly grateful to my committee members, Erik Woody and Allison Kelly, for their expertise and incisive comments and feedback. Erik, thank you for your many years of unfailingly keen, supportive, stimulating, and thought-provoking guidance, which I have cherished alongside your dependable and expert statistical help. Allison, my sincerest gratitude for your contagious warmth and wise insights, and for reminding me always that compassion is key. I would also like to thank Jonathan Oakman for the moral support and thought-inspiring discussions about OCD in our clinical work together, and to Maureen Stafford, for making everything feel like home.

I would also like to extend my sincerest gratitude to those who made this research possible through years of hard work in the Anxiety Studies Division, including David Moscovitch and members of the Purdon and Moscovitch labs. Moreover, I kindly thank my RAs – Maggie Michaelis, Ridwaan Safi, Celina Bowman-Smith, Judit Szabo, Talia Hashmani, and Sarah Forbes – who toiled through countless hours of transcription to accurately record participants' experiences. I am also grateful to those who encouraged me throughout the extended writing process and facilitated its completion, especially Jason Carr, Rod Balsom, and Bev van der Heide.

On a personal note, I would like to thank my friends and family, whose collective and unfailing love, support, laughter, kindness, and encouragement made this possible. In particular, I am eternally grateful to:

My family, Baba, Virginia, Jaclyn, and Erin, for being my loving true north;

My friends, Tiffany Yeung, Caroline Ohi, Kaylyn Crawford, Natasha Sheikh, Patty Ho, Christy Chak, and Kamal Minhas, for being there always and for making everything better;

And Braden Hurl, whose timing could not have been more imperfectly perfect, for skipping with me across the finish line.

To all, thank you,

thank you,

thank you.

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CHAPTER I

INTRODUCTION

Obsessive-Compulsive Disorder (OCD) is a common and disabling disorder, afflicting 1-2% of Canadians in their lifetime (Kessler et al., 2005) and estimated to be one of the leading causes of disability among individuals aged 15 to 44 (WHO, 2008). Characterised by recurrent, distressing intrusive thoughts (obsessions) and/or repetitive behaviours or mental acts the individual feels compelled to perform in response (compulsions), OCD can be extremely interfering and time consuming (APA, 2013). Over half of individuals with OCD report academic underachievement, 40% cannot sustain long-term employment, and many sufferers report impairment in social functioning and in their ability to perform day-to-day activities (Hollander et al., 1996). OCD symptoms tend to run a chronic course or wax and wane over time for most individuals; few cases get better without treatment, with most worsening over time and with age (Hollander, 1997; Kessler et al., 2005; McKay et al., 2015).

There is significant heterogeneity in how OCD presents, ranging from the course of illness, to symptom presentation and content, to patterns of neurological activity (Ball, Baer, & Otto, 1996; Mataix-Cols, Marks, Greist, Kobak, & Baer, 2002). OCD assessment tools thus have the unique challenge of trying to tidily capture or quantify the essential elements of the disorder without neglecting its far-ranging corners. Structured interviews administered by trained clinicians are the gold-standard assessment tool, with some measures primarily intended to establish diagnoses and others to additionally identify symptom severity. Oft-used diagnostic tools include the Structured Clinical Interview for DSM-5 (SCID-5; First et al., 2015) and the Mini International Neuropsychiatric Interview for DSM-5 (M.I.N.I. 7.0; Sheehan, 2014), which focus on the absence or presence of DSM diagnostic criteria. The Yale-Brown Obsessive-

Compulsive Scale (YBOCS; Goodman et al., 1989) is helpful in reflecting both the range of OCD symptoms, as it assesses obsession and compulsion content using a checklist of frequently reported domains, and in quantifying other disorder-relevant characteristics (e.g., insight, resistance, distress, etc.) among well-established norms.

Captured by such assessment tools, typical OCD symptom domains include obsessions about being contaminated by dirt or germs; being responsible for possible harm due to one's actions or inactions (e.g., not checking appliances well enough before leaving the house and burning it down); immoral or repugnant thoughts (e.g., aggressive, sexual, religious, or blasphemous themes); and/or a need for symmetry and exactness (e.g., papers or objects being properly aligned). These obsessions provoke compulsions to clean or wash, check repeatedly, complete superstitious rituals (e.g., touch a cross after every blasphemous thought), and order or arrange compulsively (Goodman et al., 1989; Pinto et al., 2007).

OCD is well-documented as a disorder associated with poor quality of life (QOL) across several domains, such as a subjective sense of emotional well-being, ability to work and complete household duties, ability to enjoy recreational activities, and social functioning (Coluccia et al., 2016; Eisen et al., 2006). A recent meta-analysis of 13 studies assessing QOL outcomes in OCD, compared to healthy controls, determined that all QOL domains were negatively impacted, with emotional, work, and social domains most affected. Age and sex were significant moderators, with older and female patients indicating poorer QOL relative to controls. Bafflingly, OCD severity was positively correlated with global QOL in one study, such that less severe individuals had worse QOL (Coluccia et al., 2016), while more severe individuals reported greater functional impairment in other studies (e.g., Eisen et al., 2006). This discrepancy remains unresolved, though it has been posited that less severe patients may simply have greater

insight into their functional impairments and distress, or be better able to maintain social and work activities to some extent, compared to more severe individuals, who may avoid or escape to a significant degree (Coluccia et al., 2016).

In a study of treatment-seeking individuals with OCD, Eisen and colleauges (2006) found that OCD severity was significantly correlated with all QOL domains. Moreover, associations were typically stronger between QOL ratings (overall QOL, subjective sense of wellbeing, ability to enjoy leisure activities) and obsessional severity than with compulsion severity, except for work functioning (which was more strongly correlated with compulsion severity; Eisen et al., 2006). The inherent heterogeneity of the disorder has important consequences even for QOL, with specific subtypes differentially impacting domains of functioning. Contamination and symmetry-related symptoms predicted poorer satisfaction in social relationships after controlling for OCD and depression severity, while content related to contamination and overresponsibility for harm were associated with impairments in health-related QOL. Leisure-based QOL were by and large only impacted by contamination content. Symptom content domains appeared not to be significantly associated with work, school, or wellbeing QOL (Schwartzman et al., 2017).

Significantly, poorer QOL has been found to predict poorer treatment outcomes across psychotherapy and pharmacotherapy (Maher et al., 2010), and impairment in the social functioning domain has been correlated with greater risk of drop out and relapse (Hollander et al., 2010). Fortunately, improvements in OCD symptom severity (whether via psychotherapy, pharmacotherapy, or placebo pill) do lead to subsequent changes in QOL over time. In fact, individuals with higher YBOCS scores showed greater improvements in QOL over time, perhaps due to the greater range of available progress (Asnaani et al., 2017).

Cognitive-Behavioural and Other Models of OCD

The most widely accepted model of OCD is based on cognitive-behaviour theories that arose in the 1980s and 1990s (Rachman, 1997; Salkovskis, 1985) and have changed little since that time. This model identifies obsessions as normally-occurring intrusive cognitions (specifically, thoughts, images, or impulses) that cause distress in individuals and recur, because they are appraised as signifying potential harm or revealing unwanted, ego-dystonic aspects of self (Rachman, 1997; Purdon & Clark, 1999). Factor analyses of the Obsessive-Beliefs Questionnaire (OBQ; OCCWG, 2003) have yielded three types of appraisals that are characteristic of OCD:

(1) inflated responsibility / threat estimation, which reflects an excessive sense of responsibility for negative events and concern about harm arising from acts of omission (failing to act and prevent harm one could have foreseen) or commission (behaving in a way that brings about harm);

(2) perfectionism / certainty, which represents perfectionistic, rigid standards for task completion and intolerance of uncertainty; and,

(3) importance / control of thoughts, which encapsulates implications of having the thoughts, such as thought-action fusion (the belief that having the distressing thought makes it more likely to become realised in life) and moral thought-action fusion (the concern that having the thought is the moral equivalent of having actually carried it out; OCCWG, 2003).

According to the model, the obsessional distress that results from these interpretations drives compulsive behaviours meant to prevent the negative outcome or absolve the individual of responsibility and guilt should the feared event occur, thereby relieving distress. However, such

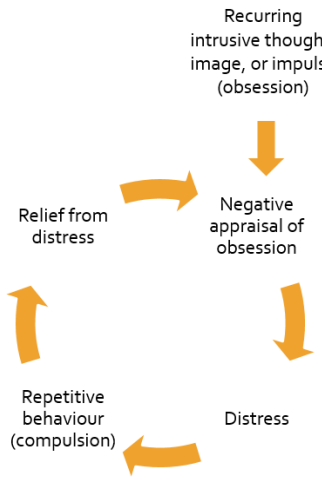

Figure 1. CBT model of OCD

behaviours are typically perseverative in that they are repeated past the point where the behaviour would be functional or are not realistically capable of preventing the feared outcome. The temporary respite from distress negatively reinforces the compulsion, encouraging individuals to repeat such behaviours, and further entrenching obsessional beliefs, thus maintaining the maladaptive cycle (Rachman, 1997; Salkovskis, 1985). This cycle is portrayed in Figure 1.

Cognitive-behaviour therapy (CBT), the most empirically-supported psychotherapy for OCD (Eddy, Dutra, Bradley, & Westen, 2004; Fisher & Wells, 2005; McKay et al., 2015), is based on the cognitive-behavioural model of OCD; thus, it focuses on challenging appraisals of the obsession as meaningful and important and conducting behavioural experiments to learn whether feared outcomes come true when compulsions are resisted. Exposure to obsessional fears while preventing compulsive responses (i.e., exposure with response prevention, ERP) is also frequently utilised to help individuals with OCD habituate to feared situations. However, treatment studies suggest that success rates are 50-60% when including those who drop out and refuse treatment (Fisher & Wells, 2005; McKay et al., 2015). This means that nearly half of treatment-seeking individuals with OCD do not benefit fully from therapy.

Significantly, treatment success is not typically defined as a complete remission of symptoms. Instead, those with posttreatment YBOCS scores indicating a reduction of 35% or more from pre-treatment scores are considered treatment responders, while non-response is defined as 25% or less change (Pallanti et al., 2002; Pallanti & Quercioli, 2006). These treatment outcomes suggest that aspects of the experience of obsessions and compulsions are being

overlooked in therapies that are currently available (whether due to lack of awareness about these aspects, or lack of attention to them in spite of knowing), or are being targeted but are not responding to intervention. Consider that high scores on repugnant obsession dimensions (e.g., sexual or religious content) predicted poorer long-term treatment outcomes with pharmacotherapy, behaviour therapy (Alonso et al., 2001), and CBT (Mataix-Cols et al., 2002; McKay et al., 2015). By contrast, some studies have shown better outcomes for those with checking rituals (Drummond, 1993; Ball et al., 1996). It may be that certain pockets of the disorder are appropriately identified by the model and thus targeted and successfully treated in CBT, while others are incompletely understood and not effectively treated. As research over the past several decades has focused primarily on obsessions, with little change in treatment success, we may need to revisit core assumptions the model makes about obsessions in OCD.

Writers and researchers have attempted to offer alternative models of OCD or conceptualisations of obsessions and compulsions across time. Early German psychiatrists in the 1950s conceptualised OCD in a more parsimonious way, labelling it "Zwangsvorstellung" (meaning a compelling presentation or fixed ideas) and using the German term "Zwang" to simultaneously denote both obsessions (Zwangsvorstellungen) and compulsions (Zwangshandlungen). This unitary approach highlighted the shared nature of both phenomena while de-emphasizing differentiating characteristics between intrusive thoughts and compulsive behaviours (Spitzer & Sigmund, 1997). However, according to Friedrich (2015), the word Zwangsvorstellung was translated as ‘obsession’ in the United Kingdom and ‘compulsion’ in the United States, and researchers settled on OCD as a mid-Atlantic compromise.

At the extreme, Robbins, Gillan, Smith, de Wit, and Ersche (2012) have proposed that OCD may be better conceptualised as compulsive-obsessive disorder (i.e., COD), with the

obsession being subconsciously identified or unintentionally created *after* the felt urge to perform the compulsion. They argue that the obsession therefore exists only as a *post hoc* rationalisation of the compulsive urge, not as an initial phenomenon in and of itself. They further argue that inflated responsibility beliefs may simply be attempts to justify the compulsive urges. In support of this contention, Cougle and Lee (2014) have observed that people with OCD do not always score higher on measures of OC-related beliefs and appraisals than anxious controls and such *post hoc* justifications have been found with moral judgements (i.e., emotions, such as disgust and shame, and intuition often precede moral reasoning). They also note that distressing reactions to intrusive thoughts may be a normative response to the frequency or uncontrollability of obsessional intrusions rather than appraisals themselves, and appraisals may therefore be simply epiphenomena (Cougle & Lee, 2014). While recognising the extreme stance taken, Robbins and colleagues (2012) caution that exclusively conceptualising obsessions as misinterpretation-based reactions to intrusive thoughts may result in missed, important features of obsessions or factors implicating difficulty dismissing intrusions. In particular, they note we know little about the time course of relations between thoughts, control strategies, beliefs, distress, and frequency, so more light needs to be shed on these aspects (Robbins et al., 2012).

Szechtman and Woody (2004) have also focused on the role of compulsions in OCD; they propose that OCD is fundamentally a disorder of stopping, wherein individuals are unable to achieve a satisfying internal sense that they have completed a task, although they are able to recognise rationally that the task appears complete, and therefore perseverate on tasks for abnormal lengths of time. Importantly, they argue that OCD results from the dysfunctional response of a natural Security Motivation System (SMS), which appraises potential danger and initiates an appropriate behavioural response to the danger. The SMS can typically be terminated

by performing corrective behaviours that help one achieve an internal, implicit, felt sense that one has completed a task to satisfaction, a sensation that Szechtman and Woody (2004) term "yedasentience" (also see Hinds et al., 2010). In OCD, the engagement in the elicited corrective or preventative behaviours fails to provide the normal, negative feedback that would terminate activation of the SMS (i.e., they are unable to achieve a 'yedasentience' signal), and thus the behavioural responses persist abnormally (Hinds, Woody, Schmidt, Van Ameringen, & Szechtman, 2015). Szechtman and Woody (2004) proposed that OCD is characterized by difficulty achieving yedasentience; thus, OCD is a problem of stopping.

Lazarov, Dar, Liberman, and Oded (2012) have put forth a different theory regarding mechanisms in OCD, named Seeking Proxies for Internal States. In this model, they suggest that individuals with OCD have difficulty accessing internal, subjective states (e.g., memory, perception, emotions, and bodily sensations) and thus rely more on objective, external cues to guide behaviour. Indeed, they may compensate by developing and relying on external proxies or substitutes that are less ambiguous and more concretely discernable, such as rigid rituals and rules, which appear as compulsive behaviours. Yet, these external cues may ironically undermine confidence in internal states, compounding the core problem (Dar, Lazarov, & Liberman, 2016; Lazarov, Dar, Liberman, & Oded, 2012; Lazarov, Liberman, Hermesh, & Dar, 2014). Indeed, nonclinical individuals with more OC behaviours performed worse on a relaxation task, displaying greater fluctuations in stress and greater stress overall, than those with fewer OC tendencies. However, when given biofeedback information – external indicators of internal relaxation states – while completing the relaxation task, they performed better than those lower in OC tendencies. Thus, individuals with greater OC symptoms perform poorly when required to

rely on their own internal cues, but when given the opportunity, they successfully used external cues to guide their behaviour (Lazarov, Dar, Oded, & Liberman, 2010).

In contrast, O'Connor (2002) has focused on the pre-compulsion experience, posing an inferential confusion hypothesis, which posits that intrusions are not just normal thoughts from one's stream of consciousness. Rather, obsessions are primary inferences (e.g., "perhaps the door was not shut properly") that develop after the individual registers an internal or external percept – an observation, feeling, or thought that arises from non-obsessional thinking (e.g., a current event or memory). The primary inference, often experienced as doubt, soon becomes a conditional premise (e.g., "if I left the door unlocked, bad things could happen"), leading to negative consequences which the individual feels compelled to prevent by way of rituals (e.g., "I better check the door, or else I will be responsible for damage and contamination inflicted by burglars"). While the internal or external percept is said to be the first event in the obsessional sequence – and the primary inference the problematic step – O'Connor argues that the negative consequences of not performing the ritual and the individual's subjective distress are more readily accessible. Inferences and appraisals can be assessed by tracing the logic back to the original premise (O'Connor, 2002). Recent studies have demonstrated good success for treatment of OCD using this inference-based model (i.e., Inference Based Treatment; Aardema & O'Connor, 2012).

All told, these alternative models offer other ways of understanding OCD phenomena and, more importantly, highlight lacunae in the obsession literature. That is, although the CBT model is the most widely recognised and used in clinical and empirical explorations of OCD, these alternate models bring to light elements of the obsessive-compulsive (OC) experience that are poorly understood, overlooked, or are implicit, untested assumptions of the model. For

example, it is unclear what comprises the elements of the OC episode – are there in fact any experiences beyond obsessions and compulsions, and are both necessary? The timeline of the episode, i.e., the sequential structure, is also a relatively unexplored area as highlighted by Robbins and colleagues (2012). We do not know if there is possibly a more dynamic and fluid relation between obsessions and compulsions or how individuals determine the OC episode to have ended, as Szechtman and Woody (2004) clarify. For that matter, we lack clarity on the experience and types of obsessional forms in the OC episode (e.g., doubt, to which O'Connor calls attention).

These issues represent important considerations, because successful treatment of the disorder requires a full understanding of key elements and processes involved in the development and persistence of the disorder. While the temporal structure of an episode, according to the CBT model, is not explicitly stated, it is implied, and treatment approaches for OCD are heavily dependent on this. An incomplete or inaccurate understanding is likely to result in moderate treatment success, at best, or improvements in specific symptom domains (e.g., extinction of specific compulsions) but the eventual discovery of OC concerns arising in new domains due to the incomplete treatment of underlying processes. One impediment to this comprehension is the dearth of rigorous phenomenological explorations of the OC experience (i.e., investigations of the direct, lived phenomena for individuals with OCD), especially into obsessions and their moment-to-moment structure in OC episodes.

Phenomenological Studies of OCD

Most traditional phenomenological studies of OCD date back to the 1970s to 1990s and focus primarily on understanding key elements of the disorder in order to diagnostically define it. Earlier studies appeared to debate whether lack of insight was required in the characterisation of

OCD (see Berrios, 1989) before focusing heavily on content domains of obsessions and compulsions. In general, these existing phenomenological studies investigate very narrow aspects of the OC experience.

Phenomenological explorations of obsessions. Early studies reported on in-depth investigations of obsessional content domains. Following interviews with OCD patients, Akhtar and colleagues (1975) identified six categories of intrusive thought content and their relative frequencies of endorsement: obsessions about dirt and contamination (42%); aggressive or harm-related ideas (29%); counting, checking, and orderliness (titled 'inanimate-impersonal,' 27%); religious concerns (11%); sexual obsessions (10%), and miscellaneous other intrusions (e.g., musical obsessions, etc.). Dowson (1977) reported somewhat similar endorsement rates, albeit with numerous other available content domain distinctions: contamination-based thoughts (54-56%, the most frequent types), thoughts about indirectly causing physical harm (24%), thoughts of violence or injury (32%), religious obsessions (5%), and sexual themes (12%). A uniquely identified domain was doubt about past events, endorsed by a whopping 49% (Dowson, 1977).

It appears that these obsession content domains persist across the lifespan, with Swedo and colleagues (1989) noting fairly comparable content categories and frequencies through clinical interviews of 70 children and adolescents with OCD (dirt and germs being most frequently endorsed at 40%, 24% something terrible happening, 17% symmetry or exactness, 13% scrupulosity or religiosity, and 4% sexual). Pitman (1987), in summarising Janet's classic writings on obsessional states, summarised obsessional content as focusing not on "things outside of their control but rather about things within their (imagined) control" (p. 293).

Phenomenological explorations of compulsions. Early studies also explored compulsions in various ways, focusing primarily on categorising compulsion focus or content.

Akhtar (1975) distinguished between two types of compulsive acts (rather than content), identifying yielding compulsions as those that give “expression to the underlying obsessive urge” (p. 344), contrasted with controlling compulsions, which tend “to divert the underlying obsession without giving expression to it" (p. 344). Of the study sample, 76% reported performing some type of compulsion, with the majority (61%) noting yielding compulsions alone rather than controlling compulsions alone (6%). Only 9% endorsed performing both types of compulsions (Akhtar et al., 1975).

By contrast, Dowson (1977) found that all but 2 participants (95%) endorsed performing compulsions. When categorised by content domain, 54% focused on cleaning oneself and 37% compulsively cleaned things other than oneself. Additionally, 46% endorsed checking behaviours, 56% noted compulsive avoidance, and a further 54% reported some other content. Stern and Cobb (1978) highlighted 8 “behavioural forms” of obsessional-compulsive neurosis, which translate to compulsion foci, from 45 interviewed OCD patients. Most frequently endorsed were cleaning compulsions (51%) and avoidance behaviours (51%), followed by repeating acts (often related to numbers, 40%), and checking compulsions (38%). Another 11% of participants endorsed compulsions that focused on a need for completeness, 9% on symmetry / exactness, and 4% on “slowing” as if lost in thought. Although the vast majority of individuals reported recognising the excessiveness or absurdity of these compulsions, nearly half were reported to be resisted minimally or not at all (Stern & Cobb, 1978).

Among children and adolescents (Swedo et al., 1989), compulsive rituals were noted to be of similar content and distribution. Specifically, washing rituals were most common (85%), with repeating (e.g., going in and out of the door) and checking rituals (doors, locks, appliances, etc.) next most frequent (51% and 46%, respectively). Rituals designed to remove contact with

contaminants (23%), counting behaviours (18%), ordering and arranging compulsions (17%), and acts intended to prevent harm (16%) were less frequently endorsed. These researchers maintained that the unifying factor across compulsion domains is that they reflect an underlying sense that the act (checking, counting, washing, arranging, etc.) did not quite feel right yet (Swedo et al., 1989).

Phenomenology of the obsessive-compulsive link. Some studies investigated OCD phenomena by collapsing across obsessions and compulsions. According to Pitman (1987), Janet first wrote that obsessions and compulsions are unified in that they "often involve the thought or action that is most objectionable to the patient and causes him the most horror" (i.e., 'association by contrast'; Pitman, 1987, p. 227). Swedo and colleagues (1989) observed that rituals were more frequently reported than obsessions among children and adolescents, and it was relatively rare to find individuals who reported obsessions but not compulsions ('pure obsessives') compared to those endorsing compulsions but not obsessions ('pure ritualisers'). They distilled OCD content into two broad themes: "a preoccupation with and/or rituals for cleanliness, grooming, and averting danger, and a pervasive doubt or inability to 'know' that one is all right" (Swedo et al., 1989, p. 336).

By contrast, principal components factor analyses completed by Leckman and colleagues (1997) on YBOCS responses yielded four factors capturing obsessive-compulsive content. These four factors encompass: (1) aggressive, sexual, religious, and somatic obsessions with checking behaviours; (2) symmetry obsessions and ordering/arranging, counting, and repeating rituals; (3) contamination concerns with cleaning and washing compulsions; and, (4) hoarding and collecting symptoms. Significantly, they advised clinicians to differentiate between these

symptom dimensions when producing clinical severity ratings, instead of obscuring changes within one aggregated total severity score (Leckman et al., 1997).

Pinto and colleagues (2007) found a similar content distribution, albeit across five factors, following an exploratory factor analysis of YBOCS responses by adults with OCD. This five-factor solution included three factors from the Leckman four-factor solution, namely Symmetry/Ordering, Hoarding, and Contamination/Cleaning. However, the remaining factor (aggressive/sexual/religious/somatic) was further differentiated into a Doubt/Checking factor (involving pathological doubt, somatic obsessions, and checking compulsions) and a novel Taboo Thoughts factor (aggressive, sexual, and religious obsessions; Pinto et al., 2007).

Other early phenomenological researchers reported on descriptive statistics characterising the frequency of OCD phenomena and other characteristics (e.g., interference, resistance, conviction, etc.) rather than content domains. OCD was noted to have poor treatment outcomes (Roy, 1979) with purportedly moderately implausible symptom content (Jakes & Hemsley, 1996). Stern and Cobb (1978) noted that individuals with OCD can recognise the absurdity of their obsessions and compulsions, but vary considerably in their ability to resist carrying out rituals. The obsessive-compulsive experience was rated nearly unanimously (i.e., by over 90% of 55 OCD patients) as highly interfering, difficult to dismiss, preoccupying (thought about all the time), pervasive (inability to think about other things at all when thinking about it), and worry- and unhappiness-provoking (Jakes & Hemsley, 1996). Reassurance seeking did not generally reduce rituals (reportedly moderate to no effects on these behaviours), perhaps due to the transient nature of the discomfort reduction (Stern & Cobb, 1978).

Significantly, Jakes and Hemsley (1996) were among the first to highlight the heterogeneity in the OCD experience. They argued that obsessions and compulsions, much like

delusions, are multidimensional experiences, in that it is not always possible to speak of such phenomena as being more or less severe than others using one feature (e.g., an obsession can be highly preoccupying but not at all interfering in the person's behaviours, or vice versa). However, it is straightforward instead to conceptualize obsessions and compulsions in terms of being more or less in various dimensions (e.g., insight, pervasiveness, resistance, etc.). In factor analyses of 55 OCD patients on several dimensions, they found that while uniformly upsetting and prominent, there is considerable variability in characteristics of obsessions and compulsions, and to a considerable extent they varied independently of one another. Obsessions and compulsions are thus arguably best conceptualised as multidimensional phenomena (Jakes & Hemsley, 1996).

However, these broad phenomenologies are now markedly outdated. They often conceptualise OCD as a "neurosis," betraying rudimentary understandings of what symptoms comprise the disorder. Indeed, the vast majority of these studies hail from early editions of the DSM, spanning the second to the fourth edition (prior to the text revision). While these studies are helpful in very openly exploring and describing OCD phenomena, they utilise different criteria for the disorder or focus almost exclusively on a few aspects of the lived obsessional-compulsive experience. Moreover, these studies typically involve interviewing individuals with OCD and asking them retrospectively to characterise their symptoms across various dimensions (e.g., preoccupation, interference, and resistance) and/or completing factor analyses of various symptom checklists to determine symptom clusters or domains of obsessional content (e.g., Jakes & Hemsley, 1996; Leckman et al., 1997; Pinto et al., 2007).

Other studies still investigate the difference between 'normal' and OCD obsessions by comparing characteristics, appraisals, and control strategies of intrusive thoughts experienced by

OCD and control groups (Purdon & Clark, 1993), with a scant few studies reporting on the history of the disorder and subjective thoughts on conceptualisations that collapse obsessions and compulsions (Burgy, 2005). While informative, existing phenomenological studies do not quite capture a complete view of the lived obsessive-compulsive experience. For example, there are significant gaps in our understanding of the obsessional state (e.g., in what forms do they appear, what do the thoughts sound like, what is the timeline, etc.) and how the intrusive elements interplay with compulsions. Fuller representations have typically been offered in subjective clinical anecdotes, case studies, and book chapters (e.g., Rachman & Hodgson, 1980).

More recent studies that focus on phenomenology offer slightly more nuanced explorations of obsessions and compulsions and offer more finesse in their focus. They appear to look beyond content domains and have begun to assess appraisals and related underlying processes, overlooked aspects of the obsessive-compulsive experience, and even other ways to conceptualise phenomena. For example, in factor analyses of intrusive thought content in an analog sample, Lee and Kwon (2003) found two categories of obsessions, each associated with specific appraisals and control strategies. They distinguish between autogenous obsessions (ego-dystonic intrusions of sexual, aggressive, and/or immoral content, typically without identifiable triggers) and reactive obsessions (relatively realistic intrusions about contamination, harm, asymmetry, etc., often evoked by identifiable stimuli). They reported that appraisals associated with autogenous obsessions relate to high control over thoughts and the importance of thoughts, resulting in avoidant control strategies (e.g., thought stopping, avoiding triggers, etc.). However, reactive obsessions are reportedly appraised in terms of inflated sense of responsibility and thus drive more confrontational control behaviours (e.g., washing, checking, reassurance seeking, etc.). These researchers argue that such a distinction is significant as it has treatment

implications; namely, CBT may work better with autogenous obsessions than traditional exposure with response prevention, as it challenges one's belief structure (Lee & Kwon, 2003).

A qualitative interview study by Van Schalkwyk and colleagues of 20 participants with OCD (2016) further highlighted often unmentioned experiences within the obsessive-compulsive episode. Individuals with OCD reported a variety of sensory phenomena preceding compulsions (e.g., panic, muscle tension, the sense that acts are incomplete, a sense of impending doom, etc.) and a wide spectrum of relief typically following compulsive acts (from none to partial to full relief). The obsessional experience is also reportedly associated with affective experiences – while some reported anxiety during obsessions, others reported a sense of incompleteness. Some individuals further described repeating acts compulsively due to a sense that they had failed to maintain good attention during tasks (e.g., cleaning). Although these participants reported feeling that they would not need to restart the compulsion so many times if they could only focus well enough the first time, the researchers noted that this appeared to extend beyond poor confidence in their memory. It may be that this lack of focus reflects ambivalent attention toward feared stimuli (e.g., both a desire to look toward threat and a wish to avoid it) rather than objective attentional deficits (Van Schalkwyk et al., 2016). Curiously, these experiences are not often mentioned in the CBT cycle, let alone the literature.

Shavitt and colleagues (2014) interviewed 1001 individuals with OCD for diagnostic revision of OCD criteria. They found that it is rare for respondents to endorse obsessions without compulsions (.5%), and 99% of participants experienced both obsessions and compulsions. This high endorsement rate is likely due to the inclusion of mental compulsions (56.7%), which are easily overlooked by clinicians and participants, and more common for symmetry / ordering / arranging obsessions and sexual / religious content (often missed in assessment or self-report)

than other domains, such as contamination. Of the .5% reporting compulsions without obsessions, all endorsed feeling sensory phenomena (e.g., physical sensations or not-just-right experiences) before the compulsion. They thus argue that the definition of obsessions should be broadened to include sensory phenomena and compulsions to include mental compulsions (Shavitt et al., 2014).

Even existing elements in the diagnostic criteria for OCD, such as obsessional images, have been to some extent neglected in the research literature and thus in models of the disorder and treatment protocols alike. Interview-based studies of images in OCD have highlighted the fact that they are prevalent, distressing, and difficult to resist (Lipton, Brewin, & Halperin, 2010) and may warrant targeted treatment, such as with imagery rescripting (Veale, Page, Woodward, & Salkovskis, 2015). Obsessional images are further discussed in Section III, below.

These more recent phenomenological studies highlight that our current understanding of the obsessive-compulsive experience is rather incomplete. Specifically, there are gaps in our conceptualisation of the disorder, ranging from nuances (e.g., different categorisation schemes for obsessional content) to core phenomena (e.g., the need to revisit the definition of obsessions to include prevalent experiences, such as sensory phenomena) and the model itself (e.g., if some individuals do not experience relief after compulsions, how do they know to stop?). Indeed, one limitation of the OCD literature is that few studies have sought to carefully revisit the lived experience of obsessions and compulsions. Given the poor response to treatment and the well-recognised heterogeneity of OCD, there is a significant need for a thorough understanding of the phenomenology of OCD and especial attention to overlooked aspects of the experience that may maintain the disorder in the face of targeted treatment. It is therefore the broad aim of this study to investigate the phenomenological experience of individuals with OCD in order to clarify

overlooked aspects of obsessive-compulsive episodes that may inform our theoretical understanding and clinical treatment of the disorder.

Recently, technological advances have allowed researchers to more completely explore the phenomenology of compulsions (e.g., Bucarelli & Purdon, 2015; Zor et al., 2009). Indeed, behavioural parsing studies have found that OCD rituals are significantly longer than those acts performed by matched control individuals, due in part to the performance of a greater repertoire of acts and a greater number of unique acts, i.e., those not shared with control individuals. In fact, control individuals spent only 20% of the time in unique acts, whereas unique behaviours in OCD individuals comprised 60% of their rituals. Sequential order was determined by parsing behaviours into linear chains of shared and unique acts, with control individuals displaying long chains of shared acts and OCD individuals shared acts interspersed among long chains of unique acts (Zor et al., 2009). Thus, treatment efforts that challenge compulsions can be targeted toward limiting (and understanding the function of) unique acts in daily behaviours while simultaneously mimicking only those short chains of shared acts.

In addition, a recent study within our own lab has revealed that compulsive episodes are time-consuming, lasting 34 minutes on average and through six repetitions. Episodes which failed to yield a sense that things were "right" or certain resulted in greater repetitions, poorer confidence in memory and sensory processes, a higher evidentiary threshold for termination of compulsions, and less reported relief. By contrast, those episodes which resulted in a sense of certainty or the "right" feeling – making up over half of the compulsive episodes – offered the subjective sense that the compulsion "worked" and the episode could be terminated, reinforcing the compulsive behaviour (Bucarelli & Purdon, 2015). As poorer memory confidence is associated with as few as five repetitions (e.g., Coles, Radomsky, & Horng, 2006), and the

subjective feel of compulsions distinguished between subsequent compulsive experiences, it may be that "not just right" or uncertainty feelings are particularly important in understanding perseveration and the subjective determination that OC episodes have concluded. However, it is unclear how these feelings arise and whether they are better conceptualised as obsessional, compulsive, or other phenomena.

Unfortunately, our inability to parse internal cognitive experiences in this manner (i.e., by breaking down in stepwise fashion actual observable footage) has made it difficult to study obsessional experiences in a similar manner, and to the best of our knowledge few studies have tried to do this careful work. At the same time, these recent phenomenologies highlight that there are significant gaps in OC episodes that are not only not fully understood but in fact so unknown that researchers might not know to investigate it. Of note, there are scattered explorations of experiences that are significant temporally within the sequence of events in an OC episode (e.g., those immediately preceding and following compulsions) but few investigations of the chronology itself. The **first aim of this study is therefore to clarify the sequential structure of the obsessive-compulsive (OC) experience**. In order to better understand the chronological structure of OC episodes, we intend to:

(1) parse the obsessional experience into its basic elements of building blocks (i.e., determine the forms in which obsessional content might appear), and

(2) elucidate the timeline of these obsessional elements and how the obsessional forms interact temporally with compulsions.

I. On the Chronological Structure of Obsessive-Compulsive Episodes

Obsessional forms. Indeed, few studies have investigated the forms in which obsessions arise. The most recent DSM identifies three main forms in which obsessions may occur:

thoughts, images, and impulses (APA, 2013). This categorisation dates back to the 3rd edition of the DSM, but it is unclear from where this distinction originates or even how such a (verbal) thought might appear. Several decades ago, studies into obsessional forms by Akhtar and colleagues (1975), as well as Reed (1985) identified several other obsessional modes that have since been overlooked or gone unrecognised with no further exploration.

Notably, Akhtar and colleagues (1975) found that the current forms recognised by the DSM (thoughts, images, and impulses or urges) were only endorsed by 34%, 7%, and 17% of their 82 OCD participants, respectively. Significantly, they helpfully defined an obsessional thought as "a seemingly endless thought chain, usually one pertaining to future events" (p. 343). By contrast, a whopping 75% of participants reported obsessional doubt (i.e., a tendency to not believe a task had been completed satisfactorily), an additional 26% reported broad obsessive fears (e.g., fear of losing self-control and inadvertently committing an embarrassing act), and 2% noted miscellaneous forms (e.g., musical obsessions, when tunes get stuck in mind). The marked prevalence of other formats for obsessional content points to the need to explore obsessional forms beyond those in the DSM-5, such as a possible doubt form (Akhtar et al., 1975).

Similarly, Reed reported that 4% of their 50 OCD participants endorsed discrete thoughts (40% were categorised as ruminations, i.e., interferingly preoccupying trains of thought that are inherently circular and unproductive), 2% visual images, and 35% urges and impulses. Doubts (defined as pervasive indecisiveness) were also common at 38%, fears at 65% (e.g., diffuse fears of having harmed people, being contaminated, etc.), and obsessional affects at 4% (strange feelings, e.g., as if just informed that someone died; Reed, 1985). Significantly, just as with the study by Akhtar and peers, the three DSM forms were not the most prevalent forms identified in Reed's study.

In addition, a growing literature indicates that people with OCD frequently experience sensory phenomena (SP) that precede or accompany compulsions. These potentially obsessional experiences, previously couched within impulses, extend beyond urges to include not-just-right-experiences, feelings of incompleteness, and other sensory experiences that are uncomfortable and distressing. In a study of 1001 OCD individuals administered the University of Sao Paulo Sensory Phenomena Scale (USP-SPS), a semi-structured interview to assess different forms of sensory phenomena (SP), 65% of individuals reported at least one type of SP, with 52% of those reporting "just right" perceptions, 37% describing physical sensations in their body, 14% noting "energy release" sensations, and 24% identifying urges only. Most individuals reported that their SP were less severe than their obsessions, although 15% endorsed similar severity, and 16% described their SP as more severe than their obsessions. SP often co-occurred with symmetry / ordering / arranging and contamination / washing symptom dimensions (Ferrao et al., 2012).

The idea that SP are important obsessional phenomena is further corroborated by other studies, which have found that intrusive thoughts are more perceptual than assumed. In one study, 73% of OCD individuals endorsed at least one mild perceptual feature accompanying their obsessive thoughts (most commonly in a somatic or visual sensory modality). The presence of these perceptual properties has been associated with lower insight into the excessive or unrealistic quality of obsessions and compulsions (Moritz, Claussen, Hauschildt, & Kellner, 2014) and previously with poorer outcome in CBT for OCD (Steketee et al., 2011). Thus, SP – or, obsessional thoughts with perceptual properties – may be common but overlooked in OCD and may be interfering with treatment success.

Meanwhile, a couple of studies exploring obsessional experiences from other approaches (e.g., qualitative case study, dialogical rather than cognitive conceptualisation) have highlighted

obsessional content via an internal OCD voice. In analysing one woman's account of OCD, O'Neill (1999) described three different 'voices' she used: a factual 'narrative' voice (largely used for first-person descriptive purposes), an 'interpretative' voice (much like one's conscience, reacting to external social rules), and finally a 'controlling,' dominant voice to characterise OCD. This OCD voice was described as appearing privileged with knowledge that others do not have and thus holds a position of authority, power, and/or control over the individual. In fact, the narrator described the OCD voice as "imperative," "almost a threat" (p. 80) and argued or conversed with her own rational voice all the time. The presence of the OCD voice made it so that she had to negotiate a morally defensible position for herself both from within (given access to her own thoughts) and from outside (from those who would view her actions; O'Neill, 1999).

In discussing their dialogical approach to understanding obsessions (and ensuing dialogical therapy), Hallam and O'Connor (2002) also describe how narrative voices as obsessions can be inferred from the internal interactions shared by individuals with OCD. Of note, they describe these interactions with obsessional content "as though" they were voices, quoting from several participants who described voices (e.g., as "judging" in tone, like the voice of her mother, etc.). Should obsessions be experienced as persuasive and engaging dialogues, there are important clinical implications, as compensatory or neutralising behaviours would perhaps be proportional to the power of the narrative rather than the appraisal itself. Indeed, these authors posit that dialogical therapy would be appropriate; this therapy would be aimed at exposing the obsessional narratives and then empowering the individual to modify these narratives, rather than ignoring them or treating them as if they are meaningless (Hallam & O'Connor, 2002).

In the eating disorder world, a critical-internal voice or dialogue has been documented as a prevalent and clinically important aspect of the anorexic experience. Reported by over 90% of individuals suffering from an eating disorder (Noordenbos, Aliakbari, & Campbell, 2014), recent studies indicate the necessity of learning to defend against this anorexic voice during the recovery process, as it has been implicated in relapses for enticing individuals back to their eating disorder (Pugh, 2016; Pugh & Waller, 2016). This voice is experienced as a second- or third-person commentary often 'heard' by the individual, in a way distinct from typical cognitions, to be remarking on body shape, weight, food, and consequences for self-worth. Significantly, this voice is understood to first emerge as a benign and positive guiding force (e.g., praising weight loss and protecting against distressing emotions), later evolving into a hostile and abusive presence, encouraging harmful behaviours and attacking one's self-esteem in dominant, critical fashion. Indeed, weight loss and other aspects of eating pathology may arise as a defense against internal attacks from the anorexic voice (Pugh, 2016; Pugh & Waller, 2016) or other interpersonal events such as shame. Higher self-criticism has been associated with elevated eating disorder pathology through shame (Kelly & Carter, 2013). These findings have important implications for treatment, and researchers have been supporting the use of self-compassion therapy to combat this critical internal voice.

Additional attempts to categorise characteristics of the anorexic voice have clarified associations between the voice and ED symptomatology. Specifically, lower BMI (i.e., more severe ED pathology) was associated with greater desire to fight the anorexic voice but heightened perceived inability to do so (entrapment by the voice). Benevolent voices (i.e., those perceived as being on one's side) were associated with more pathological eating beliefs while voices perceived as omnipotent were related to longer disorder duration. Stronger (more

powerful) anorexic voices were found in those with greater ED cognitive pathology, worse compensatory behaviours (i.e., laxative use and purging, etc.), and longer disorder duration (Pugh & Waller, 2016).

It is thus conceivable that in OCD an internal-critical voice also fuels symptoms such as obsessions and perseveration with compulsions. However, no research beyond those few reviewed has specifically explored whether individuals with OCD experience such an internal voice or, if present, what its perceived nature or aspects of its voice might be (e.g., as with psychotic experiences, what is its perceived power, benevolence vs malevolence, etc.). We thus hope to determine whether individuals with OCD report obsessions that appear in the form of an internal voice or narrative, and if so, what characteristics the voice or narrative might carry. Is it dominant and hostile? Can it be neutral and/or warm?

Even among forms already identified in the DSM, relatively little research has explored non-verbal forms, such as images. Only recently have researchers begun to explore intrusive images, with preliminary studies identifying prevalence rates of intrusive OCD images at 95% and 81% and purporting that images are more common, frequent (appearing on average 5 to 10 times per week), and distressing than expected (Lipton et al., 2010; Speckens et al., 2007). Given the noteworthy presence of these intrusive images, researchers have begun to explore the possibility and success of rescripting OCD images (originally developed for anxiety and depressive disorders) in treatment (e.g., Rusch, Grunert, Mendelsohn, & Smucker, 2000).

It is thus evident that current assessment and treatment approaches are based on an incomplete understanding of the various forms that obsessions take in OC episodes. Perhaps an inherent difficulty in the study of obsessional forms is the heterogeneity of the disorder both within and across individuals. Reed (1985) noted that the various forms, however carefully

defined, will tend to overlap. Additionally, most individuals experience multiple forms, even if one form tends to be their predominant obsessional experience. He also qualitatively observed that the longer his participants were studied, the more they disclosed, and the more complicated the obsessional picture became; rather than one discrete obsession, the obsessional experience could be an interconnected web of various obsessional forms and rituals (Reed, 1985). Yet, this has not been replicated or acknowledged in current models and treatments.

