Experimental and Phenomenological Examinations of Nonverbal Reassurance Seeking in Association with Obsessive-Compulsive Disorder

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ABSTRACT

EXPERIMENTAL AND PHENOMENOLOGICAL EXAMINATIONS OF NONVERBAL REASSURANCE SEEKING IN ASSOCIATION WITH OBSESSIVE-COMPULSIVE DISORDER

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Concordia University, 2024

In obsessive-compulsive disorder (OCD), excessive reassurance seeking (RS) has been construed as overt direct questions and/or covert subtle statements which prompt information to allay obsessional doubts and/or fears. However, an exclusively verbal conceptualization of RS lacks theoretical justification and fails to explain the use of nonverbal actions (e.g., prolonged pauses) ostensibly to prompt reassurance following an