Indeed, there is a need for a more systematic study of the common forms of obsessions endorsed by individuals with OCD in recent OC episodes. Despite support for additional forms, only three remain recognised by the DSM, and there is increasing pressure to investigate obsessional forms. At the time of publication, Akhtar and colleagues (1975) cautioned that fellow psychiatrists typically use terms like obsessive doubts, fear, and impulses facilely, in the absence of appropriate operational definitions of such terms, and doing so prompts such interchangeable use that the distinctions lose significance. Currently, almost all existing OCD research focuses on verbally-mediated thoughts, disregarding images and impulses. However, it is unclear even what an obsessional thought entails – interpretation is largely at the discretion of the researcher and can encompass discrete, word-based cognitions to broad ideas.

Attempts made by researchers conducting phenomenological interviews of specific obsessional forms have shed some light on aspects of the obsessional experience. From these, we can glean that there is evidence for the existence of obsessions in other forms – such as sensory phenomena, doubts, and narratives or voices – and the need to understand more about obsessional images. However, these attempts are often limited in scope, focusing on a narrow aspect of the fuller OC experience without an understanding of how it fits within the broader context of the full episode (e.g., how do images arise within the episode? How should we

understand obsessional doubts?). Moreover, there is a lack of clarity about whether some elements should be subsumed under others, or whether and how they should be identified separately, as researchers have suggested. For example, doubt simply indicates a lack of confidence or uncertainty, and it is unclear whether doubts and the internal narrative should be conceptualised under the general 'verbally-mediated thoughts,' or exist independently as noted (e.g., Akhtar et al., 1975; O'Neill, 1999).

In understanding the first part of our first research question, this study asks specifically: do obsessions only occur in the forms suggested by the DSM (i.e., verbally-mediated thoughts, images, and urges), or do individuals with OCD identify other obsessional forms – such as sensory phenomena, doubt, and internal narratives – as significant components in their episodes that warrant clinical attention? Between these forms, are some consistently more distressing and thus impactful than others, or does one type tend to initiate an episode? Moreover, within any given episode, does one form persist alone, or is the obsessional experience dynamic, with multiple forms interwoven? Are internal voices or narratives prevalent among individuals with OCD, and what do they sound like? Clarifying the obsessional elements or forms that cut across episodes render one well-positioned to understand the chronological timeline (and interactional nature) of these elements with compulsions, i.e., the second part of our first research aim, creating a cognitive parsing system that approximates as best we can the behavioural parsing compulsion studies described above.

OC episode timeline. Implicit in the model (and diagnostic criteria) is the notion that obsessions and compulsions are discrete entities that occur chronologically and linearly, with obsessions always preceding compulsions and the experience of obsessions terminating upon performance of the compulsion. However, recent literature has called to question four possible

distinct models of OCD, each of which places obsessions and compulsions in slightly different longitudinal temporal arrangements: no coupling, goal directed, habit-driven, and reciprocal (e.g., Laposa, Hawley, Grimm, Katz, & Rector, 2019). At one extreme, the 'no coupling' model represents obsessions and compulsions as being rather independent phenomena, changing independently over time without relations between the two. This is arguably represented in both the diagnostic criteria for the disorder, which allow for obsessions without compulsions and vice versa (APA, 2013), as well as mentions in the literature of the 'pure obsessional' form (e.g., Baer, 1994), though researchers criticize this latter notion for overlooking specific types of compulsive behaviours, such as avoidance and mental rituals (Leonard & Riemann, 2012; Williams et al., 2011). In the 'goal directed model,' obsessions are followed temporally by compulsions and thus lead to changes in compulsions; the goal directed model is represented most prominently by the CBT model, previously described in detail (Rachman & Hodgson, 1980; Salkovskis, 1985).

The 'habit-driven' hypothesis or model posits that OCD is a disorder of habit, namely that compulsions arise out of deficits in goal-directed action systems and a persistent overreliance on the habitual system (i.e., through stimulus-response, automatic habit formation; Gillan et al., 2011). Compulsions constitute habitual behaviours that are not typically or cannot be explained, and so obsessions would follow temporally as post-hoc rationalizations; the conceptualization of OCD as compulsive-obsessive disorder (Robbins et al., 2012), previously discussed in detail, represents this habit-driven model. Proponents of this view note that individuals with OCD performed worse on 'slips-of-action' tasks (in which they completed a task to artificially develop a habitual response and then the same task with the outcomes reversed, so that their new goal required that they override the habit system), and performance

was correlated with symptom severity (Gillan et al., 2011). They also point to a stimulus-response study in which individuals with OCD were trained to respond habitually to avoid shocks, but continued to respond avoidantly out of habit even when informed they would no longer be receiving such shocks (Gillan et al., 2015). Taken together, they note that individuals with OCD erroneously conclude that "if they felt driven to perform an act of (habitual) avoidance, they must have had something to fear" (Gillan & Sahakian, 2015, p.248).

However, Kalanthroff, Abramovitch, Steinman, Abramowitz, and Simpson (2016) offer a critique of this model across many levels. They highlight that several processes and mechanisms would typically be involved in such a goal-directed system, and the literature demonstrating deficits in OCD is inconsistent at best for specific mechanisms (and typically marked by small to moderate effect sizes or clinically insignificant presentation). These researchers furthermore note that some OCD rituals are so complex and deliberate that they cannot possibly be construed as automatic habits; similarly, OCD beliefs can be so severe and complex that they could not feasibly be post-hoc explanations or rationalisations for 'slips of action.' Moreover, even if it is true that those with OCD rely more heavily on habitual systems than goal directed, the direction of the causal pathway would be unclear (i.e., is the habit formation a consequence or cause of OCD; Kalanthroff et al., 2016).

Significantly, the last model – the reciprocal model – combines both the goal directed and habit-driven models (Laposa et al., 2019). This representation would putatively reflect bidirectional relations between obsessions and compulsions, such that obsessions influence compulsions and vice versa. As highlighted by Laposa and colleagues (2019), findings that bidirectional relations exist between changes in OCD beliefs and behaviours might support this model (Rhéaume & Ladouceur, 2000).

Most recently, treatment-based studies have attempted to examine the time sequencing of obsessions and compulsions over the course of treatment, i.e., determine whether obsessional symptom levels predict compulsion levels at end of treatment, or whether compulsions affect obsession scores across treatment. Laposa and colleagues (2019) used latent difference score analysis to determine which of these models might best capture the temporal relations of obsessions and compulsions in a 12-week CBT group for OCD. By their analyses, the goal directed model was the best fit, as they found that obsession scores, measured by the Y-BOCS, led to subsequent changes in the compulsions scores, but not the reverse (Laposa et al., 2019).

However, Falkenstein and colleagues (2020) found slightly different results in a study of individuals undergoing intensive residential treatment (consisting of 6-to 8-week-long individual and group therapy, including 4 hours of exposure with response prevention daily). When including obsessive beliefs and state and trait characteristics in their random intercepts cross-lagged panel models, findings supported the reciprocal model, in that both the goal directed and habit-driven models were evidenced in their data. Specifically, greater intensity of obsessive beliefs led to greater obsession severity, which then led to greater compulsions during treatment (supporting the goal directed model). Yet, compulsions led to more obsessive beliefs – specifically, greater responsibility and threat beliefs – which then led to greater levels of obsessions (supporting the habit-driven hypothesis). The researchers note that resisting compulsions thus results in decreased obsessions via this belief-driven pathway (Falkenstein et al., 2020); of note, this is the exact mechanism by which behavioural experiments are proposed to have therapeutic effect (Salkovskis, 1999). In further support of the habit-driven side of the reciprocal model, individuals who performed higher levels of compulsions midway through treatment (week 4) had higher levels of obsessions at discharge (Falkenstein et al., 2020).

While these studies offer some insight into the sequential relationships of obsessions and compulsions in the OC cycle, the results support different temporal models. The recent treatment studies provide compelling support for the goal directed model and possibly the reciprocal model, but they are limited in that they offer information about how OCD symptoms unfold specifically during treatment. In so doing, these researchers are extrapolating from symptom change across treatment (i.e., treatment mechanisms in treatment studies) how the disorder might present itself in and be experienced by individuals themselves. Such results cannot definitively clarify whether these patterns would be seen in a non-treatment seeking sample, that is, most significantly, in the general phenomenology and/or natural course of OCD. Moreover, these models investigate in broad strokes the direction(s) in which OCD symptoms exert influence in an attempt to understand the longitudinal temporal relationship between obsessions and compulsions. They do not directly inquire whether obsessions and compulsions exist non-sequentially (i.e., concurrently) and/or if they may be ordered differently than obsessions occurring only before compulsions. Indeed, to the best of our knowledge, there have been no such careful phenomenological explorations of the episode timeline.

Additional studies have not quite explicitly highlighted the episode timeline but elements around compulsive phenomena. For example, Berrios (1989) wrote about how Ball first noted that an operational criterion for OCD should be the experience of a tension release following completion of the compulsion. Van Schalkwyk and colleagues (2016) reported that participants tended to report a variety of experiential qualities prior to compulsions (physiological signs of anxiety, felt senses of incompleteness or doom, etc.) and anywhere from full to no relief following the acts. Significantly, they noted that some individuals with OCD reported repeating aspects of their compulsion after one or more iterations due to an internal sense (e.g., they had

not focused well enough on the task). However, it is unclear from their description whether the experience that prompted a repetition of the compulsion is in fact a resurgence or emergence of an obsessional experience after the compulsive act (Van Schalkwyk et al., 2016).

Indeed, anecdotal evidence from our own clients supports not only the co-occurrence of obsessions and compulsion but the existence of obsessional phenomena beyond the end of compulsive acts. As no studies have empirically demonstrated this, this study seeks to determine whether individuals with OCD report that aspects of the obsessional experience: (a) persist through the performance of the compulsive behaviour and (b) beyond the completion of the compulsion, leading to repetitions of the compulsive act and/or performance of different types of compulsions.

Another key aspect of understanding the episode timeline involves understanding how individuals perceive that they have done enough for the OC episode to terminate. While the CBT model posits that the relief from distress obtained after neutralising the obsession (i.e., by completing the compulsion) maintains the cycle via reinforcement of obsessional appraisals and the performance of the compulsion, it does not clearly specify how the episode terminates. Few efforts have also been spent in establishing empirically how individuals know that the OC episode is over (and/or they can stop perseverating).

As Szechtman and Woody's (2004) model posits OCD as a disorder of stopping, it offers one of the few explanations for episode termination. Specifically, they suggest that individuals with OCD fail to achieve yedasentience, an "internally generated feeling of knowing [that] provides not only a phenomenological sign of goal-attainment but is also the physiological mechanism that actually shuts down security motivation" (Szechtman & Woody, 2004, p.115). Yedasentience is reportedly an internally felt sense – a feeling of knowing – much like how one

knows to stop drinking water once one has quenched one's thirst (i.e., the feeling of satiation), and is thus unrelated to one's rationalisations or cognitively-explained appraisals. Rather, yedasentience captures a "subjective conviction [that is] functionally separate from knowledge of objective reality" (Szechtman & Woody, 2004, p. 115). This feeling is reportedly the stop signal that is emotionally distinct from the obsessional distress itself (anxiety is a go signal), just as the feeling of satiation is different from that of the thirst. Indeed, they found that experimentally blocking this feeling through hypnotism induced compulsive-like checking in nonclinical individuals (Woody et al., 2005).

Some initial research suggests that individuals with OCD require more information when making decisions about terminating compulsive behaviours. In a study exploring how individuals decide when to stop typical OCD compulsive behaviours (e.g., washing, checking), Wahl and colleagues (2008) found that individuals with OCD who wash compulsively use arbitrary stop rules (i.e., subjective criteria) more frequently – and consider them more important – in determining when to stop washing than non-washing individuals with OCD and healthy controls. Additionally, regardless of their typically performed type of compulsion, individuals with OCD used more criteria than control participants before terminating washes, increasing the length of hand washing. This suggests that elevated evidence requirements may be involved in general decision-making strategies in OCD and that the use of subjective criteria may typically impede stopping ability (Wahl, Salkovskis, & Cotter, 2008). The reliance on subjective criteria may further complicate stopping abilities, given the Seeking Proxies for Internal States model findings that those higher in OCD symptom severity doubt internal cues and rely instead on external cues to guide behaviour (Lazarov et al., 2010). To the extent that such external cues are

maladaptive attempts to achieve that same satisfactory decision, this may explain differences in evidence requirements.

Moreover, investigations of compulsion sequences implicate a just-right feeling in the termination of compulsive episodes. Bucarelli and Purdon (2015) determined that among individuals with OCD, episodes which failed to yield a sense that things were "right" or certain resulted in greater repetitions of the compulsive act, a higher evidentiary threshold for termination of compulsions, and less reported relief. These episodes were also associated with poorer rated confidence in their memories and sensory processes. By contrast, episodes which resulted in a sense of certainty or the "right" feeling – making up over half of the compulsive episodes – offered individuals the subjective sense that the compulsion "worked" and the episode could be terminated, reinforcing the compulsive behaviour (Bucarelli & Purdon, 2015).

In understanding the second component of our first research question, this study aims to clarify aspects of the episode chronology implied in current models but not phenomenologically investigated, namely whether obsessions precede, overlap with (i.e., appear concurrently), and/or extend beyond compulsions. Our study furthermore asks: what obsessional form tends to appear first in the episode and which forms tend to dominate the experience or persist the longest? What criteria do individuals with OCD use to terminate episodes? Are they unable to end compulsions based on the subjective sense that they have done enough (i.e., failure to achieve yedasentience), as Szechtman and Woody (2004) suggest?

All in all, current thinking identifies obsessions and compulsions as distinct phenomena, occurring in sequential fashion. Researchers have not inquired directly of individuals with OCD whether there might be a potential dynamic relation between the two, though a recent modelling study of change across treatment indicates the relationship may be reciprocal (Falkenstein et al.,

2020). However, findings from both components of our first research question will allow us to appreciate a fuller picture of the OC episode. Specifically, by putting such findings together, we can understand the basic elements of the episode (i.e., the various forms obsessions typically take) and the way in which they are arranged chronologically. This clarification allows us to investigate those elements that might initiate and/or dominate the experience (i.e., obsessional forms that wield the most power through distress and persistence), as well as the manner in which these two phenomena interact, whether mutually exclusively in sequence or dynamically interwoven and overlapping. Importantly, such results can help us understand how individuals determine that their episode is over, which may be influential both from a theoretical and an intervention standpoint (e.g., how to facilitate their efforts to achieve that conclusion).

The determination of the true sequential order of obsessive-compulsive (OC) phenomena has important clinical implications beyond the theoretical. Should Robbins' theory (i.e., the habit-driven model) prove to be accurate, therapeutic focus would shift to exclusively overcoming compulsive urges, as there would be no obsession without a compulsion or its compulsive urge. On the other hand, if obsessions occur first but continue to be experienced through (and beyond) the onset of the compulsive behaviour (including being influenced by compulsions, i.e., reciprocal model), it will be important to understand the impacts of this dynamic relationship (i.e., how the continued obsessional experience may be informing the compulsion and the reverse) and address this in treatment through both cognitive and behavioural strategies. As it is not clear whether these timelines may in fact vary depending on the actual form of the obsessions (e.g., images may terminate easily upon performance of compulsions but doubt tends to persist beyond) this first research question provides the overarching framework to guide our findings from our latter two research questions. Specifically,

research questions two and three focus, as discussed below, on more fine-grained details about two obsessional forms in particular – obsessional doubt and obsessional images – due to the vast lacunae in OCD literature but their anticipated clinical significance, discussed in the following two sections.

II. On Obsessional Doubt

Doubt in OCD presents a curious case; it has long been noted in clinical accounts of the disorder, but our empirical understanding of doubt is woefully scattered. The doubt research landscape in OCD is peppered by incomplete or unclear definitions and by researchers' highly varied ideas, rather than being unified by the perspectives of disorder sufferers themselves. Early OCD literature is sprinkled with numerous clinical accounts and descriptions of doubt. First touted as the 'doubting disease,' or *folie du doute*, in writings by 19th century French psychiatrists like Esquirol and du Saulle, OCD was posited to begin with spontaneous and irresistible thoughts that were accompanied by feelings of doubt or brooding, ultimately leading to the establishment of rituals. Ribot further described OCD as "hesitation over futile issues and incapacity to make decisions" (Berrios, 1989, p. 290).

Janet expanded on the presence of doubt in his descriptions of OCD in 1903, noting that "everything is doubted" in the disorder. These feelings of incompleteness reportedly may manifest across behaviours, feelings, perceptions, and cognitions. Significantly, individuals "may feel that an action wasn't done well or completely, that it lacked something, or that it didn't produce the sought-for satisfaction ... although to an observer all may appear perfectly well done" (Pitman, 1987, p. 226). Reed (1985) conceptualised OCD as simple indecisiveness to the point that their doubts are all-pervasive, robbing an individual of volitional resources and

rendering them unable to act even if they were to resolve their doubt. This OCD doubt is posited to be around content such as a specific occurrence, memory, or their self-concept (Reed, 1985).

Of note, pathological doubt was investigated as a possible severity rating item in the development of the YBOCS, alongside items such as pathological slowness, pathological responsibility, and indecisiveness. The pathological doubt item of the YBOCS asks whether individuals with OCD (1) doubt whether they performed an activity correctly after completing it; (2) doubt whether they completed the activity at all; or (3) feel that they don't trust their senses (what they see, hear, or touch) when carrying out routine activities. The item is rated on a 5-point Likert scale, from not at all to extreme uncertainty about perceptions that are constantly present and substantial interference in almost all activities (Goodman et al., 1989).

Unfortunately, the items under investigation for pathological doubt were not retained in the final YBOCS severity rating score – which includes items rating the amount of time occupied by symptoms, interference, resistance, and distress – due to insufficient evidence of their core relevance to OCD (Goodman et al., 1989). These items and this conceptualisation of doubt also do not appear much in the literature, doubt-centric or not. It is also unclear whether this formulation of doubt is data-driven, i.e., as told by participants themselves, or if it is researcher-asserted. Nevertheless, this single item captures many different ways in which pathological doubt can present in OCD. Indeed, the extant literature reveals that investigations of doubt in OCD vary widely, as doubt is conceptualised in very specific ways by individual researchers, existing in silo-like fashion from the way doubt is being investigated by other researchers.

Doubt as an obsessional or compulsive form (taken across content domains). The first mentions of doubt were as forms in OCD, both across the compulsive or behavioural domain (Stern & Cobb, 1978) and the obsessional (Akhtar et al., 1975). Stern and Cobb (1978)

described a domain of compulsive behaviour termed 'striving for completeness,' characterizing 11% of their 45 participant OCD sample, that captures their rendition of OCD doubt. These 'striving for completeness' behaviours encompass spending inordinate amounts of time completing a behaviour due to "doubt whether he had completed [the] activity correctly" (thus trying to prove that it was done properly) or repetition of simple actions due to being "plagued by the thought that the ritual might not have been carried through according to prescription" (Stern & Cobb, 1978, p. 229).

By contrast, Akhtar (1975) identified doubt as a form that obsessional content can take (much like a verbal thought or an image), consisting of "an inclination not to believe that a completed task has been accomplished satisfactorily" (e.g., Did I turn off the stove? Am I sure?) even in the face of a "a clear and accurate remembrance of having done so" (Akhtar, 1975, p. 343). He argued that doubts, reportedly endorsed by 75% of his OCD sample, are the most prominent feature of obsessional neurosis and wrote of his agreement with earlier representations of the disorder as 'manie du doute.' Indeed, researchers have written of doubt appearing across a range of OCD symptoms but appearing in its purest form in checking rituals (e.g., Tolin et al., 2001). Yet, even these reports of doubt as an obsessional form are limited in scope.

Doubt as an obsessional content domain or topic. Obsessional doubt has also often been conceptualised as a content domain (i.e., the focus of an obsession, much like contamination fears or repugnant sexual and blasphemous thoughts). As previously discussed, Swedo and colleagues (1989) first identified doubt, or uncertainty about whether one is safe, as a broad content domain for obsessions and compulsions. Doubt as a content domain appears very briefly in the Anxiety Disorders Interview Schedule for DSM-5 as an OCD item about excessive doubting of locks, appliances, and other tasks having been completed accurately (Brown &

Barlow, 2014). Doubt is again captured in the symptom checklist of the YBOCS in two items capturing content about fears one unknowingly and carelessly caused harm to others (e.g., a hit-and-run automobile accident) or one was responsible for something terrible happening (e.g., a fire from not having checked the house properly before departure), both within the cluster of aggressive obsessions (Goodman et al., 1989).

In fact, Pinto and colleagues (2007) identified Doubt/Checking as one of five factors extracted in factor analyses of content categories; it was comprised of the two aforementioned doubt items (grouped into a "pathological doubt" category), somatic obsessions (e.g., excessive concern with illness or disease), and checking compulsions (e.g., stoves, locks, no harm to others, no mistake took place, or nothing terrible will happen). Significantly, this distinction appears to indicate that Doubt/Checking content occurs somewhat independently from the other aggressive obsessions, which have historically been considered with sexual and religious obsessions in the Taboo Thoughts factor. This is of clinical utility, as these domains have reportedly been associated with different treatment response (Pinto et al., 2007).

An international study was also completed by Radomsky and colleagues (2013) to assess the prevalence of intrusive thought content domains across 13 countries and 6 continents using the standardised International Intrusive Thoughts Interview Schedule. In this study, they found that doubting intrusions were the most commonly endorsed content area, while sexual / religious / immoral obsessions were least common (compared to obsessional domains such as contamination, harm / injury / aggression, etc.). This pattern was again repeated when participants were asked to report on the most distressing content domain. Given this unexpected prevalence of doubt-content intrusions compared to all other domain types – and moreover consistently found at nearly every study location – the researchers highlight the need to explore

more the role of doubt in OCD, especially in relation to the intolerance of uncertainty construct (Radomsky, Dugas, Alcolado, & Lavoie, 2014).

Obsessional doubt as pervasive indecisiveness. Consistent with this idea, investigations of doubt as a cognitive process at work (or failing to work) have also been conducted by different researchers, yielding various results. Within this conceptualisation, doubt is typically defined as difficulty making or feeling confident in one's decisions. Indeed, OCD has been referred to as a disorder of decision-making (Sachdev & Malhi, 2005) and a state of pathological indecisiveness (Beech, 1974), that is, "the experience of decision problems…resulting in overt choice-related behaviours" such as delays and post-decision rumination (Rassin, 2007, p. 2).

While not always explicitly stated to be an investigation into doubt in OCD, several other studies have explored indecisiveness among individuals with OCD. Indecisiveness is readily apparent in clinical accounts of OCD (e.g., repetitive checking due to difficulty determining if the door is locked) and existing research offers an empirical link between OCD and indecisiveness, both among nonclinical and clinical individuals. Scores on self-report indecisiveness scales have been shown to be correlated with OCD checking and doubting symptom scales in nonclinical individuals, but not with other OCD symptom scales, such as washing scores (Frost & Shows, 1993; Gayton, Clavin, Clavin, & Broida, 1994). Associations between indecisiveness and total OCD symptom severity are inconsistent, with one study finding a significant relation (Gayton et al., 1994) and one failing to reach statistical significance (Frost & Shows, 1993).

Several experimental studies of decision-making in clinical OCD populations have yielded evidence of group differences in objective markers of indecisiveness, namely, latency for decisions and evidence requirements for decisions (i.e., amount of information required to make

a decision). Individuals with OCD seem to be slower to make decisions in some contexts, taking longer to complete tasks with many solutions (Goodwin & Sher, 1992) and spending more time deliberating about low-risk and OCD-relevant hypothetical scenarios (Foa et al., 2003) than control participants. Additionally, OCD groups performed more slowly than healthy controls on probability-based gambling tasks when presented under negative, threat-based frames (e.g., possible losses as opposed to gains; Sip, Muratore & Stern 2016). However, another study found that individuals with OCD did not differ from control participants in total response time or decision latency for scenarios when deliberating about hypothetical, explicitly moral dilemmas (Franklin, McNally, & Riemann, 2009).

As well, as previously highlighted, individuals with OCD have a higher threshold for evidence requirements in decision-making. Compared to control participants, individuals with OCD required more information before making decisions about hypothetical scenarios (Foa et al., 2003) and requested more repetition of trials on a signal detection task despite no difference in performance (Milner, Beech, & Walker, 1971). Additionally, Banca and colleagues (2015) found that under high uncertainty those with OCD needed more evidence before making determinations about the direction of moving dots; however, they were able to lower thresholds to control levels (normalise reaction times and evidence requirements) under low uncertainty contexts when monetary incentives were provided for speed. Thus, those with OCD might not have true decision-making deficits per se; rather, they may simply accumulate evidence from data inefficiently (Banca et al., 2015) or rely on subjective thresholds that can be adjusted under specific conditions, when certain concerns are appeased.

Nestadt and colleagues (2016) defined this orientation more explicitly in a theoretical paper elucidating the hypothesized core deficit in OCD, stating that:

> "Doubt can be defined as lack of certitude or confidence in one's memory, attention, intuition, and perceptions, such that it is difficult to trust one's internal experiences; hence retarding satisfactory responses to cues or possibly to information in general. This appears to occur at a reflexive level and often leads to indecision or even a sense of incompleteness or a 'not-just-right' feeling" (p. 2).

Significantly, these authors hypothesized that doubt, uncertainty, or lack of confidence could be used interchangeably to describe the deficit in the decision-making process, which is the core impairment in OCD. They note that this difficulty is distinct from impairments in other aspects of the decision-making process, such as error detection or making choices with conflicting alternatives. In this case, it is at the stage of information accumulation, a process that necessarily proceeds until the decision threshold is exceeded (i.e., the individual perceives that enough information has been collected to a point that they can make a decision and begin to respond), that doubt exerts its influence, affecting the time taken to make a decision. These researchers posit that OCD symptoms develop when an individual with a tendency to doubt encounters an experience wherein perceptual information available at that time and the individual's internal knowledge prevent the individual from smoothly engaging in and completing a decision-making process. This may transpire at a largely unconscious level (Nestadt et al., 2016).

Marton and colleagues (2019) put this hypothesis to the test with the development of a Doubt Questionnaire which clinically assessed doubt defined in this manner. The items were devised to capture the experience of doubt in several domains, including memory, decisions, task accuracy and completion, visual perception, and auditory perception (e.g., "I second-guess my decisions," "I feel that I might have missed something because I didn't look carefully enough," and "I don't trust my memory of simple, everyday things"). As predicted, participants with OCD

scored significantly higher on doubt than control participants. Significantly, these OCD vs control group findings appear to parallel the high vs low doubt results, and in conjunction with the Doubt Questionnaire results, the researchers suggest that high levels of doubt may affect decision-making processes in individuals with OCD (Marton et al., 2019).

Yet, overall, these studies indicate that while individuals with OCD may sometimes appear to struggle with indecisiveness, it is not due to a true inability to make decisions, but rather that there are factors that impede their ability to feel certain in the decisions they have made. In fact, these studies point to the evolution of doubt investigations into explorations of broader distrust in one's internal senses.

Obsessional doubt as a distrust of reality (result of inferential confusion). The inference-based approach outlined by O'Connor et al. (2005) focuses more narrowly on doubt as a core distrust of internally-derived (sensory) information in OCD. In this model, they posit that individuals with OCD rely too heavily on hypothetical possibilities that may in fact negate reality or persist in the face of no sensory-based evidence. Due to this inferential confusion, individuals are plagued by inferences drawn subjectively through inductive reasoning (i.e., obsessions) and perseverate with compulsions despite no evidence in support of the obsessional content. Within this framework, obsessional doubt is inferential doubt, i.e., doubt in the conclusions one draws about the world (e.g., the door has been locked) due to a distrust of reality and one's senses in favour of hypothetical dangers (Aardema, O'Connor, Pelissier, & Lavoie, 2009; Nikodijevic et al., 2015; O'Connor et al., 2005). In this approach, doubt has been experimentally tested using two tasks – the Reasoning with Inductive Arguments Task (O'Connor et al., 2005) and the Inference Process Task (Aardema et al., 2009) – and thus quantified in slightly different ways.

In the Reasoning with Inductive Arguments Task (RIAT), participants are measured on how much their belief in an initial conclusion, drawn from two premise statements, could be undermined (i.e., doubt introduced) by externally provided alternative conclusions as opposed to internally generated alternatives. Individuals with OCD, while not inherently higher in baseline doubt than anxious and healthy controls, did doubt significantly more (i.e., reported a greater change in the strength of belief in the original conclusion) when provided with an alternative that was provided by an external source rather than produced by themselves. This was interpreted to indicate similar reasoning abilities but a different inductive reasoning strategy, one which relies too heavily on externally-provided rules, reassurance, or inferences (Pelissier, O'Connor, & Dupuis, 2009).

A later study found that when provided with alternative possibilities that contradicted the original conclusion on the RIAT, doubt was generated in both the OCD and healthy control groups; however, doubt increases were greater in the OCD group than healthy control for neutral but not OCD-relevant items. Yet, when the alternatives supported the initial conclusion, healthy controls benefited (i.e., reported greater increases in confidence), while the OCD group remained unaffected (O'Connor, Wilson, Taillon, Pelissier, & Audet, 2018). Thus, it appears that people with OCD do rely more on external than internal sources of information to draw inferences about the world, but perhaps in biased ways, such that it tends to be doubt-generating rather than doubt-inhibiting.

Studies using the Inference Process Task (IPT) found similar support for this inferential confusion hypothesis. In this task, participants are provided with vignettes and pieces of information that alternate in terms of whether they are 'reality-based' (i.e., factual) or 'possibility-based' in a bid to measure how much individuals are impacted by the different types

of information. Aardema et al. (2009) found that, as expected, people with OCD are more impacted by possibility-based information (i.e., subjective sources) than nonclinical controls. This increased reliance on uncertainty-based information comes at the expense of reality-based information and thus leads to higher levels of doubt in OCD (Aardema et al., 2009). When completed by nonclinical participants, those with higher levels of OCD and feared self beliefs (i.e., the extent to which they identify undesirable aspects of themselves) showed greater fluctuations in doubt, indicating greater vulnerability to possibility-based information, especially for OCD-relevant scenarios (contamination and checking content). Moreover, it appears that it may be feared self beliefs that make individuals susceptible to doubt in relation to OCD symptomatology (Nikodijevic et al., 2016).

Yet, some studies have failed to replicate findings supporting the doubt-provoking role of inferential confusion. Gangemi and colleagues (2015) found that it was the threatening nature of the information provided (i.e., does it communicate safety or danger?) that actually impacted the levels of doubt evoked. Specifically, when probability-based information indicated safety in a hypothetical scenario and reality-based information confirmed danger, individuals with OCD were swayed by the danger-oriented factual information. The researchers thus posit that individuals with OCD actually enact a 'prudential reasoning strategy' (i.e., a "better safe than sorry" policy) wherein doubt and the ensuing preoccupation is provoked by any information that might indicate danger, regardless of whether it is framed as reality- or probability-based (Gangemi et al., 2015).

Moreover, a therapy designed specifically to target inferential confusion, inference-based therapy (IBT), while improving 44% of the OCD group's ability to achieve non-clinical levels of doubt on the IPT, did not resolve this inferential confusion or doubt for 35%. Additionally, while

IPT performance improved for these individuals after treatment and they reported lower levels of obsessionality and negative mood states, this improvement was not associated with improvements in the YBOCS clinician scores (Aardema & O'Connor, 2012). Thus, even this conceptualisation of doubt requires further clarification for a more thorough understanding.

Obsessional doubt as uncertainty about one's behaviour due to poor memory confidence. Several studies, in discussing doubt in OCD, have also made reference to extant metamemory literature, especially the role of poor confidence in one's memory on checking behaviours. While the early metamemory OCD studies sometimes make no reference to doubt (Radomsky, Gilchrist, & Dussault, 2006; Tolin et al., 2001; van den Hout & Kindt, 2003) or expound little on it (Nedeljkovic, Moulding, Kyrios, & Doron, 2009; Radomsky & Alcolado, 2010), they provide context and understanding for the later studies that directly explored it. Of note, these metamemory researchers appear to focus exclusively on doubt in having completed checking behaviours.

Early metamemory studies found that individuals with OCD appear to demonstrate selectively low confidence in their memory but not worse memory accuracy for objects that are deemed unsafe (in memory tasks); in OCD, there is even a progressive worsening of their memory confidence in repeated trials of object presentation (Tolin et al., 2001). In a questionnaire-based study assessing metamemory and metacognition in OCD, researchers found that the confidence in memory scale (but not confidence in decision-making or concentration ability, or perfectionistic expectations of memory) uniquely predicted OCD severity measured on the Y-BOCS, over and above anxiety and depressive symptomatology and other OCD-relevant beliefs (Nedeljkovic et al., 2009).

Moreover, manipulating beliefs about one's memory can produce OCD-like checking behaviours. In a nonclinical student population, those offered false feedback suggesting below average performance on memory tasks, and advised not to trust their sense of how well they did, demonstrated greater doubt in their memory and urge to check (e.g., higher urges to check the memory task, start over on the memory task, and even check whether a light – unrelated to the task at hand – had been turned off; Alcolado & Radomsky, 2011). The reverse – that repeated checking inherently creates memory distrust in individuals – has been repeatedly demonstrated across various objects, such as stoves (e.g., van den Hout & Kindt, 2003; Radomsky et al., 2006) and faucets (Radomsky et al., 2014), including both physical and mental checks (Radomsky & Alcolado, 2010). Of note, it appears that the reductions in memory confidence are specific to the modality of the checks themselves, such that repeated physical checking only erodes confidence in memory of the physical check, not mental, and vice versa (Radomsky & Alcolado, 2010).

The mechanism behind doubting one's memory (of a check) was posited to relate to reduced vividness and a shift from perceptual, detailed remembering to semantic or conceptual memory with repeated checking (i.e., from 'remembering' the check to 'knowing' that it had been done; van den Hout & Kindt, 2003), as people use perceptual aspects of memories to differentiate real from imagined autobiographical events (Johnson et al., 1988). Indeed, later studies demonstrated that when non-OCD individuals were asked to check a stove repeatedly, they reported not only poorer memory confidence but reduced vividness and detail in the memory compared to ratings after one check and compared to those who repeatedly checked a faucet instead of a stove (Radomsky et al., 2006). As memory accuracy has been only slightly affected by repeated checking in some studies (Radomsky & Alcolado, 2010) or trended toward it (Radomsky et al., 2006) but not in others (e.g., van den Hout & Kindt, 2003), its links to

repetitive behaviours need to be further explored. Of note, it is not possible at this time to disentangle the possible effects of doubt on accuracy results; that is, it is unclear whether doubt arising from repeated checking makes one alter an otherwise accurate answer (i.e., the memory is intact but not trusted and therefore reported on incorrectly).

Altogether then, individuals with OCD are believed to suffer from a "self-perpetuating checking/doubting mechanism" in which repeated checking paradoxically increases doubt, which then increases checking (Radomsky et al., 2014, p.30). In particular, checking behaviours in OCD are understood to arise out of obsessional concern, consistent with Rachman's model (1997), but exert detrimental effects on memory confidence, producing conditions that promote doubt, which perpetuates checking behaviour, and so on (Radomsky et al., 2014). Significantly, an fMRI study of individuals tested on recall of objects seen while virtually 'walking' through four rooms found differences in activated brain regions between the OCD and health control groups. Specifically, in spite of no difference in memory accuracy, the OCD group activated areas associated with greater pathological doubt in memory tasks (posterior cingulate cortex and premotor / dorsolateral prefrontal cortex; Olson et al., 2016). These doubt investigations are thus couched entirely within the context of metamemory and checking behaviours.

Obsessional doubt as reduced access to internal states (sensory, affective, cognitive, etc.). As previously described, the Seeking Proxies for Internal States model captures obsessive-compulsive doubt and uncertainty as not content-bound but concerning any internal, subjective state that cannot be fully accessed by external observers or measures. These internal states include but are not limited to: cognitive states such as perception and memory, affective states such as emotions and attraction, and bodily states such as tension and proprioception. This attenuated or reduced access to their internal signals may result in pervasive doubts and a

compensatory reliance on external proxies (e.g., compulsive rituals). These external proxies may however erode confidence in internal states, then ironically justifying their doubts, further reinforcing reliance on external criteria and the idea that their internal states should not be focused on or trusted (Dar et al., 2016; Lazarov et al., 2012; Lazarov et al., 2014).

When asked to complete a muscle tensing task, individuals with OCD were less accurate than anxious controls and healthy controls at producing muscle tension levels in a specific muscle without external feedback (i.e., internally determining the level of the internal tension state required to produce certain magnitudes). However, when offered biofeedback monitoring information of muscle tension levels as an objective, external proxy, the OCD group's performance improved to the point of equalling the other groups. OCD individuals were also more likely to request biofeedback proxy information when offered the opportunity; and, when given false feedback on the biofeedback monitor about the tension levels they were producing, the OCD group relied more on that external information than their internal sense (i.e., misguidedly adjusted muscle tension significantly more) than anxious and healthy controls (Lazarov et al., 2014). This pattern of findings has also been demonstrated in a student population comparing individuals with high vs low OCD symptomatology, measured by self-report questionnaire (Lazarov et al., 2012).

When the Seeking Proxies for Internal States model hypothesis was tested for emotional states, using emotion intelligence (EI) measured on the Mayer-Salovey-Caruso Emotional Intelligence Test, similar results were observed. Specifically, participants scoring high in OCD symptomatology performed worse than those low in OCD symptoms on scales measuring their ability to perceive and use emotions or affective states (experiential EI, a more internally-based cue) but equivalently on scales measuring their ability to understand and manage emotions

(strategic EI, argued to be a more external indicator). When used continuously, OCD symptom severity was also negatively correlated with experiential (internal) EI but not strategic (external) EI. Moreover, in an unselected group of participants, individuals who received an 'undermined confidence' induction for doubt (informed that some people can feel confident in identifying emotions but are actually inaccurate) performed more poorly than the control group in experiential but not strategic EI, mimicking the high OC group results. Thus, the model findings appear to extend to the emotional domain, with experimental induction of doubt in one's emotions producing performance like that of individuals with high OC symptoms without any induction, namely deficiencies in perception and use of internal emotional states (Dar et al., 2016).

Unfortunately, a more recent study failed to substantially replicate these Seeking Proxies for Internal States model findings on a task measuring grip strength, which researchers noted might be more familiar, under greater individual control, and therefore more resistant to doubt than the rather unknown flexor carpi ulnaris muscle (Wong, Williams, & Grisham, 2017). Indeed, these researchers found that OCD symptomatology in a student population was not significantly associated with poorer accuracy in grip strength when feedback was unavailable (as predicted). Rather, previous findings may have reflected the ability to perceive internal states but the inability to physically produce the necessary performance for muscle tension (lack of practice, physical limitations). The predictions outlined by this model failed to withstand testing in another sensory domain (distance perception, which is a familiar form of visual estimation that may be ecologically valid for the OCD population. The opposite pattern of results was found, with higher OCD symptomatology associated with better distance perception prior to feedback; additionally, feedback as an external proxy was more influential in the high than low OC group,

as the Seeking Proxies for Internal States model would expect, but it did not reliably improve performance, instead worsening it so that the groups were equivalent. This feedback was posited to instead introduce doubt in their performance. Rather than reducing access to internal states (or any actual deficit in ability to ascertain internal states), individuals with OCD were argued to generally be vulnerable to doubting or distrusting their senses or cognitive performance, much like the inferential confusion hypothesis and cognitive appraisal models (Wong et al., 2017).

Obsessional doubt as uncertainty due to poor confidence in internal senses. Wong and colleagues (2017) thus agreed with and extended previous schools of thought regarding the broad scope of doubt, namely: doubt in OCD encompasses one's memory, decision-making and concentration abilities, sensory perception, etc. in the absence of any concrete deficits. In fact, their study findings highlight that OCD individuals might show enhanced performance when internal states are involved. Yoris and colleagues (2017) similarly found such a pattern of results when they asked participants with OCD, panic disorder, and no diagnosis (healthy control) to follow their own heartbeats through mental or motor tracking (heart beat detection task). Those with OCD performed better than anxious and healthy controls when asked to synchronise motor responses to their internal heartbeats but reported lower confidence in their performance. Significantly, it may be that individuals with OCD simply have a tendency to overmonitor internal sensations, such as one's heartbeat, given that they exhibited an enhanced heart evoked potential on electroencephalography, a sign of greater attention allocation to changes in heart rate, regardless of their accuracy on the task (Yoris et al., 2017). This study thus supports the view that there are no decrements in (and perhaps enhancements in performance due to increased attention to) internal state monitoring but rather poor confidence in one's ability to do so.

Phenomenological investigation of OCD doubt. Yet, of all the studies of doubt in OCD, only one to our knowledge comes close to directly asking individuals about their experience and defining it accordingly from their perspective. Samuels et al. (2017) define doubt as "lack of subjective certainty about, and confidence in, one's perceptions and internal states" (p. 117) and allude to the many OCD studies investigating a lack of confidence in one's own memory, attention, and perception, not to mention indecisiveness and intolerance of uncertainty. They thus investigated OCD doubt by asking individuals diagnosed with OCD an item from an earlier version of the YBOCS:

> "After you complete an activity, do you doubt whether you performed it correctly? Do you doubt whether you did it at all? When carrying out routine activities, did you feel you didn't trust your senses (i.e., what you see, hear, or touch)?" (Samuels et al., p. 119)

The researchers found that many individuals with OCD rate themselves as being severely (19%) or extremely (10%) burdened with such doubt, although a sizeable proportion endorsed no (29%) or mild (15%) doubt; the remaining 27% endorsed moderate doubt. Doubt appears to speak to disorder severity, as doubt severity was correlated with OCD severity and impacted global scores of impairment (44% in the no doubt group vs 81% in the extreme doubt group endorsed 'marked or extreme impairment') with odds of impairment significantly increasing from severe (odds ratio of 2.6) to extreme doubt (odds ratio of 5.5), relative to no doubt. Significantly, doubt severity seems to be a prognostic indicator, with the proportion reporting a good response to CBT declining precipitously with increased severity (58% of those with no doubt to 35% with extreme doubt). Results were similar for pharmacotherapy response (serotonin reuptake

inhibitors). Alarmingly, the odds of a good response to CBT were very low (0.40) for those with extreme doubt, relative to no doubt (Samuels et al., 2017).

Perhaps unsurprisingly, this OCD doubt endorsement was related to contamination or cleaning and hoarding dimensions but strongest for checking symptoms. These findings are important in that they suggest doubt may not be a core OCD feature spanning all cases; rather it may be a frequent and impactful or prognostic symptom when it does occur. Yet, in spite of a comparatively broader investigative purview (relative to the experimental studies mentioning OCD doubt), this study's exploration of OCD doubt is limited in scope, having assessed only those doubts about performing activities and trusting one senses (Samuels et al., 2017).

OCD doubt as a scattered landscape. Altogether, therefore, OCD researchers have variously conceptualised doubt as an obsessional or compulsive form (e.g., Akhtar et al., 1975), an obsessional content domain (e.g., Pinto et al., 2007; Radomsky et al., 2013), pervasive indecisiveness in decision-making (e.g., Nestadt et al., 2016), or a distrust of reality (inferential confusion; Aardema et al., 2009; Nikodijevic et al., 2016). Doubt has also been defined specifically as uncertainty about checking behaviour due to poor memory confidence (e.g., Radomsky et al., 2014), a broad deficit in one's ability to access internal states (sensory, affective, or cognitive; e.g., Lazarov et al., 2012, 2014), or the converse – individuals with intact or enhanced ability to access internal states but poor confidence in it (e.g., Wong et al., 2017). One of the few studies asking individuals with OCD to reflect on their own doubt experience still couched it within a combination of uncertainty about whether they performed an activity correctly or at all and a distrust of one's senses (Samuels et al., 2017).

These various operationalisations of doubt have created a scattered landscape, wherein doubt is consistently observed and acknowledged, but is variably defined and thus discrepantly

measured and assessed. These definitions encompass invisible cognitive processes, subjective feelings accessed by the individual, (conversely) a lack of or difficulty accessing subjective feelings, and observable behaviours (as in poor decision-making). Some conceptualisations are in direct opposition to others, with some researchers arguing that it is a core process in OCD applying to all, while others posit that it is limited in scope and experienced only by some. Additionally, some of these understandings defy thought experiments testing the construct; for example, if doubt is a content domain like contamination, it ought theoretically to be manifested across the existing forms (e.g., verbal thoughts of doubt content, images of doubt, urges of doubt, etc.), but it is difficult to conceive of examples for the latter two. It is unclear whether doubt is even a disorder-wide construct, obsession-specific, or compulsion-specific.

It is therefore difficult to make any conclusions about obsessional doubt in OCD (other than that it is highly prevalent in some manner), because findings are entirely dependent on how each researcher has conceptualized doubt. Perhaps one of the main challenges in doubt investigations is the nebulous, highly conceptual nature of doubt, which is made more difficult by our lack of understanding of the construct at a phenomenological level. Importantly, to our knowledge, all studies of doubt in OCD (but one) have approached doubt in an experimental fashion and failed to capture the lived experience of doubt among individuals with OCD. A basic understanding of obsessional doubt is lacking, as it is unclear at this point whether individuals are referring to a physiological sensation, an affective state, a verbal dialogue that consistently undermines an internal conviction, an underlying cognitive mechanism, or any other experience.

A strong case can be made for doubt as an obsessional form, although it can be applied to compulsions as well. Consider the table below, which outlines various ways in which doubt,

alongside other obsessional forms, may appear across various content domains and may take place with respect to the accuracy, success, or relevancy of one's compulsive behaviours.

Table 1.

Examples of Forms in Which Obsessional Content Can Appear (Thoughts, Images, and Doubts).

Content domain	**Obsessional thought**	**Obsessional image**	**Doubt-related obsession**	**Doubt about compulsion**
Contamination	I feel contaminated	Intrusive image of microscopic bacteria crawling around	Did I unknowingly touch that contaminated object? What if a dirty or sick person touched that surface?	Did I wash my hands well or thoroughly enough?
Harm to self or others	It's possible I could push my friend, with whom I am walking, into traffic and kill her (though I do not want to)	Intrusive image of me shoving friend into traffic	Did I hit someone with my car without realising? I can't remember if I turned off my hair straightener (in which case I will burn down my house and my pets in it).	Can I trust my eyes when I look back to check? Did I properly turn off that hair straightener?
Sexual	I am a sexual deviant	Intrusive image of sexual activity	Am I a homosexual and	Did I not do a careful enough

		between random individuals (e.g., neighbours)	don't know it? What if I am a pedophile and a danger to society?	job of avoiding areas where children gather? What if did not control my thoughts carefully enough when I was at my nephew's birthday party?
Scrupulosity or religiosity	I am not right with God	Intrusive blasphemous images (e.g., Jesus performing inappropriate behaviours)	Am I possibly the Devil incarnate?	Did I not complete that prayer carefully enough?
Symmetry / exactness	These objects are off. These things are not quite right	Image as somatosensory buzzing or "not just right" feeling	I'm not sure that object is positioned quite right. Is that exactly so?	Has this been arranged quite right by me? Have I done enough to ensure this is exactly appropriate?

If doubt can manifest across symptom clusters, just as other obsessional forms, it should also be characterisable in ways that are similar to image- or thought-based intrusions (e.g., prevalence, distress, interference, etc.) and likewise provoke compulsions in an attempt to get rid

of the form. However, we lack key information about the experiential qualities of obsessional doubt that would not only help us characterise doubt appropriately (is it a form, a cognitive process, or metacognitive state?) but also allow us to understand its role in the development and/or maintenance of OCD and inform treatments accordingly. Indeed, it may be that the mixed findings across the studies are the equivalent of uncovering specific aspects of the broad obsessional doubt experience (i.e., small slices of the pie that while sometimes inconsistent with other slices hold together in totality to comprise the overall construct).

Further research is thus needed to clarify several aspects of obsessional doubt. Given the lack of phenomenological understanding, we seek to explore these elements in our interview. The **second aim of this study is therefore to understand how doubt is experienced, appraised, and neutralised by individuals with OCD.** In understanding this second aim, this study asks: when individuals endorse doubt, what are they doubting (i.e., doubt content domains) and how do they know it (is it a verbal stream of thoughts, a felt sense, or other experience)? How convinced are individuals that their doubt is true, and how distressing and interfering is it? For that matter, how prevalent is obsessional doubt, and is it associated with OCD symptom severity? Moreover, at what point does obsessional doubt terminate, and to what extent do individuals perform specific compulsions to prevent doubt or in response? In fact, how is obsessional doubt appraised – does it have special meaning or significance to them?

Results of this exploration into obsessional doubt will have significant impacts both theoretically and clinically. Consider that, presently, many individuals at post-treatment may either never have discussed obsessional doubt or it may not have been addressed fully in treatment, given the lack of empirical clarity. Indeed, some cases of treatment non-response may be explained by significant doubt that continues to fuel obsessional concerns. From a theoretical

perspective, conclusions from this investigation will address key lacuna in the OCD literature and clarify current models.

III. On Obsessional Images

There exists a considerably larger pocket of literature on obsessional or intrusive images in the context of OCD. Despite early debate about whether images are encoded as verbal mental descriptions or as distinct cognitions with spatial and sensory properties, decades of research have established that mental images are distinct and impactful cognitions that play a significant role in daily functioning and in psychopathology alike (see Kosslyn, Ganis, & Thompson, 2001; Pearson, Naselaris, Holmes, & Kosslyn, 2015). Mental images have been defined in various ways by different researchers, including:

- "contents of consciousness that possess sensory qualities as opposed to those that are purely verbal or abstract" (Hackman, 1998, p. 301);
- "neural representations constructed from…elemental sensory information" (Holmes & Mathews, 2010, p. 350); and,
- "representations and the accompanying experience of sensory information without a direct external stimulus" (Pearson et al., 2015, p. 590).

These definitions highlight that mental images are internal, cognitive representations that involve a notable sensory experience. Kosslyn et al. (2001) likened visual and auditory imagery to "seeing with the mind's eye" or "hearing with the mind's ear."

Images and emotion. Images in psychological disorders have recently garnered more attention due to their vast impacts on one's emotional experience. Holmes and Mathews (2010) describe their significance as arising from three different paths through which images – over any other type of cognition, such as verbal thoughts – have special links to emotions. First, mental

images are able to directly influence emotional systems in the brain that are inherently responsive to specific sensory signals, such as those inherent in images. In particular, such sensory cues are able to bypass higher-level processing by routing through the amygdala, an evolutionary by-product of a rapid signalling system to facilitate responses to danger or reward cues (Holmes & Mathews, 2010).

Support for this pathway comes from studies noting amygdala activation in response to emotional stimuli (e.g., pictures of angry faces) that are presented outside of one's attention and when masked to prevent participant awareness of the stimuli. It is not that higher-level processing is completely removed, as instructions to consider the stimuli in a different way (via top-down conscious control) can reduce, if not eliminate, amygdala activation (Mathews, Yiend, & Lawrence, 2004). Rather, mental images, by nature of their intrinsically sensory inputs, may activate brain systems that underlie emotions more directly than symbolic representations such as verbal material that do not contain sensory codes. In fact, verbal processing may actually undermine one's affective experience, perhaps by routing through one's semantic memory and potentially accessing conflicting information. Indeed, consider that Borkovec and colleagues (Borkovec, Alcaine & Behar, 2004; Sibrava & Borkovec, 2006) proposed that verbal worry in generalised anxiety disorder serves a cognitive avoidance function in response to threatening and distressing information, potentially buffering against emotional engagement and intensity.

Second, mental images may evoke emotion through a more indirect pathway, namely that emotion-arousing images may actually feel as if they are being perceived in real life, eliciting an emotional response due to the perceptual processes involved (Holmes & Mathews, 2010). Lang (1979) first expounded on this in his bio-informational theory of emotional imagery, in which he noted that a mental image of an emotion-provoking stimulus (e.g., a spider) will

activate an associative network of stored information that overlaps with networks activated by the stimulus in real life (e.g., an encounter with a live spider). This associative network of information contains various types of information about the stimulus, ranging from perceptual (colour, shape, texture, etc.) to semantic (what it means), somatovisceral (what it feels like to encounter the stimulus), and behavioural (preparatory motor responses evoked by encounter). Given this overlap in perceptual information between imagined and real stimuli, images can operate as "as-if real" templates of real interactions with the stimulus, evoking the corresponding emotional and behavioural responses (Lang, 1979).

A wealth of research from activation studies supports Lang's notion that images provoke emotional and physiological reactions consistent with "as-if real" templates. Functional magnetic resonance imaging (fMRI) results indicate amygdala activation when participants are given emotional script-driven imagery, regardless of positive or negative content, compared to neutral imagery (Costa, Lang, Sabatinelli, Versace, & Bradley, 2010). Additionally, visual mental imagery has been observed to activate areas in the visual cortex, as if one is seeing the content of the image in real life (Kosslyn & Thompson, 2003). Moreover, mental imagery of high *vs.* low arousal scenarios did in fact provoke greater corresponding physiological activity reflecting emotional response, such as greater heart rate acceleration (Vrana, 1995; Vrana, Cuthbert, & Lang, 1986), skin conductance response levels (Lang, Levin, Miller, & Kozak, 1983), and respiratory responses (Van Diest et al., 2001). Repeatedly imagining a finger movement sequence not only improves performance behaviourally but activates corresponding activity changes in one's motor cortex (Sirigu & Duhamel, 2001).

This is significant in that individuals who feel as if their imagery was real (e.g., through concrete physical reactions) – in spite of knowledge that it is not – may still find their behavior

influenced or impacted by the images. Indeed, repeatedly imagining a future event increases the perceived likelihood that it will occur for the individual (Szpunar & Schacter, 2013). Dubbed the simulation heuristic, it has been shown to provoke mood-consistent emotions, increasing anxiety levels in participants who imagined anxiety-provoking future events (Raune, MacLeod, & Holmes, 2005). Further, imagining an event as having taken place in the past (even if it did not) inflated individuals' confidence that the event actually did take place (Garry, Manning, Loftus, & Sherman, 1996), likely lending further feelings of realness to visual mental imagery.

Studies finding evidence of selective interference (i.e., competition for shared cognitive resources in mental imagery tasks with same-modality perceptual demands) highlight the overlapping neural activation patterns between imagery and perceptual processes, consistent with an "as-if real" emotional pathway. Indeed, task interference has been noted for individuals completing tasks involving mental imagery and perceptual processes that share the same sensory modality across auditory and visual stimuli (Holmes & Matthews, 2010). Researchers have found that holding a visual image in mind selectively interferes with detection of a faint signal of the same modality (i.e., a visual signal), just as auditory images interfere with detection of auditory stimuli (Segal & Fusella, 1969). Additionally, vividness of visual imagery is selectively reduced by the concurrent completion of visuo-spatial tasks, just as auditory image vividness is reduced by counting aloud (Baddeley & Andrade, 2000). Disruption of emotional mental imagery via perceptual engagement also reduces emotional impacts: when tapping spatial patterns with one's finger or engaging in lateral eye movements while generating visual imagery from emotionally negative cues, participants report reduced imagery vividness and corresponding declines in intensity of emotional responding compared to neutral cues (Andrade,

Kavanagh, & Baddeley, 1997). Thus, images may indeed have a pathway to emotions via "as-if real" templates.

Third, researchers have noted that generation of images can draw on autobiographical memories; mental images that derive source material from emotional memories of lived events may then reactivate the feeling states related to the incident. (Holmes & Mathews, 2010). Consider that most forms of remembering involve images (Brewer, 1996), making it sensible that autobiographical recall and image construction are intricately interlinked. Indeed, Schacter, Addis, and Buckner (2007) noted that neuroimaging studies reveal that memory-based processes responsible for the assembly of autobiographical memories (by using memory fragments stored within the individual's database of general knowledge) are the very same processes involved in generating new mental images, as they rely upon fragments that are reproduced from memories of past events (Schacter et al., 2007).

In further support of this overlap, studies have found that amnesic individuals (subsequent to occipital lobe injury) who struggle to produce personal visual images were also unable to retrieve mental images of personal events that had transpired prior to the injury, unless they were in a different modality (i.e., non-visual such as listening to music; Conway & Pleydell-Pearce, 2000). Moreover, it appears that there are top-down effects, with emotional processing style affecting one's experience of constructed images and recalled memories. D'Argembeau and Van der Linden (2006) report that individuals who report greater habitual avoidance of emotional expression endorse less imagery vividness (fewer sensory details) when remembering autobiographical events and generating images of imagined future events.

Researchers speculate that this type of overlapping reconstruction process (in which generation of new images relies upon autobiographical memory recall processes and fragments)

may be advantageous in that it allows for information from one's memory to be used in mental simulation of future events (Schacter et al., 2007). A natural consequence of this system would be that constructed mental images would also reinstate emotions experienced in the past events accessed (to the extent that these memories include feelings). Emotional responses to images involving memories may thus come about by virtue of (1) recapitulated feelings originally associated with that event in one's memory, and (2) feelings generated anew by the experience of perceiving the constructed image itself.

Yet, not all images have an equal impact on emotion: images seen from a field (i.e., first-person) perspective are associated with greater emotional intensity and more detailed memory of emotional reactions and sensations than images seen in the observer perspective (Holmes & Mathews, 2010). Individuals may then deliberately apply an observer perspective to intrusive imagery as an attempt to reduce associated distress. Indeed, the adoption of an observer perspective is common in other psychological disorders, such as social anxiety disorder (Wells, Clark, & Ahmad, 1995) and depression (Williams & Moulds, 2007); however, this observer perspective imagery is not associated with improved long-term outcomes. Holmes, Mathews, Mackintosh, & Dalgleish (2008) have hypothesised that the observer perspective may maintain some disorders by focusing the individual's attention on a negative and distorted self-image instead of broader and more positive sources of information. It may thus be necessary for the images to be switched to a field perspective to encourage positive emotions (e.g., in depression; Holmes et al., 2008).

Images and behaviour. Images are also uniquely linked to behavioural patterns. They allow us to mentally simulate actions (Moulton & Kosslyn, 2009) and organise our behaviour to achieve goals (Conway, Meares, & Standart, 2004), priming us to act. Significantly, images also

help us to generate predictions about outcomes based on past experiences (Moulton & Kosslyn, 2009). Extant research has found that the simulation heuristic, in which imagining a future event increases the perceived subjective likelihood that the event will occur, is moderated by the ease with which this event can be imagined, with participants who imagined themselves falling ill with more easily imagined symptoms reporting greater likelihood of contracting the disease (Sherman, Cialdini, Schwartzman, & Reynolds, 1985). This prepares us to act accordingly.

Imagery also has implications for performance of behaviours, with evidence that imagined rehearsal of actions increasing the likelihood that the action be completed (e.g., in voting behaviour; Libby et al., 2007). It is possible that this is due to activation of the corresponding areas of the motor cortex (Holmes & Mathews, 2010) that enhances the individual's readiness to act in an appropriate manner (Conway et al., 2004). In fact, mental imagery has been argued to be a key aspect of the 'prospective brain,' as it enables individuals to simulate hypothetical future outcomes using their memories and past experiences as a fount of knowledge. In so doing, individuals can effectively 'try out' different futures to facilitate predictions and inform plans (Moulton & Kosslyn, 2009; Schacter et al., 2007). Significantly, given the emotional access afforded by imagery, individuals are also able to try out emotional consequences of various courses of action, a phenomenon termed 'mental emulation' (Moulton & Kosslyn, 2009).

Images in OCD. More recently, OCD, along with other anxiety disorders, has benefited from a surge of interest in imagery. Within the context of OCD, intrusive images have been defined as "mental pictures that interrupt ongoing mentation" and, much like intrusive verbal thoughts, "are unselected, unexpected, uninvited, [and] often unwelcome" (Rachman, 2007, p. 404). Intrusive images have been listed as a diagnostic criterion for OCD since the third version

of the DSM (American Psychiatric Association, 1980), yet research over the last several decades has focused almost exclusively on verbal intrusions, with a few studies recently explicitly and directly exploring images in OCD (e.g., Lipton et al., 2010; Speckenset al., 2007).

De Silva first wrote an exploratory paper on the matter, reporting that images can occur in the context of OCD as obsessional or compulsive images (1986). If obsessional, images are unwanted, intrusive pictures (e.g., mutilated or rotting bodies, scenes of sexual or violent acts, etc.) or videos (e.g., hitting a child with one's fist, violently attacking an elderly parent) of typical OCD content. If compulsive, the image may be corrective to reduce urge-driven discomfort (i.e., corrects or neutralises the original image, such as imagining the mutilated bodies as healthy, intact people standing or walking around) or independently produced to reduce distress (e.g., picturing photographs of loved ones after intrusive thoughts of harm). He described further categorisations of images into disaster images, representing the feared sequelae of obsessions or failure to complete compulsions, and disruptive images, which invalidate compulsions while they are being complete (De Silva, 1986). However, De Silva's writings on images have largely been overlooked, with recent studies on obsessional images focusing on properties of the images themselves.

Pearson, Deeprose, Wallace-Hadrill, Heyes, and Holmes (2015) point out that mental images can be created directly from perceptual information immediately available in the short-term (e.g., creating a mental image while looking at a picture of a cat) or crafted from previously stored information in one's long-term memory (Pearson et al., 2015). Given that obsessional imagery in OCD takes place in the absence of actual, concrete sensory stimuli, intrusive OCD images can be understood to correspond with the latter type. Such images generated from long-term memory are typically less accurate in sensory information than those of short-term origin

and differ in the associative network they provoke (emotional, behavioural information, etc.). It is thus vital to explore the lived experience of OCD images to better understand how this may manifest in the disorder.

Speckens and colleagues (2007) offered the first systematic study of mental imagery in OCD, conducting a phenomenological interview of 37 individuals with OCD, followed soon after by Lipton and colleagues (2010), who interviewed 21 OCD and 22 anxious control participants. Prevalence rates in both studies are high, ranging from 81% (Speckens et al., 2007) to 95% (Lipton et al., 2010). Reports across both studies also converge in the highly visual nature of OCD images as well as their tendency to be seen as if from out of one's eyes (i.e., field perspective), estimated at 68% in the earlier and 85% in the later study (Speckens et al., 2007), compared to an estimated 45% of Lipton and colleagues' (2010) anxious control group.

Intrusive images are also frequently recurring experiences in OCD, with the median frequency reported to be 10 times a week in one study (Speckens et al., 2007), echoed in 79% endorsement of more than 5 occurrences per week in the other OCD group in contrast to 35% of the anxious control group (Lipton et al., 2010). Both studies also reported that images were sometimes drawn directly from actual memories of autobiographical events (34% in the former study and 15% in the latter study) and more commonly simply associated with an earlier event but not of the memory itself (68% and 55%, respectively). In fact, Lipton et al. (2010) found that there were much higher associations between actual memories and intrusive images in those with a diagnosed anxiety disorder than those with OCD.

Each of the two studies also investigated unique aspects of imagery not explored by the other. Speckens and colleagues (2007) reported that the vast majority of OCD images appeared either as a snapshot (46% endorsement) or film (43%), with a limited proportion (11%)

describing the image as a series of unconnected pictures. Vividness was rated highly and distress even more so, alongside provoked feelings of anxiety, helplessness, sadness, guilt, and shame (Speckens et al., 2007). OCD images appeared to primarily center around unacceptable ideas of harm (often violent or sexual in nature) to self or others by acts of commission or omission (75%), with only 10% noting image content about contamination and somatic complaints. In contrast, images in anxious control participants encompassed several other topics (e.g., 15% endorsed unacceptable ideas of harm in their images, 35% contamination and somatic complaints, 35% social rejection, and 15% miscellaneous; Lipton et al., 2010). Roughly 75% of individuals reported performing some sort of ritual when experiencing the image (e.g., avoidance, distraction, pushing the image out of mind, seeking reassurance, etc.). Those who experienced more intrusive images also endorsed higher severity of anxiety and OCD symptoms, especially in obsessive perseveration and neutralising. Curiously, individuals who experienced images reported more responsibility beliefs than those without (Speckens et al., 2007); however, no other appraisals have been investigated within the context of intrusive images.

To the best of our knowledge, these two studies are the only empirical phenomenological studies of intrusive OCD images. Rachman (2007) offered further commentary in a non-experimental paper, noting distinctive properties of intrusive images over other obsessional content. He described images as appearing primarily as visual pictures, fully formed (rather than in disconnected splashes or patches), and brief (under one minute in duration). Rachman noted that these mental pictures are stable from occasion to occasion, as if preserved in its complete form, leading individuals to dread their reappearance and even resist them. Identified neutralising compulsions might involve modifying the image (e.g., reshaping it or forming a corrective image), using counterthoughts, or superimposing a more acceptable image over the distressing

one. Significantly, repugnant images may be particularly toxic because of the damage done to the person's self-concept, especially in the moral domain.

Indeed, Rachman (2007) noted that the CBT-based appraisal model could be applied to understand the maintenance of intrusive images in OCD. Specifically, he described how an intrusive image may persistently recur in individuals with OCD due to interpretations of the image in personally significant ways. The catastrophic misinterpretation (e.g., "it means I am losing my mind") leads to distress that drives avoidance or neutralising behaviours (e.g., attempts to block or suppress the image); this in turn fuels the significance of the images, contributing to their distressing recurrence. Rachman thus posited that the cycle could be disrupted by appropriately negating or modifying the maladaptive interpretations of images to more benign alternatives, circumventing any need to block or suppress OCD images (Rachman, 2007).

Rachman (2007) went on to note that it may sometimes be necessary to directly manipulate OCD images should they not respond to typical therapeutic methods. Other intervention points suggested include replacing the image with an innocuous one, reshaping or shrinking down the image, or even rescripting the image (Rachman, 2007). Indeed, current gold standard OCD treatments have been developed to intervene with primarily verbal material. However, if intrusive images are functionally and significantly phenomenologically different from intrusive verbal thoughts, it may be necessary to target OCD images directly with image-specific interventions. This begs the question: is there a need to focus specifically on OCD images, apart from verbal thoughts?

The literature on mental images in psychological disorders, neuropsychological research, and the limited existing studies on images in OCD reviewed above converge to suggest that images are distinct from verbal thoughts, structurally and functionally, in important ways.

Indeed, consider thinking, “I am about to be hit by a falling brick,” compared to visualising a brick falling onto oneself. Significantly, Keen, Brown, and Wheatley (2008) noted that individuals with OCD were better able to mentally simulate (that is, imagine) scenarios relevant to their core OCD fear (i.e., personally relevant scenarios) than other OCD and non-OCD fears. Moreover, better simulation of feared scenarios was associated with more worrying behaviour about the feared outcome, and this relationship was not moderated by the perceived likelihood of the outcome (Keen et al., 2008). These findings together present a loaded picture for individuals with OCD, as they may thus more readily create imaginary narratives for feared scenes; mentally emulate the scenarios, evoking enhanced negative emotions; in consequence feel that such outcomes are more likely; and be better motivated, organised, and primed to react compulsively. These systems together may powerfully fuel OCD symptoms.

Interventions for intrusive images. Given the potential uniqueness of the intrusive image experience, it has been hypothesized that intrusive images may require direct and image-specific intervention, outside of current verbally-based treatments, due to the understanding that their encoding and storage mechanisms differ considerably from verbally encoded information. Intrusive images are not exclusive to OCD; they have been reported in numerous disorders, including social anxiety disorder, panic disorder, depression, and posttraumatic stress disorder (Brewin, Gregory, Lipton, & Burgess, 2010; Moscovitch, Gavric, Merrifield, Bielak, & Moscovitch, 2011). Imagery rescripting for distressing, unwanted images has been added to treatments for social anxiety disorder, depression, and post-traumatic stress disorder, with studies into its efficacy supporting its use in treatment (Stopa, 2011).

Broadly speaking, imagery rescripting techniques used in CBT are those that aim to modify negative interpretations of distressing autobiographical memories in an attempt to update

meanings and see them in context (Stopa, 2011). These strategies include: (1) taking an existing negative mental image and transforming it into a more benign or positive image (e.g., bringing an adult self into the memory to stop the abuse), or (2) construct a new and positive image that captures more adaptive interpretations or meanings to counteract negative schemas or beliefs associated with the original image (e.g., creating positive future-self imagery; Holmes, Arntz, & Smucker, 2007). In Arntz's three-stage technique, early traumatic childhood memories are modified by first reliving the event as a child, incorporating an adult self into the memory, and then reviewing the full image as a child once more (Arntz & Weeterman, 1999).

Only a couple studies have actually studied the use of imagery rescripting for OCD to determine if it might be an effective intervention. Veale and colleagues (2015) found that following a single session of Arntz's imagery rescripting procedure, there were clinically significant changes (i.e., 10-point reduction in YBOCS scores) in 42% of participants (5 of 12). Gains continued to be made over time, with 58% reporting clinically significant change at 3-month follow-up, and 2 of those individuals achieving asymptomatic status (i.e., score of 7 or less on the YBOCS). Significantly, the researchers highlight that none of the participants were treatment naïve, with all participants having completed at least one trial of CBT more than one year before this intervention (Veale et al., 2015). It is thus difficult to determine whether these effects are the result of imagery rescripting alone or the compounded effects of imagery rescripting and previous treatment.

In a broader test of image-neutralisation, Marks and colleagues (2000) demonstrated that individuals with OCD were able to significantly reduce discomfort provoked by an OCD image by imagining a cancelling image, although the discomfort did not come down to the baseline level of the neutral image. It appears exposure and response prevention (ERP) treatment may

also successfully improve image-related distress from OCD images specifically but not other types of anxiety-related images, as indicated by pre- and post-treatment discomfort ratings. However, once again, discomfort did not fall to the low levels of neutral images, indicating that ERP offers some but not full benefits even in this domain, in keeping with the treatment response literature (Marks et al., 2000).

Curiously, there has been little evidence of investigations into applications of existing therapies (i.e., exposure-only based interventions) to OCD images. Ferris, Mills, and Hanstock (2012) did detail a case study of exposure and response prevention for repugnant images, in which the patient completed imaginal exposures to her hierarchy of distressing images (e.g., her father dying, children getting hurt, hurting her own children). While the latter two image categories were treated in an exposure-based way so as not to facilitate avoidance, descriptions of the first category seem to indicate rescripting (e.g., feeling empowered after changing the image and story). No quantitative measures were reported, though the authors note the patient reported improvements in functioning, and treatment ended prematurely due to her attainment of full-time employment (Ferris et al., 2012).

Need for further research into OCD images. Indeed, De Silva (1986) lamented over thirty years ago that in spite of numerous clinical accounts of images in OCD, "the literature is almost totally bereft of any detailed examination of obsessive-compulsive imagery as a specific phenomenon in its own right" (p. 334). Since that time, there have been scattered attempts to understand images in OCD and strategies to treat them. The few existing studies on OCD images suggest that they are prevalent, distressing, distinct from verbal thoughts, and may benefit from specific intervention, such as imagery rescripting. However, such studies are limited in scope, possibly coloured by self-selection bias (individuals without images opting not to participate),

and it is therefore difficult to understand how intrusive images fit within the general OC episode or obsessional landscape.

The targeted study of image-based obsessions in OCD is therefore warranted; yet, few studies have explicitly and directly investigated intrusive images in OCD. This study thus also seeks to determine if existing findings can be replicated, to explore novel aspects of the phenomenology, and to clarify the model in which we can understand OCD images. The **third aim of this study is therefore to elucidate how intrusive images are experienced and appraised in OCD, and what compensatory strategies are performed in relation to images.** More specifically, this study asks what the true prevalence of intrusive images might be in the overall obsessive-compulsive experience, as well as their typical content and other characteristics (vividness, difficulty with which they are dismissed or resisted, manner in which they are experienced, etc.). Moreover, how do these images terminate? Is it a spontaneous conclusion, or do they rely on preventative compulsions or those performed after the image appears? How do individuals appraise and make sense of the images, and is their presence associated with increased OCD severity?

In couching this exploration within a broader phenomenological study, we can obtain a more accurate estimate of the prevalence of intrusive images in OCD. The existing studies of OCD images, advertised as in-lab interviews about images, may be vulnerable to inflated prevalence statistics, as individuals who do not experience obsessional images may simply decline to participate in a study about which they know themselves to have no information.

Further clarifying image-specific obsessions also has significant implications. Currently, assessment of obsessional imagery has not yet become a standard part of clinical work and may thus be underreported if neither the client nor clinician know to distinguish between thoughts,

impulses, and images. Assuming that images are distressing and disorder-maintaining clinical phenomena in OCD, failing to address or target images in an appropriate manner may contribute to treatment nonresponse in OCD. This exploration will also allow us to determine whether the CBT model plausibly applies to obsessions that appear in image form. Of note, if the CBT model does not actually apply well to the imagery experience of individuals with OCD, then CBT with ERP strategies may doubly fail to treat OCD. That is, verbally-based CBT with ERP may neglect to reach image-related distress and impairment, unless clinicians specifically attend to the OCD images, and will not detoxify this form if the mechanism of their maintenance is not verbal.

Appraisals in OCD: How to Understand Doubt and Imagery

A fundamental component of the CBT model, on which our most empirically supported treatment currently depends, is that it is the manner in which intrusive cognitions are interpreted or appraised (e.g., uncontrollable, harmful, or dangerous) that drives the obsessional distress and maintains OCD as a disorder. The significance of the OCD appraisal is highlighted in the CBT model by reflections that 99% of the population, most of whom do not develop OCD, report having experienced at least one intrusive image, impulse, or thought at some point (Purdon & Clark, 1993; Rachman & da Silva, 1978).

Appraisals about the meaning and importance of obsessions and compulsions may arise from or reflect schema that individuals have about themselves, the world, others, or the future and that specifically threaten their self-view. As reported above, beliefs are typically assessed using the OBQ-44 and based on factor analyses are believed to fall under the following categories: inflated responsibility and threat overestimation, perfectionism and intolerance of uncertainty, and importance and overcontrol of thoughts (OCCWG, 2001). These appraisals echo statements made in Pitman's (1987) summary of Janet's writing, in which he reflected that

obsessional content reflects things within the individual's imagined control, rather than those outside of their sphere of influence. Moreover, OCD symptoms are thought to reflect content that is most objectionable or most horrific to the individual, which he coined 'association by contrast' (Pitman, 1987).

Curiously, recent studies have found that some individuals with OCD do not endorse any obsessive-compulsive (OC) beliefs or score very low on belief measures, which contradicts one of the central tenets of the theory. These low-belief individuals tend to report "not just right experiences" that researchers argue represent a purely sensory-affective symptom, without any cognitive component (Taylor et al., 2006). Moreover, Cougle and Lee (2014) suggest that such obsessive beliefs and the focus on catastrophic misinterpretations are epiphenomena or of secondary importance. Specifically, they note that these dysfunctional beliefs traditionally associated with OCD are not specific to OCD, and success rates of cognitively-focused interventions targeting these beliefs are inferior to behavioural approaches (Cougle & Lee, 2014). However, instead, it may be that this finding represents an assessment problem, in which appraisals for other obsessional forms (e.g., doubt) have not been identified and therefore are not measured in these scales. Alternatively, it is possible that the appraisals these individuals make are simply broader in nature, tapping into schemas they have for themselves, in particular their sense of self, and are not captured by OBQ items. Or, it may only take one or two beliefs, strongly held, to lead to clinically significant difficulties.

Indeed, Rachman (1997) first noted that obsessions are distressing because the individual 'catastrophically misinterprets' the personal significance of the intrusive thought in a way that endangers his/her view of self. Purdon and Clark (1999) further elaborated on this, proposing that the obsessional thought persists specifically because it is appraised negatively due to its ego-

dystonic nature (that is, its inconsistency with the individual's sense of self, beliefs, or values, including the types of thoughts one might expect to have). Rowa and Purdon (2003), moreover, found that participants' upsetting intrusive thoughts were characterised by more negative appraisals and greater reported contradiction of valued aspects of the self than their least upsetting thoughts.

Self-related appraisals in OCD. Ferrier and Brewin (2005) extended both Rachman's (1997) and Rowa and Purdon's (2003) reflections on self-representations. They found that OCD individuals drew more negative inferences about themselves due to their intrusions than anxious controls (AC), who in turn drew more negative inferences than non-anxious controls. Significantly, content analysis of the negative traits these groups reported concern about becoming (i.e., feared self) yielded four -themes, namely:

(1) a dangerous self that is bad, dangerous, immoral, or will harm others or be out of control;
(2) a flawed self, involving negative traits that are undesirable but not inherently dangerous or harmful to others (e.g., weak);
(3) a rejected self, involving self-views of oneself as alone or unloved; and,
(4) a depressed or anxious self, wherein one's self-perceptions are symptom-related (e.g., fearful or hopeless).

The feared self in the OCD group was more likely to involve bad and immoral traits, leading to significantly more endorsements of the 'dangerous self' category in the OCD group than either of the control groups. The non-anxious control group reported significantly more 'flawed self' traits than the other two groups, and the anxious control group tended toward endorsing more 'anxious/depressed self' traits than any other group (Ferrier & Brewin, 2005).

The groups were also asked to identify the extent of the discrepancy between how they perceive their actual self to be against who they ought ideally to be (i.e., actual-ideal discrepancy) and against the negative self they feared becoming (i.e., actual-feared discrepancy). Ferrier and Brewin found that OCD individuals reported similar levels of actual-ideal and actual-feared discrepancies as anxious control individuals, but both groups reported significantly greater discrepancies than the non-anxious control group (Ferrier & Brewin, 2005).

Gentes and Ruscio (2015) experimentally manipulated undergraduate students' appraisals of three different types of negative cognitions by providing negative feedback (i.e., that their upsetting thoughts are more uncontrollable, rare, and frequently occurring than most people), normalising feedback (i.e., that their thoughts are perfectly average in those aspects), and no feedback at all. However, they found that neither feedback condition (i.e., manipulated thought appraisal) nor thought type reported (ruminative thoughts about the past, worry thoughts about the future, or obsessional intrusive thoughts) affected their negative emotionality at the time. Instead, in the Negative Feedback condition, it was their pre-existing beliefs about cognitions – specifically, how much they believed that thoughts can be dangerous, uncontrollable, or harmful – that influenced their experience of negative affect after reporting any kind of upsetting thought. Those in the Normalizing Feedback condition demonstrated that their emotions were not influenced by the feedback nor by pre-existing beliefs. This study demonstrated that an individual's appraisal of their cognitions, specifically their beliefs about their thoughts, can sometimes be more influential in the emotional outcome than the type of thought itself (Gentes & Ruscio, 2015).

Appraisals of obsessional doubt. Why might doubt be particularly toxic for individuals with OCD? Currently, floated models about obsessional doubt do not rest on the CBT model but

rather explore alternatives (e.g., inference-based models). Research suggests that individuals with OCD do not doubt globally or have broadly impaired decision-making abilities; rather, doubt is limited to OCD-specific content or ambiguous situations (Kim et al., 2015). Indeed, as Moritz and colleagues demonstrated in a directed forgetting paradigm (2011), which asked participants to remember one list of words and forget another list of words, OCD individuals are not more doubtful on responses for neutral and OCD-relevant words, suggesting that they do not have a 'cold impairment' that would manifest in neutral situations. Instead, decreased confidence among OCD individuals may only be triggered by maladaptive beliefs in OCD scenarios and situations (Moritz et al., 2011). While appraisals in doubt-relevant situations have not been directly studied, we can generalise from existing literature that suggests doubt-related obsessions are particularly upsetting because of the ways they are appraised.

Inference- and appraisal-based models are purported not to be mutually exclusive; whereas appraisal models are mostly concerned with interpretations of an intrusion after the event, inferential confusion relates to the perceived likelihood of the feared event at the time of the intrusion (Clark & O'Connor, 2005). In one inference-based model study, nonclinical participants were investigated for the role that feared self-beliefs might play in levels of doubt and their preference for possibility- vs reality-based information. Nikodijevic and colleagues (2015) found that individuals who reported greater levels of feared self (i.e., the belief there are hidden and negative aspects to one's personality) endorsed higher levels of baseline doubt and were more heavily influenced by the doubt-provoking information (i.e., possibility-based statements), demonstrating greater variations in doubt in response to the doubt-provoking statements. In fact, they maintain that these results are the first to suggest that feared self-beliefs might in part underlie obsessional doubt, via the influence of possibility-based information

(Nikodijevic et al., 2015). Yet, this is a significant lacuna in the literature, extending from the dearth of obsessional doubt research, and there is a need to further explore appraisals of doubt.

Appraisals of intrusive images. There have been slightly more explorations into the manner in which intrusive images are appraised. Lipton and colleagues (2010) directly explored inferences about the self using the categories first created by Ferrier and Brewin (2005) for intrusions at large. When the researchers asked what self-beliefs individuals inferred from intrusive images, they found that the majority of the OCD group reported the theme of a dangerous self (55%), which was largely absent from the anxious control group (5%). In fact, a chi-square test indicated significantly greater frequency of 'dangerous self' endorsement in the OCD group than all other themes combined. The next most frequently endorsed appraisal type was depressed/anxious self (30%), followed by flawed self (15%; Lipton et al., 2010).

Cili and Stopa (2015) further expounded on how intrusive images might help maintain different types of disorders through their influence on individuals' sense of self. They highlight how image-related OCD literature investigates links between images and memories as well as associated emotions but has not investigated one's broader sense of self in understanding these links and what mechanisms might be set in motion when intrusive self-images are activated. Specifically, they link images and one's sense of self via one's memories through the self-memory system model. Consider one's most significant memories, especially those considered to be self-defining, which can powerfully evoke images that confirm one's beliefs about oneself or highlight moments that transformed their sense of self (e.g., 'I am an embarrassment' in social anxiety disorder). These researchers invoke the concept of the working self, that is, the version or representation of one's sense of self that is active at any given time; this working self allows an individual to adapt flexibly to the circumstances at hand while still keeping a stable and coherent

sense of self over time. They propose that when in situations that resemble adverse events experienced by the individual, they experience not only activation of related images but activation of the entire working self (self-beliefs, goals, images, etc.). As such, the intrusive images are actually part of the working self linked to the memory, and their purpose (as well as that of associated compulsions) is to distance the individual from the possible failure or threat represented by the image (Cili & Stopa, 2015).

Self-concept in OCD. It may not make intuitive sense why ideas about the self one fears to be might play such a significant role in OCD. Self-concept has been studied in depression, social anxiety disorder, and personality disorders, but curiously not much in OCD. In continuation with the appraisal findings detailed above, consider that OCD content, including doubt-related content, may be particularly potent for the individual with OCD, as OC participants have been shown to be ambivalent about themselves, holding conflicting and dichotomous views in domains they deem important (e.g., I am a good and bad person). Indeed, Bhar and Kyrios (2007) created a Self-Ambivalence Measure (SAM) specifically to study self-ambivalence in OCD, specifically ambivalence about one's morality and self-worth.

Additionally, discrepancies between low perceived competence and high ascribed importance – that is, self-sensitivity – in self-domains such as morality has been associated with higher levels of OCD symptoms and beliefs when compared to other anxiety disorders and when controlling for overall self-worth (Doron, Moulding, Kyrios, & Nedeljkovic, 2008). This suggests that individuals with OCD may be particularly vulnerable to situations that might reflect their moral worth, as they feel incompetent but deem it important (Doron et al., 2008). Indeed, studies have indicated that among individuals who are high in self-ambivalence, activation of a self-sensitive domain results in more OC cognitions (Abramovitch, Doron, Sar-El, &

Altenburger, 2013), greater compulsive urges (Doron, Sar-El, & Mikulincer, 2012), and longer deliberation on moral dilemmas (Perera-Delcourt, Nash, & Thorpe, 2014).

Altogether, according to Doron and colleagues (2008) it may be that the individual with OCD holds highly ambivalent notions about valued aspects of self, reflected in dichotomous and conflicting beliefs about oneself. These valued domains also represent aspects of self in which the individual feels uncertain about his/her worth or standing but to which s/he attributes great importance. Consequently, the individual with OCD attends closely to any information that may reflect negative personal characteristics in these domains, attributes great importance to any evidence of these unwanted traits, and goes to great efforts to prove that s/he instead falls on the positive and moral side of these self-domains. With respect to self-concept, then, there are three key aspects – importance of domain, perceived competence in that domain, and felt uncertainty (or ambivalence) in the self-domain – and it is the discrepancy between high importance and low competence (self-sensitivity), couched in a broad self-uncertainty, that is of greatest import in OCD. Obsessions are therefore excessive preoccupations about these ruptures in their ideal self-image, and compulsions and other neutralisation strategies are attempted solutions to resolve their self-ambivalence and reinstate their ideal self (Doron et al., 2008).

Indeed, Ahern and colleagues (2015) found that when participants with OCD repeatedly listened to an idiosyncratic, unwanted intrusion and then implemented a neutralising strategy in an experimental paradigm designed by Salkovskis and colleagues' (2003), they reported significant increases in self-worth, a temporary decrease in distress, and then a rebound effect of increased distress and urge to neutralise, compared to when they implemented a control strategy. Thus, it appears that neutralisation strategies may in fact be used to boost self-worth after experiencing a distressing intrusion. Limitations to interpretations of these findings include the

fact that researchers used just one global measure of self-worth, which did not reflect worth in specific domains (e.g., morality), and their study did not explore self-uncertainty (self-worth captures ways in which the self has value whereas self-ambivalence taps into a slightly different construct, namely lack of certainty in these important self-domains; Ahern et al., 2015).

All in all, we thus have a rather incomplete picture of the manner in which intrusions might be appraised in OCD. This occurs first at the level of broad self-concept. More specifically, what does the individual think the obsession and its content reveals or says about him/herself? This occurs at another level in terms of explicit investigation of appraisals occurring for specific obsessional forms (currently identified or hypothesized), such as obsessional images and doubt). For example, how is the content of the intrusive image or obsessional doubt personally threatening? How significant would this be to the individual, and is it deemed to be likely? These are identified as subcomponents within our existing research questions for Sections II (doubt) and III (images) and will not only potentially inform our theoretical models of the disorder – updating the longstanding CBT model – but also offer treatment targets in therapy.

Obsessional Phenomena: Continuous, Dimensional Experiences?

A natural follow-up question to investigations of self-concept in OCD is the following: if a faulty appraisal of the self may be at the crux of clinically significant obsessions and the maintenance of OCD, what of the average individual with intrusive cognitions that do not become distressing and/or time consuming obsessions for which they perform life impairing compulsions? Do they simply not make these maladaptive self-appraisals, or are the interpretations less potent or less believable? For that matter, are there other differences in the obsessional experiences between individuals with clinical vs subclinical levels of OCD, especially among those that will not have received much investigation (e.g., obsessional doubt

and images)? These are questions that could fundamentally change our understanding of the OCD model (factors involved in its development and maintenance) and are necessary to resolve.

A longstanding debate in OCD has been whether obsessive-compulsive phenomena, like other psychopathology (e.g., anxiety and depression symptoms) exist on a continuum or a dimension ranging from nonpathological to pathological levels (an incremental phenomenon), instead of qualitatively different states or entities at the different levels. Given the high proportion of individuals in community who endorse low-level OC symptoms without significant interference, the general consensus is that this view has merit. Indeed, "various definitions of subclinical OCD…share the assumption that subclinical OCD is a weaker manifestation of the full-blown disorder" (Gibbs, 1996, p. 735), though prevalence estimates are difficult to obtain due to variability in how it is defined (i.e., how many symptoms must be endorsed). This dimensional view has long justified the use of nonclinical populations in researching OCD.

In fact, in perhaps the most comprehensive study to date, unwanted intrusive thoughts were investigated in 777 university students across 15 sites in 13 countries across the world. Radomsky and colleagues (2014) concluded that 94.3% of the sample reported at least one kind of intrusive thought in the months prior, with doubting most commonly reported and sexual / religious / immoral intrusions least commonly reported. Significantly, these individuals reported that the intrusions were moderately distressing and described OCD-like appraisals (from the OBQ-44) and attempts to control the intrusions much like those observed in OCD (e.g., thought stopping, distraction, reassurance seeking, etc.). In sum, the researchers note that their findings support the investigation of obsessions on a continuum (normal to abnormal thoughts; Radomsky et al., 2014). This is further supported by a few existing studies that suggest that clinical and subclinical obsessional content are comparable, and there is no evidence of a subtype of

obsessions that might characterize abnormal or clinical content (Garcia-Soriano, Belloch, Morillo, & Clark, 2011; Gibbs, 1996).

A comprehensive review completed by Gibbs (1996) suggests that, in general, subclinical and clinical OCD individuals suffer similar types of symptomatology (content, comorbidity, etc.), simply enduring a lower severity of these symptoms. In particular, individuals with clinically significant OCD are more likely to endorse multiple obsessions and compulsions, whereas subclinical individuals tend to exhibit an obsession or compulsion alone. Rather, they posit that the primary distinguishing difference from subclinical to clinical status may be the manner in which the obsessions are interpreted, as well as the type and effectiveness of coping strategies enacted in response to symptoms. Specifically, it was observed that there is a large percentage of subclinical individuals who did nothing in response to obsessions (0% of clinical) and a greater tendency for clinical individuals to use distraction. Those with diagnostic levels of OCD also reported significantly more strategies and that strategies were on average less effective (Gibbs, 1996).

Yet, direct comparisons between clinical OCD and those with obsessive-compulsive symptomatology below diagnostic levels (i.e., subclinical or subthreshold OCD) are very infrequently made; instead, the vast majority of comparisons made against individuals with OCD consist of either anxious controls (i.e., those without OCD) or healthy controls (those without OCD or any other anxiety disorder diagnosis). Gibbs (1996) posited that unwanted intrusive cognitions can be considered precursors to clinical obsessions, with maladaptive appraisals serving as the process by which clinical levels are met. Yet, appraisals between subclinical and clinical OCD individuals have not been directly compared, nor has there been a careful comparison between phenomenological elements of the obsessive-compulsive experience. We

seek to address this in our study by examining these features in both participants with clinically significant OCD and those individuals with some identified OC symptoms but not sufficiently interfering to meet diagnostic threshold. These two groups – clinical and subclinical – will allow us to more accurately compare experiences and more deeply understand how to conceptualise the clinical syndrome and its development.

Altogether, these highlighted lacunae in the OCD literature shed light into the incomplete understanding that researchers and clinicians alike possess of the disorder. Specifically, we lack the phenomenological grounding to understand models of OCD, especially regarding the timeline and the components that would make up the obsessional elements or forms as defined in the DSM, such as images. We also fail to comprehend obsessional doubt in spite of various attempts to understand the doubting disease, with present research reflecting only researcher-driven ideas rather than open-ended reflections by the individuals themselves. Considering the middling treatment response results for gold standard psychotherapy, it may be that we are overlooking phenomenological aspects of the OC experience important in the maintenance of the disorder that lead to treatment nonresponse in certain individuals. As such, this study aims to address these gaps in the literature in the following manner.

CHAPTER II

RESEARCH QUESTIONS AND HYPOTHESES

RQ1. The first aim of the proposed studies was to clarify the sequential structure of the obsessive-compulsive (OC) experience. Specifically, our first research question asks: **what is the chronological structure of obsessions and compulsions in OC episodes?** In order to clarify this sequential structure, we sought to understand:

a) the basic elements or building blocks that comprise the obsessional experience, namely the quantity and quality of forms in which obsessional content might appear, and
b) the timeline of these elements in OC episodes, that is, the manner in which such obsessional forms are arranged chronologically alongside compulsive acts.

In an attempt to ascertain what obsessional elements may be present in the OC experience (RQ1a), we aimed to explore: the number of forms endorsed in an OC episode and the prevalence of each; whether participants experience obsessions in the form of an internal voice or narrative, and if so, the associated tone; and which forms might be the most distressing and therefore impactful to individuals. In light of extant literature and clinical experiences, we advanced the following hypotheses about the quantity and quality of obsessional forms:

1.1 Frequency and number of endorsed forms. We anticipate that participants will report that the obsessional aspect of their OC experience is marked by the presence of more than one type of obsessional form (e.g., doubt and images). Additionally, we hypothesise that images, doubt, and the internal narrative or voice will be among the most frequently endorsed forms.

1.2 Understanding the internal voice(s) form. Moreover, in spite of limited research, we predict that intrusive thoughts will be frequently endorsed in the form of an internal voice, narrative, conversation, or dialogue. Specifically, we anticipate that the tone of this internal voice

or narrative will be primarily described as hostile and dominant. Such a format would likely not be well captured by or within the ambiguously broad "verbal thoughts" umbrella and will be endorsed by participants as a separate phenomenon (and thus measured separately).

1.3 Relative rankings of distress among endorsed forms. We predict that certain obsessional forms will be more distressing than others, with obsessional doubt and intrusive images proving to be the most distressing forms in which obsessional content can appear.

In order to clarify the manner in which obsessional and compulsive elements are temporally arranged (RQ1b), we further aimed to understand what form tends to appear first in the episode and which forms tend to dominate the experience or persist the longest. Most significantly, we hoped to clarify aspects of the episode chronology implied in current models, namely whether obsessions overlap with compulsions (i.e., appear concurrently), if obsessions extend beyond the termination of compulsions in episodes, and how individuals determine that their episodes are over. We made additional predictions about our exploration into the timeline of obsessional and compulsive elements in OC episodes:

1.4 First obsessional form experienced. As there is no existing literature to guide hypotheses on which obsessional form might appear first in individuals' awareness, we have no formal hypotheses.

1.5 Duration of each form and most predominant form experienced. As this inquiry is similarly lacking in literature, we have no formal predictions about which forms might persist for longer in the episode or have such intensity that it tends to dominate the experience.

1.6 Do obsessions co-occur or overlap with compulsions in the episode chronology? We anticipate the relationship between obsessional and compulsions is not linear (i.e., purely

sequentially) but dynamic, with both phenomena co-occurring or intermittently appearing for the majority of the OC experience.

1.7 Do obsessions extend beyond compulsions in the episode chronology? We predict that obsessions do not terminate upon performance of the compulsion but rather persist beyond or onset again after completion of the compulsion.

1.8 Episode termination criteria. Much like Szechtman and Woody (2004), we predict that individuals will report experiences other than completion of compulsions as how they know their OC episode has ended. Specifically, we posit that they will report an internal subjective feeling and/or the experience of subsiding obsessional forms that allows them to determine that the OC episode is over.

RQ2. The second aim of the interview was to better understand the nature of obsessional doubt in OCD, such that we are able to conclude how best to conceptualise OCD (e.g., an obsessional form, a content domain, or some other psychological process). Specifically, our second research question asks: **how is doubt experienced, appraised, and neutralised by individuals with OCD?** We made the following predictions:

2.1 Prevalence of obsessional doubt. In light of the fact OCD is known as the doubting disease, we anticipate that obsessional doubt is a highly prevalent experience and that endorsement rates will be equivalent to or greater than those of images.

2.2 Content of obsessional doubt. We also predict that doubt content, like other obsessional forms, will be reported across known OCD obsessional content domains (e.g., contamination that provokes washing, doubt that prompts checking, etc.).

2.3 Characteristics of obsessional doubt. Doubt, like other obsessional forms, is hypothesised to be highly distressing, interfering, persistent, and convincing, despite recognition

by individuals that their doubt is excessive or unrealistic. From clinical anecdotal experience, we also predict that doubt will be primarily experienced as a felt sense in one's body, making it further difficult to resist.

2.4 Termination of obsessional doubt. Consequently, we also predict that doubt will terminate based on an internal sense or feeling within individuals (e.g., relief or satisfaction).

2.5 Appraisals of obsessional doubt. We anticipate that individuals will readily report personal interpretations of OCD doubt in ways that are consistent with other obsessional forms. Specifically, we predict that individuals will primarily appraise obsessional doubt and its catastrophic consequences as revealing dangerous aspects of themselves (especially in terms of their morality), such as indicating that they are bad or evil.

2.6 Doubt-related compulsions. We hypothesise that individuals will also perform compulsions in response to obsessional doubt and perhaps demonstrate a proclivity for certain types (e.g., checking and reassurance seeking).

2.7 Correlates between doubt characteristics and OCD symptom severity. We further anticipate that overall OCD symptom severity is significantly correlated to the distress and interference associated with both obsessional doubt and its compulsions, in that the greater the distress and interference the more severe the OCD. We also predict that the poorer the ability to resist doubt-related compulsions, the more severe the OCD.

RQ3. The final aim of the interview was to investigate obsessional images in OCD, both to determine if findings in the existing literature can be replicated and to clarify novel aspects of images not yet explored. Our third research question was thus: **how are intrusive images experienced and appraised in OCD, and what compensatory strategies are performed in relation to images?** We anticipate the following results:

3.1 Prevalence of intrusive images. Intrusive images are predicted to be highly prevalent, comparable to prevalence rates established in prior studies of obsessional images in OCD, namely 81 to 95%.

3.2 Content of intrusive images. Consistent with extant literature, we also anticipate that the content of intrusive images will consist primarily of unacceptable ideas of harm, then of contamination and somatic complaints.

3.3 Characteristics of intrusive images. We expect obsessional images to be rated as distressing, primarily visual, vivid, and difficult to dismiss or resist. We also hypothesise that they are largely experienced as akin to coloured, still photographs (like a visual snapshot).

3.4 Termination of intrusive images. Such obsessional images are hypothesised to terminate only after an internal feeling has been achieved (e.g., satisfaction, calmness, etc.), as in the case of the ending of the episode.

3.5 Appraisals of intrusive images. As we had predicted with obsessional doubt, we anticipate that individuals will report interpreting OCD images as indicating something dangerous or morally bad about themselves (i.e., dangerous or morality-based self-appraisals).

3.6 Image-related compulsions. We expect that intrusive images will also elicit compensatory strategies such as checking and washing behaviours. As with De Silva's early writings, we also expect that images will be utilised in a compulsive way, namely to be corrective or to reduce discomfort. Moreover, consistent with Rachman's (2009) writings, we predict that attempts will be made to directly manipulate the image (e.g., rescripting, reshaping the image, etc.)

3.7 Correlates between image characteristics and OCD symptom severity. As with obsessional doubt, we predict that overall OCD symptom severity is significantly related to

image-provoked distress and interference, as well as the distress and interference elicited by image-related compulsions. We also anticipate that more severe OCD symptomatology is correlated with poorer ability to resist image-related compulsions.

Lastly, across all domains, we anticipate that clinical and subclinical participants' descriptions of their OC experiences will be more phenomenologically similar than they are divergent. Specifically, we expect that clinical and subclinical experiences fall on a continuum from clinically insignificant (subclinical) to functionally impairing (clinical status). Thus, some aspects of the experience may differ between clinical and subclinical groups (e.g., number of forms, type and effectiveness of compensatory strategies, rated distress or interference of compulsions and obsessional forms), but the vast majority of other characteristics (e.g., sequential structure of the episode, appraisals of doubt and images, etc.) are expected to be consistent across groups.

CHAPTER III

METHODS

Development of the Phenomenological Interview of the Obsessive-Compulsive Experience

In order to better understand these elements of the obsessional experience, including the relationship between obsessions and compulsions, we sought to directly interview people with OCD about their lived experience of obsessive-compulsive episodes. As there are no such interview tools in existence, and given the scant phenomenological literature and the limited studies on obsessional phenomena, we first conducted a preliminary study with a narrower scope. We chose to focus this study on one of our research questions, with the intention to utilize study findings and lessons learned from participant responses to guide development of the broader phenomenological interview. We decided to investigate the phenomenological experience of obsessional images in a study administered online to individuals recruited from an existing participant pool, as there exists more of an empirical foundation for this domain than for our other research questions. A summary of these results is provided in the following section; full results are offered in Appendix A.

Preliminary study of obsessional images. The aims of this preliminary web-based study were to establish the prevalence of obsessional images in our pool of community participants; to determine the basic characteristics of the images, consistent with aspects of our image-specific research question; and to help guide the development of a detailed phenomenological interview that encompassed all three research questions. In particular, we hoped that results from this pilot study would verify that obsessional images are, in fact, a prevalent and significant component of the obsessional experience, enabling further study. Moreover, we hoped that participant responses to our questioning would clarify to what extent

respondents are capable of reporting on their lived obsessional experiences, highlight important findings in need of replication, and elucidate domains in need of further investigation.

Participants were 54 members from the community who had endorsed OCD symptomatology on semi-structured assessment tools in a previous recruitment study for the participant database of the Anxiety Studies Division (full details available in Moscovitch et al., 2015). All participants in this pool were members of the community assessed for anxiety, mood, and other disorders, and who had consented to being contacted for future research studies. Of the 54 participants who completed this study, 42 met full diagnostic criteria for OCD ("clinical" group); the remaining 12 individuals reported subthreshold OCD symptoms ("subclinical," i.e., symptoms did not cause clinically significant distress or impairment in functioning) but met full diagnostic criteria for another DSM disorder. Inclusion of this group allowed for interpretation of characteristics within some context (i.e., serve as a quasi-control group) while overcoming incompatibility issues for a phenomenological interview administered to individuals who experience no obsessional doubt or other obsessional experiences.

Participants were recruited by email and provided with a link to the online study. After informed consent was obtained, participants were asked to identify a recent obsessional thought. If this recent obsession was not in the form of an image, attempts were made to identify whether they experienced any obsessional images. Participants were provided with a definition and several examples of OCD-specific obsessional thoughts and asked to identify and describe the most distressing obsessional thought they had experienced in the past week. Participants then identified the thought's form (i.e., word-based or verbal thought, image or picture in one's mind, or impulse). If they did not first identify an obsessional image, they were asked whether the

obsessional thought was accompanied by images, or, eventually, whether they had experienced intrusive images at any point in their lifetime.

In order to understand image-related characteristics, appraisals, and compulsions identified in the second research question, all participants who reported an intrusive, recurrent image at some point in the study were asked to describe the image, verify its recurrent nature, and report on several characteristics. Specifically, we asked participants to rate characteristics previously explored in other studies (e.g., Lipton et al., 2010), such as frequency, duration, perspective, vividness, etc., as well as those not yet investigated but we identified as gaps in literature (e.g., the manner in which such images appear, whether as the initial intrusive experience or simply as part of the episode itself, after some other initial obsessional form). Participants also rated the distress and interference associated with the intrusive image, described the strategies they used to get rid of the image, and rated the perceived success of those compensatory strategies. All ratings were completed on an eight-point Likert scale. In appreciation of their time, participants were entered into a draw for one of two $50 gift cards.

Full results can be found in Appendix A. In brief, intrusive images were highly prevalent in the past week (endorsed by 71% of clinical and 50% of subclinical participants) and more so in lifetime prevalence rates (86% of clinical and 50% of subclinical participants). The majority of people with clinically significant OCD (95%) experienced them weekly whereas just over half of those with subclinical OCD experienced them weekly. The image content was categorised according to OCD themes identified by Lipton and colleagues (2010) in their interview study of OCD images. Participants with subclinical OCD reported exclusively images depicting unacceptable ideas of harm or aggression (e.g., “I didn't [check the lock] right and play through the image of it not being locked”). The vast majority (74%) of clinical individuals also reported

harm-based images, while a portion (14%) endorsed images of contamination or somatic complaints (e.g., "black, fuzzy, crumbling growths on the inside of my throat"), much less commonly, images of social rejection (6%; e.g., "the reaction [of others] because of the racial slur [I fear I uttered]") and miscellaneous images (3%; e.g., "I keep picturing my girlfriend being pregnant").

Consistent with our expectations, intrusive images were revealed to be brief, colourful, multisensory experiences that were moderately vivid, distressing, and interfering, regardless of the individual's clinical or subclinical status. The duration of images reported by participants varied widely, spanning seconds to hours. However, it is unclear from the phrasing of our question (and by the participant responses) whether these duration estimates reflect one continuous occurrence of an image that spans the length of time reported, or if multiple recurrences of the image flash discontinuously across that time period (i.e., one image lasting an hour, or one hour-long episode with 60 one-minute recurrences). Direct inquiry of participants in dialogue would resolve this issue.

All individuals reported feeling compelled to act in response to the images, and participants frequently reported using more than one strategy (e.g., distracting from the image, suppressing the image after it has arisen, and/or blocking the image before it appears). Strategies used did differ somewhat between groups, but comparisons are difficult due to the small subclinical sample size. Compensatory strategies were rated to be moderately successful at getting rid of the image; however, it may be that individuals have goals other than removing the image (e.g., relief from distress), for which these strategies prove more successful. Further exploration of image-based compensatory strategies performed by individuals is needed.

Significantly, this study offers some insight into the way in which intrusive and disturbing images arise. Specifically, it appears that images are often endorsed as the focal obsessional experience. Yet, for some individuals, they may not spontaneously report images as the principal obsessional cognition (instead typically endorsing verbal obsessions). However, when prompted with direct questions, these participants recognise images to be an additional, accompanying component of their main obsessional experience. However, our ability to draw such broad conclusions about the chronological structure of obsessions is limited by the study design. We therefore aimed to address this and other limitations in our main study.

Considerations in creating the interview. Although the online format of the preliminary study offered a brief exploration into OCD images, conclusions from findings were limited by several aspects of the methodology. First, there was a lack of clinician judgment in identifying OCD images (*vs*. those arising from other disorder content, such as depression or eating disorders), as they were exclusively based on participant self-report and participants' understanding of disorder-driven images. The self-report format also hindered exploration of certain image characteristics (e.g., duration, details about compulsions and related motivations) and precluded queries about more nuanced but significant aspects of the experience (e.g., image appraisals, how images arise in these episodes or amongst any other obsessional forms, such as thoughts). There was also a sometimes-lengthy gap in time between diagnosis and study completion for some participants, ranging from months to years. It was therefore possible that participants, at the time of recruitment and study completion, may have had a slightly different diagnostic status. Additionally, it is possible that participants self-selected for the study based on existing experiences of images, given that descriptions of the study in recruitment materials focused on images, resulting in inflated prevalence statistics.

We therefore aimed to develop a comprehensive, structured interview that could be conducted with individuals reporting OCD symptomatology (at a clinically significant and subclinical level) in order to explore their experience of OCD phenomena and episodes. Most significantly, the use of a structured interview administered by one trained clinician would allow for the use of clinical judgement in identifying OCD images (vs. those related to other disorders) and in querying other key aspects that typically require further clinical prompts (e.g., appraisals), as well as ensuring consistency across respondents.

This interview was built to meet all four dissertation aims, namely to better understand the sequential structure of obsessions and compulsions in the OC experience, as well as the manner in which obsessional images and doubt appear, are appraised, and provoke compulsions. As such, questions about images were couched within one module of a broader interview. This also served to prevent a self-selection bias among participants, i.e., wherein mostly those with obsessional images elect to complete the study because of its relevance to their experience, but inflating the seeming prevalence of OCD images. More specific and targeted screening of participants was also employed during the recruitment phase to ensure accurate and current diagnostic status for both clinical and subclinical OCD participants. Associated characteristics left unexplored in the online study were moreover incorporated into the interview (e.g., more details about compulsions and related motivations during perseverative behaviours).

In order to facilitate comparisons and enrich our understanding of the phenomena, the interview was designed to be flexibly administrable to both individuals with clinically significant OCD and those who experience OC phenomena but do not meet full criteria for the disorder (i.e., subclinical OCD). This allows the interpretation of findings within the same context (i.e., serve as a quasi-control group for comparison) while overcoming incompatibility issues that would

undoubtedly arise when trying to administer a phenomenological interview to individuals who do not at all experience recurrent obsessions.

It should be noted that the use of a clinician-administered interview to investigate these issues is limited due to the nature of retrospective participant report. Reported recollections may be distorted by the participant's own ideas about the order in which events typically occur, rather than the actual order of the phenomena, or may be coloured by the very post-hoc rationalisations identified by Robbins and colleagues (2012), resulting in participants misremembering the true sequence in a more rationally explicable manner. Given that this appears to be the best available methodology, results will be interpreted with these limitations in mind.

Participants

Participants were 65 individuals from the community who had been assessed using the MINI 6.0 (Sheehan et al., 1998) or 7.0 (Sheehan, 2014) and ADIS-IV (Brown et al., 1994) or ADIS-5 (Brown & Barlow, 2015) within the past several years, as in the preliminary study. In order to be eligible for the study, participants had to meet criteria for at least one disorder (OCD, anxiety, or mood, etc.) and endorse current OCD symptomatology, whether at clinical or subclinical levels (i.e., clinical control group). Forty-four individuals met criteria for OCD according to DSM-5 criteria (68%), while 21 participants endorsed some OCD subclinical symptoms but did not meet full criteria for the disorder. These subclinical OCD participants also met criteria for at least one clinically significant anxiety and/or mood disorder. Clinician severity ratings (CSRs) from the ADIS-5 were assigned for all participants. According to the scale, a CSR of four or higher (to a maximum of 8) denotes clinically significant difficulties. Clinical participants were 81.8% female, and 32 years old on average (SD = 11.4).

For the majority of the clinical participants (72.7%), OCD was the principal or co-principal diagnosis, moderately severe on average (mean CSR = 4.8, SD = .8, range = 4 to 7); the only co-principal diagnosis was generalised anxiety disorder (GAD). Subclinical participants were 85.7% female, with a mean age of 30 years (SD = 8.6). Principal or co-principal diagnoses of participants with subclinical OCD include anxiety disorders (social anxiety disorder, GAD, panic disorder, agoraphobia, specific phobia, and other specified anxiety disorder), posttraumatic stress disorder, depressive disorders (major depressive disorder and persistent depressive disorder/dysthymia), and eating disorders (bulimia nervosa, other specified eating disorder. The mean CSR for subclinical participants was 2.5 (SD = .7, range = 1 to 3), although CSRs were missing for four participants because they were not assigned by the assessor at the time of assessment.

Phenomenological Interview of the Obsessive-Compulsive Experience.

Please see Appendix B for the full interview. This interview was developed to assess the lived experience of OCD symptoms as they arise in individuals who endorse obsessions and/or compulsions. In particular, this assessment tool was meant to explore the sequential structure (including the component parts) of these OCD episodes, in addition to the characteristics, appraisals, and compulsions associated with obsessional images and obsessional doubt. The interview consists of five modules, the first three of which are administered to all participants and the latter two to only those who endorse those specific obsessional forms. The interview typically takes 1.5 to 2 hours to complete, depending on elements such as participant response style (verbose vs succinct), speed (slow and thoughtful vs efficiently direct), and insight (considerable vs lacking). The overall structure of the interview is as follows:

(1) Recent Obsessive-Compulsive Episode. All participants are first provided with a detailed description of obsessional thoughts:

"*We are interested in repeated unwanted, upsetting thoughts people have and the forms that they take. When thoughts are unwanted but keep coming back, almost like an upsetting pop-up, we refer to them as obsessional thoughts. We are interested in obsessional thoughts that you might have.*

An obsessional thought can be a thought, image, or urge to do something, and it is unwanted, yet persistent and difficult to control. Obsessional thoughts tend to reflect concerns that are irrational, extreme, unnecessary, and/or excessive even though they can feel rational, normal, necessary, and justified in the moment. Obsessional thoughts can also reflect concerns about committing acts that contradict one's values, morals and personality. Examples of obsessional thoughts include concern that the stove has been left on and will cause a dreadful accident; fear that your hands are 'contaminated,' and you will make someone terribly ill; concern that you have harmed someone without realizing it (e.g., by having hit them with your car); concern that you are not right with God; thoughts/impulses of doing or saying something terrible to someone whom you would never want to harm; concern that something you have done or failed to do will cause harm; and unwanted images or mental pictures of a sexual, morbid, or grotesque nature.

Obsessional thoughts cause distress or discomfort and often lead to corrective action, such as checking, cleaning/washing, repeating, seeking reassurance, mental 'correction,' undoing, rationalizing or self-reassurance. These are often called compulsive behaviours, or, when performed in a very specific way, can be referred to as compulsive rituals."

Participants are then asked to identify a recent episode when they would have felt particularly distressed or emotional because of such an obsessional thought and provide details on the content and when it took place. The presence of a compulsive behaviour or act is also assessed.

(2) Obsessive-Compulsive Episode Timeline. Participants are then asked to report on markers of the start and conclusion of their experience (i.e., the very first and last thing to happen), framing for the interviewer the boundaries of the episode. Participants are then asked to describe how they had subjectively determined that the episode had ended ("how did you know the episode had ended?"). Next, they are systematically queried on whether various obsessional forms arose in their experience:

a) word-based (verbal) thoughts;

b) an internal narrative, voice, dialogue, or conversation in their thoughts;

c) images or pictures in their mind;

d) doubt-related thoughts or impressions;

e) a sense they were going to do something or act in a way they did not want to act (i.e., urges); and,

f) felt senses, including sensations in their body (i.e., physiological sensations).

If endorsed, participants are asked to offer additional descriptions for each form, rate how much of the episode would have been occupied by each form (e.g., 50%), and rank the forms from most to least distressing. They are also asked to identify the form that predominated their experience and the first form of which they became aware.

These categories of obsessional forms were established by supplementing the three identified in the DSM-5 (verbal thoughts, images, and urges; APA, 2013) with additional

forms observed in clinical interviews and accounts (internal narrative or voice; Hallam & O'Connor, 2002), clinical and empirical accounts (doubt; e.g., Reed, 1985), and supported by emerging research (sensory phenomena; e.g., Ferrao et al., 2012). While some elements may overlap across the obsessional forms (e.g., word-based thoughts and internal narrative), participants are asked to identify the form that best captures their experience of the obsessional elements (e.g., internal voice or narrative if the experience was of someone speaking or voicing thoughts, vs. word-based thoughts if the experience is less like a running monologue narrated by an individual and/or involves short phrases). With respect to doubt, in both this section and in the module dedicated solely to obsessional doubt, the aim was to query participants about their experience in a manner that was parallel to that of other forms (e.g., images) but to remain agnostic about whether it could be understood or viewed in a way consistent with an obsessional form. In developing this section of the interview, particular attention was paid to any endorsement of an internal narrative, voice, or conversation in one's thoughts. Drawing from clinical experiences, there were additional questions to ask about the tone of the voice(s) or conversation and any resemblance to people known to the participant. Recognising that the experience of an internal narrative, voice, or conversation would result in some type of interpersonal relationship or effect, we ask participants to specifically rate the quality of the narrative or voice. The interpersonal circumplex model of behaviour (Wiggins, 1992) was used as a framework, with the endorsed internal narrative, voice, or conversation being rated on dominance-submissiveness and affiliative-hostility continua. Participants are also asked to identify any compulsions that were performed in response to these obsessional experiences.

(3) Obsessive-Compulsive Episode Description. Participants are then asked to freely recount a detailed description of this recent episode, with the interviewer offering limited prompts to clarify or obtain additional details, including the chronological structure of the episode. Individuals are instructed to "think of the episode as happening along a timeline, and walk [the researcher] through a detailed play-by-play of what happened." They are encouraged to describe the episode in present tense, as if they are reliving and experiencing it again in an attempt to capture, *in vivo*, the most vivid affect from the episode and therefore the most accurate descriptions of the episode. The clinician works to ensure that a fulsome description is presented, including ensuring that the participant does not omit in this description any forms endorsed in the previous section.

Once the episode is recounted in detail, the participant is asked to answer two questions about the chronological nature of the experiential elements in the episode:

1. Did any obsessions overlay (or co-occur temporally with) the reported compulsion(s)?
2. Did any obsessional experiences start after the compulsion ended or continue beyond the conclusion of a compulsive act?

(4) Doubt. Participants who have already endorsed obsessional doubt are then administered this module; for those who have not yet reported doubt, they are asked if doubt was a relevant part of any OC experience (present or past) and complete this section if endorsed. After identifying the percentage of OC episodes involving doubt, participants are asked to report on several characteristics. Significantly, in a bid to clarify the marked variability in operationalisations of doubt in the literature, we asked respondents to describe how they experience their doubt. Consistent with literature and clinical

experience, they were provided with four categories: a verbal stream of thoughts, a felt sense in their body, a felt knowledge (e.g., a drawn inference that is just known to the individual), or some other sensory state. Some features are rated quantitatively on an 11-point Likert scale, such as: felt conviction in their doubt, perceived excessiveness of doubt, difficulty dismissing doubt, ability to resist the doubt, doubt-related distress, and doubt-related interference. On other doubt characteristics, participant responses are recorded descriptively (e.g., doubt content, how they experience their doubt, emotions evoked by doubt, duration of doubt, how their doubt ultimately terminates, etc.).

Next, we assess participant appraisals of their doubt, that is, idiosyncratic interpretations that highlight the personal significance of the obsessional doubt and why it makes compulsive urges so compelling. As appraisals of obsessions are not necessarily immediately accessible to each individual, much like negative core beliefs in the CBT model, participants are asked three introductory questions to facilitate clearer responses to the appraisal item. First, participants are asked to identify their most feared, worst-case scenario that would happen if their doubts came true. They then rate – again, from 0 to 10 – the perceived likelihood (in the moment, when most emotional) of this worst-case scenario and then the severity of the consequences should it happen. Finally, they are asked to identify what it would mean (about them, other people, or the world) if this worst-case scenario came true and the consequences were real. If they struggle to report on this item, they are asked alternatively whether the doubt indicates anything about them, others, or the world.

Ultimately, participants are asked whether they complete certain doubt-related compulsions. The doubt compulsions in our interview are categorized separately

according to those we hypothesized might be performed in response to the distressing doubt (we term these reactive compulsions, such as checking or washing repeatedly, distraction, reassurance seeking, etc.) and those performed preemptively to prevent any experience of the doubt (we term these proactive compulsions, such as avoidance, distraction, etc.). Participants describe their aims in completing these reactive and proactive doubt-related compulsions, their perceived success in achieving these aims, and the frequency of these behaviours. Lastly, respondents report on their attempts or ability to resist performing compulsions and rate the overall distress and interference provoked by all doubt-related compulsions. It is worth noting that this section refers to all behaviours as compulsions, despite the fact that we did not assess for the excessive nature of each act they endorsed in this section (as it would then have been a prohibitively long interview). Instead, we relied on the participant's report that s/he feels compelled to perform these acts due to the doubt and on the understanding that, as a collective experience, the repertoire of these compulsive acts for each individual had already been established as inherently excessive and beyond functionality (or not, in the case of subclinical individuals) from previous assessment and diagnostic status clarification.

(5) Images. The last module focuses on obsessional images and is completed if the participant has ever experienced any image-based experiences in their OC episodes. The structure of this module mirrors that of the doubt module: participants report the estimated percentage of all OC episodes that involve images and then rate several image characteristics on an 11-point Likert scale (e.g., vividness of the image, how real the image feels, ability to dismiss the experience, ability to resist the image, image-related distress, and image-related interference). They are also asked to report on other

qualitative aspects of the obsessional images (e.g., the form of the image as photo or video, whether it appears in observer or field perspective, whether its origins are in fiction or memory, associated emotions, duration, etc.).

In designing this section of the interview, we did not wish to make assumptions about why obsessional images were threatening to participants. As such, image appraisal questions probe for the personal meaning or significance individuals draw from these images in a broader way. First, participants are asked how they make sense of the image, or if the image means anything about them, others, or the world. Second, they are asked – much like with doubt – what they are afraid will happen as a result of the image, or (in the case of ongoing struggle to report negative consequences) what feels so bad about the image. Finally, they are asked to report on any self-related appraisals (what it would mean about them or their character) if the worst-case scenario happened and the consequences came true.

Finally, participants are asked whether they complete image-related compulsions. These were again categorized according to reactive image compulsions (i.e., those performed after the image arises, including checking behaviours or superimposing an acceptable image) and proactive image compulsions (i.e., those performed pre-emptively, before the image arises and/or to prevent the image, such as blocking the image or avoidance behaviours). Individuals narrate the aim behind any endorsed reactive and proactive image-related compulsions, their success in accomplishing the aim, and the frequency of the acts. They then quantitatively rate their ability to resist these compulsions, the distress provoked by and impairment resulting from image-related compulsions.

(6) Conclusion. At the end of the interview, participants are invited to offer additional information or insights about their OC episodes or experiences (including aspects about which we have not yet asked). They are also given the option to offer feedback or suggestions and to reflect on the experience of talking about these phenomena.

It is worth noting that earlier versions of the interview included a sixth section, which focused on sensory phenomena (i.e., physical sensations), with consideration of another section on verbal thoughts to allow for comparisons between forms. The sensory phenomena module, and the planned verbal thoughts module, was designed to parallel the image and doubt section's third module on sensory phenomena, with consideration of a fourth module on verbal thoughts to allow for comparisons between forms. However, study appointments that involved use of the full interview took over 2 hours to complete, and participants appeared to be visibly fatigued with the length of the study and the details they were asked to provide. The decision was taken to remove this section from the interview.

Procedure

Participants were recruited for the study by email or by phone from the participant database used in Study 1. Participants were selected based on endorsement of OCD symptomatology in their diagnostic assessment. All individuals endorsing OCD symptoms – regardless of obsessional content – were invited to participate in the study, and it was broadly described to prevent a self-selection bias (e.g., wherein mostly those with obsessional images elect to complete the study because of its relevance to their experience, but inflating the seeming prevalence of OCD images). To ensure the most accurate and consistent diagnostic picture, those participants whose assessments had been completed over a year before the recruitment date were re-assessed for OCD symptoms by the author at the time of recruitment – typically within one

month of the actual study appointment – using the OCD module of the ADIS-5 (Brown & Barlow, 2014) and assigned an appropriate CSR. If eligible, participants were provided with a description of the study and offered a chance to participate in the in-person interview.

After informed consent was obtained, including consent to be anonymously and directly quoted in publications and presentations, all participants were administered the Phenomenological Interview of the Obsessive-Compulsive Experience by this author. All participants but one consented to having their interviews audio-recorded for accuracy of data; these interviews were then transcribed by a trained research assistant and the transcriptions checked again by another trained research assistant for accuracy against the audio file. Participants were remunerated with a $30 gift card to one of three businesses in appreciation of their time commitment.

Coding of termination responses. A coding manual was developed – based on our theorised predictions – to score participant responses describing how they knew certain experiences had ended (i.e., termination of their OC episode, obsessional doubt, and intrusive image). We identified four categories of termination criteria based on our predictions and existing theories, namely that the experience was reported to have terminated:

(1) upon completion of the compulsion (as current theories would indicate);

(2) due to element(s) of the intrusive experience subsiding or going away, whether it appear as an internal narrative, verbal thought, image, sense of doubt, urge, or preidentified sensory experience (consistent with our own theorising);

(3) after the experience of a subjective internal feeling, such as a sense of relief, release, yedasentience, or satisfaction, etc. (consistent with existing theories); or,

(4) in a not applicable category.

Consistent with procedures utilised previously by Purdon and Holdaway (2006) and Purdon and Watson (2010), coding was completed independently by two researchers (this author and her advisor, who was blind to participants' group membership) using this termination criteria coding manual. Initial levels of interrater agreement were high for coding of episode termination (kappas of .91, .93, and .72, across categories) and doubt termination (kappas of .76, .83, .94). Interrater agreement for image termination categories was moderate (kappas of .50, .43, .48) and noticeably lower than the other termination codes. Additionally, as we were aiming for perfect agreement between coders, discrepancies were identified and discussed.

The discrepancies in coded termination responses highlighted a lack of clarity in how to differentiate between two coding categories for some participant responses, which were more prevalent in image termination descriptions. Definitions for categories 2 and 3 were therefore revised. In particular, the category for decreased or absent intrusive experiences (category 2) was modified to capture the removal of negative affect or sensations (e.g., less tension, anxiety symptoms, etc.). In contrast, the category for a subjective internal sense (category 3) was modified to catalogue the introduction or addition of new affect or sensations (often positive affect experiences, such as a sense of calm, relaxation, relief, etc.). This distinction parallels that between positive and negative psychotic symptoms. Please see Appendix C for the final termination criteria coding manual. Subsequent to this revision and discussion, interrater agreement was perfect. Significantly, participants are theorised to potentially use multiple criteria to determine that an experience has concluded. As such, responses were coded in terms of the presence or absence of each category, allowing for several concurrently endorsed termination criteria.

Coding of self-appraisal responses. As a coding system for intrusion self-appraisals was developed by Ferrier and Brewin (2005), and utilized again by Lipton and colleagues (2010) for intrusive image appraisals, we did not develop one of our own. Instead, the appraisal coding manual was obtained from the original authors and, following a discussion between the same two coders, updated slightly to clarify further the categories. Interrater agreement was very high across categories, ranging from .74 to .94 for doubt appraisals and .77 to 1.00 for image appraisals. Discrepancies in coded appraisals between the two coders were identified and resolved quickly through discussion to achieve perfect agreement; the coding manual was revised accordingly and the final kappas are necessarily 1.00. Ultimately, participant appraisals of what they feared their obsessional doubts or intrusive images – and the anticipated consequences of these intrusive experiences – might indicate about their selves were coded independently using the following system (see Appendix D for the final appraisal coding manual). Participant responses were permitted to be coded as containing content from more than one domain (though few did). According to their categorisation, self-related appraisals in OCD address four domains:

(1) a dangerous self, that is bad, evil, immoral, or likely to result in harm coming to others (e.g., irresponsible, careless, bad person, etc.);

(2) a flawed self, involving negative traits that are undesirable but not inherently dangerous or harmful to others (e.g., weak);

(3) a rejected self, involving self-views of oneself as alone or unloved (e.g., untrustworthy, disappointing to others); and,

(4) a depressed or anxious self, wherein one's self-perceptions are symptom-related or consistent with depressive self-concept (e.g., failure, worthless, incompetent, etc.).

Coding for doubt content responses. Respondent descriptions of doubt content (i.e., "what is your doubt about?") also required coding; however, there are no existing phenomenological studies of obsessional doubt and no extant literature on doubt content themes. As such, a content analysis of the reported content of participants' OC doubt was completed by each coder and both analyses yielded three themes (of nearly identical domains). Definitions of these themes were developed, and a corresponding coding manual was created for reported doubt content. All participant responses were then independently coded by both coders according to three themes – doubt of obsessional content, doubt about having completed a compulsion properly, and doubt about one's senses or memory abilities. Levels of agreement across the three categories varied widely, with kappa values of .28, .69, and .27, respectively. Given the weak agreement for the first and third themes, the two coders discussed and clarified conceptually the first theme, which was most vague domain – the idea of doubt content involving typical obsessional ideas. The more detailed version of the coding manual, with clear examples for each, is provided in Appendix E. These three themes consist of:

(1) Doubt about one's safety status or the state of things (i.e., obsessional content, an obsessional idea in the form of doubt that prompts or evokes the compulsion (e.g., "am I safe, or is it clean?" or "did I lock the door?");

(2) Doubt about having performed compulsions properly or sufficiently to avert harm (e.g., "did I lock the door or wash my hands properly or well enough?"); and,

(3) Doubt about one's senses, memory, or cognitive capacity (e.g., "I know I checked but can I trust what I saw," "am I capable of doing it and keeping myself clean or safe," or "I remember doing it, but can I believe my memory?").

After revising these categories, we achieved perfect agreement across the group.

Coding for image content responses. Lastly, reported content of intrusive images was categorised according to the themes identified by Lipton and colleagues (2010) in their interview study of OCD images:

(1) unacceptable ideas of harm (repugnant images of aggressive or violent harm, harm caused by acts of commission or omission, and catastrophic outcomes),

(2) contamination and somatic complaints (contamination-related images of illness, disease, uncleanliness, etc.),

(3) social rejection (images of negative social judgments or humiliation), and

(4) miscellaneous superstitious or senseless imagery.

As the image content descriptions were clearly elucidated with participants during the interview and straightforward to place into categories, the interviewer alone coded respondents' image content categories as they reported them.

CHAPTER IV

RESULTS

I. On the Chronological Structure of OC Episodes

The first aim of this interview was to better understand the basic element(s) or building block(s) of the obsessional experience, that is, the forms in which the obsessional content might appear. In order to elucidate the quantity and quality of forms that comprise the experience of intrusive cognitions, we analysed the frequency and number of endorsed obsessional forms in OCD episodes (including the relative distress associated with the form) and the reported descriptors for experienced internal narrative(s) or voice(s).

1.1 Number and frequency of endorsed forms. Consistent with our hypotheses, participants reported that the obsessional components of their episodes were typically marked by the presence of several forms, not simply one type. Across both participant groups, individuals reported experiencing on average 3 identifiable obsessional forms – out of 7 possible forms proffered – in their most recent episode (standard deviation of 1). In fact, it was relatively infrequent for individuals to report only experiencing one obsessional form in their OC episode, with nearly all clinical and subclinical individuals reporting at least two forms in their obsessional experience. Table 2 reports the frequency with which various numbers of forms were endorsed. These results indicate that obsessional states are typically complex and dynamic experiences (even before compulsions enter the equation), which may compound distress by virtue of their intertwined nature.

Table 2.

Number of Obsessional Forms Endorsed by Participants in the Most Recent OC Episode.

	Clinical Group	Subclinical Group

	(N = 44)	(N = 21)
One obsessional form	9.1%	4.8%
Two forms	22.7%	33.3%
Three forms	31.8%	42.9%
Four forms	31.8%	14.3%
Five forms	4.5%	4.8%
Average number of forms	3.0 (SD = 1.1)	2.8 (SD = 0.9)

In fact, the forms we had predicted would be experienced most frequently were among the four most frequently endorsed types of obsessional forms across clinical and subclinical participants alike: obsessional doubt, sensory phenomena, internal voice(s), and images. While endorsement rates for each form differed somewhat between participant groups, it is striking that nearly 80% of clinical participants reported obsessional doubt (*vs.* over 60% of subclinical individuals), nearly two-thirds reported experiencing an internal voice (*vs.* over 75% of subclinical individuals), and just over half of each group endorsed obsessional images. Please see Table 3 for full results of the percentage of participants who reported experiencing each obsessional form. Obsessional forms reported by participants as fitting into the 'Other' category – because they determined it as not belonging to our provided categories – almost exclusively consisted of focused affective experiences (e.g., fear, anxiety, and worry). These affective obsessional experiences are consistent with Akhtar's (1975) affect category. One other respondent noted that the experience was like a non-physical "feeling in [his/her] head that it is not supposed to be this way."

Table 3.

Types of Obsessional Forms Endorsed in the Most Recent OC Episode.

	Clinical Group (N = 44)	Subclinical Group (N = 21)
Doubt	79.5%	61.9%
Sensory phenomena	70.5%	76.2%
Internal voice(s)	65.9%	76.2%
Image	54.5%	52.4%
Verbal thoughts	11.4%	9.5%
Other	11.4%	4.9%
Urge	0%	4.9%

1.2 Understanding the internal voice(s) form. Next, as predicted, intrusive thoughts frequently did appear in the form of internal voice(s), alternately identified as a narrative, conversation, or dialogue. This format is not well captured by or necessarily equated with the ambiguously broad "verbal thoughts" umbrella, as participants readily identified this intrusive experience as distinct from verbal (or word-based) thoughts in their head. Indeed, participants were intentionally queried about verbal thoughts prior to the internal voice in the interview so that only the unique and true experience of internal voice(s) were captured, not by default inflating endorsement rates. When asked to label their experience of the voice(s), half of each group – the most popular response by far – called it simply a voice. The next most frequent descriptors in the clinical group included dialogue (25%), conversation (14%), and narrative (11%). By contrast, subclinical participants next most frequently preferred to call the experience

a narrative (19%), dialogue (12.5%), checklist or mental note (12.5%), or conversation (6%). For ease of reporting, and due to the most frequent endorsement of this experience as an internal voice, for ease of reporting, subsequent references to this form will allude to internal voice(s) but will encompass those identified by all labels.

Internal voice tone. However, participant reports of the tone of the internal voice differed slightly from our predictions. Within Wiggins' interpersonal circumplex framework, individuals were able to rate the voice(s) on its affiliative qualities (ratings of 'friendly,' 'between neutral and friendly,' 'neutral,' 'between neutral and hostile,' or' 'hostile') and dominant qualities ('submissive,' 'between neutral and submissive,' 'neutral,' 'between neutral and dominant,' or 'dominant'). When participants endorsed more than one voice (or conversation or dialogue), it was typically described as a "tug-of-war" or "back-and-forth" between a supportive or encouraging voice and a distress-provoking voice that fuelled OCD concerns; in such cases, we recorded the tone of the OCD-maintaining voice in the obsessional experience.

See Table 4 for findings on the tone of the internal voice. Contrary to expectations, clinical respondents did not describe their internal OCD voice as predominantly hostile in tone. Instead, over half described the voice as neutral in affiliation (neither hostile nor friendly, but rather "matter-of-fact" or "objective"), with one-third of respondents with OCD labelling the voice on the hostile side. Yet, consistent with our predictions, clinical OCD individuals generally reported the voice(s) as sounding anxious (70%). Although the vast majority of clinical respondents also described the voice as somewhat or purely dominant, a small percentage found the voice neutral or even submissive. Data on the dominant and anxious qualities of the voice are missing for 2 participants due to lack of clarity. Importantly, the general experience of the obsessional internal voice in individuals with OCD is revealed to be a fairly objective (neutral)

and authoritative individual who is anxious or worried; however, it is of note that over one-third experience this internal voice as anxious and authoritative but hostile.

Subclinical individuals were significantly more homogeneous in their description of the internal voice; consistent with our expectations, the OCD voice in subclinical OCD respondents is largely experienced as hostile, dominant, and anxious. In fact, 75% of this group rated the voice as on the hostile side, and 88% described the voice as sounding on the dominant side. Reports of other tone descriptors were relatively infrequent. Over 80% of the subclinical group stated that the voice was anxious. Thus, unlike the clinical group, subclinical OCD voices sound generally hostile-dominant ("angry," "stern," "accusatory") and anxious.

Table 4.

Identified Affiliation and Dominance of the Internal Voice Tone.

	Clinical Group (N = 29)	Subclinical Group (N = 16)
Affiliation		
Hostile	24.1%	18.8%
Between neutral and hostile	13.8%	56.3%
Neutral	51.7%	18.8%
Between neutral and friendly	10.3%	6.3%
Friendly	0%	0%
Dominance		
Dominant	62.1%	43.8%
Between neutral and dominant	3.4%	43.8%
Neutral	17.2%	6.3%

Between neutral and submissive	6.9%	0%
Submissive	3.4%	6.3%

Internal voice distress. Regarding the distress provoked by the internal voice(s), more detailed results will be shared in the section immediately below (1.3 Relative rankings of distress among endorsed forms). However, of those clinical individuals who endorsed the internal voice, the relative ranking of its associated distress varied widely between the most distressing form (31%), second most distressing (31%), and third most distressing (28%), among others. Considering that on average three forms were endorsed, subclinical individuals tended to rate it as a slightly less distressing form (19% reported it as the most distressing form, 44% second most distressing, and 25% third most distressing). Thus, we can likely conclude that the internal voice has significant power in provoking distress but does not universally, by virtue of its presence, present as the most toxically distressing obsessional form.

1.3 Relative rankings of distress among endorsed forms. Third, we predicted that obsessional doubt and images would be perceived as more distressing than other obsessional forms, given our clinical experience (regarding the persistence of doubt) and the extant literature on images and emotionality. See Table 5 for full results. When clinical participants were asked to rank order obsessional forms they had endorsed experiencing in the most recent episode (from most to least distressing), doubt was most frequently reported to be the most distressing form. Images were relatively infrequently reported to be the most distressing form; rather, the next most frequently endorsed distressing forms were internal voice(s) and sensory phenomena. Lower ranks of distress (2^{nd} and 3^{rd} most distressing forms) were fairly evenly split between doubt, internal voice(s), and sensory phenomena when more than one form was endorsed in an episode. Intrusions that appear in the form of images overall seemed to be fairly low ranked in

terms of distress, especially when several forms (4 or more) were endorsed within the episode (over half the participants ranked images as 4th most distressing).

Table 5.

Percentages (and Frequency Counts) of Clinical Participants Endorsing Obsessional Forms at Various Levels of Distress.

	Most distressing form (N = 44)	2nd most distressing form (N = 40)	3rd most distressing form (N = 29)	4th most distressing form (N = 15)	5th most distressing form (N = 1)
Doubt	45.5% N = 20	22.5% N = 9	24.1% N = 7	0%	0%
Internal voice(s)	20.5% N = 9	22.5% N = 9	27.6% N = 8	13.3% N = 2	100% N = 1
Sensory phenomena	18.2% N = 8	25.0% N = 10	31.0% N = 9	33.3% N = 5	0%
Image	13.6% N = 6	12.5% N = 5	13.8% N = 4	53.3% N = 8	0%
Other	2.3% N = 1	10.0% N = 4	0%	0%	0%
Verbal thoughts	0%	7.5% N = 3	3.4% N = 1	0%	0%
Urge	0%	0%	0%	0%	0%

Notably, these relative distress results are influenced by the base rates of each forms. That is, rarely endorsed but distressing forms might look relatively unimpressive at the "most distressing form" variable due to low *N*, even if their presence guarantees the highest distress. We thus additionally looked at distress rankings within those who endorsed specific obsessional forms, which are captured by observing the counts across the rows (provided below the percentages) instead of down the columns on Table 5 above. Of particular interest, we reviewed relative rankings of distress for doubt, images, and sensory phenomena (internal voice is discussed above in Section 1.2).

Results indicate that when endorsed, doubt was most likely to be the most distressing form – 56% of clinical participants ranked it first in distress – with a noteworthy 25% of clinical participants ranking it as second most distressing. Again, when images were a part of the obsessional experience, they were identified as provoking less distress (35% reported it as the fourth most distressing form, though a fair number – 26% and 22%, respectively – reported it as the top or second-most distressing form). Sensory phenomena appeared to be relatively broad in its range, spanning 25-31% endorsement rates for top three rankings of distress. Thus, doubt is a strikingly distressing obsessional form among participants with clinically significant OCD, while images are likely to be less distressing.

Much like the clinical findings, subclinical participants frequently reported obsessions in the form of doubt as a most distressing form in their experience, while images were quite infrequently rated as such (see Table 6). Yet, uniquely, subclinical participants had the highest endorsement rates for sensory phenomena as the most upsetting obsessional form (greater even than doubt). We again explored distress rankings within groups of participants who endorsed specific obsessional forms. Strikingly, if sensory phenomena or doubt were a part of the

obsessional experience, they were most frequently reported to be the most distressing form present, relative to all other elements in their obsessional experience (56% and 54% for sensory phenomena and doubt, respectively). Images tended to be ranked second (36%) or third (27%) in distress. Therefore, among individuals with subclinical levels of OCD, sensory phenomena and doubt are most likely to be the most distressing form present, while images are again likely to be less distressing than other forms.

Table 6.

Percentages and Frequency Counts of Subclinical Participants Endorsing Obsessional Forms at Various Levels of Distress.

	Most distressing form (N = 21)	2nd most distressing form (N = 20)	3rd most distressing form (N = 13)	4th most distressing form (N = 5)	5th most distressing form (N = 1)
Sensory phenomena	42.9% N = 9	20.0% N = 4	23.1% N = 3	0%	0%
Doubt	33.3% N = 7	15.0% N = 3	15.4% N = 2	20.0% N = 1	0%
Internal voice(s)	14.3% N = 3	35.0% N = 7	30.8% N = 4	40.0% N = 2	0%
Image	9.5% N = 2	20.0% N = 4	23.1% N = 3	20.0% N = 1	100% N = 1
Urge	0%	5.0% N = 1	0%	0%	0%

Other	0%	5.0% N = 1	0%	0%	0%
Verbal thoughts	0%	0%	7.7% N = 1	20.0% N = 1	0%

A second component of the first aim of the interview was to better understand the timeline of elements in obsessive-compulsive episodes, namely the manner in which the previously investigated obsessional building blocks (i.e., forms) and compulsive acts are arranged chronologically. To analyse this, we asked participants to report on the obsessional form they first became aware of in the episode, the extent to which each obsessional form lasted through the episode, and whether any obsessional elements were being experienced at the same time as compulsive acts were being performed and/or extended beyond the conclusion of a compulsive behaviour (e.g., one iteration of a compulsion). Lastly, individuals were asked in an open-ended manner to identify how they knew the episode to be over (i.e., subjective termination criteria for the OC episode).

1.4 First obsessional form experienced. Among clinical participants, the internal voice (or narrative) was the form most frequently endorsed as the element in the episode that first came to the individual's awareness (39.5%). The remaining participants were fairly evenly split, variably experiencing an image (18.6%), doubt (18.6%), or sensory phenomena (16.3%) first. Verbal thoughts (4.7%) and other forms (affect, 2.3%) were infrequently reported to be the initial obsessional form (one missing data point from question omission). Subclinically, the internal voice was also commonly endorsed as the initial form (28.6%); yet, sensory phenomena were the most frequently reported first form among subclinical participants (38.1%). Doubt (14.3%) and

images (9.5%) were endorsed by a few individuals, and only one person reported experiencing an urge (4.8%) and an 'other' form (4.8%) in the subclinical group. Thus, a good portion of clinical and subclinical individuals alike appear to first notice an internal voice in their obsessional experience; however, among subclinical participants, sensory phenomena appear to more frequently be the first form of which individuals become aware.

1.5 Duration of each form and most predominant form experienced. Participants were also asked to quantify the percentage of the OC episode through which each endorsed obsessional form would have lasted. Full results are provided in Table 7 below. Responses were possible from 0% (none at all) to 100% (the entire duration of the episode). Overall, obsessional doubt appeared on average to be the most persistent form experienced by both clinical and subclinical participants, lasting over 70% of the episode (except for obsessional urge, which was only endorsed by one subclinical individual at 100%). Both groups were aligned in identifying the "Other" category – most frequently identified as affect – as the next most persistent (about 70% in duration) obsessional form, followed by the internal voice (approximately 60% of the episode). Strikingly, all obsessional forms in the clinical group were present for much, if not most, of the episode (nearly all 50% or more). By contrast, subclinical respondents either noted forms as being quite persistent (over 60% of the episode) or brief and fleeting (lasting for 15% or 25% of the episode).

Table 7.

Average Duration of Each Form, Relative to Episode Length

	Clinical Group Mean (SD)	Subclinical Group Mean (SD)
Doubt	72.6% (22.9)	70.4% (29.7)

	Range: 20 to 100 N = 35	Range: 20 to 100 N = 13
Other	69.0% (20.7) Range: 50 to 100 N = 5	70.0% (0) Range: 70 to 70 N = 1
Internal voice(s)	57.7% (33.4) Range: 10 to 100 N = 29	61.3% (31.8) Range: 5 to 100 N = 16
Verbal thoughts	49.5% (32.7) Range: 13 to 90 N = 5	15% (7.1) Range: 10 to 20 N = 2
Sensory phenomena	47.6% (35.2) Range: 5 to 100 N = 31	63.4% (30.9) Range: 10 to 100 N = 16
Image	42.3% (31.5) Range: 5 to 100 N = 24	23.8% (23.5) Range: 2 to 80 N = 11
Urge	0%	100% (0) Range: 100 to 100 N = 1

N.B.: Number of individuals endorsing each form are provided in the bottom of each cell.

Participants were asked separately what they perceived to be the most predominant form during the episode (in terms of duration and/or intensity), and results differed slightly from the

duration reports noted above. Specifically, doubt remained most highly endorsed as the predominant obsessional form by the clinical group (34.1%), with internal voice close behind (31.8%). However, the persistent "Other" form was almost never (4.5%) endorsed by clinical individuals as the most predominant form. Remaining endorsements among clinical respondents were low (image at 13.6%, sensory phenomena at 11.4%, and verbal thoughts at 4.5%).

Curiously, subclinical individuals most frequently complained of sensory phenomena as the predominant form (38.1%), despite the fact that doubt was reported above to be the most persistent form on average. Doubt and internal voice were next most frequently endorsed subclinical participants (23.8% each) as the most predominant form, followed by minimal reports for image (9.5%) and urge (4.8%). Strikingly, though identified as nearly equivalent in its persistence to the topmost form (doubt), the "other" obsessional form category was not at all (0%) reported as the predominant form by subclinical participants. Thus, it appears that regardless of the self-reported duration of these forms, the subjective experience of obsessional forms that dominate the OC episode differs slightly, centering around doubt and the internal voice, as well as sensory phenomena in subclinical individuals.

1.6 Do obsessions co-occur or overlap with compulsions in the episode chronology?

We had predicted that obsessions and compulsions do not occur purely sequentially but that they occur concurrently and interact with each other in dynamic fashion. Thus, following the detailed, step-by-step recounting of the most recent OC episode, participants were asked to state whether their experiences of the obsessional forms occurred in the complete absence of aspects of their compulsive behaviours. Due to the thorough description, the interviewer was able to identify any potential discrepancies between the participants' responses to this question and that made evident by the recounting immediately prior; no such discrepancies were identified. As we predicted,

nearly all participants (including 86.4% of clinical respondents and 79.2% of subclinical individuals) reported that obsessions and compulsions overlapped with each other in time to some extent. For example, one participant described the timeline of this experience as:

> "Well the voice and the sensations are almost always in tandem. They start almost simultaneously. There is a small portion where all three [internal voice, physiological sensations, and doubt] are active at once and it's usually when I'm washing my hands. Afterwards, it's the doubt and the sensations for a while and the sensations drop before the doubt does."

Other clinical participants described the overlapping experience of obsessions and compulsions as contributing to the urge to repeat compulsive behaviours. For example:

> "[While washing my hands, the internal voice is] basically saying, 'Not done yet. Keep going. You're- It's not good enough. Not thorough enough.' Which is why I do it twice. Because I'm doubting. I'm doubting that my hands were clean the first time… but then I doubt that I did my hands properly, so I have to do it twice."

Another clinical individual described this dynamic obsession-compulsion overlap as:

> "[While completing cleaning compulsions and wiping down the stove and counter, the internal] narrative would tell me to clean it, [and] make sure it's clean. The doubt would be saying, 'Are you sure it's clean?' So that's why I do it multiple times instead of just doing just once."

Thus, aspects of obsessional forms do, in fact, co-occur or overlap in time with aspects of compulsions; significantly, this finding contradicts the sequential and mutually

exclusive (chronological) manner in which CBT models and theories portray obsessions and compulsions.

1.7 Do obsessions extend beyond compulsions in the episode chronology? Similarly, we asked participants to indicate whether elements of their obsessional forms extended beyond the conclusion of the compulsion (any one iteration of it) in their experience. Once again, as predicted, nearly all participants (86.4% of the clinical group and 81.0% of subclinical individuals) endorsed obsessions that either began or continued after the compulsive act(s) had been completed. One clinical participant described this dynamic as:

> "Sometimes when I'm done cleaning, I think it's clean, but then I look at it and [the internal voice will] say, 'That doesn't look clean,' and I clean it again and wipe it." (Clinical)

Another clinical individual reported that the doubt resurfaces after an initial check to prompt another compulsion:

> "As soon as I opened the kitchen door and I saw [the stove], I said, 'Okay everything's fine,' but then I have the very massive thought that was playing around my head. Like, 'Am I checking this right, am I looking at this right that it is off?' Maybe that was all, there were so many other emotions going in my head or feelings. I checked it and then I asked, 'Am I doing this right?' so then I would do it again."

Subclinical participants similarly offered statements describing how elements of their obsessional experience persist beyond the completion of a compulsion, for example:

> "[Sometimes even after clean or wash has ended], the narrative for sure [will continue]. The bodily sensations… like if there was only a couple of dishes and

> for some reason I had that same reaction, then the time in the hot water will be less [so] sometimes I will still feel like it won't feel like enough. So either I'll clean something else or I'll end up like taking that and still feeling it in my body with whatever I'm doing next. Sometimes I'll just end up leaving and going out again just to like walk it off or something."

Strikingly, this finding directly contradicts the general understanding that obsessions terminate upon initiation or completion of the compulsive act, and that the end of the compulsion also marks the ending of the episode.

1.8 Episode termination criteria. We also predicted that individuals would not typically use the conclusion of their compulsion(s) as their termination criterion, but would primarily utilise other criteria. Specifically, we anticipated that individuals would determine that the episode had terminated using: 1) an internal subjective feeling (e.g., yedasentience, relief, etc.), and/or 2) the decrease or absence of intrusive experiences (e.g., fewer thoughts, reduced doubt, less tension, etc.). Indeed, we found that clinical and subclinical participants tend to rely almost exclusively upon these two categories as criteria to know that their OC episode is over. See Table 8 for full results.

More specifically, participants appear to depend most on the obsessional experience subsiding as an indicator of episode termination, as well over half of each group endorsed this criterion. In this category, various participants described knowing that the episode had terminated "because I didn't think about it again" or when "everything, like all the doubt and thought is gone. It just evaporated." Respondents often spoke of the voice, doubt, or anxiety symptoms "stopping" or the internal conversation becoming "quieter" than other thoughts

(retreating "into the background buzz"), such that they could then focus on other tasks. For example, one clinical individual stated that she knows the episode has terminated when she has:

> "The ability to start focusing on other activities. Like my thoughts, the thoughts, were…mine again, I guess. I can just start talking and enjoying other people's company, like my boyfriend or whatever. It's just life slowly starts to become normal again and that's when I know the episode has decreased, or ended."

Internal feelings were somewhat less frequently endorsed but still markedly popular (half or slightly less reported relying on this information), with numerous individuals referring specifically to a "relief" or "release" sensation. Vivid descriptions of this category include an experience like a "psychological exhale," much like a sigh of relief, or a sense that "I'm done with this." Indeed, one participant stated that:

> "There's just like a release, like a 'you can let it go' sort of feeling, like there is an actual mental sort of sensation that goes along with just it being done and ok… If you've ever gone to the chiropractor and had a really bad knot in your neck and when they crack the knot you sort of get that flood of heat from the blood being able to circulate again. It's kind of like that where you get a flood of 'it's okay.'"

Other types of subjective, internal feelings that cue the completion of the episode were described. For example, one clinical participant described it as, "when it felt right. Like those are honestly the best words to use for it, which is strange." Another clinical individual stated that:

> "This is going to sound weird but when I feel dirty, I literally can feel the dirt on my hands. As soon as I'm washing them and as soon as I rinse off the soap, I can

just feel they're clean so that's the only reason why I know it's done. Like that's why as soon as I turn off the sink I just know. It's a feeling."

Between groups, clinical individuals tended to use completion of the compulsion as a termination criterion more often than subclinical participants, but neither group endorsed it frequently. Clinical endorsement rates were slightly lower than subclinical rates for using reduced intrusions and slightly higher for using internal feelings. Those who did simply stated that the episode ended "because I had completed the routine…there is not much thought to it." Another participant similarly reported that, "It's a routine. I do it everyday. So as long as I do it three times, I think I'm okay, and I can walk away."

Table 8.

Reported Criteria for Episode Termination Among Interview Respondents.

	Clinical Group (N = 44)	Subclinical Group (N = 21)
Intrusive experience subsided	63.6%	76.2%
Internal feeling or sense	50.0%	42.9%
Completion of compulsion	27.3%	9.5%
Not applicable	0%	0%

Chi-square tests indicated no difference between groups on each termination criterion category, across completion of compulsion ($\chi 2[65] = 2.7$, $p = .12$ using Fisher's exact test because the expected count for one cell fell below 5), the subsiding of the intrusive experience ($\chi 2[65] = 1.0$, $p = .31$), and the arrival of an internal feeling ($\chi 2[65] = .3$, $p = .59$]).

We had anticipated that clinical individuals might use a greater number of criteria than subclinical individuals to judge that the episode has concluded, but the mean number of categories used were nearly identical between groups (1.4 clinical and 1.3 subclinical, SD = .5). This appears to be in part due to limited range, as all but one participant described either one or two categories; the outlier was one clinical individual who endorsed three categories. However, these results may be constrained by the fact that we coded responses into broad categories instead of recording the absolute number of criteria reported that might be present within each category. Nevertheless, these results highlight the fact that individuals do not tend to rely upon cues from their compulsions to determine that their episode is over; instead, they require input from the obsessional experience and/or some other subjective feeling to know that the episode has ended.

II. On Obsessional Doubt

The second aim of this interview was to better understand the nature of obsessional doubt, how individuals appraise this doubt, and what sorts of acts they feel compelled to perform in relation to the intrusive doubt. In order to elucidate these factors, we computed descriptive statistics and coded participant responses from the module on doubt.

2.1 Prevalence of obsessional doubt. As predicted, intrusive doubt was very frequently endorsed, with all but one clinical participant (97.7%) and all but four subclinical participants (81.0%) reportedly experiencing recurrent obsessional doubt at some point in their lives. Similarly, doubt appears to be a persistent experience across the disorder itself, with reports that it intrudes in the vast majority of OC episodes for clinical (mean = 79.8%, SD = 26.5) and subclinical respondents (71.9%, SD = 34.3) who have experienced the form.

2.2 Content of obsessional doubt. Participant responses to the query "what is your doubt about" were coded according to the three themes identified by our two coders. Quotes exemplifying each domain were excerpted from transcripts and are provided in Table 9. Contrary to expectations, doubt-related content was not limited to typical OCD obsessional content domains, instead extending to other topics (e.g., compulsive behaviours, individuals' own cognitive capabilities, etc.).

Table 9.

Participant Quotes Describing Intrusive Doubt Content in Specific Content Domains.

	Clinical Group (N = 43)	Subclinical Group (N = 17)
Doubt about one's safety status or the state of things (i.e., obsessional content)	"[My doubt is] about whether or not I would get sick or not…'cause I would have touched the railings to get on the bus or like the arm rest. I would think it's dirty. 'Have these been washed between shifts? Probably not. Have they ever been cleaned? Do people wipe these down?' I see people eating food on the bus and touching things after, and I don't know if they are smearing meat there or something that would go bad over time and manifest bacteria and I would touch it…Am I getting contaminated because I'm touching them or around them?"	"I'll doubt that I turned the stove off even though I didn't use it. Also my hair straightener. It is pretty much specifically about things that I routinely check, and I can't remember if I turn off, and then I have to go back and do it."

Doubt about having performed compulsions properly enough or sufficiently to avert harm	One individual: "I'd say for most cases the doubt is that I did it the proper amount of times or I did it correctly. So the light switch maybe I have to do it 20 times or say I'm turning off something and I didn't do it correctly." Another participant: "For cleaning, it would be just did I do a good job? Is it actually clean? I know it won't be 100% clean but if it's up to the cleaning standard, it's clean in a way."	"I know I did it (i.e., turned things off), but I worry I didn't do it properly (and there were times I actually didn't do it properly)."
Doubt about one's senses, memory, or cognitive capacity	"Whether or not I saw things being off or questioning whether what I saw was true. I know I've checked, so I'm not doubting the fact that I've checked. I'm doubting what I saw."	"I'm doubting my memory, like I can't completely trust that what I'm remembering is accurate…of turning something off, making sure…I double check for stoves and stuff too."

It is worth noting that the second category of doubt content inherently captures a type of obsession that arises after one's compulsive action(s), though it is unclear whether it onsets independently or if it is specifically influenced by the compulsion itself (the latter of which would in part support the reciprocal model). The frequencies with which doubt categories were identified among clinical and subclinical OCD participants are displayed in Table 10. Across groups, doubt appears most often to be about what might be considered typical obsessional content (e.g., the state of things and whether doors have been locked, surfaces are clean or

contaminated, etc.), though the prevalence rate of this doubt domain in subclinical participants is strikingly high. Both clinical and subclinical individuals less frequently reported doubt about the third domain, i.e., their senses or cognitive abilities. As individuals sometimes reported more than one type of doubt content, the columns do not sum to 100%.

Notably, no subclinical participants reported doubting whether they had properly performed certain behaviours (i.e., compulsions) as a content domain on its own, whereas 23% of clinical participants endorsed that category alone. Rather, when subclinical individuals endorsed that content area, they invariably endorsed another category, such as the state of things ("Did I do that, and whether it's locking a door, whether it's turning off the stove…it's basically me, did I do that correctly? I don't think so, I should check"). One subclinical respondent endorsed all three categories ("[I doubt that] the response to some thought was executed appropriately. So, locked door, did I actually lock the door? Put keys in place, did I do that? And did I do it right, or did I forget that I did it, or was I not paying attention and accidentally didn't do it?").

Table 10.

Percentage of Interview Respondents Reporting Different Domains of Doubt Content.

	Clinical Group (N = 43)	Subclinical Group (N = 17)
Doubt about one's safety status or the state of things (i.e., obsessional content)	58.1%	76.5%
Doubt about having performed compulsions properly enough or sufficiently to avert harm	48.8%	35.3%

Doubt about one's senses, memory, or cognitive capacity	27.9%	29.4%

On average, clinical and subclinical individuals alike reported 1.4 doubt content categories. The distribution was nearly identical across groups as well, with the vast majority endorsing one doubt content category (70% clinical and 65% subclinical individuals), fewer reporting two categories (26% clinical and 29% subclinical participants), and very few endorsing three (5% clinical and 6% subclinical individuals).

2.3 Characteristics of obsessional doubt. Full results for endorsed characteristics of obsessional doubt are presented in Table 11. As predicted, participants reported that their experience of obsessional doubt is typically highly distressing, very interfering, and markedly difficult to dismiss. While clinical and subclinical respondents alike are able to recognise their doubt as very excessive, they rate it as exceedingly real in the moment and thus paradoxically report high conviction in their doubt (i.e., belief) at the time of their experience. Significantly, the emotion that is most intensely provoked by doubt is reportedly anxiety (endorsed by 79.1% of clinical and 58.8% of subclinical participants). Other common associated emotions included guilt, shame, and anger. The vast majority of participants thus report that they attempt to resist their doubt (72.1% of clinical and 64.7% of subclinical participants), though it appears that their ability to resist doubt is similarly poor (mean of 4.4 out of 10, SD = 2.3, for clinical participants; mean of 4.3, SD = 2.4 for subclinical individuals).

Results further indicate that doubt is, across groups, experienced in various forms. The most frequently endorsed ways doubt was experienced were as a verbal stream of thoughts and/or a felt sense in the body. While some participants easily identified how they experienced their doubt, others struggled considerably to put to words their internal experience of doubt for

the interviewer. Doubt that took the form of a verbal stream of thoughts were described in words such as "a demon…that I'm fighting that I wish would stop, [and] it comes and goes" or like "a debate" that is taking place internally. Doubt as a felt sense in the body was reported variably as a "nagging feeling," muscle tension with raised "hair on my arms or…goose bumps," a "sinking feeling in [my] chest and stomach," a "stomach in knots," or a feeling in the "pit of [my] stomach like cold acid." Clinical, but not subclinical, individuals also reported experiencing the doubt as a felt knowledge (e.g., "It's just like I know it, like two plus two is four").

As individuals were able to report more than one sensory experience of doubt, the percentages do not sum to 100%. No participant endorsed more than two categories. One such individual (Clinical group) who endorsed doubt as a felt sense in her body as well as a felt knowledge described her experience as:

> "…more of a feeling, but like it's a thought, but not like a verbal stream. I'm not sitting there and talking to myself about it. But I guess it's more of a feeling. It's a gut feeling and a thought at the same time. I don't have to verbalize the thoughts in my head, so it's kind of like a flash."

Both clinical and subclinical groups endorsed doubt in the category of a different sensory state that they deemed not to fit into existing categories. Clinical participants' descriptions of their doubt experience were of "emotional guilt," a "lack of confidence in [her] memories," and an outright "blank mind (i.e., no memory)" of the action. Subclinical participants' descriptions included "feelings of guilt, shame, or loss," and a "fuzzy feeling in [the participant's] brain" akin to "unsureness, feeling blurry, [so I] can't be sure I did that."

We gathered information on the duration of obsessional doubt, but it proved not possible to code, as the estimates varied wildly both between individuals and within an individual (i.e.,

they were unable to report on one consistent estimate), ranging from seconds or minutes to hours and days. As such, we are unable to report on an overall statistic to capture the duration of intrusive doubt.

Table 11.

Characteristics of Intrusive Doubt Identified by Clinical and Subclinical Interview Participants.

	Mean (SD) or % endorsing	
	Clinical Group (N = 43)	Subclinical Group (N = 17)
1. Conviction in doubt, 0-10	7.0 (2.6)	6.7 (1.9)
2. Sensory experience of doubt		
Verbal stream of thoughts	69.8%	70.6%
Felt sense in body	44.2%	64.7%
Felt knowledge	20.9%	0%
Other sensory state	7.0%	23.5%
3. Perceived excessiveness of doubt, 0-10	7.0 (2.8)	7.0 (1.8)
4. Perceived realness, 0-10	7.7 (2.1)	7.7 (1.8)
5. Associated emotion		
Anxiety or fear	95.2%	94.1%
Shame	54.8%	35.3%
Guilt	53.5%	58.5%
Sadness	40.5%	29.4%

Anger	38.1%	58.8%
6. Difficulty dismissing doubt, 0-10	7.6 (2.3)	8.2 (1.7)
7. Distress, 0-10	6.7 (2.5)	6.6 (2.0)
8. Interference, 0-10	6.7 (2.2)	6.4 (2.4)

2.4 Termination of obsessional doubt. Full results are presented in Table 12, with frequencies summing to over 100% due to the possibility that more than one termination criterion could be endorsed. Contrary to expectations, clinical participants most frequently stated that their doubt ends when they complete their compulsion; just under half of subclinical respondents reported the same. These doubt experiences were quite simply reported as terminating "once I've checked," after "the act of cleansing," or "once I check and make sure that what I did was done." Moreover, few clinical and subclinical participants reported that they used an internal feeling or sense to determine that their doubt had terminated. These individuals tended to note the presence of certainty, "relief," or "some gratification…There's this sense of empowerment. I feel sort of a regained my composure a bit. The confidence is there."

Instead, among subclinical participants, the most frequent report was for termination of doubt through the intrusive experience subsiding. Participant descriptions of this experience commented on how "it retreats back into a background buzz, but this noise can raise or lower depending on the circumstance" or "it will end when I know that everything is fine and I'll have like a [sic] peace of mind." Thoughts that "go away" were mentioned by several participants who noted knowing their doubt has terminated because:

"Those thoughts go away. And I don't feel the anxiety anymore, I don't feel that it is dirty there or whatever." (Clinical)

"It seems to go away. It's always there but it doesn't permeate my thoughts anymore." (Clinical)

Two individuals reported that their doubt does not end and are thus captured under the 'Not Applicable' category. The average number of criteria endorsed was identical across both clinical and subclinical groups (1.2, SD of .4).

Table 12.

Categorised Reported Reasons for Doubt Termination Among Interview Respondents.

	Clinical Group (N = 42)	Subclinical Group (N = 17)
Completion of compulsion	64.3%	47.1%
Intrusive experience subsided	38.1%	64.7%
Internal feeling or sense	16.7%	11.8%
Not applicable	4.8%	0%

N.B.: One missing data point from a clinical participant due to an unclear response.

2.5 Appraisals of obsessional doubt. To elucidate the personal significance of OCD doubt, we examined how compelling individuals find the feared consequences of their doubt and the way(s) in which they appraise their doubt in relation to their self-views. Feared consequences reported by participants included catastrophic outcomes (e.g., "[I] get sick and die," or "the house would burn down…and the dogs would be in the house… [and with the door] locked they couldn't get out"). Broadly, participants also noted concerns about their mental state (becoming

"severely depressed," or "worst case would be being in an asylum somewhere with skin grafts on my hands and a straitjacket") and social rejection ("being ostracized, and…being a horrible person"). Clinical and subclinical respondents alike reported that they believed these feared consequences to be highly likely in the thick of their OC episode (mean likelihood of 6.0 among clinical participants, SD of 2.7; subclinical mean of 6.3, SD of 2.2). The two groups also did not differ in severity ratings of the consequences, on average determined to be catastrophically severe should they come true (clinical mean of 9.3, SD of 1.4; subclinical mean 9.2, SD of 1.5).

Participant descriptions of what the worst-case scenario might mean about them, others, or the world, should their doubt content come true, were coded according to Ferrier and Brewin's scheme (2005). See Table 13 for full results. Nearly all participants reported a self-appraisal that was captured according to the four self themes, with four clinical individuals (9.3%) and two subclinical (11.8%) denying that such an event would mean something about their sense of self, thus reporting no self-appraisals. Endorsement rates are nearly identical across clinical and subclinical participants. Consistent with our expectations, most of the appraisals of doubt were reported to pertain to a negative view of one's moral self (i.e., bad, evil, irresponsible, careless, etc.) should the worst-case scenario come true.

Table 13.

Endorsement of Categorised Appraisals of Obsessional Doubt Among Interview Respondents.

	Clinical Group (N = 43)	Subclinical Group (N = 17)
Moralistic / Dangerous Self	53.5%	58.8%
Depressed / Anxious Self	30.2%	23.5%

Rejected Self	18.6%	17.6%
Negative Personality / Flawed Self	14.0%	5.9%

Language used by some participants was particularly striking. For example, when describing negative, moralistic self-appraisals, participants shared such comments as:

> "It would mean I was a danger. It would be like leaving someone who has Alzheimer's out in the world. Just, they don't know what they are doing, it's not safe for them, it's not safe for the people around them..." (clinical), or
>
> "If the doubt was true, that I really am someone who would do that, then I'd be torturing animals, and it would be… Oh, I'd be a monster" (clinical), or
>
> "It would mean that I am very careless and that I am a bad person that shouldn't be taking care of a cat" (subclinical), or
>
> "I can't be trusted to leave my house. That people think of me as forgetful or irresponsible" (subclinical).

Depressed or anxious negative self-appraisals were also endorsed. For example, one clinical participant stated that it would mean "I am a failure as a person and that I really am worthless," and one subclinical respondent detailed that it would mean "I failed – I'm a loser." The latter two domains were far less frequently reported. Rejected self-appraisals commented on concerns that "I would kind of just say, 'How did you let this happen? You would be such a disappointment to others.' Kind of like people would look at me differently." Flawed self-appraisals were least frequent; for example, one clinical respondent noted that "I guess it would mean that…I cut corners I guess… maybe I like to take the fast, easier route. Like I'm a bit messy or eager to be done."

2.6 Doubt-related compulsions. Every participant reported performing some compulsive or compensatory behaviour in response to (i.e., after experiencing) their obsessional doubt, but not every individual noted completing an act pre-emptively to prevent their doubt. Endorsement rates of doubt related compensatory strategies are displayed in Table 14, grouped according to their temporal relation to the doubt (i.e., behaviours performed after and in response to the doubt are labelled under reactive compulsions, while those completed preventatively prior to the doubt are proactive compulsions). As noted in our Methods, each reported action was not assessed for excessiveness consistent with a compulsive behaviour; rather, each behaviour identified here is understood to be a part of the repertoire of compulsions collectively determined to be excessive beyond the point of functionality.

Table 14.

Frequency of Endorsement for Doubt-Related Compulsions.

	Clinical Group (N = 43)	Subclinical Group (N = 17)
Reactive Compulsion	**100%**	**100%**
Check repeatedly	67.4%	88.2%
Reassurance (from others or for oneself)	48.8%	76.5%
Distract	48.8%	35.3%
Wash repeatedly	41.9%	5.9%
Other reactive compulsion	39.5%	35.3%
Counteract thoughts	37.2%	11.8%

Suppress or block doubt	30.2%	5.9%
Proactive Compulsion	**62.8%**	**70.6%**
Other proactive compulsion	52.4%	58.8%
Avoid triggers / things	25.6%	11.8%
Distract	11.6%	0%

Reactive doubt-related compulsions. Clinical participants' reactive compulsions appear to be fairly well distributed between the compensatory behaviour categories, albeit with a slight preference for checking in response to doubt. By contrast, there appeared to be a more differentiated profile among subclinical participants, with a particularly strong preference for checking and reassurance seeking in response to doubt.

As noted by the high endorsement of the "Other" reactive compulsion category, our posited categories did not seem to capture well all types of doubt-related behaviours among clinical and subclinical participants. The various "Other" compensatory actions described by clinical participants include: five reports of conjuring up images of actual memories (mental checks of memories to fight off the doubt and one mention of proving their doubt is justified, 11.6%), two reports of avoiding touching things that may further spread contamination, two reports of attempting to logically counter the doubting thoughts, and individual mentions of counting and "intentionally tensing [my] body to fight off the doubt." Other compulsions reported by subclinical participants also include the use of mental images and "rationalising," as well as taking actual "pictures of things unplugged so [I have] proof" of safety. While on average clinical and subclinical participants endorsed a fairly similar number of reactive compulsion

categories (clinical mean = 3.1, SD = 1.6; subclinical mean = 2.6, SD = .9), those with OCD diagnostic status reported a wider range of behaviours (1 to 7) than did subclinical (1 to 4).

Chi-square tests comparing endorsement rates of reactive compulsions between groups either approached significance (reassurance seeking, $\chi 2[65] = 3.8$, $p = .052$, and suppressing doubt, $p = .05$, Fisher's exact test due to low expected cell count) or were outright significant (washing repeatedly, $\chi 2[65] = 7.3$, $p = .007$).

Participants reported various aims in performing these reactive compulsions. These reasons ranged from "alleviating the doubt" or "trying to quiet down the intrusive thoughts," to preventing negative outcomes (e.g., "To reassure myself that everything – it's fine. That I did whatever I could, everything I could. That I can find peace and that I don't have to check again"). Some individuals also reported wanting to function more normally (e.g., "I want freedom from this invasiveness. I think it's a waste of energy and I want to be more normal"). Both groups rated their compensatory strategies as highly successful in the long-term in achieving their doubt-related aims (mean of 7.3 out of 10 for clinical participants, SD = 2.9; mean of 7.5 for subclinical participants, SD = 2.5).

Proactive doubt-related compulsions. Most, but not all, participants reported performing behaviours pre-emptively in relation to the doubt. Avoidance behaviours reported by clinical respondents included "having others do dishes for me," refraining from touching contaminated surfaces, or avoiding approaching people who might be contaminated. Yet, the most highly endorsed category of proactive compulsions across participants was the Other domain, capturing strategies we had not anticipated. A fair number of clinical participants reported completing preventative checks before the doubt arises (e.g., before leaving one's home), sometimes repeatedly (18.6%). Similarly, 17.6% of subclinical individuals noted preventative checks; one

respondent reported doing tasks "early so by the time I leave, [the obsessional thoughts] cool down," whereas another individual described leaving "later so I have no time to doubt."

Fascinatingly, a number of participants also independently reported completing more careful actions or slower actions in order to prevent obsessional doubt. Almost 10% of clinical respondents described making conscious, deliberate efforts to commit a check to memory (e.g., saying to herself "okay, you're pulling this out, or when I'm with my partner, I'll say, ok [name], the straightener's off, we're good to go, so kind of just like overemphasizing the situation"), paying special attention to checks, more thorough and careful washes, standing in front of the stove for longer in order to ensure its safety status is remembered, etc. Such careful or slower actions were also prevalent among subclinical participants (23.5%), with descriptions such as: "just focusing all my energy [on] doing it… trying to put all my conscious mental energy into being like, 'Ok I did this right the first time'"; or, "I tell myself, 'I am doing this,' so that later on that doubt won't be there…I *do* this, I *lock* the door, I *turn off* my computer…so the memory sticks." Attempts were also made to "take a few extra minutes to be mindful of my checking, then I doubt less" and to "as I'm unplugging something…take this mental snap shot in my head…so when I start to worry that I've done it, I can remember that this is what it looked like when I was pulling it out." Avoidance proactive compulsion endorsement frequency did not differ significantly between groups, $p = .31$, Fisher's exact test.

Individuals reported a variety of aims in performing these doubt-related proactive compulsions, such as avoidance of the fear ("that I won't be anxious about it, that the fear won't creep in"), a sense of certainty ("my goal is to do it so that when I start to think about it, I can say, no I've done that…I guess to reassure myself that it's been done"), or to prevent any escalation in the persistence of that anxious, OC event ("that it will prevent the episodes").

Overall, subclinical respondents noted that their proactive compulsions were very successful in accomplishing these aims (mean of 7.4 out of 10, SD of 2.4), with moderately high success also reported by clinical participants (mean of 6.6, SD of 2.4).

Frequency of doubt-related compulsions. Full results for how often doubt-related compulsions are performed are presented in Table 15. Of note, there is a striking discrepancy between clinical and subclinical participants in how often reactive compulsions are performed, with over half of clinical respondents reporting actions in response to the doubt multiple times a day but nearly half of subclinical respondents completing behaviours multiple times a week. The two groups were similar in reports of proactive compulsion frequency, with approximately half of each group feeling compelled to act preventatively multiple times a day.

The frequency with which doubt-related reactive compulsions are performed is significantly different across groups, according to a two-sided Fisher's exact test ($p = .002$). Specifically, clinical individuals are far more likely to report highly frequent occurrences of reactive compulsions (multiple times a day) and less likely than subclinical individuals to report that it takes place on a weekly basis (two to three times a week).

Table 15.

Frequency with which Doubt-Related Compulsions are Performed among Clinical and Subclinical Participants

	Reactive Compulsions		Proactive Compulsions	
	Clinical Group (N = 43)	Subclinical Group (N = 17)	Clinical Group (N = 27)	Subclinical Group (N = 12)
Multiple times a day	55.8%	17.6%	48.1%	50.0%

Once a day	20.9%	17.6%	11.1%	16.7%
Two to three times a week	18.6%	47.1%	25.9%	33.3%
Once a week	0%	0%	3.7%	0%
Two to three times a month	0%	17.6%	0%	0%

N.B.: As there are missing reactive compulsion data for 2 clinical participants and proactive compulsion data for 3 clinical participants, those columns do not sum to 100%.

Doubt-related compulsion impairment. Clinical and subclinical respondents differed significantly on two indices of doubt-related compulsion impairment. First, clinical participants rated the compulsions they perform in response to or to prevent doubt as significantly more interfering than those of subclinical respondents, $t(57) = 2.3$, $p = .03$ (clinical mean of 5.6, SD of 2.0; subclinical mean of 3.8, SD of 2.6). Overall, participants varied in reports of whether they attempted to resist their doubt-related compulsions, with 41.9% of clinical and 27.1% of subclinical individuals endorsing resistance. However, clinical participants reported significantly lower ability to resist their compulsions, $t(24) = -3.1$, $p = .005$. In fact, on average, clinical respondents rated their ability as fairly poor (3.6 out of 10, SD of 1.8), whereas subclinical respondents noted moderately good ability to resist doubt-related compulsions (6.0, SD of 1.9). The groups reported fairly similar levels of moderately low distress provoked by doubt compulsions (clinical mean of 4.4 out of 10, SD of 3.1; subclinical mean of 3.5, SD of 3.2).

2.7 Correlates between doubt characteristics and OCD symptom severity. Contrary to expectations, when data was collapsed across groups and symptom severity (clinician severity rating, CSR) was used as a continuous variable, there were two significant correlations. Specifically, OCD symptom severity was correlated with ratings of doubt-related compulsion

interference, $r = .32$, $p = .01$. Participants' OCD severity ratings were also significantly related to their ability to resist compulsions such that the greater their CSR, the worse they rated their resistance ability ($r = -.43$, $N = 26$, $p = .03$). Given the links between doubt compulsions and overall OCD symptom severity, we further explored some compulsion-related indices. Greater OCD symptom severity was found to be significantly correlated with greater number of reactive compulsion categories endorsed ($r = .29$, $N = 60$, $p = .03$). Significantly, CSR was negatively correlated with the rated success with which they achieved their proactive compulsion aims ($r = -.35$, $N = 39$, $p = .03$), indicating that the more severe the OCD, the less able the participant felt to achieve their proactive compulsion aim. No other correlations (between CSR and doubt-provoked distress or interference, ability to resist compulsions, or compulsion-related distress) were significant, with r-values ranging from .01 to .09, $p > .05$.

III. ON OBSESSIONAL IMAGES

The last aim of this study was to clarify the nature and characteristics of intrusive images, appraisals of obsessional images, and compulsions associated with these images. To clarify these factors, we again computed descriptive statistics and coded responses from the interview module on images.

3.1 Prevalence of intrusive images. As predicted, intrusive images were frequently endorsed across both groups. Of 44 clinical participants, 63.6% reported experiencing a recurrent, obsessional image at some point in their lifetime. A very similar 66.7% of the 21 subclinical participants reported the same. Clinical respondents reported that obsessional images are present in approximately 60.4% of their OC episodes (SD = 35.4); subclinical participants similarly reported intrusive images in over half of their OC episodes (mean = 54.0%; SD = 42.4).

3.2 Content of intrusive images. Excerpts of described image content from both clinical and subclinical participants are provided in Table 16, grouped according to Lipton and colleagues' (2010) categories.

Table 16.

Participant Quotes Describing Intrusive Image Content in Specific Content Domains.

	Clinical Group (N = 28)	Subclinical Group (N = 14)
Images involving unacceptable ideas of harm	"I have no clue how YouTube allowed that…but the scene they showed was of a priest raping a nun who was like 70 and then … for some reason, like that image just stuck in my head a lot"; OR "Car accidents…construction, dump trucks backing into cars, something falls from construction site, another car hitting them, anything that ruins the car in a way, or the people inside of it"	"If there were a hammer on the table, I would picture it hitting me. If there was a knife on the table …it would specifically be an image that I saw. It could be that I walk by the hammer on the table like 50 times but then one…that I picture it hurting me."
Images involving contamination	"My hands being dirty with germs on them. I [can] actually see the	"A substance, just like a vague kind of substance that's not

and somatic complaints	germs. It's a rapid fire of stuff. Dogs going poop and surgeries and blood and all kinds of waste-related images."	supposed to be there…dust or dirt…like kicked dust"
Images involving social rejection	"Me embarrassing myself…things that I kind of make up myself"	None identified
Miscellaneous image content	"A body of a dead woman, a coffin and she's in a long white dress. Her skin looked really pale and…sometimes there is nothing scary in that image, but it's a sensation of being buried in the darkness, alone"	"Things like the door, the garage door, the oven – like the stove – the stove top…various appliances"

Consistent with our predictions, images of unacceptable ideas of harm (i.e., repugnant images) were by far the most frequently reported image across both participant groups, followed by contamination content among clinical respondents and miscellaneous content among subclinical individuals. The frequencies with which image content categories were identified among clinical and subclinical OCD participants are displayed in Table 17. As a few respondents identified more than one category of image when describing image content, the summed percentages exceed 100% in both groups of participants.

Table 17.

Percentage of Interview Respondents Reporting Images of Specific Content Domains.

	Clinical Group (N = 28)	Subclinical Group (N = 14)
Unacceptable ideas of harm	67.9%	85.7%
Contamination and somatic complaints	28.6%	7.7%
Social rejection	7.1%	0%
Miscellaneous	3.6%	14.3%

3.3 Characteristics of intrusive images. Please refer to Table 18 for quantitative results of intrusive image characteristics across participants. Images were reported to be brief (typically seconds long among both clinical and subclinical participants), colourful, vivid, and distressing. In fact, clinical respondents rated images as significantly more vivid than subclinical individuals, $t(40) = 2.2$, $p = .03$. The majority of respondents reported that anxiety- or fear-based emotions were the most intensely felt emotions elicited by the image (60.7% of clinical and 78.6% of subclinical individuals). Within the group of OCD participants, 85.7% reported that the image repeated itself within the episode, on average 6 times (SD = 7.8). Subclinical participants similarly endorsed nearly 6 repetitions within an episode (SD = 8.7, with one outlier excluded as the participant did not provide an actual estimate for "non-stop" repetitiveness) for the 71.4% who endorsed recurring images. Considerably more clinical than subclinical participants reported attempting to resist the image (57.1% clinical vs. 35.7% subclinical), and participants' reported

ability to resist was comparably moderate-to-low between groups (4.3 out of 10 for individuals with OCD, SD = 2.0, but 3.6 for subclinical individuals, SD = 2.5).

All images were visual in nature, both among clinical and subclinical participants, and typically involved one or two senses. Tactile (i.e., touch-based) sensations were more frequently noted by subclinical than clinical participants in their images. For example, one subclinical participant's description of a tactile intrusive image of harm was that "it was weird – I didn't feel the pain of it but I felt what it would feel like for the knife to go through my chest. The metal just going through and breaking a rib. It was weird, and I would feel the emotion. I feel like I felt like I was there."

When asked to describe the temporal association or "tense" of their intrusive images – i.e., when it felt like the image was taking place, whether past, present, or future – clinical and subclinical participants differed slightly in their report. Clinical participants generally reported present-focused images (e.g., "now" and a current "daydream") with future-oriented images next most common (e.g., "very near future that could happen now" and "imminent, just about to happen"). One respondent with OCD offered a response categorised as having an 'Other' temporal association, because s/he described experiencing "all three [tenses] mixed together" in an image of contamination content: as if "there will be a cockroach *and* there was a bug there" and there is one currently. By contrast, subclinical respondents reported predominantly future-oriented images ("about to happen"), then images that felt like they were in the present ("while it's happening"), and lastly images that evoked a sense of the past ("if I could've done [a specific behaviour], I could've prevented it"). One subclinical respondent denied experiencing any temporal association, noting that it felt like an image that was "spliced onto a movie."

While clinical individuals tended to report more than one format for the visual image (most frequently videos *and* still photos in their intrusive image experience; mean of 1.3 formats, SD of .4), subclinical participants only ever endorsed one image format (most often still photos). The endorsement rate of the video format was significantly different between groups, $\chi^2(42) = 4.2$, $p < .05$. The majority of clinical participants (60.7%) reported images that were viewed from a field perspective (i.e., out of their mind's eye), with only 25% endorsing images from an observer's point of view. The remaining 14.3% of clinical participants noted a mix of field and observer's perspectives in their intrusive images (switching viewpoints), on average more heavily of field (66.8%) than observer perspective (33.2%). Similarly, the majority of subclinical participants reported field perspective images (64.3%), with only 14.3% noting observer's perspective images, and 21.4% reporting mixed perspectives (70% field, 30% observer).

It appears that the source material for image content (i.e., is the image completely fictional or is it derived from lived experiences?) also varied between clinical and subclinical participants. While the majority of individuals with OCD reported images that were a mix of fictional material and actual memories (on average, comprised of 58.2% fiction and 41.8% memory), subclinical participants were split evenly. Half endorsed purely fictional images and half endorsed mixed images (on average, comprised of 68.9% fiction and 21.1% memory). In describing the mixed images, clinical individuals reported that they might take their actual stove and surroundings and envision repercussions using fictional "things seen in movies." Alternatively, "I may not be wearing the same outfit as I did when I actually did it but it's still my hands all the time so it's kind of like a mixture of both." Similarly, subclinical respondents noted that mixed images might consist of a background that is "real" with "positioning [of the doorknob that] is made up." By contrast, a subclinical participant described a purely fictional

image as “almost like a 3D model that you’d see on the computer, that you could like spin around.”

Table 18.

Characteristics of Intrusive Images Identified by Clinical and Subclinical Participants.

	Mean (SD) or % endorsing	
	Clinical Group (N = 28)	Subclinical Group (N = 14)
1. Black-and-white vs. colour	89.3% colour	100% colour
2. Vividness, 0-10	8.0 (1.9)	6.6 (1.9)
3. Image duration		
< 10 secs	53.6%	64.3%
10-30 secs	10.7%	7.1%
30-60 secs	21.4%	14.3%
1 to 2 mins.	7.1%	0%
2 to 5 mins.	3.6%	7.1%
5 to 15 mins.	0%	7.1%
> 1 hour	3.6%	0%
4. Associated emotion		
Anxiety or fear	96.4%	100%
Sadness	42.9%	7.1%
Anger	28.6%	14.3%

Guilt	39.3%	28.6%
Shame	35.7%	35.7%
Disgust	10.7%	14.3%
5. Senses involved		
Sight	100%	100%
Sound	28.6%	21.4%
Touch	17.9%	28.6%
Smell	3.6%	7.1%
Taste	0%	7.1%
6. Temporal association		
Past tense	17.9%	14.3%
Present tense	46.4%	25.7%
Future tense	32.1%	42.9%
Other association	3.6%	0%
No association	0%	7.1%
7. Image as…		
Video	75.0%	42.9%
Snapshot/still photo	42.9%	50.0%
Series of photos	7.1%	7.1%
8. Image content …		
purely from memory	14.3%	0%
vs. mix of both	60.7%	50%
vs. purely fictional	25.0%	50%

9. Perceived realness, 0-10	6.2 (2.8)	7.8 (1.6)
10. Difficulty dismissing image, 0-10	5.4 (3.0)	6.0 (3.3)
11. Distress, 0-10	6.8 (2.3)	6.4 (2.7)
12. Interference, 0-10	6.0 (2.7)	4.4 (2.4)

3.4 Termination of intrusive images. Full results are provided in Table 19. Contrary to our predictions, the vast majority of individuals – clinical and subclinical alike – reported that the image terminated "on its own," "fading," "going away," or petering out of its own accord (e.g., "it just disappears"). Several respondents noted specifically that they knew the image had concluded because it had subsided sufficiently for them to focus on other tasks or think of other things (e.g., "As soon as I do something else, but that doesn't mean it won't pop up again. As we're talking about it now it's popping up"). A small portion of participants also reported that the completion of a compulsion terminated the obsessional image (e.g., the image ends "when I know for a fact that I've turned it off and I've met that standard of 'standard' of checking it."). Although individuals were again able to report more than one termination criterion with respect to their images, the average number of reasons reported was identical across both groups (1.1, clinical SD of .4 and subclinical SD of .3).

Table 19.

Categorised Reported Reasons for Image Termination Among Interview Respondents.

	Clinical Group (N = 28)	Subclinical Group (N = 14)

Intrusive experience subsided	82.1%	85.7%
Completion of compulsion	25.0%	21.4%
Internal feeling	7.1%	0%
Not applicable	0%	0%

3.5 Appraisals of intrusive images. As with the intrusive doubt module, we explored the personal significance of OCD images by examining individuals' feared consequences of their images and what they might mean about them (i.e., self-appraisals) if they came true. Participant descriptions of the most feared consequences of their images conveyed concerns about the image itself coming true (e.g., "it will become reality") as well as the downstream effects (e.g., "that I did forget something and…it's a symbol of me forgetting to do something…so it means I didn't do other things," or "that more dogs are going to go through that abuse…and those people…are going to keep doing it with many others"). A feared consequence that appeared to be almost exclusive to subclinical participants is that the image will lead to worse anxiety or the perpetuation of the obsessive-compulsive episode (e.g., "if I focus too much on it…it could develop into its own anxiety" or "spiral into" other parts of the OCD episode [subclinical]).

Curiously, clinical respondents seemed to identify the feared image consequences as less likely to happen than the subclinical respondents, though the difference did not quite reach statistical significance, $t(34) = -1.9$, $p = .06$ (clinical mean of 4.7, SD of 3.3; subclinical mean of 6.8, SD of 2.5). Both groups reported the feared consequences as similarly catastrophically severe (clinical mean of 9.1, SD of 1.6; subclinical mean of 9.5, SD of .8).

The reported implications of these worst-case image scenarios, should they come true, were again categorised according to the four self-appraisal domains utilised by Ferrier and Brewin (2005) and by Lipton and colleagues (2010) in their image-specific study. See Table 20 for full results. Contrary to our predictions, the most frequently endorsed category across groups was the "no appraisal" category. That is, nearly half of clinical and nearly 60% of subclinical participants denied that the image, should it come true, meant anything about themselves (or even the world and others). These individuals tended to interpret the image as a warning or "safety precaution" of some sort (e.g., a "reminder of why I'm doing what I'm doing and why I need to double check. It is my body's warning" [clinical] or "my brain just moves a little too much… and the image is more of a reminder to me…have I done this, have I not done this" [subclinical]). Some individuals truly denied any appraisal at all (e.g., the image was "just visually disgusting" or meant "nothing"). Yet, a sizeable proportion of subclinical individuals appeared to interpret the obsessional images in moralistically negative ways.

Participant descriptions of moralistic self-appraisals expressed concerns such as "I am bad person" or "careless" (clinical), or "that I am violent, that I am angry, that I am sadistic" (subclinical). One individual expressed worries about repugnant images, fearing "that I was a bad person for thinking them…because I thought I was consciously thinking these things and that there was something wrong with me and that I was bad. That I couldn't tell anyone or they would think I was crazy, or think I was evil" (subclinical). Concerns coded under the 'depressed or anxious self' category captured fears of being "incompetent," whereas 'rejected' self-appraisals included interpretations that "I've let somebody down or that I can't be trusted …that I'm not dependable, I'm not loyal or things like that" (clinical). Image appraisals that consisted

of negative personality traits were typically of being “weak,” “stupid” (subclinical), or “that I don’t have the initiative, that I’m not strong, that I’m not powerful” (clinical).

Table 20.

Categorised Appraisals of Obsessional Images Among Interview Respondents.

	Clinical Group (N = 28)	Subclinical Group (N = 14)
No Appraisal	46.4%	57.1%
Moralistic / Dangerous Self	21.4%	42.9%
Depressed / Anxious Self	17.9%	0%
Negative Personality / Flawed Self	10.7%	7.1%
Rejected Self	7.1%	14.3%

3.6 Image-related compulsions. The vast majority of clinical and subclinical participants reported performing some compulsive or compensatory behaviour related to their intrusive images; of note, a small percentage of each group (14.3% of OCD participants and 28.6% of subclinical) denied doing anything in relation to their images. Participant endorsements of image-related compensatory strategies are presented in Table 21. As with the doubt-related compulsions, compensatory strategies are grouped according to their temporal relation to the intrusive image, such that behaviours performed in response to the image (i.e., after the image) are labelled as reactive compulsions, whereas those completed in a preventative manner (i.e., before the image) are called proactive compulsions. Although participants could report both, neither, or one of these types of compulsion, participants invariably did not endorse a proactive

compulsion without a reactive compulsion, and the prevalence rate of reactive compulsions is thus the same as the rate of image-related compulsions in general. Additionally, as with the doubt-related compulsions, we did not attempt to determine whether each behaviour was performed repetitively past the point of functionality; instead, we considered these acts to be part of the repertoire of compulsions assessed to be either clinically or not significantly interfering, consistent with diagnostic status.

Table 21.

Frequency of Endorsement of Image-Related Compulsions

	Clinical Group (N = 28)	Subclinical Group (N = 14)
No Compulsion	**14.3%**	**28.6%**
Reactive Compulsion	**85.7%**	**71.4%**
Distract	53.6%	35.7%
Check repeatedly	50.0%	35.7%
Suppress or block image	50.0%	28.6%
Superimpose acceptable image	32.1%	0%
Reassurance (from others or for oneself)	28.6%	42.9%
Other reactive compulsion	28.6%	21.4%
Wash repeatedly	17.9%	0%
Reshape or correct image	10.7%	14.3%

Proactive Compulsion	**35.7%**	**21.4%**
Distract	14.3%	14.3%
Avoid triggers	14.3%	7.1%
Block image	7.1%	14.3%
Other proactive compulsion	14.0%	0%

Reactive image-related compulsions. Reactive compulsions in the clinical group included the superimposition of more acceptable images (e.g., "happy pictures of my daughter," "things I like," "visualize I'm crossing it out…it's a big X [and] it's wrong," or "imagine myself healthy") or a correction or reshaping of the existing image (e.g., replaying "the tape to the end to where I come home and it's either just a drill that had happened or it was my neighbour that lit her stove on fire and it didn't affect my unit at all"; or, imagining "my hands clean"). Other noted reactive image-related compulsions in the clinical group included recruiting one's "husband to check" and verbal statements ("saying aloud, 'No!'" or in one's head, "go away," or "stupid"). Yet, the most commonly reported compulsions performed in reaction to the images were acts that did not necessitate any such direct interaction with the image (i.e., distraction, suppression, or checking behaviours).

Reactive compulsions in the subclinical group resembled those of the clinical group, with slightly varied distribution of endorsement and some colourful variations (e.g., reshaping the image by "photoshopping it, editing it, the bits and pieces I don't like" or "maybe think of a way to escape"; and other acts like steering widely clear of individuals featured in intrusive images of harm). There was a notable absence of some strategies (superimposing acceptable images and

washing) and less frequent reliance on some (checking, distraction, and suppression), including more reports of no associated compulsion, in the subclinical group compared to the clinical OCD group. In fact, group differences were statistically significant for the superimposing strategy, $p = .025$, Fisher's exact test, but not for reassurance or washing.

Participants were also queried about their aim in performing these reactive behaviours. These responses covered various topics, such as to improve how they felt ("get rid of stress" or "make me feel better"), to stop the image ("get rid of image" or "image will go away"), to satisfy their obsessional concern ("done due diligence" to prevent negative outcome or ensure safety), and to stop the escalation of the episode ("stop cascade" or "not get caught in cycle"). Clinical and subclinical OCD participants alike reported generally perceiving that their reactive compulsions were successful at completing the noted aim (clinical mean of 6.3 and SD of 2.9, and subclinical mean of 6.3 and SD of 3.8).

Proactive image-related compulsions. Proactive compulsions were significantly less frequently endorsed than reactive compulsions within groups, and less frequently utilised by the subclinical (3 individuals) than the clinical group (10 individuals). Indeed, most participants remarked on the fact that it was "not possible" to act proactively, as obsessional images are highly intrusive and difficult to anticipate. Between groups, fewer types of compulsions were endorsed by subclinical than clinical individuals (e.g., no preventative checks or 'other' compulsions). Refer to Table I for results. Proactive compulsions endorsed by clinical individuals that fall in the 'Other' category included checking preventatively, ordering or tidying objects in one's environment, avoidance of triggers (e.g., "graphic images") "to add less fuel to the fire," or saying "NO instantly" at the first sense that an image is forming.

Participants spoke very frequently of their aim to simply prevent the occurrence of the image, with some mentions of aiming to stop the escalation of the episode ("not to go through the whole sadness and the whole [cycle] – all those symptoms that I mentioned"). Both groups of participants noted good success in accomplishing their specific proactive compulsion aim (mean of 6.0, SD of 2.1 in clinical OCD group, and mean of 7.2, SD of 1.9 in subclinical group).

Frequency of image-related compulsions. Detailed results for the frequency with which different types of compulsions are performed across groups are displayed in Table 22. Approximately half of clinical participants reported performing compulsions on a daily basis, both in terms of reactive and proactive compulsions. Frequency reports of subclinical compulsions varied quite widely (though tending to be at least multiple times a week), although results are likely hindered by the very small sample size.

Table 22.

Frequency of Image-Related Compulsions among Clinical and Subclinical Participants.

	Reactive Compulsions		Proactive Compulsions	
	Clinical Group (N = 24)	Subclinical Group (N = 10)	Clinical Group (N = 10)	Subclinical Group (N = 3)
Multiple times a day	16.7%	30.0%	10.0%	33.3%
Once a day	25.0%	0%	40.0%	0%
Two to three times a week	20.8%	40.0%	30.0%	33.3%
Once a week	12.5%	0%	0%	0%
Two to three times a month	4.2%	10.0%	0%	0%

Once a month	4.2%	0%	0%	0%
Multiple times a year	4.2%	20.0%	20.0%	33.3%

N.B.: As there are missing reactive compulsion data for 3 clinical participants, that column does not sum to 100%.

Image-related compulsion impairment. Although clinical and subclinical participants alike reported moderately low interference by the image-related compulsions (mean = 3.9, SD = 2.6 for clinical group, and mean = 3.0, SD = 2.2 for subclinical group), there was a notable difference between the rated distress caused by image-related compulsions, $t(34) = 6.4$, $p = .02$, with clinical individuals identifying their image-provoked behaviours as significantly more distressing (M = 3.6, SD = 2.8) than subclinical individuals (M = 1.5, SD = 1.5). Of those participants endorsing compulsions, a small percentage reported actually attempting to resist their compulsions (29.2% of clinical and 16.7% of subclinical individuals). These participants reported moderate to low ability to resist their compulsions, across clinical individuals (mean = 4.9, SD = 1.9) and subclinical individuals (mean = 3.3, SD = .4).

3.7 Correlates between image characteristics and OCD symptom severity. When collapsed across groups using the continuous CSR data, correlational results contradicted our expectations. The only significant correlation was between CSR and rated distress of image-related compulsions, $r = .38$, $N = 36$, $p = .02$. Additional exploration of links between image-related compulsions and OCD symptom severity did not yield any significant correlations, though the relation between CSR and number of reactive compulsion categories endorsed did approach significance ($r = .30$, $N = 34$, $p = .08$). The remaining hypothesised relations between CSR and rated image-related distress, rated interference by the image itself, rated interference posed by image-related compulsions, and rated ability to resist image-related compulsions were

not statistically significant (*r*-values ranging from .03 to .32, *N*s ranging from 9 to 42, $p > .05$). However, it is worth noting that our results are likely limited by low *N* for some variables given low endorsement rates (e.g., rated ability to resist compulsions).

CHAPTER V

DISCUSSION

This study aimed to investigate through clinical interviews the phenomenological experience of obsessive-compulsive episodes in OCD, with a focus on better understanding obsessional phenomena, the chronological nature of events, and the unexplored or poorly understood areas of obsessional doubt and images. In so doing, we interviewed 44 individuals with a principal diagnosis of OCD (clinical OCD group), as well as 21 individuals with a mood and/or anxiety disorder diagnosis but subclinical symptoms of OCD (subclinical OCD group) to serve as a point of comparison. Analyses of their rich responses answered our three main research questions and will inform theoretical understanding and clinical applications in OCD.

I. On the Chronological Structure of Obsessive-Compulsive Episodes

Obsessional forms. The first aim of the study was to clarify the sequential, or chronological, structure of the OC episode by first parsing the obsessional experience into its elemental building blocks (i.e., obsessional forms) and then, once clarified, determining how these elements interact – or not – temporally with compulsions. To the best of our knowledge, this is the first systematic exploration of obsessional forms in recent history and one of the few existing phenomenological studies, thus shedding new and necessary light onto the basic structures embedded in our CBT model. Our study findings indicated that the obsessional component of OC episodes are complex and dynamic experiences perhaps more accurately represented as an obsessional state. Episodes are typically marked by the presence of several obsessional forms, each of which varies in duration throughout the episode. On average, both groups alike reported 3 obsessional forms in the most recent OC episode, with nearly a third of clinical individuals reporting four forms (rarely reported by the subclinical group). In fact, it was

very infrequent for any individual to report only one obsessional form in the episode, which is an underlying and inherent assumption in current theoretical and treatment models of OCD. This is consistent with reports by Reed (1985) indicating that episodes consist of multiple, overlapping forms painting a complex picture, rather than endorsement of only one obsession.

Moreover, the most frequently endorsed obsessional forms in these described episodes were not actually the three typically highlighted in the DSM (namely, verbal thoughts, images, and urges). Instead, the three most prevalent forms – true across clinical and subclinical individuals alike – were intrusive cognitions that were experienced as doubt, sensory phenomena, and an internal voice or narrative. Endorsement rates were high across clinical (80% reporting doubt, 71% sensory phenomena, and 66% internal voice) and subclinical participants (62% doubt, 76% sensory phenomena, and 76% internal voice). Among the obsessional forms noted in the DSM, images were still fairly common (endorsed by just over half of each group), but very few individuals reported general verbal thoughts or urges. These findings highlight the significance of intrusions that appear in the form of doubt, sensory phenomena, and internal voices or narratives.

These prevalence rates for various obsessional forms are very much in keeping with those reported by Akhtar and colleagues (1975), who found relatively low endorsement rates for current DSM forms and a similar whopping 75% for doubt. The high prevalence rate of sensory phenomena is also consistent with existing study estimates of 65 to 73% in the OCD literature (Ferrao et al., 2012; Moritz et al., 2014). It is difficult to ascertain the extent to which these frequencies compare to Reed's (1985) results, given the vastly different categories he used and the ambiguity regarding the boundaries of these forms (e.g., how thoughts differ from ruminations, how the unpopular 'affects' fit within our categories or are distinguished from his

own ‘fears’ category, etc.). Thus, these findings support existing phenomenological studies and offer a point of concern, as they highlight the mismatch between current clinical or conceptual approaches and the phenomena as it is actually experienced at ground level (by participants).

The form that the obsession takes (e.g., doubt, image, voice, etc.) does seem to affect the associated distress perceived by the individual. Specifically, doubt – already most frequently reported in general – was most often identified as the most distressing form among clinical individuals, while nonclinical individuals frequently reported sensory phenomena and doubt to be the most distressing forms in their episodes when present. Somewhat contrary to expectations, given the intrusive imagery literature, obsessional images were relatively infrequently reported to be the most distressing form, often being ranked less distressing relative to other forms. Significantly, these study findings are not necessarily indicative of the distribution of obsessional forms across all episodes, as participants were simply asked to report on a recent episode, and it is unclear to what extent it was representative of their average experience. Further research is necessary to first replicate results, including a more exhaustive ecological sampling study to obtain a truer sense of the prevalence of forms across episodes.

The OCD voice. While further discussion about doubt and images as obsessional forms follows below – and sensory phenomena are explored in another pocket of literature (see Ferrao et al., 2012) – to our knowledge, this study offers the first look into understanding the internal (obsessional) voice and its phenomenological qualities. From participant reports, we can glean that the internal voice is highly prevalent and, while distressing, is not consistently topmost in distressing forms (though typically in the top three). It thus has significant power in provoking distress but does not in large measure – by virtue of its presence – serve as a toxically distressing

obsessional form. Although individuals conceptualise this internal narrative in different ways (e.g., conversation, dialogue, etc.), it is most often described as an OCD-maintaining voice.

The described tone of the internal OCD voice is particularly illuminating and echoes the brief mentions available in literature. When offered some structure within Wiggins' interpersonal circumplex framework, the OCD group experienced their internal voice as a fairly objective or neutral (i.e., neither friendly nor hostile), yet authoritative or dominant, individual who is anxious and worried; about one quarter of the clinical group would experience it to some extent as a hostile but anxious and authoritative figure. The subclinical group were more homogeneous in their description, with the vast majority experiencing the OCD-provoking voice as sounding dominant, hostile, and anxious ("angry," "stern," and "accusatory"). These findings are consistent with those reported by O'Neill (1999), characterising the OCD voice in the case study as dominant and imperative (though almost to the point of threatening). They also echo Hallam and O'Connor's (2002) study characterising the narratives as "voices" that seem to judge a person and engage them in persuasive dialogues about moral conduct.

This difference in tone between groups is a novel finding and interesting in that a non-hostile, dominant, anxious voice may be one that should be obeyed rather than fought, offering a possibility for understanding distinctions between the clinical disorder and subclinical status. One option is that the OCD voice evolves over time into an ego-syntonic presence in the clinical disorder and loses its hostile façade because the individual aligns with (or buys into) the internal voice as something that helps rather than hinders. This would be the opposite of the path outlined by Pugh (2016) in the evolution of eating anorexia. Alternatively, it may be that those individuals whose OCD voice is originally a neutral, dominant voice are consequently driven to develop OC symptoms that reach clinical significance. Indeed, it may feel hard to combat a voice

that sounds concerned and authoritative but objective (like a knowledgeable expert), as opposed to a hostile, critical voice that may be dismissed as unfair or biased and resisted easily.

The quality of the OCD voice may have significant implications, and future research should explore how the internal voice – just like any other obsessional form – tends to be appraised by individuals. Models of auditory hallucinations suggest that the distress linked to those voices is related not to intensity or content of voices but the appraisals held by the individual. Rather counterintuitively, voices that individuals perceive to be benevolent are more likely to be engaged with, provoking greater distress, than those perceived to be malevolent or omnipotent (which are resisted; Pugh, 2016). Indeed, Hallam and O'Connor (2002) posit that compulsions and their associated distress are more intimately linked to and driven by the power of the narrative than by traditional 'catastrophic misinterpretations' or appraisals. More detailed and targeted explorations of the internal OCD voice can further clarify aspects of the experience.

OC episode timeline. Our phenomenological, interview-based exploration of the chronological structure of the OC episode is also, to our knowledge, the first of its kind and adds to existing attempts to elucidate the longitudinal, temporal relationship between obsessions and compulsions. We found that the manner in which these obsessional elements are arranged sequentially amongst themselves (i.e., other obsessional forms) appears to present a fairly diffuse picture, but there is marked consistency in how they interact with compulsive acts. Chronologically speaking, the obsessional form that clinical individuals become aware of first (i.e., most frequently detected first) is the internal voice; as the OCD voice narrates the symptom-provoking stance, this finding perhaps explains the heavy focus on verbal cognitions within current models and treatment. The internal voice is also frequently endorsed as the initial form for subclinical individuals, but sensory phenomena were more commonly reported to

appear first, in keeping with their sense of distress. There was fairly even endorsement (16-19%) between three other forms (image, doubt, and sensory phenomena) for the clinical group; only doubt in the subclinical group approached this level of frequency (14%).

Yet, the average duration of obsessional forms (measured in terms of the proportion of the entire episode length it is present) varied somewhat between clinical and subclinical groups. When present in the episode, all obsessional forms are fairly persistent in clinical individuals, lasting on average at least 40% of the episode, with nearly all forms extending through most of the OC episode (≥50%). By contrast, the distribution of durations in the subclinical group was split, with either very brief experiences of the obsessional form (15-25% for verbal thoughts and images) or markedly persistent states (over 60% of the episode length). Significantly, it appears that doubt and the internal voice are consistently enduring obsessional forms across both groups, lasting approximately 70% and 60% of the episode, respectively. The 'Other' category, most often capturing diffuse affect or fear, though infrequently endorsed, was similarly long lasting across clinical and subclinical individuals (70%). Reports differed on the sensory phenomena front, which occupied approximately half of clinical episodes but the majority of subclinical. It is conceivable then that clinically significant episodes differ from subclinical not in the number of forms experienced but in the extent to which the forms endure in the episode. Importantly, these results highlight that among those meeting diagnostic criteria, OC episodes are marked by layered and overlapping obsessional forms which may stop and start across the episode but do not appear one at a time. This may compound distress by virtue of their entwined nature.

Participants were also asked to reflect on what form seemed to predominate in the episode, in order to assess their subjective experience of the most overwhelming, dominant, and/or distressing aspect of the episode. Results echoed the duration and distress findings, with

both groups noting doubt and internal voice as predominant forms, with the even more frequent report of sensory phenomena in the subclinical group. Of note, the persistent 'Other' category is not mentioned anywhere. Thus, regardless of the self-reported persistence of individual forms, the subjective experience of predominating obsessional forms align with distress and duration ratings, once again highlighting the significance of doubt and internal voice across groups, as well as sensory phenomena in subclinical individuals.

Thus, obsessional states are complex and dynamic experiences even before compulsions enter the equation; once present in the episode, compulsions also overlapped with the obsessional forms for nearly all participants. That is, the vast majority of all participants stated that at least one obsessional form appeared concurrently with part or all of the compulsive act. Some participants detailed how the presence of the obsessional forms during the compulsive act contributed to the urge to repeat the compulsion or fuelled the need to perseverate with the compulsive behaviour.

Moreover, nearly all participants – clinical and subclinical alike – reported that elements of their obsessional forms extended beyond the conclusion of compulsive acts (sometimes specifically after any one iteration of the compulsion). This occurred sometimes when the entire obsessional form began anew, prompting a full repetition of the compulsion (e.g., a voice that intrudes after an attempt at cleaning and prompts further cleaning again). At other times, there was simply a continuation of the obsession that exceeded the length of the compulsive act and thus continued to fuel repetitions of the compulsion (checking, washing, etc.).

Together, these findings suggest that obsessions and compulsions are significantly more dynamic and interlinked than the CBT model currently assumes, with compulsions overlapping temporally with obsessional forms, obsessions extending beyond the completion of a

compulsion, and even obsessions initiating anew after a compulsion has concluded. This is true of clinical and subclinical participants alike. Specifically, these results contradict the sequential and mutually exclusive or chronological manner in which current treatment models and theories portray OC phenomena.

These findings support the goal-directed model, as participant descriptions clearly indicate that obsessions provoke compulsions longitudinally. It is unclear whether elements of the descriptions can be interpreted as supporting the reciprocal model, as the doubt findings and descriptions of obsessional doubt content that transpire after the compulsion may possibly offer support for habit-driven model sequencing. Specifically, while we have examples of obsessions that onset or arose after the initiation and/or completion of compulsions, we did not inquire as to whether these were causally linked, or if the compulsion influenced in some way the onset of the obsession. It is entirely possible that obsessions would have recurred on their own in time, completely independent of the occurrence or presence of compulsions in the cycle. Additionally, it is worth noting that not all acts after which these individuals reported doubt are necessarily compulsive in the defined sense (i.e., repetitively done or performed in a way that surpasses its function), as this level of distinction was not assessed in our study. Moreover, this level of proof is not evident in other obsessional forms. Further research can clarify these points.

These outcomes also challenge the idea that the episode terminates at the end of the compulsion, like one neat cycle of obsessional thought producing a compulsive act that terminates the episode. Indeed, the dynamic nature of the obsessive-compulsive state may be better depicted as a whack-a-mole like experience or multi-pronged, like the mythological Hydra with its many, ever-generating heads. These analogies highlight the extent to which such a layered and iterative experience may be chaotic, distressing, and difficult to combat.

How then do episodes terminate? Only one quarter of clinical participants reported that their OC episodes ended at the conclusion of the compulsion (as current thinking would imply), with an even smaller 10% of the subclinical group reporting the same. Instead, the majority of individuals relied most on the obsessional forms or the obsessional experience subsiding as an indicator that the episode was over. This criterion encompassed statements such as, "I didn't think about it again"; "everything was (all the doubt and thoughts were) gone, evaporated"; intrusions "stopped"; the internal voice because "quieter" than other thoughts so s/he could focus on other things. The use of internal feelings as criteria to know the episode was over was also frequently reported, though this transpired to a lesser extent. Such internal feelings used to determine that the episode was determined were most frequently described as "relief," a "release," a "psychological exhale," sense of being "done with this," "it's okay" feeling, sense of being "right," and a sense of "just know[ing]" it was clean. Chi-square test results indicated no significant difference between groups, though it is tempting to wonder whether clinical respondents grow to rely less on the obsessional experience subsiding as a termination criterion and more on other categories (completion of compulsion, internal feelings).

In describing their termination criteria, respondents struggled to report exactly the number of criteria at which their threshold for concluding the episode was met; instead, they tended to describe their experience just prior to and at the end of the episode. We were able to code the number of categories respondents used, which did not differ between groups at just over one criterion endorsed. Our study thus did not support the findings by Wahl and colleagues (2008) which found that individuals with OCD use more criteria to terminate their OC episodes. Rather, these findings suggest that they tend to persist with compulsions and/or struggle with obsessional distress *until* they achieve their particular termination criteria of choice.

In OC episodes, then, people do not tend to rely on cues from their compulsions to determine that their episode has ended. Instead, they rely heavily on obsessional cues and require input from their obsessional experience and/or some other subjective feeling to know that it has ended. More research is needed to clarify how they choose these criteria and whether this evolves over time as diagnostic status changes, or if the strategy remains static across time, ultimately driving clinical status. Moreover, it is unclear at this time whether the episode persists because of a threshold issue (i.e., the *level* at which the termination criterion is met is simply too high to be perceived for some time) or if it is a difficulty in achieving a very normal threshold (i.e., the level at which the termination criterion is appropriate, but the individual cannot access or does not feel confident in it for some time).

The chronology of the OC episode requires further attention, and additional research will be required to concretely confirm whether the reciprocal model of OCD is the best fit (as opposed to the consistently supported goal directed model) and how bidirectional relations might affect treatment. These results also suggest the need to at least include these dynamic relations in the CBT model, both within the obsessional state (i.e., between obsessional forms) and between obsessions and compulsions. This more involved interplay between OCD phenomena, specifically the recurring nature of obsessional forms within an episode itself and their power in provoking perseveration and repetitions of a compulsive behaviour even after its conclusion, is likely currently being overlooked. This would help inform how the episode – and furthermore the disorder – is maintained. Significantly, we lack some significant pieces of information, including how an influential form, such as obsessional doubt, might contribute to the OC cycle.

II. On Obsessional Doubt

The second aim of this study was to understand how doubt is experienced, appraised, and neutralised by individuals with OCD. To the best of our knowledge, this exploration was the first attempt to define doubt in the obsessive-compulsive experience by interviewing individuals on their lived experiences. This has enabled us to operationalise OCD doubt using a bottom-up approach, that is, driven by descriptive data from participants themselves, rather than a top-down approach, hypothesised and arbitrarily settled upon by researchers. These novel insights stand apart from the existing literature, which reveals a scattered landscape, in which researchers conceptualised and therefore tested their own definitions of doubt in silo-like fashion without directly exploring the phenomenology of obsessional doubt among individuals with OCD.

Doubt characteristics. From participant descriptions, it is clear that doubt is so prevalent that it is experienced by nearly all individuals with OC symptoms at some point across their life, subclinical and clinical alike. Moreover, for those who endorsed having experienced OCD doubt at some point, it appears to occur in the vast majority of their OC episodes, thus continuing to exert its distressing and interfering presence. This doubt is difficult to dismiss, highly real and convincing in the moment – even though the individual recognises it to be excessive – and almost always anxiety-provoking. The manner in which the doubt manifests across groups is also varied, predominantly being experienced verbally, like a stream of thoughts, and even a sensory experience in the body. While the strongly verbal presentation might be tempting to subsume under verbal thoughts and/or the internal voice, it is important to note that doubt was identified by individuals as a form distinct from both of these forms (and was queried about and thus endorsed after them). The strongly verbal presentation of this obsessional doubt – albeit often more complexly accompanied by other sensory experiences – can be understood as perhaps part

of the *format* in which this obsessional form appears. It is also possible that the highly verbal or storytelling way in which we inquired about this experience – and in which people often make sense of experience – may colour this endorsement.

In our experience interviewing participants, OCD doubt is an elusive phenomenon that requires significant insight and/or emotional awareness by the individual to pinpoint and describe, even when guided clinically by a knowledgeable interviewer, further explaining why experimental tests of the concept struggle to shed a light on the lived experience and/or coalesce with other experimental studies. Significantly, a fascinating clinical presentation of doubt is as a "felt knowledge" (i.e., a drawn inference that arrives, complete and convincingly, that for instance the door is not locked or the stove is not turned off), which might make it more powerful and difficult to combat, much like the authoritative but neutral internal voice.

Definition of OCD doubt and its content. The content of the doubt as identified by the individuals themselves – i.e., what they consider their doubt to be about – is fairly diverse, encompassing various themes or domains. The three coded categories we identified seem to capture a wide range of content, and thus comprise our definition of OCD doubt. Specifically, obsessional doubt encompasses doubt about one's safety status or the state of things (i.e., did I lock the door or do the task? Is it clean?), whether one's actions were done properly enough to avert harm (i.e., did I lock the door *properly* or *well enough*?), and ultimately one's senses or cognitive capacity (i.e., I remember doing it, but can I trust that my senses are or my memory is correct?). We conceptualise the first doubt content domain as typically provoking an initial compulsive behaviour, with the latter two content domains perhaps explaining perseveration (i.e., repetitions and several iterations) of a completed compulsive behaviour.

The far-reaching nature of these three themes that thus define obsessional doubt may explain why researchers have captured such a scattered, yet often fruitful, landscape in researching OCD doubt. Indeed, many of the doubt literature pockets reviewed in our introduction can be identified as falling within or across our identified doubt content categories. Our first identified category, regarding one's safety status, seems to subsume well the literature investigating doubt as an obsessional content domain or topic (e.g., utilising the YBOCS item, "was I responsible for something terrible happening?"). Papers factor analysing the YBOCS thus target this type of doubt (e.g., Pinto et al., 2007). Our domain further broadens the scope, extending beyond the range of harm-related doubt and adding state-related concerns from other obsessional content domains to it (e.g., am I contaminated? Am I clean? Is the door locked?). This doubt category likely also captures the inferential confusion research by O'Connor and colleagues (O'Connor et al., 2005; Aardema et al., 2009; etc.), which focuses on the individual's distrust of reality (e.g., the door has been locked) in favour of hypothetical, even improbable, dangers (e.g., the door is unlocked). This doubt domain would identify the type of content that the inferential confusion research would explain mechanistically.

Doubt about having completed a task satisfactorily or properly enough, sometimes even in the face of clear and accurate memories, captures our second category. This section appears to incorporate the literature exploring doubt as an obsessional or compulsive form, taken across content domains, like those identified by Akhtar and colleagues (difficulty believing that a task had been achieved to satisfaction; 1975) and Stern and Cobb ('striving for completeness' due to doubt the activity had been completed correctly; 1978). These researchers conceptualised this doubt slightly differently, with the former considering it an obsessional concern and the latter as related to a compulsive form. This does call to question the extent to which the first two doubt

categories have different associations and consequences, as the former is most likely to precede and the latter more likely to follow a compulsive behaviour.

Our last category established from the data, namely doubt about one's senses, memory, or cognitive capacity (i.e., I have a memory of doing it, but I cannot trust my senses, memory, or attention) may encapsulate the literature related to the Seeking Proxies for Internal States model, namely that individuals doubt their internal states (emotions, memory, bodily states, etc.) to such an extent, due to poor access to the information, that it provokes their OCD symptoms. It is also consistent with Nestadt and colleagues' (2016) conceptualisation of doubt regarding internal experiences, although his definition of OCD doubt is firmly embedded in the decision-making deficit research. Marton and colleagues' (2019) Doubt Questionnaire is thus a measure of this specific domain of OCD doubt. Meanwhile, the literature linking OCD doubt to pervasive indecisiveness is likely better conceptualised as a product or outcome of this doubt. That is, the indecisiveness is a behavioural – perhaps at times cognitive – indicator of one of these doubt domains.

The metamemory literature as it has evolved over time does appear to encompass these three doubt themes, albeit with a sole focus on doubt about checking behaviours. While it appears to have begun with a focus on having checked or checked well enough (i.e., our first two categories), it has now extended into a putative mechanism around doubting one's memory, the products of which (checked repeatedly) further fuel the doubt. It thus reflects well the three ways in which we would define OCD doubt within the specific symptom domain of checking (e.g., Radomsky et al., 2014) that could conceivably and easily be extended to the domain of contamination / washing. This begins to support the conceptualisation of obsessional doubt as an obsessional form that provokes compulsions and can appear across various content domains.

Curiously, the questions asked on the YBOCS for the pathological doubt item (Goodman et al., 1989) and utilised in the phenomenological study by Samuels and colleagues (2017) almost perfectly parallel our categories. Of note, our content domains were independently arrived at, as this paper was found in a review of the literature only after we had coded our data. The YBOCS item, which is not typically in use, is comprised of three questions which cover exactly our three domains in a slightly different order: "After you complete an activity, do you doubt whether you performed it correctly? Do you doubt whether you did it at all? When carrying out routine activities, did you feel you didn't trust your senses (i.e., what you see, hear, or touch)?" (Samuels et al., p. 119). While this captures a broader scope than the metamemory literature, as it allows for doubt of activities beyond checking, our conceptualisation offers an even greater scope. Our definition allows for this three-pronged doubt of more abstract concerns, such as one's or an object's state of being (e.g., clean or contaminated) and character or identity (e.g., immoral thoughts of a sexual or blasphemous nature). Might this obsessional doubt that people describe then be a multi-layered state that mimics other types of obsessional forms, in terms of appraisals and compulsions?

Doubt appraisals. Compellingly, obsessional doubt does apparently evoke feared self-beliefs and threaten specific aspects of their sense of self. Reportedly, this OCD doubt led individuals who experienced it to believe primarily that their moral self-worth is compromised or at risk (e.g., I am a monster or danger to others, as endorsed by over half of each group). The doubt itself is personally threatening, and it is often deemed as indicating that they are a bad, careless, or immoral person. These doubt appraisals are particularly powerful, as the threat behind them feels realistic and frightening; the worst-case scenario that participants reported as ensuing from doubt content, should it turn out to be true, was rated as highly likely in the heat of

the moment and maximally catastrophic if accurate. It is perhaps no surprise then that participants would find this obsessional doubt distressing and interfering, as previously described, and feel motivated to end the experience, disprove the content, or negate the appraisal. The 'moralistic self' focus is also consistent with existing literature highlighting the sensitive nature of the moral construct in one's sense of self among individuals with OCD (see Bhar & Kyrios, 2007; Doron et al., 2008).

Other self-appraisals were noted in this sample, with a small percentage endorsing symptom-related interpretations of the self (i.e., as reflecting a hopeless, fearful, 'depressed or anxious self'). This area of self-concept focus is more typically associated with anxious controls (Lipton et al., 2010) but was still associated with a good portion of OCD doubt respondents, likely reflecting the overlapping anxiety experiences and processes. Fewer than 20% endorsed a 'rejected self' appraisal; very few endorsed 'flawed self' interpretations, consistent with the general understanding that a flawed self or "negative personality" appraisal is more typically associated with non-anxious control participants. The diverse endorsement is somewhat surprising although it does highlight the heterogeneity of the disorder and the importance of working within each individual's idiosyncratic belief and appraisal system. It is unfortunately not possible to compare the proportions of each category against those of the Ferrier and Brewin (2005) study population, as they did not tabulate the appraisals by self-related categories. However, these doubt appraisal findings echoed almost exactly the results by Lipton and colleagues (2010) on intrusive image appraisals in OCD, further adding support to the idea that doubt might fit well among the obsessional forms, given its similar appraisal patterns with the image form appraisals.

Across the board, distribution of appraisal categories was nearly identical between the clinical and subclinical group, rather contrary to the idea that it is the catastrophic interpretation that gives it clinical significance. The interpretations from intrusive doubt thus do not differ between those meeting and those not meeting the diagnostic threshold; rather obsessional doubt is consistently compelling in a personally appraised way, and differences in clinical status likely originate elsewhere in doubt-related phenomena. It is unclear whether this suggests that we did not appropriately measure or investigate an aspect of the appraisal experience that would have differentiated the two groups. Alternatively, this may simply reflect that the self-appraisals underlying doubt serve as a necessary stepping stone to the disorder (e.g., a stop on the train prior to reaching clinical status) and it is thus some other characteristics or process that moves an individual along the dimension or continuum from non-clinical to clinical OCD status.

It is worth noting that approximately 10% of each group denied any self-appraisal, and it is unclear whether this reflects poor insight, defensiveness, unwillingness to disclose negative self-beliefs, or true lack of appraisal. We are mindful of the fact that this was the first and last point of contact for participants completing the study, and that the lack of appraisal reported in a more established therapeutic relationship or longstanding alliance may more accurately reflect such an obsessional phenomenon that would exist outside the CBT model. Further research will clarify this aspect.

Doubt-related compulsions. As we expected, obsessional doubt provoked all individuals to perform compulsive behaviours in reaction to the doubt and, moreover, compelled most to act proactively to prevent the experience. It appears that both groups show high frequency of checking in response to doubt, and subclinical individuals for reassurance seeking, but the remaining reactive compulsion categories were well distributed for clinical individuals. It is

difficult to determine if the significant difference between groups on washing behaviours (and the near significance of doubt suppression) may be due to our small subclinical *N* and therefore the limited scope of their reported doubt content. If, however, this remains consistent in a larger sample, it would rather suggest that wash-provoking doubt is a clinical phenomenon and that the doubt suppression strategy is specific to the clinical group.

It is fascinating to note that the subclinical group trended toward relying more on reassurance seeking than clinical individuals. It is unclear whether strategies implemented more frequently by subclinical individuals are actually more effective strategies, allowing them to remain at subclinical status, or if clinical individuals have attempted them but discontinued their use due to lack of success (i.e., it fails at more intense or frequent levels). Perhaps the more illuminating insights will come from more detailed exploration of strategies reported in one group but not at all in the other. Alternatively, it may be that the specific type of strategy used is not significant in achieving respite or relief from doubt so much as it is about what the strategy symbolises or what fears it quells. Support for this notion comes from the fact that rated success of compensatory strategies in subclinical individuals is not significantly higher than that of clinical individuals' rated success. However, it should be noted that respondents were asked specifically to rate success in getting rid of the doubt, which presupposes that doubt removal is their aim. It may be that individuals have other goals (e.g., relief from distress, or achieving some other feeling) rather than getting rid of the doubt, for which these strategies prove more successful or for which they perform other acts.

Significantly, the participants taught us that a strategy often used to prevent doubt is to simply complete a more careful or slower initial behaviour (e.g., check, wash, lock, etc.) in hopes that certainty will be achieved and persist. As we did not directly query all participants about this

strategy, it is possible that more individuals rely on the strategy but neglected to mention it; our findings thus do not constitute true endorsement rates for this strategy, and we are similarly unable to make statistical comparisons between groups. Yet, this meticulous action warrants further investigation to determine whether this is an effective strategy and whether the manner in which it is performed may minimise the doubting experience or restrict OCD severity to subclinical levels. Another important question to clarify whether the habit-driven hypothesis is valid – rendering the reciprocal model the best fit for OCD – is whether such proactive compulsions ever arise before an OC episode even begins. That is, if a pre-emptive action meant to prevent doubt – habitual, perhaps, in nature – does in fact provoke a full iteration of an obsessional state and compensatory compulsions. This would support the reciprocal model in its truest form. Further exploration of doubt-based compensatory strategies performed by individuals, their aim in performing such behaviours, and their perceived success in accomplishing that goal is needed.

Lastly, perhaps a clue in the clinical vs subclinical divide lies in the significant difference between groups in their compulsions, specifically those performed in response to doubt. While proactive compulsions appear to take place at a similar frequency, the highly frequent reactive behaviours may betray any or all of the following in clinical individuals: (1) a higher frequency with which obsessional doubt intrudes, (2) more ineffective compensatory strategies, which allow doubt to persist and necessitate repetition of compulsions, (3) a lower doubt threshold at which the individual feels compelled to react with a compensatory strategy, and/or (4) a more noxious or powerful type of doubt that does not subside on its own and thus actually requires intervention.

The fact that the clinical group find their compulsions significantly more interfering and more difficult to resist than the subclinical group, in spite of their comparable ratings of obsession-specific distress, indicates that the struggle may lie not in one's experience of obsessional doubt or one's appraisal of it but in one's strategies in responding to the obsessional phenomenon. Indeed, significant correlations between OCD symptom severity and numerous doubt compulsion-related characteristics – namely, greater rated interference of compulsions, worse ability to resist compulsions, greater number of reactive compulsion categories endorsed, and less success in achieving proactive compulsions – further supports this notion that obsessional doubt is interfering through its compensatory strategies.

Further research will be vital in clarifying the difference between compulsions or compensatory strategies utilised by those with clinical vs subclinical levels of OCD symptomatology. Specifically, are those with subthreshold OCD simply able to establish a sense of certainty through their pre-emptive or proactive strategies, assuaging their doubt? Do they simply have "tidier" or more effective compulsive behaviours? Consider the compulsion parsing studies that found OCD compulsions to look almost messier (i.e., shared acts with controls with several chains of unique acts interspersed) – is it possible then that messy sections of compensatory strategies degrade rather than facilitate certainty?

Termination of doubt. Groups differed somewhat in the criteria involved in the end of their doubt. Specifically, clinical individuals most often noted their doubt as ending when the compulsion was completed, whereas subclinical participants reported that doubt terminated by subsiding or simply going away (e.g., retreating into the background buzz). A good portion of each of these categories was still endorsed by the other group. This is a fascinating divide, as it would rather support the fourth proposed explanation for the reactive compulsion frequency

results. Namely, in spite of somewhat similar reported characteristics regarding its distress and meaning, it is possible that something about the doubt experience or the individual's own traits in subclinical individuals renders their obsessional doubt a phenomenon that can terminate by just subsiding without behavioural intervention. It is unclear whether this is a matter of: a less powerful or intractable doubt experience in subclinical participants (on a characteristic we did not measure) that permits this subsidence, greater individual ability to tolerate the experience (letting it thus extinguish gradually in a way clinical participants cannot withstand), or superior doubt-related strategy that when compromised contributes to clinical status. Further research will be necessary to clarify this matter.

Of interest, termination criteria for obsessional doubt appear to be distinguishable from overall episode termination criteria. For one, there is minimal endorsement of using an internal feeling or sense to know that the doubt has ended, compared to the episode in general. For another, there is significantly greater mention of compulsion involvement in the obsessional doubt form but not the whole episode. Consistent across both sets of termination criteria is the focus on intrusive experiences subsiding or going away. These initial findings seem to indicate that the experience of the full episode – and efforts to terminate it – is qualitatively different and separate from its most distressing and persistent obsessional form alone. Specifically, methods to terminate doubt do not necessarily align with methods to terminate the episode. Rather, it is likely the case that with its many dynamic parts, the OC episode is a complex and moving target that is more than the sum of its parts, let alone an obsession and subsequent compulsion. This complexity is not accounted for within the model and may explain why current treatments – which are based on a simpler model – seem often not to resolve the distress and/or perseverative drive behind current episodes.

Conclusions about doubt. Results of the first study aim illuminated how the obsessional doubt form is situated within the broader OC episode and relative to other obsessional forms. Specifically, doubt is powerful, often rated as the most distressing, most pervasive, and longest lasting among the forms. In the second study aim, we closely investigated the OCD doubt experience on its own and found that it presents in varied forms but is a nearly ubiquitous, distressing, compelling, cognitive (thought-based) and viscerally felt (involving bodily senses) phenomenon. When defined by individuals themselves, OCD doubt includes concern about one's safety status (Is it locked?), as well as uncertainty about how properly a task was executed (Did I lock it properly?) and one's senses or cognitive functioning (Can I trust my memory of locking it or my senses when I did it?). These discriminations may be important, because they may offer increasingly greater individual responsibility for any possible negative outcome. This obsessional doubt is highly convincing, interfering, and often interpreted in ways that threaten their moralistic sense of self, prompting compensatory strategies in response to doubt and often prior to it arising.

Significant parallels and similarities exist between clinical and subclinical doubting experiences, but aspects of doubt-related compulsions appear to reliably discriminate between the two. Indeed, clinical individuals differ from subclinical on some strategies used, frequency with which they perform reactive compulsive behaviours, and even possibly reliance on compulsion completion as a termination criterion. Compulsive strategies are also intimately connected to doubt-related interference, including direct ratings of elevated interference as well as significant correlations between symptom severity and several compulsion-related characteristics (e.g., ability to resist them, failure to achieve the aims of doubt-preventing behaviours, etc.). It may thus be that the experience of doubt as an obsessional phenomenon is

fairly consistent between clinical and subclinical status, but that elements around individuals' strategies in response to or in an attempt to prevent doubt contribute to or arise out of differences between the two groups.

The metamemory literature (e.g., Radomsky et al., 2014) offers an explanation for how compulsive behaviours – especially those that are repeated – may ironically further drive doubt and maintain or perpetuate the OCD cycle. It is possible that this process may apply to other compulsive behaviours, with frequent compulsions or rehearsal of one's memory further reducing the vividness of one's memory for and consequently one's confidence in that which is being doubted (e.g., contaminated or clean status, completed behaviours, memory, etc.). If this is the case, treatment efforts should be focused at breaking this cycle and attempts to increase certainty and/or tolerate uncertainty. More detailed discussion about intervention efforts follows.

Further research will need to replicate and further extend these findings. On a qualitative note, there was such variability in some aspects of the obsessional doubt experience that it is hardly surprising that the literature is in a state of disrepair. Even when one trained clinician attempted to collect information in a fairly standardised way, different participants spoke about doubt in very different ways, and it was evident at times that the variability made it difficult to use one overall statistic to capture a specific element of the picture (e.g., doubt duration). Nevertheless, participants did readily endorse experiencing doubt and further identified it as such a significant and distressing element of their obsessional experience that it warrants further investigation.

III. On Obsessional Images

The third aim of this study was to clarify how obsessional images are experienced and appraised by individuals in OCD, and what individuals feel compelled to do preventatively or in

response to the intrusions. This interview-based study allowed us to explore OCD images in a more rigorous, detailed, and phenomenologically-rich manner than most existing studies. We were able to implement clinician judgment, focused pre-interview screening for OCD diagnostic status, recruitment of participants with all obsessional forms (not simply images), use of subclinical participants for comparison, and detailed inquiry about all aspects of the intrusive image phenomenon and its associations.

Image characteristics. Our findings suggest that obsessional images are highly prevalent experiences, both across clinical and subclinical individuals and across obsessive-compulsive episodes (when experiencing OCD symptoms, images were present over half of the time). However, the lifetime prevalence of images revealed in our study is lower than the 81-95% reported in the few existing studies on OCD images (Lipton et al., 2010; Speckens et al., 2007). It may be that image-focused papers have thus far yielded an overestimate of image prevalence estimates due to self-selection biases in the recruitment phase of OCD image studies. In couching this exploration within a broader phenomenological study, our findings of roughly 65% represent a more accurate estimate of the phenomenon. The existing studies of OCD images, advertised as in-lab interviews about images, may be vulnerable to inflated prevalence statistics, as individuals who do not experience obsessional images may simply decline to participate in a study about which they know themselves to have no information. Of note, prevalence estimates were nearly equivalent between clinical and subclinical groups, lending further support to the notion that intrusive images, like any other obsessional thought, are a common experience on a dimensional scale – not exclusive to individuals with OCD – that in certain individuals leads to the development and/or maintenance of OCD.

As expected, images were visual, colourful, often video-like in nature, anxiety-provoking, and distressing, much like those specified by Lipton and colleagues (2010) and Speckens and colleagues (2007). Clinical individuals' images were significantly more vivid than subclinical individuals' images. Most images were noted to be seen from a field perspective, with percentage endorsements matching closely results by Speckens and colleagues (2007), which are less dichotomised than Lipton and colleagues (2010). Yet, the images were notably brief across both groups (85% reported a duration of one minute or less and over half of respondents described images that lasted mere seconds), suggesting that images pack an emotional punch in what they represent, rather than distress simply from its ongoing presence. One clinical individual did appear to be an outlier, reporting an hours-long image that persisted continuously, which no subclinical respondent did, though subclinical OCD individuals did report images of more intermediate duration (2 to 15 minutes).

Reported image content domains were narrower in subclinical than clinical participants, though the vast majority of both groups reported experiencing intrusive images that portrayed harm or aggressive outcomes (86% of subclinical individuals and 68% of clinical respondents, similar to the 75% estimated by Lipton and colleagues [2010]). Contamination-related images were reported by a good portion of clinical individuals (28.6%) but by very few subclinical participants (7.7%); the remaining categories were endorsed by few participants across groups (or none, as in the case of social rejection images in subclinical individuals). These content distributions thus tell us that the vast majority of images inherently convey some implied threat of harm or unwanted outcome in the manifestation of the form itself.

In consequence, images are complex emotional stimuli, as previously reported (Lipton et al., 2010), triggering more than anxiety alone – in fact, among clinical individuals, images

frequently provoke difficult moral emotions (specifically, guilt and shame) and sadness. There was a near consensus among participants that anxiety was associated with intrusive images; similarly, (nearly) equivalent proportions of respondents endorsed shame (one-third) and disgust (<15%) with their images, which may explain why images are not often voluntarily or spontaneously disclosed. Significantly, clinical participants stood apart in their uniquely strong endorsement of sadness and image-provoked guilt and anger.

Some phenomenological qualities in this study differed from those reported in the few existing studies of clinical participants. Considerably more of our participants tended to report images that appeared as videos rather than still photos, and even fewer still noted experiencing images in the form of series of photos. This finding differs somewhat from Speckens and colleagues (2007), who found nearly equivalent reports of video and snapshots of photos, a finding more consistent with our subclinical group.

This study also revealed novel aspects of OCD images, such as the fact that obsessional images in the clinical group most often seemed to be created from a mix of fictional material and memories, while those in the subclinical group were split evenly between a mix and pure fiction. This most closely echoes findings by Lipton and colleagues (2010) that 70% of participants with OCD connected their recurrent image to a memory or an earlier event, although even more of the anxious control group reported the same. As we know from imagery literature, connections to actual memories, besides serving as threatening reminders of incidents that have happened in the past, allow images to provoke more intense emotional experiences by drawing from emotions of the lived experiences from which the images draw their fragments. As such, memory-based or associated images may drive individuals to feel additionally compelled to react or act. It is worth noting that it is difficult to know whether the images are originally formed using snippets of

one's memory (i.e., organically, upon first appearance), or whether the individual makes this association as it takes on personal significance, evolving the image over time.

It also appears that clinical and subclinical respondents experience images in slightly different temporal perspectives – nearly half of clinical participants experience their image in the present tense (happening "now") whereas nearly half of subclinical individuals report experiencing it in the future tense. Few individuals reported images as feeling like they occur in the past. The heightened present focus in clinical respondents' images may explain the greater vividness, the slightly different emotional reactions, and the greater difficulty in letting the image be without performing some compulsion. It may be that the experience of the image currently happening (temporally oriented in the present) or, to a lesser degree, imminently about to happen (future-based), renders the threat of the image into something that is more powerful. Such imagined events may provoke similar affective reactions to the real event and lead the individual to feel it is more likely to happen. Further research will need to replicate this finding and clarify more accurately the temporal perspective associated with the images (past, present, or future focus).

Moreover, instead of persisting in one continuous manner, obsessional images are repetitive experiences, returning for nearly 6 recurrences within an episode. One clinical individual did appear to be an outlier, reporting an hours-long image that persisted continuously, which no subclinical respondent did, though subclinical OCD individuals did report images of more intermediate duration (2 to 15 minutes). The consistently visual nature of images, with frequent accompaniment of auditory and tactile sensations, shed light on the very physically felt sense of intrusive images and may help researchers understand why images are difficult to ignore. Additionally, tactile sensations in images were unexpectedly a larger part of subclinical

images than clinical images. It may be that individuals with OCD have greater difficulty accessing physical senses as one of their internal states, as observed in studies conducted by Lazarov and colleagues (2012), and this deficit is particularly noticeable because of the frequency of tactile sensations in images.

Image appraisals. Indeed, exploration of image appraisals yielded interesting findings that differed from those of Lipton and colleagues (2010). The fact that the most highly endorsed category was one of no appraisal, with participants denying any type of self-related interpretation as a result of viewing the images, contradicted our expectations. These individuals who tended to view the images as a warning, safety precaution, or reminder, denied that the content or its related worst case scenario would indicate anything about their sense of self or reflect in any manner on their being. Moralistic self concerns were next most highly endorsed, consistent with our predictions relative to other possible self-appraisals. Curiously, clinical respondents reported feeling that feared image consequences were less likely to happen than subclinical respondents, with both endorsing high severity of consequences.

It is unclear why these striking differences in appraisals may have arisen, as the Lipton study did not explain their self inference assessment process study beyond specifying that they used open-ended questions to collect image-related beliefs about the self. Our own study procedures were similar in that we queried participants using typical core belief exploratory questions often applied in CBT ("what would it mean about you, others, or the world") to ascertain inferred beliefs about the self from the intrusive images. It is possible that the nature of the questioning between studies differed enough to allow insistence that there was no appraisal in our study but an answer for a self-related appraisal in the study by Lipton and colleagues (2010). Indeed, in soliciting image-related appraisals, we were more curious about broad interpretations

about the image, and we thus investigated both appraisals about the image that related to the self and more general appraisals that might exist outside of the self ("how do you make sense of this image?").

Alternatively, it may be that the population and/or the types of images we captured in our interview strategy differed from those in the study by Lipton and colleagues, which resulted in discrepant appraisal results. For example, if our sample included people whose images are not the prominent obsessional concern and play more of a supporting role for other, more distressing obsessional forms (i.e., accompany rather than drive distress), their lack of image-related self-appraisal might actually be true to their experience. By contrast, if the 2010 study happened to recruit participants whose images tend to be the distressing obsessional form that initiates and/or drives the OC cycle, it would make sense that feared self-appraisals would be endorsed by all participants.

Image-related compulsions. Although the vast majority of each group reported doing something in response to the images, with prevalence rates roughly equivalent to that of the Speckens and colleagues sample (2007; the Lipton study did not specifically query about what individuals did in response to images), a notable portion denied doing anything in response to or to prevent obsessional images. Of interest are the findings that, much like in obsessional doubt, subclinical individuals report higher rates of reassurance seeking than clinical individuals, but an absence of some strategies noted by the clinical group (washing, superimposing an acceptable image). As with doubt, it may be worth investigating the strategies themselves to determine if they are in and of themselves particularly helpful or toxic behavioural interventions in relation to the OC cycle and symptom severity. After all, both groups report moderately high success in compulsions meeting their intended aims. At quick glance, it is possible that some compulsions

mimic or closely resemble current treatment approaches (e.g., reshaping or correcting the image, which could potentially approximate imagery rescripting), although the endorsement rate is quite low. Perhaps more detailed queries of most relied upon or putatively effective strategies might further clarify image-related behaviours that keep them at bay vs. those that perpetuate the cycle.

Moreover, similar sorts of patterns arose with image-related compulsions that were observed with doubt-related compulsions. Specifically, there appear to be indications that the struggle or interference offered by obsessional images arises not primarily from the obsessional phenomenon itself but from the compulsions associated with the images. Once again, although distress ratings of the image itself were equivalent between groups, clinical image-related compulsions were significantly more distressing than subclinical compulsions. Associations were significant such that the greater the rated distress of the image-related compulsions, the higher the clinician severity ratings were for the individual's OCD. Even the correlation between CSR and the number of reactive compulsion categories endorsed approached significance, suggesting that compensatory strategies related to intrusive images may primarily drive the interference offered by the form.

Image termination. Rather unexpectedly, the vast majority of participants noted that the images subside or fade on their own. It is unclear whether this is simply a cue they rely upon subsequent to performance of some compulsive behaviour(s) or if it is a truly spontaneous manner in which the image simply "goes away." That is, it is not clear whether the strategies are directly effective at making images subside, or if they are completed regardless of their effect on the image's duration, with the image ultimately terminating on its own. This has important implications on the OCD cycle and therapeutic interventions, given the notable distress associated with the compulsive side. It would be interesting to ascertain individuals' attributions

in this respect and to test these strategies in blanket fashion. Indeed, the moderation in the ratings of how successful the compulsions are at achieving their aim, and the varied reports of the intentions behind their compulsions, make it difficult to make such conclusions. Roughly one quarter of respondents in each group still relied on completion of some image-related compulsion.

Conclusions about images. All in all, this study adds compelling new insights to the literature on obsessional images, as it is one of the few existing phenomenological studies on intrusive images in OCD and is – to our knowledge – by far the most comprehensive study to do so. Our findings across these two research aims offer new perspectives into obsessional images. While the literature suggests that intrusive images are significantly distressing and interfering, contributing to disorder maintenance and severity, our findings suggest that in the context of the entire episode – and relative to other obsessional forms that are present in an episode – images may be comparatively innocuous. This finding requires replication through other phenomenological investigations but is only possible by the broad approach of our interview. Significantly, it appears that image do play a part in the maintenance of the disorder, alongside the other form, but perhaps more as fodder or fuel that continues the episode rather than starting or driving it. Indeed, intrusive images are not as much at the crux of the episode for most individual with OCD as we had thought and research would indicate; in our sample, obsessional image were not a crucially interfering component of the episode.

Obsessional images appear to be less prevalent than expected when more broadly investigated, with 64% and 67% in the clinical and subclinical group respectively endorsing its presence. They appear to focus predominantly on harm content and to be associated with memories (drawing from autobiographical information mixed with fiction) in clinical

individuals. Unexpectedly, the most often endorsed appraisal category was one of no self-appraisals, contrary to existing research, suggesting that the CBT model might not hold true for images in the way we might expect. This does not negate the fact that the images might still be concerning at face value, raising the stakes of inaction, but participants were fairly insistent that they did not catastrophically interpret, at a self-concept level, the meaning of the upsetting images. It is of course still possible that this is a function of poor insight or profound shame, making it difficult to fully emotionally engage in the material to assess appraisals or report to a stranger; additional research can help clarify this point. The high lack of appraisal perhaps explains why a number of individuals denied any compensatory strategies in response to their images. Nevertheless image-related compulsions are significant in that they appear to drive a lot of the distress and interference (symptom severity) suffered by the individual in the disorder.

This study is the first to explore certain new characteristics of images (e.g., temporal orientation of images, image termination criteria, etc.). We discovered that clinical images often feel as if they are happening now, with some endorsement of feeling portentous (future-oriented, as if they are about to happen). When considered in conjunction with the harm content, rated vividness and realness, recurrent nature, and associations with real memories, it is perhaps unsurprising that images, when they appear in the OC episode, serve to maintain distress, aggravate feared self-appraisals, and provoke compulsive action. Curiously, the overwhelming majority of individuals noted that their images terminated by subsiding on their own, which contradicts and erodes support in our current understanding of the CBT cycle.

Of note, the four categories of images reported by De Silva (1986) appear to be well reflected here. Both his obsessional and disaster images categories seem to be encapsulated by typical obsessions in the form of mental images. His compulsive image category also aligns well

with the broad scheme of image-based compulsions, whether produced in response to an obsessional image or an obsession in another form (e.g., verbal thought, doubt, etc.). However, the 'disruptive image' category most closely lines up with a timeline-specific event clarified by our first study aim, namely a resurgence of an intrusive image after or during the completion of a compulsion.

This study is also the first interview study to investigate images in subclinical OCD. These explorations help us better understand that obsessional images might in fact exist on a continuum, much like other intrusive thoughts, as the images of those meeting criteria for OCD are not fundamentally different in phenomenology from those without OCD. In fact, clinical and subclinical individuals reported vastly similar experiences of their images, especially image characteristics, appraisals (or lack thereof), and termination criteria. Slight differences arose in vividness ratings and compulsion-related characteristics (and one strategy), cluing us to those elements that contribute to diagnostic status and might warrant attention in treatment, should it be deemed helpful.

Theoretical Implications

Results of this study indicate that there may be a need to update the CBT model in order to capture the dynamic and complex relations inherent in OC episodes. First, the basic elements or building blocks that comprise the obsessional experience are more varied and layered than we assume, with the most frequently endorsed forms consisting of those not even mentioned in the DSM, namely, doubt, sensory phenomena, and internal voice. These forms are identified as more distressing, more dominant, and more likely to be perceived to initiate the obsessional experience. This focus on the form in which obsessional content takes place is significant because of the differential impact that the forms have on the experience among individuals and

their engagement with the content, provoking the rest of the cycle. In particular, there is good evidence that obsessional doubt – capturing many types of obsessional uncertainty – though fairly ubiquitous, can be conceptualised as a form, fitting into the CBT model just as verbal thoughts or images. There is thus some impetus to further explore and update in the model the obsessional forms consisting of doubt and possibly internal voice and sensory phenomena.

Moreover, while current thinking conceptualises obsessions as almost singular events in form (e.g., thoughts about contamination which then washing compulsions), this is evidently oversimplified. Significantly, these obsessional forms tend to persist, overlapping with each other through much of the OC episode and ever co-occurring with the compulsive act(s). Contrary to the position widely held by the CBT community (e.g., Rachman, 1997; Salkovskis, 1985), the vast majority of these obsessional forms then extended beyond the termination of the compulsions, or onset again after the completion of the compulsive behaviour. It may thus be more helpful to think of the obsessional experience as an obsessional *state*. This obsessional state would itself be a dynamic and flowing entity with forms interlinked, starting and stopping or interacting amongst themselves. The obsessional state would then precipitate and serve as a backdrop for compulsive and compensatory behaviours, either persisting throughout or ebbing and re-intruding at the same time as the acts. There seems to be consistent support for the goal directed model and some possible indicators for the reciprocal model, but additional investigation is necessary to properly clarify whether the obsessions that recur after compulsions are longitudinally related to compulsions or do so independently. These findings echo Reed's (1985) cautions that the obsessional experience is more like a complex, interconnected web than it is the simple picture painted in models of the time.

Given this dominant positioning of the obsessional state, it is perhaps not surprising that OC episodes were determined by participants to be over through use of termination criteria that typically did not involve the compulsion, focusing instead on the absence or subsiding of the intrusive obsessional experience or the presence of another subjective internal feeling or sense as proxy. It is also possible that these results support the Seeking Proxies for Internal States model posited by Lazarov and colleagues (2012), if we conceptualise the internal feelings as a proxy for internal states that the individual cannot reach (e.g., the relative absence of a distressing obsessional form). It is conceivable that the framing of some of the criteria (waiting for the onset of new feelings, such as relief or release, or the ability to "focus on other things") serve as a proxy for internal states that are difficult to access or achieve (e.g., the relative absence of a distressing obsessional form). Of note, these termination criteria results offer strong support to the SMS posited by Szechtman and Woody (2004). Several descriptions of OC episode termination criteria closely resemble their description of yedasentience, especially in terms of the internal feelings experienced (e.g., "just knowing" that the object was clean, a sense of "being done," etc.). Further research will be necessary to clarify this.

We also know that concern about the obsessional content prompts individuals to react after their occurrence and, in some cases, pre-emptively intervene before the obsession even arises (proactive compulsions, as we have termed them). This provides a new angle into the ways in which individuals might further fuel the OC cycle, prime the self-appraisal, or provoke obsessional distress without directly interacting with the obsession itself. Indeed, this may highlight a pathway between self-appraisals and compulsions that does not (yet) involve the obsession directly. More research needs to be completed to determine the impact of proactive

compulsions, especially whether there might be scenarios where they help more than they hinder. Their place in the CBT model and cycle is not immediately clear.

The more detailed phenomenological investigations into doubt and images call into question the role of the appraisal in the maintenance of the disorder. While there were strong endorsements of problematic self-related appraisals in relation to obsessional doubt, there was weaker support among obsessional images. It is unclear at this time whether this is a finding specific to the image form but not to doubt or thoughts. At one level, it is possible that images are largely sensory experiences that provoke emotions by non-verbal pathways, making it either difficult to ascribe verbally-based impressions to it or leading such verbally-mediated appraisals to not exist at all. At another level, it may be that the appraisals simply allow obsessions to evoke more powerful distress or are only associated with the primarily distressing obsessional form for the individual (which was not often the image). This would make obsessions with appraisals and those without almost different rungs on the hierarchy of distress and interference. Alternatively, it is possible that, as Szechtman and Woody (2014) have posited, appraisals can be produced but are not fundamental to the disorder cycle. Further research into various obsessional forms and their appraisals will need to clarify this point; in particular, comparisons between verbally-mediated forms (e.g., internal voice and doubt) and non-verbal forms (e.g., sensory phenomena and images) will be particularly useful in determining the role of the appraisal.

Moreover, these findings do debunk the model by Robbins et al. (2012) positing that OCD should be named COD. Indeed, there is such a strong presence of obsessional phenomena and detailed, consistent ability to report on various aspects of these obsessional forms that obsessions cannot simply be epiphenomena following from compulsions. Instead, the frequent similarities between obsession characteristics investigated in our interview (albeit only images

and doubt), as rated by clinical and subclinical individuals, support the notion that obsessions are dimensional phenomena that exist on a continuum. The obsessional experiences described by those with clinically significant OCD and those without are not categorically different phenomena, especially at the obsessional level. Instead, the diagnostic status appears to become apparent through compensatory strategies, especially with respect to the number and frequency of reactive compulsions, though their impact on appraisals may require further investigation.

Clinical Implications

These theoretical modifications may also be helpful in clinical practise across assessment and treatment. In understanding the true sequential order of OC phenomena, it is clear that there is a need to carefully assess and clarify for each individual the manner in which their obsessional forms (what type and number) arise and interact, not only amongst themselves but their interplay with compulsions. Do the obsessions persist throughout the compulsive behaviours, making it difficult to stop, or do they make a resurgence after the completion of these acts, prompting repetitions that are difficult to resist? Verbal reports from some respondents informed us that this type of insight, outside of any actual intervention, offered some therapeutic relief for the individuals, as it helped to distill and explain their chaotic experience and provided a framework for understanding their distressing episode. Moreover, parsing the confusing episode into its component parts provided participants with some semblance of control and the opportunity for spontaneous intervention of their own (e.g., the ability to observe the absurdity of the images or doubt, etc.).

Targeted intervention may also be possible following this individual chronological formulation. For example, identifying and understanding the cues currently used to determine when the episode has terminated may allow individuals to modify them accordingly. Behavioural

experiments can be used with earlier or more practical termination points determined ahead of time, according to updated termination criteria from a better-understood episode experience. In so doing, individuals would concurrently learn to tolerate the sensations or anxiety, allowing it to extinguish, and challenge thoughts or beliefs about what might happen as they learn that outcomes remain benign and fine.

Due to the highly prevalent and distressing nature of these forms, it will also be important to inquire specifically about obsessional doubt, the presence of an internal voice, and sensory phenomena in the episode. Finding out more about the tone in which the narrative takes place, how the individual engages with it, and whether it is accordingly resisted can offer an avenue into behavioural experiments to challenge the compelling OCD ideology. Treatment would then possibly focus on countering this internal voice and learning whether its tone shifts unhelpfully (e.g., more hostile, urgent, and/or dominant?) through CBT exposures or behavioural experiments. The introduction of a compassionate, affiliative therapeutic clinician (and later internal) voice may be helpful in convincingly contrasting (especially from an interpersonal circumplex perspective) this OCD voice. Similarly, inquiring after and attending to sensations that may insidiously perpetuate the cycle or heighten distress will allow interventions such as behavioural experiments and/or opportunities for exposures with response prevention aimed at tolerating the sensations. Assuming that these obsessional phenomena are distressing and disorder-maintaining clinical phenomena in OCD, failing to address or target them in an appropriate manner may contribute to treatment nonresponse in OCD.

We are also able to comment in more detail on the obsessional forms we more closely investigated. Findings from our doubt exploration suggest that it is necessary to investigate the manner in which their doubt manifests, its content, and – perhaps often overlooked – what

individuals might be doing proactively to avoid doubt's occurrence. It may be helpful to explore behavioural strategies, such as: tolerating the doubt without intervening (as exposures with response prevention or behavioural experiments); completing simply one iteration of the compensatory behaviour without repetition; and perhaps incorporating more careful attention to the sensory experience to make the memory more vivid.

Cognitive strategies may also be important, beginning with understanding the manner in which their doubt initiates and/or maintains the OCD cycle and ensuing distress. It may also be helpful to identify the appraisals being made in relation to their sense of self (What does the individual think the obsession and its content reveals about him/herself? How is it personally threatening?) and evaluate its accuracy appropriately. The questions utilised in the interview invariably extracted from individuals direct self-appraisals and may thus be helpful in this purpose. Core belief work (often used in CBT) focused in this manner may render these intrusive obsessional forms less compelling and thus more tolerable without compulsive intervention. Cognitive intervention may also require individuals to challenge their worst-case scenarios with most likely outcomes and clarify and strengthen their self-concept, especially in the moral domain. Other helpful and necessary strategies may become clear as the obsessional doubt phenomenon is further clarified.

Currently, assessment of obsessional imagery has not yet become a standard part of clinical work and may thus be underreported if neither the client nor clinician know to distinguish between thoughts, impulses, and images. Of note, if the CBT model does not actually apply well to the non-verbal imagery experience of individuals with OCD, then CBT strategies may doubly fail to treat OCD. That is, verbally-based CBT with ERP may neglect to reach image-related distress and impairment, unless clinicians specifically attend to the OCD images,

and will not detoxify this type of obsession if that is not the mechanism of their maintenance. There is some indication that self-appraisals still apply to some individuals' images, and they may thus still benefit from CBT. For those endorsing no appraisals, there are a variety of imagery-based treatments that might be noteworthy. Specifically, imagery techniques can exist on two dimensions: (1) targeting intrusive negative imagery as opposed to promoting positive imagery, and (2) addressing and working with the image either directly or indirectly. For example, direct image-based strategies encompass interacting with the image itself by way of imaginal exposure, imagery rescripting, or creating new and positively valenced imagery. Indirect strategies, on the other hand, conceptualise the image as a mental representation and thus more broadly aim to intervene by offering imagery-competing tasks, focusing on mindfulness strategies, or even retrain one's attention (Holmes et al., 2007). It is possible that the comparatively lower distress provoked by images indicates that the relative benefit of targeting images will also be less than that of more distressing forms (e.g., internal voice or doubt). Indeed, it may be that image-specific interventions are 'low-hanging fruit' for individuals whose primary obsessional complaint is not of images. It may be worthwhile exploring its power as an adjunctive treatment.

Limitations

To the best of our knowledge, this exploration was the first attempt to phenomenologically explore and elucidate the chronology of the OC episode, as well as define and explore doubt in OCD, by interviewing individuals on their lived experiences. This has enabled us to rebuff assumptions about the nature of obsessions and their (seemingly) straightforward relation with compulsions. This was possible through a wide-angle approach (i.e., setting the scene with the episode at large first) before focusing on obsession-specific

queries. This broad approach also instills confidence in our prevalence estimates, as there would be minimal concern for selection biases toward specific obsessional forms. Yet, significant questions remain about certain aspects of the obsessional experience, as revealed in gaps in our study, and it will be helpful for future research to address these phenomenological questions. Specifically, clarifying the role that image appraisals play, as well as gathering more information about the internal voice or narrative and its possible place as an obsessional form alongside sensory phenomena.

These findings have also allowed us to operationalise OCD doubt using a bottom-up approach, that is, driven by descriptive data from participants themselves, rather than a top-down approach, hypothesised and arbitrarily settled upon by researchers. These novel insights stand apart from the existing literature, which reveals a scattered landscape, in which researchers conceptualised and therefore tested their own definitions of doubt in silo-like fashion without directly exploring the phenomenology of obsessional doubt among individuals with OCD. In a similar vein, our own questions regarding the experience, while attempting to remain open-ended, are yet guided by our conceptualisations of doubt (e.g., inquiring about conviction, the way in which it manifests, etc.). As such, our results are not nearly as driven by a bottom-up approach as a purely qualitative study.

Another strength is that each participant interview was conducted by this author, who is trained in clinical assessment, offering both trained clinical judgement and consistency (removing interrater variabilities in how questions asked and how answers rated or interpreted). Yet, we recognise that this study was limited by a small subclinical OCD group sample, and participants' retrospective self-report will necessarily be skewed by hindsight bias and filtered through their own understanding of their obsessional experience. As always, it is also possible

that demand characteristics contributed to participant responses, in spite of attempts to ask open-ended questions of participants, by the types of questions being asked by the researcher.

We also recognise that the explorations into compensatory strategies did not offer an exhaustive check into whether each reported behaviour was conducted in an excessive and/or time-consuming manner, given our lengthy interview and its time constraints. Instead, the entirety of the behaviours performed in relation to the obsession were confirmed to meet compulsion criteria. As such, it is difficult to ascertain if some individual behaviours may not be as repetitively performed or excessive in terms of its intended functionality as we would expect of truly defined compulsive acts. On the other hand, it is possible that compulsions may be better understood as a repertoire of acts performed with some distress- or obsession-related intent, rather than a more singular action performed repetitively. Later studies will need to clarify this, as it may distinguish those helpful acts (i.e., appropriate and helpful in terminating the episode) from those that maintain the disorder cycle.

It also should be noted that the use of a clinician-administered interview to investigate these issues is limited due to the nature of retrospective participant report. Reported recollections may be distorted by the participant's own ideas about the order in which events typically occur, rather than the actual order of the phenomena, or may be coloured by the very post-hoc rationalisations bemoaned by Robbins and colleagues (2012), resulting in participants misremembering the true sequence in a more rationally explicable manner. Given that this appears to be the best available methodology, results will have to be interpreted with these limitations in mind. Future research can undoubtedly advance both study methodology and findings with broad clinical and theoretical benefits.

Conclusion

All in all, these study findings highlight the need to update some key elements of the CBT model widely used to understand the development and maintenance of OCD and to treat the disorder. It appears that our current understanding of OCD is somewhat incomplete, as it fails to capture significant elements of the OC experience and the correct chronology of events. Given that these results diverge in ways from our current assumptions, there is a need to acknowledge that the obsessional experience may in fact be a dynamic state consisting of multiple, interlinking forms that start and stop throughout the episode, driving distress. This obsessional state likely serves as a backdrop that persists through and extends beyond the compulsive experience, which itself must be broadened to capture compulsions performed preventatively (prior to distress) in addition to reactively (after obsessional distress). Of import, obsessional doubt and the internal OCD voice are overlooked but highly impactful forms and warrant further theoretical and clinical investigation. This research thus offers another way of investigating the OCD experience and a clarified foundation from which we can develop a better understanding of the development and maintenance of the disorder. Moreover, we are hopeful that by targeting overlooked forms and their related self-appraisals and compulsions in therapy, individuals with OCD may improve their understanding of the disorder and respond better to treatment.

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Appendix A

Summary Report on Preliminary Imagery Study

Methods

Participants. Participants were 54 members of the community assessed in the past several years using the Mini International Neuropsychiatric Interview, Version 6.0 (MINI 6.0; Sheehan et al., 1998) and the OCD module of the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV; Brown et al., 1994) for those assessed before DSM-5 and, post-DSM-5, the MINI 7.0 (Sheehan, 2014) and ADIS-5 (Brown & Barlow, 2014). Forty-two individuals were diagnosed with clinically significant OCD (61.9% according to DSM-IV-TR criteria and 38.1% according to DSM-5 criteria). The subclinical sample comprised 12 individuals with a principal diagnosis of another DSM disorder (16.7% assessed according to DSM-5 criteria) but who reported OCD symptoms that did not reach clinical significance (i.e., symptoms did not occupy over one hour per day and/or were not associated with distress or impairment in functioning).

OCD was the principal or co-principal diagnosis for 74% of clinical participants; other principal or co-principal diagnoses included social anxiety disorder, panic disorder, agoraphobia, specific phobia, major depressive disorder, bulimia nervosa, generalised anxiety disorder, posttraumatic stress disorder, and dysthymia. Clinician severity ratings (CSRs) from the ADIS were assigned for all participants. According to the scale, a CSR of four or higher denotes clinically significant difficulties. Participants in the clinical OCD group were 83.3% female with a mean OCD CSR of 5.1 (SD of 0.8) and a mean age of 29.6 years (SD of 8.7). Subclinical OCD participants were 83.3% female with a mean OCD CSR of 2.6 (SD of 0.5) and a mean age of 26.2 years (SD of 4.0).

Procedure. Participants were recruited by email from an existing participant database and provided with a link to the study, designed on the Qualtrics platform. After informed consent was obtained, they were provided with a definition and several examples of OCD-specific obsessional thoughts and asked to identify and describe the most distressing obsessional thought from the past week they had experienced. Participants then identified the form in which they had experienced the thought (i.e., word-based thought, image or picture in one's mind, or impulse). If they did not immediately identify an obsessional image, they were prompted further (e.g., "Did you experience any images associated with the thought" or, eventually, "have you experienced any intrusive images ever?").

All participants who reported an intrusive, recurrent image at any point in the study were asked to describe the image, verify its recurrent nature, and report on several characteristics. They were asked to rate the frequency, duration, perspective, sensory experience, and vividness of the image, among other characteristics. Participants also reported on the distress and interference associated with the intrusive image, the strategies they used to get rid of the image, and the perceived success of those compensatory strategies. All ratings were completed on an eight-point Likert scale. In appreciation of their time, participants were entered into a draw for two $50 gift cards. See Figure 1 for study outline.

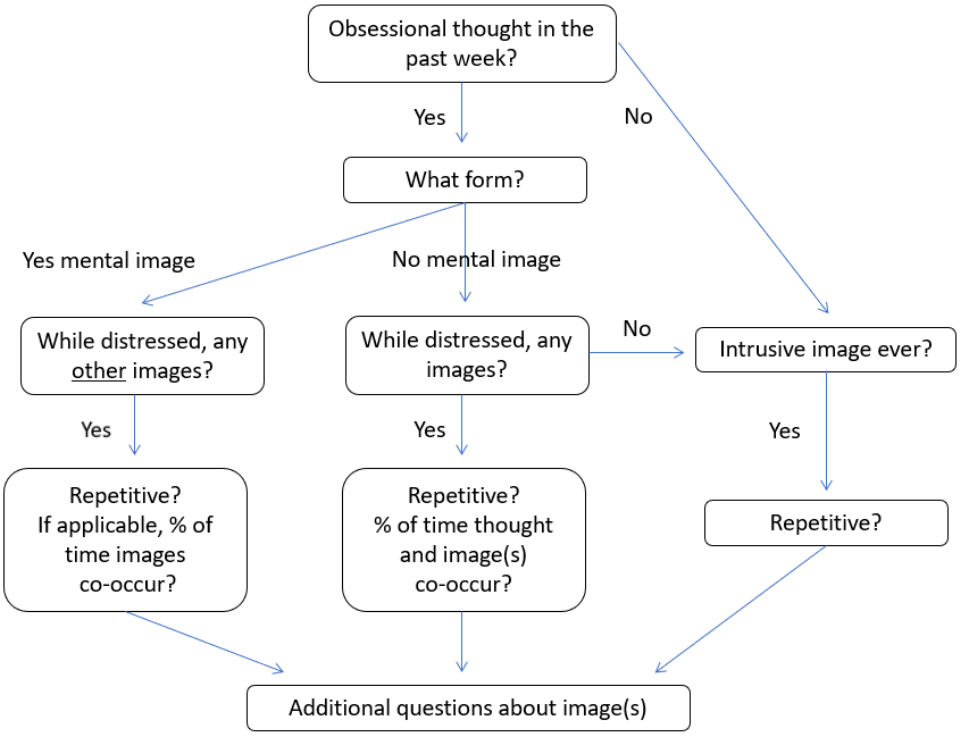

Figure 1. Procedure for online study of intrusive images.

Study 1 Results

Content of obsessional thoughts. All but three clinical participants (92.9%) reported experiencing an obsession in the past week, whereas 66.7% of subclinical participants reported experiencing an obsessional thought in the past week. The content of the obsessions/obsessional thoughts reported by participants was categorised according to content domains used by Radomsky and colleagues (2013) in a multisite study of intrusive thoughts: contamination, doubting, harm-related, religious or immoral (i.e., repugnant), sexual, and other obsessions. An additional category, symmetry/exactness (e.g., not just-right experiences), was added because there is good evidence for its existence as a distinct content domain (Goodman et al., 1989) and in OCD literature (e.g., Coles, Frost, Heimberg, & Rheaume, 2003).

Obsessional content in the clinical OCD group was distributed widely across the content domains. See Table 1 for details. The most commonly reported type of intrusive cognition pertained to harm, injury, or aggression. Obsessions categorised under "other" were surprisingly similarly common, most typically capturing superstitious fears (e.g., "unable to enter certain areas of my house [for fear of] something horrible happening") or imagined failures (interpersonal conflict or failing to achieve personal values) that were difficult to categorise under other OCD domains. Doubting intrusions were the next most commonly reported among clinical OCD participants, followed by contamination concerns. The least common intrusion types were symmetry/exactness, religious/immoral (i.e., repugnant), and sexual obsessions. Those in the subclinical OCD group reporting a recent intrusive thought described a much narrower set of obsessional content, only endorsing three types of obsessions overall. Doubting

obsessions were most common among subclinical participants, followed by harm / injury / aggression and contamination intrusions.

Table 1.

Percentage of Online Respondents Reporting Obsessions of Specific Content Domains

	Clinical (N = 42)	Subclinical (N = 12)
Harm/Injury/Aggression	23.8%	16.7%
Other intrusion	23.8%	--
Doubt/Checking	19.0%	33.3%
Contamination	11.9%	16.7%
Symmetry/Exactness	4.8%	--
Religious/Immoral	4.8%	--
Sexual	4.8%	--
No obsession	7.1%	33.3%

Prevalence of intrusive images. Of 42 clinical participants, 25 individuals (59.5%) experienced their most recent obsessional thought in the form of a mental image or picture. When prompted further, an additional 5 participants (11.9%) – who had denied experiencing their most recent obsession as an image – reported that an intrusive image did accompany their verbal or urge-based obsession; images reportedly co-occur with these alternative forms 63.4% of the time on average (range 30 to 90%). A total of 36 (85.7%) participants reported experiencing intrusive images at some point in their lifetime. These intrusive images were largely noted to be recurrent (97% of participants).

Similarly, of the 12 subclinical participants, 6 (50%) reported experiencing their most recent obsessional thought as an image. The remaining 6 participants reported that their obsessional thoughts are not accompanied by images, nor had they ever experienced intrusive images in their lifetime.

Content of intrusive images. Given that not all obsessional content co-occurred with, or was even linked to, intrusive images, the content of the intrusive images was categorised separately from intrusive thoughts initially described. Reported content of intrusive images was categorised according to the themes identified by Lipton and colleagues (2010) in their interview study of OCD images:

> (1) unacceptable ideas of harm (repugnant images of aggressive or violent harm, harm caused by acts of commission or omission, and catastrophic outcomes),
> (2) contamination and somatic complaints (contamination-related images of illness, disease, uncleanliness, etc.),
> (3) social rejection (images of negative social judgments or humiliation), and
> (4) miscellaneous superstitious or senseless imagery.

Prevalence rates of images according to these content domains are displayed in Table 2. Examples of harm-based images described in our sample of OCD individuals include “my cat

climbing to the windowsill and then leaning on the net and falling through" and "heaps of bodies being cleaned out of a gas chamber, being tortured, skinned alive, set on fire, disemboweled, etc." Descriptions of harm-related images experienced by subclinical participants did not appear to differ from those of clinical individuals. For example, subclinical participants reported mentally seeing "I didn't [check the lock] right and play through the image of it not being locked" or "images of [my husband] hurt somewhere, or having to identify him [at the morgue], or crying over him when he's dead."

No subclinical participants reported any images of other content domains, whereas clinical OCD individuals described other images such as "black, fuzzy, crumbling growths on the inside of my throat" and "paint… on my feet, hands or clothing causing it to spread to unwanted areas" (contamination and somatic complaints). Clinical participants also described images of social rejection ("the reaction [of others] because of the racial slur [I fear I uttered]") and miscellaneous images ("I keep picturing my girlfriend being pregnant").

Table 2.

Percentage of Online Respondents Reporting Images of Specific Content Domains

	Clinical (N = 25)	Subclinical (N = 6)
Unacceptable ideas of harm	74.2%	100%
Contamination and somatic complaints	14.3%	--
Social rejection	5.7%	--
Miscellaneous	2.9%	--

Frequency of intrusive images. Clinical participants reported experiencing their identified intrusive image frequently, with 61.1% endorsing at least daily recurrence of the particular image (and 41.7% noting that it recurred multiple times a day). One third (33.3%) reported experiencing their images on a weekly basis, and the remaining 5.6% of clinical participants experienced images only several times a year (i.e., not quite monthly). By contrast, subclinical participants reported more even distribution in the perceived frequency of their reported intrusive image. Only 41.6% of subclinical participants endorsed intrusive images at least daily (33.3% noting multiple recurrences in a day). One quarter (25%) of subclinical participants reported monthly images, 16.7% weekly, and another 16.7% noted images that intruded several times throughout the year (less than monthly).

Characteristics of intrusive images. Images were reported to be rich sensory experiences, involving on average two senses for clinical and subclinical participants alike, but always visual. Although individuals mostly reported experiencing images in only one of the offered formats – a snapshot-like photo, a series of photos, or a video – a small portion (25% of clinical and 33.3% of subclinical individuals) noted that their images were more complex, involving two or more of these formats. Images were typically observed from the field perspective – i.e., as if out of one's own eyes – according to 58.4% of clinical and 50% of subclinical participants. A smaller portion of individuals reported images viewed from an observer's perspective (19.5% clinical, 16.7% subclinical), or an even mix of the two (e.g., switching between the two views). Of those reporting images, 66.7% of clinical and 58.3% of

subclinical participants reported that their image had added significance, because it was linked to an actual, unpleasant memory or an imagined, feared prediction. Participant descriptions were coded to clarify whether their image was linked to the past memory or to the future prediction. Images were generally reported to be moderately distressing and interfering. See Table 3 for detailed results.

Table 3.

Characteristics of Intrusive Images Identified by Clinical and Subclinical Online Participants.

	Mean (SD)	
	Clinical (N = 36)	Subclinical (N = 12)
1. Vividness, 0-7	4.6 (1.7)	4.6 (1.4)
2. Senses involved		
Sight	100%	100%
Sound	47.2%	41.7%
Touch	33.3%	41.7%
Smell	16.7%	8.3%
Taste	5.6%	8.3%
3. Image as…		
Video	63.9%	91.7%
Snapshot	41.7%	41.7%
Series of photos	22.2%	16.7%
4. Black-and-white vs. colour	88.9% colour	100% colour
5. Image duration		
< 1 min.	38.3%	75.0%
1 to 2 mins.	8.8%	--
2 to 5 mins.	26.5%	16.7%
5 to 15 mins.	8.8%	--
15 mins to 1 hr	2.9%	8.3%
> 1 hour	14.7%	--
6. Temporal association		
Past memory	33.3%	16.7%
Future prediction	27.8%	16.7%
Mix of both	5.6%	25.0%
No association	33.3%	58.3%
7. Distress, rated 0-7	4.7 (1.3)	4.1 (2.2)
8. Interference, 0-7	3.5 (1.8)	3.5 (2.0)

Image-based compensatory strategies. All individuals reported feeling compelled to act in order to remove the images. See Table 4 for rates of endorsement for the various strategies offered in the study; as participants frequently reported more than one strategy, percentages do not sum to 100%. A large percentage (61% of clinical participants and 75% of subclinical individuals) reported performing an image-based compulsion other than those offered as options in the study. Consequently, their described compulsions were further coded into recurring

themes, such as avoidance, self-reassurance, superimposing a different sensory experience (e.g., "turn up the music or TV loudly," "focus on a very intense stimulus [i.e., cold shower/hot shower]," or "shake my head"), playing the image out to the end, etc. The remaining miscellaneous compulsions included such acts as using humour, counting to three, and repeating the phrase "broken brain back of the train" to oneself. Image-based compensatory strategies (i.e., compulsions) were only moderately helpful in removing the image.

Table 4.

Percentage of Online Respondents Reporting Image-Related Compensatory Strategies

	Clinical (N = 36)	Subclinical (N = 12)
Distract from image	66.7%	91.7%
Suppress image in head	58.3%	58.3%
Block image	30.6%	58.3%
Correct image	22.2%	16.7%
Other compulsion	61.1%	66.7%
Self-reassurance	27.8%	16.7%
Satisfy compulsive urge (e.g., check, wash)	16.7%	8.3%
Superimpose sensory experience	8.3%	16.7%
Avoidance	5.6%	--
Breathing skills	2.8%	8.3%
Play the image out to end	--	16.7%
Miscellaneous	11.1%	8.3%
Success of compensatory strategies, 0-7	3.4 (1.6)	4.1 (1.5)

Study 1 Discussion

The results of this online study support our expectations and corroborate the results of the limited literature on obsessional images in OCD, although discussion of the results is necessarily limited by the small sample size of the subclinical participant group and the online format of the study. Consistent with our expectations, given extant literature (Lipton et al., 2010; Speckens et al., 2007), intrusive images were revealed to be common, brief, and multisensory experiences. These images, often seen as if out of participants' own eyes (from a field perspective), are colourful, moderately vivid, distressing, and interfering, regardless of the individual's clinical or subclinical status. They appear to be future-oriented images (i.e., seemingly predictive intrusive images), highlighting the need to further explore its implications and clarify more accurately the temporal perspective associated with the images (past, present, or future focus).

The content of the images themselves were largely of unacceptable ideas of harm or aggression, which may explain the affective impact of obsessions: ego-dystonic aggressive images may provoke fear and distress and also invoke moral emotions, such as guilt and shame, in turn making individuals more sensitive to such images and obsessional content. Unfortunately,

individual appraisals of intrusive images and emotions provoked by intrusive images were not explored in this study, and we plan to address this lacuna in our next study.

The duration of images reported by participants varied widely, spanning seconds to hours. However, it is unclear whether these duration estimates reflect one occurrence of an image that spans the length of time reported, or if these episodes capture multiple recurrences of the image, which flashes in much briefer fashion (i.e., one image lasting an hour, or one hour-long episode with 60 one-minute recurrences). The open-ended phrasing of the question ("how long did the (image) experience last?") makes it difficult to interpret the findings, beyond a notable brevity in the subclinical image experience, also warranting a more thorough exploration in our next study. It may be that clinical images are inherently longer in duration than subclinical images, or that they more persistently recur within an episode. It is also possible that clinical levels of distress lead to difficulty disengaging attention from the image and lengthier experiences with the distressing images.

All participants attempted to get rid of the image, often using strategies such as distraction, suppression, and blocking the image. Strategies used did differ somewhat between groups, but comparisons are difficult due to the small subclinical sample size. It is unclear whether strategies implemented more frequently by subclinical individuals are actually more effective strategies, allowing them to remain at subclinical status, or if clinical individuals have attempted them but discontinued their use due to lack of success (i.e., it fails at more intense or frequent levels). Alternatively, it may be that the actual type of strategy used is not significant in achieving respite or relief from images; support for this notion comes from the fact that rated success of compensatory strategies in subclinical individuals is not significantly higher than that of clinical individuals' rated success. It should be noted that respondents were asked specifically to rate success in getting rid of the image, which presupposes that image removal is their aim. It may be that individuals have other goals (e.g., relief from distress, or extinction of doubt) rather than getting rid of the image, for which these strategies prove more successful or for which they perform other acts. Further exploration of image-based compensatory strategies performed by individuals, their aim in performing such behaviours, and their perceived success in accomplishing that goal is needed.

Significantly, this study offers insight into the way in which these intrusive and disturbing images arise. It appears that images are often and easily endorsed as the focal obsessional experience. For some individuals, images accompany the main obsessional experience, typically verbal in nature; while these individuals seemingly do not consider these images to be the principal obsessional cognition, the images do appear to be an additional component of their obsessional experience. These images serve as rich sensory experiences that evoke distress, interfere with functioning, provoke compensatory action, and often prompt flashes forward (of a predictive nature) or backward (into past memories). Curiously, they would not report obsessional images unless otherwise prompted, though the images frequently co-occur with their obsessional verbal thoughts or urges. This renders these images a likely overlooked but recurring issue that may undermine attempts to intervene therapeutically. It is therefore important to further investigate and explore the way in which intrusive images arise in OCD.

Although the online format of this study offered a more inclusive look into OCD images, conclusions from our study findings were limited by several aspects of our study methodology. Limitations of this study include the lack of clinician judgment in identifying OCD images (*vs.* those arising from other disorder content, such as depression or eating disorders) and a sometimes-lengthy gap in time between diagnosis and study completion for some participants, ranging from months to years. This study also lacked information about other aspects of OCD images, such as associated emotions, relevant appraisals, and more specific details about the duration and recurrence of images. Additionally, it is possible that participants self-selected for the study based on existing experiences of images, given that descriptions of the study in recruitment materials focused on images. A broad study of the phenomenology of all types of obsessions may in fact better reveal the true prevalence of intrusive images, which may be lower than estimates from image-focused studies. To address these limitations, we designed a comprehensive interview-based follow-up study focusing on the phenomenology of obsessions, including the lived experience of intrusive images in OCD.

Appendix B

Phenomenological Interview of the Obsessive-Compulsive Experience

ID #:		ASD ID #:		DATE:	
SEX:	M / F	AGE:		DOB:	

We are interested in repeated unwanted, upsetting thoughts people have and the forms that they take. When thoughts are unwanted but keep coming back, almost like an upsetting pop-up, we refer to them as obsessional thoughts. We are interested in obsessional thoughts that you might have.

An obsessional thought can be a thought, image, or urge to do something, and it is unwanted, yet persistent and difficult to control. Obsessional thoughts tend to reflect concerns that are irrational, extreme, unnecessary, and/or excessive even though they can feel rational, normal, necessary, and justified in the moment. Obsessional thoughts can also reflect concerns about committing acts that contradict one's values, morals and personality.

Examples of obsessional thoughts include concern that the stove has been left on and will cause a dreadful accident; fear that your hands are "contaminated," and you will make someone terribly ill; concern that you have harmed someone without realizing it (e.g., by having hit them with your car); concern that you are not right with God; thoughts/impulses of doing or saying something terrible to someone whom you would never want to harm; concern that something you have done or failed to do will cause harm; and unwanted images or mental pictures of a sexual, morbid, or grotesque nature.

Obsessional thoughts cause distress or discomfort and often lead to corrective action, such as checking, cleaning/washing, repeating, seeking reassurance, mental "correction", undoing, rationalizing or self-reassurance. These are often called compulsive behaviours, or, when performed in a very specific way, can be referred to as compulsive rituals.

A) RECENT OC EPISODE

1. Can you think of a recent episode when you were feeling particularly distressed or emotional because of an obsessional thought? Y / N [N: probe for any obsession, ever]

2. When was this?

3. What was the nature / content of your obsessional concern?

4. Is this the obsessional thought that has been bothering you the most in the past week?
   Y / N [Y: "I'd like to get more information about this recent episode."
   N: Elicit most distressing thought in past week (A3) and when (A2).]

B) OC EPISODE TIMELINE

I'd like to get some more information about this episode. I would like to get from you a detailed recap of the episode in a bit, but these first few questions will help me get a broad sense of your experience.

1. How did the episode start? Did something trigger your obsessional thought? What was it?

2. In this episode, can you recall experiencing…

	✓ / ✗	How much of the episode was occupied by … (% or duration)?	Rank from most -> least distressing.
… any word-based thoughts? Examples.			
… an internal voice, dialogue, or conversation in your thoughts? Whose voice? What was the tone? (friendly / hostile, dominant / submissive, anxious? calm? caring?)			
… any images or pictures in your mind?			
… any doubt-related thoughts or impressions?			
… a sense you were going to do something or act in a way you did not want to act? Describe.			
… any felt senses, including any felt sensations in your body? Describe.			
… any other types of experiences?			

If more than one endorsed: Which one was **predominantly** your experience?
If more than one endorsed: Which one did you become aware of **first** in your experience?

3. Do you feel compelled to do anything in response to these intrusive experiences? Y / N
What do you do?

4. If you count from the first thought to when you knew the episode was over, how long did the episode last? What was the very last thing to happen?

   How did you know the episode had ended? What made you feel like or know that it had ended? (e.g., did it end with the completion of the compulsion, or did the obsessional thought stop intruding into your mind, or some other experience?)

5. In as much detail as possible, try to give me a vivid sense of what the experience was like for you. Think of the episode as happening along a timeline, and walk me through a detailed play-by-play of what happened. Put yourself back in time, as if you are currently reliving and experiencing it again, and then walk me through the episode as if it is in the present. For example, first I feel __ then I realise I'm thinking __ and I do ___. If it helps, you can mark the different parts of your experience on this line (provide pen and sheet with timeline). If you feel comfortable, you can shut your eyes to try to bring the episode clearly to mind. [Note: Ensure all endorsed forms are covered on the timeline. Make sure you code the point at which the compulsion took place. See below for prompts.]

   a. What happened right before ___ OR right after ___?

   b. Tell me about what happened next.
      And then what happened?

   c. When you thought / felt / were doing ___, what else was going on for you?

   d. Walk me through that experience in detail.

   e. To pinpoint place on timeline: Was that experience before / after ___?

   f. At what point did you do [compulsion]?

   g. Only to elicit more detail if they have already identified a form / behaviour:
      What did you do in response to ___ ?
      What did that feel like in your body?
      What was going through your mind at that time?
      What did that sound like in your head?

Did any obsessions overlay (or co-occur temporally with) the reported compulsion?	
Did any obsessional experiences start after the compulsion ended or continue beyond the conclusion of a compulsive act?	

C) DOUBT

Now I'd like to ask you about doubt in your experience.

If Y to doubt in section B2, skip to C2 and say, "You mentioned earlier that you felt a sense of doubt or uncertainty in this most recent episode."

1. Do you ever experience a feeling of doubt or uncertainty in these OC episodes? Y / N
   [If N, confirm that participant has NEVER experienced any doubt, uncertainty, feelings of hesitation or reservation at any point in past for both obsessional thoughts and during, before, or after performing compulsion or ritualised act. Skip to Section D if no doubt ever.]

2. Has this doubting experience happened more than once? Y / N
   How often does this take place? (% of time doubt exists within OCD experience)

3. If doubt WAS endorsed in current episode, say:
   I'm going to ask you some questions about various aspects of your doubting experience. I'd like you to focus on the doubt and uncertainty that came up in the episode we just talked about.

   If doubt WAS NOT endorsed in current episode, say:
   I'm going to ask you some questions about various aspects of your doubting experience. I'd like you to focus on the most recent OC episode in which you experienced this feeling of doubt.
   When did this take place?

DOUBT: CHARACTERISTICS

4. Content / Context
   What was the doubt about / what were you doubting? [Note: if unclear, inquire as to whether the doubt was related to obsessional thought / compulsive behaviour / disorder itself]

5. Sensory experience
   How would you describe this doubt / feeling of uncertainty? (What would you call it?)

   How do you experience your doubt? Is it a felt sense in your body, a verbal stream of thoughts, a felt knowledge, or some other sensory state?

   Depending on how doubt is experienced: What does the doubt sound like? Where in your body do you feel this doubt? What senses are involved in the experience (sight / sound / smell / taste / touch / other)?

6. Conviction
   To what extent do you believe the doubt? Is the doubt warranted / a real probability or is true?
   0 (not at all) to 10 (completely) true. How do you know this?

7. Stability
   Does your conviction or belief in your doubts ever change or fluctuate? Y / N
   How much / often does it fluctuate? 0 to 100% of time.
   Tell me more about what helps keep your doubt stable / makes it fluctuate.

8. Realness
   How real does the doubt feel? 0 (completely unreal) to 10 (completely real)

9. Emotions
   What emotions does this doubt elicit / evoke?

anxiety /	fear	Y / N
depressed / low	mood	Y / N
anger		Y / N
guilt		Y / N
shame		Y / N

   What emotion do you feel the most?

   If do not endorse any emotions from above list, prompt with, "Do you feel ___ with the doubt?"

10. Excessiveness / Insight
    To what extent do you believe your doubt is excessive or senseless? How do you know this?
    0 (totally reasonable) to 10 (absolutely excessive)

11. Dismissibility
    How difficult is it to dismiss the doubt? 0 (no trouble at all) to 10 (not possible to dismiss).

12. Resistance / Success of efforts to resist
    Do you try to resist the doubt? To what extent do you feel able to resist the doubt? 0 (not at all) to 10 (totally).

13. Duration
    How long does your doubt typically last?

14. Termination
    At what point does your doubt end or terminate? How does your doubt end?

15. Distress
    How distressing is this doubt? 0 to 10 (extremely).

16. Interference / Impairment
    How much does the doubt interfere with your ability to do other things at the time? 0 to 10. Examples of impairment (social / work / school / family / friends / daily life).

17. Intrusive quality
    Does the doubt seem to pop up / intrude into your awareness, without you deliberately thinking about it? OR come up only after you deliberately think about it? OR mix? What % each?

18. Situation / Trigger
    When does it come up? What are the circumstances under which it occurs? What tends to trigger this doubt?

DOUBT: APPRAISALS

19. Anticipated consequences of doubt
    What would happen if the doubts came true? What would be the worst case scenario if your doubts came true?

20. Likelihood of anticipated consequences of doubt
    How likely do you think this is to happen? 0 to 10 (100% likely) – in moment

21. Severity of anticipated consequences of doubt
    How bad would it be if that happened / the consequences came true? 0 to 10 (terrible).

22. Meaning of anticipated consequences of doubt
    What would it mean about you / other people / the world if these doubts came true and the consequences were real?

23. Appraisal of doubt
    How do you make sense of the doubt?

    What does this doubt mean about you? About others? About the world?

DOUBT: COMPULSIONS

24. Reactive doubt-related compulsions
    Do you do anything in response to the doubt once it has occurred? What do you do?

Check things repeatedly	
Distraction	
Think specific thoughts to counteract doubt	
Suppress thoughts	

Seek reassurance	
Other strategy	

25. Aim of reactive doubt-related compulsions
    What is your aim or goal in performing these behaviours? What are you hoping will happen after or while you complete these acts?

26. Success of reactive doubt-related compulsions
    How successful are these strategies in the short term? 0 to 10. In the long term? 0 to 10.

27. Frequency of reactive doubt-related compulsions
    How often do you do these things?

28. Proactive doubt-related compulsions
    Is there anything that you do to try and prevent doubt from entering your mind in the first place? How do you do this?

Distract yourself	
Avoid thinking about things	
Other strategy	

29. Aim of proactive doubt-related compulsions
    What is your aim or goal in performing these behaviours? What are you hoping will happen after or while you complete these acts?

30. Success of proactive doubt-related compulsions
    How successful are these strategies in the short term? 0 to 10. In the long term? 0 to 10.

31. Frequency of proactive doubt-related compulsions
    How often do you do these things?

32. Resistance
    Do you resist the urge to do any of these behaviours? Y / N How? Why/Why not?

33. Success of efforts to resist
    If Y to 33, Do you generally feel able to resist performing these behaviours? 0 to 10. What helps you / what gets in the way?

34. Distress
    Are these behaviours (summarise above) distressing or upsetting to you? How distressing? Rate from 0 (not at all) to 10 (extremely).

35. Interference / Impairment
    Do these behaviours (summarise above) interfere with your ability to do other things? How much do these doubt-related behaviours interfere with what you are doing at the time? 0 to 10. Examples of impairment (social / work / school / family / friends / daily life).

D) <u>IMAGE</u>

Now I'd like to ask you about intrusive images in your experience.
If Y to images in section B2, skip to D2 and say, "You mentioned earlier that you experienced images or pictures in your mind in this most recent episode."

1. Do you ever experience unwanted images/pictures in your mind in these episodes? Y / N
   [If Y, ensure that they are unwanted, intrusive, and unpleasant.
   If N, confirm that participant has NEVER experienced any intrusive images or pictures in mind at any point in past for both obsessional thoughts and during, before, or after performing compulsion or ritualised act. Skip to Section E if no image ever.]

2. Have these intrusive images happened more than once? Y / N
   How often does this take place? (% of time images exist within OCD experience)

3. If intrusive image WAS endorsed in current episode, say:
   I'm going to ask you some questions about various aspects of the image(s) you experience. I'd like you to focus on the image(s) that came up in the episode we just talked about.

   If intrusive image WAS NOT endorsed in current episode, say:
   I'm going to ask you some questions about various aspects of the image(s) you experience. I'd like you to focus on the most recent OC episode in which you experienced this intrusive image. When did this take place?

IMAGE: CHARACTERISTICS

4. Perspective
   From which perspective do you experience this image? Field/own eyes vs. observer/other's eyes.

   Is it consistently from one POV or does it change? How much in each perspective (e.g., 40/60 or 100/0, etc.)?

5. Form
   In what form do you experience the image? Is it like a photo, a series of photos, or a video?

6. Content / Context
   What is in the image? What are the images of? [Note: if unclear, inquire as to whether the image is related to the obsessional thoughts or the compulsive behaviour]

7. Sensory experience
   How do you experience your image? Is it a felt sense in your body or some other sensory state? What senses are involved in the experience (sight / sound / smell / taste / touch / other)?

8. Colour
   Is the image in colour or black & white?

9. Vividness
   How vivid is the image? 0 to 10

10. Fictionality
    Is the image entirely of an actual memory? Is it a purely fictional creation? Or is it a mix of both (partly reconstructed from memory, part fiction)? What is the mix (% memory, % fiction)?

11. Realness
    How real does the image feel? 0 (completely unreal) to 10 (completely real)

12. Temporal orientation
    What's your tense? Is it past / present / future? Does it fluctuate / become mixed?

13. [Conviction]
    To what extent do you believe the image is actually in this tense? 0 – 100%

14. Emotions
    What emotions does this image elicit / evoke?

anxiety /	fear	Y / N
depressed / low	mood	Y / N
anger		Y / N
guilt		Y / N
shame		Y / N

    What emotion do you feel the most?

    If do not endorse any emotions from above list, prompt with, "Do you feel ___ with the image?"

15. Duration
    How long does your image typically last? Is this image with you throughout your OC experience or does it go away and come back?

16. Stability
    Does your image ever change or fluctuate? 0 to 100% of time. How? Under what conditions?

17. Resistance / Success of efforts to resist
    Do you try to resist the image? To what extent do you feel able to resist the image? 0 to 10

18. Dismissibility
    How difficult is it to dismiss the image? 0 (no trouble at all) to 10 (not dismissible).

19. Termination
    At what point does your image end or terminate? How does your image end?

20. Distress
    Is the image distressing or upsetting to you? How distressing? 0 (not at all) to 10 (extremely).

21. Interference / Impairment
    Does the image interfere with your ability to do other things? How much does the image interfere with what you are doing at the time? 0 to 10. Examples of impairment (social / work / school / family / friends / daily life).

22. Intrusive quality
    Does the image(s) seem to pop up in your awareness, without you thinking about them first? OR do they always come up only after you think about them? OR a mix of both? What % each?

23. Situation / Trigger
    When does it come up? What are the circumstances under which it occurs? What tends to trigger this image?

24. (Un)accompanied
    Do you experience this image on its own OR does it co-occur with other kinds of obsessional forms (e.g., verbal thoughts, sensations, doubts, etc.)?

<u>IMAGE: APPRAISALS</u>

25. Appraisal of image
    How do you make sense of this image?

    What does this image mean about you? About others? About the world?

26. Anticipated consequences of image
    What are you afraid will happen as a result of the image? What feels so bad about this image?

27. Likelihood of anticipated consequences of image
    How likely do you think this is to happen? 0 to 10 (100% likely) – in moment

28. Severity of anticipated consequences of image
    How bad would it be if that happened / the consequences came true? 0 to 10

    What would it mean about you if that happened / the consequences came true?

IMAGE: COMPULSIONS

29. Reactive image-related compulsions
    Do you do anything in response to the image once it has occurred? What do you do?

Correct image	
Superimpose acceptable image	
Reshape image	
Check repeatedly	
Distraction	
Suppress image	
Seek reassurance from others	
Other strategy	

30. Aim of reactive image-related compulsions
    What is your aim or goal in performing these behaviours? What are you hoping will happen after or while you complete these acts?

31. Success of reactive image-related compulsions
    How successful are these strategies in the short term? 0 to 10. In the long term? 0 to 10.

32. Frequency of reactive image-related compulsions
    How often do you do these things?

33. Proactive image-related compulsions
    Is there anything that you do to try and prevent the image from entering your mind in the first place? How do you do this?

Block image	
Distract yourself	
Avoid thinking about image	
Other strategy	

34. Aim of proactive image-related compulsions
    What is your aim or goal in performing these behaviours? What are you hoping will happen after or while you complete these acts?

35. Success of proactive image-related compulsions
    How successful are these strategies in the short term? 0 to 10. In the long term? 0 to 10.

36. Frequency of proactive image-related compulsions
    How often do you do these things?

37. Resistance
    Do you try to resist the urge to do any of these behaviours? Y / N How? Why/Why not?

38. Success of efforts to resist
    If Y to 37, Do you generally feel able to resist performing these behaviours? 0 to 10. What helps you / what gets in the way?

39. Distress
    Are these behaviours (summarise) distressing or upsetting to you? How distressing? 0 to 10.

40. Interference / Impairment
    Do these behaviours (summarise above) interfere with your ability to do other things? How much do these image-related behaviours interfere with what you are doing at the time? 0 to 10. Examples of impairment (social / work / school / family / friends / daily life).

E) <u>CONCLUDE</u>

Thank you for all that helpful information! I've asked all the questions I need to ask, and we've talked about quite a lot today, including [briefly summarise the different forms discussed].

Is there anything we haven't asked about your OC episodes (or qualities of your OC experience) that you think it's important we know about?

Lastly, I'm curious - What was this experience like (talking about these phenomena)?
Do you have any feedback or suggestions for us?

Appendix C

Termination Criteria Coding Manual

Coding manual for the termination or end of the obsessive-compulsive episode AND the termination or end of obsessional forms (doubt, images)

Code 1 = Yes if the participant reports content consistent with each category,
OR 0 = No if the participant does not report any content consistent with the category.

If the obsessional form has not been endorsed, leave the cell blank.

Category: Completion of compulsion

- The individual states s/he knows the episode has ended or is over once the compulsive act has been completed or because the compulsion has been performed.

Category: Intrusive experience subsided

- The individual states s/he knows the episode has ended or is over because the obsessional or intrusive experience has subsided or has gone. This obsession or intrusion can appear in the form of an internal narrative, verbal thought, image, sense of doubt, urge, or preidentified sensory experience (e.g., buzzing, physiological anxiety symptoms, etc.). [Edit: This category is distinguished from the third category below (internal feeling or sense) in that it captures the removal of negative affect or sensations (e.g., less tension, anxiety, heart racing, etc.) as the termination criteria in the individual's experience.]

Category: Internal feeling or sense (e.g., relief, release, yedasentience)

- The individual states s/he knows the episode has ended or is over because of a subjective internal, emotional, or physiological feeling. This can consist of a sense of relief, release, or calm. Alternatively, it can appear as a sense of satisfaction, completion, or yedasentience (i.e., a satisfying internal sense that they have completed a task). [Edit: This category can be differentiated from the second category above (intrusive experience subsided) in that it catalogues the introduction or addition of new affect or sensations, likely positive affective experiences, as the termination criteria in the individual's experience.]

Category: Not applicable

- The individual states that the episode did not end or is not over.

Appendix D

Appraisal Coding Manual

APPENDIX G
Coding Manual

Moralistic theme DANGEROUS SELF

This theme concerns Rachman's (1997) notion that intrusions are interpreted by individual's with OCD as revealing important and often hidden elements to their character. He notes that the main themes concern moral systems such as sex, criminality, religiosity and aggression. Other work such as Purdon and Clark (1994) found that obsessions are interpreted as evidence of being bad, evil, dangerous, insane, immoral and weird. This theme therefore taps traits such as immoral, bad, evil or insane but also taps milder traits such as unkind which have an element of active intent. & irresponsible, bad, careless

Depressive/Anxiety theme DEPRESSED/ANXIOUS SELF

This theme concerns anxiety or depressive symptoms but also themes that are evident within an anxious or depressive individual, for example fearful and hopeless respectively. & failure, worthless, incompetent, not good enough

Rejection theme REJECTED SELF

This theme taps into Rachman's (1997) idea that individuals with OCD fear rejection from others. It therefore concerns traits concerned with loneliness or rejection by others but also concerns about being unloved. & untrustworthy, disappointing others / letting them down

Negative personality theme FLAWED SELF

This concerns negative personality traits that are not concerned with violating moral codes. Examples would include selfish and proud. & weak

Uncodable theme

This includes any traits which do not fit into the above themes.

Appendix E

Doubt Content Coding Manual

Coding manual for the reported content of doubt

Code 1 = Yes if the participant reports content consistent with each category,
OR 0 = No if the participant does not report any content consistent with the category.

If the obsessional form has not been endorsed, leave the cell blank.

Category: Doubt about one's safety status or the state of things (i.e., obsessional content)

- The individual states that his/her doubt focuses on typical obsessional content (i.e., is an obsession that occurs in the form of doubt). In this category, the doubt is the idea itself that prompts or evokes the compulsion. For example, this doubt is of the nature that asks the question, "am I safe, or is it clean?" [Edit: This category captures uncertainty about one's safety status or the state of matters and thus whether a behavior has been performed, e.g., "did I lock the door or turn off the straightener?"]

Category: Doubt about having performed compulsions properly enough or sufficiently to avert harm

- The individual states that his/her doubt focuses on whether s/he has performed his/her compulsion properly or well enough such that harm has been averted. For example, this doubt asks the question, "did I do it properly?" Often, this is explicitly couched with a statement of certainty, such as "I know I did it, but did I do it well enough?"

Category: Doubt about one's senses, capabilities, or cognitive capacity

- The individual states that his/her doubt focuses on whether his/her senses, memory, sanity, and/or other cognitive capabilities can be trusted. This doubt can arise either in the context of the compulsion or the individual him/herself. For example, this doubt asks questions such as: "I know I checked but can I trust what I saw," "am I capable of doing it [and keeping myself clean or safe]," or "I remember doing it, but can I believe my memory?" Responses that are consistent with poor memory or cognitive confidence belong to this category.

Category: Not applicable

- The individual states that his/her doubt focuses on content other than the categories identified.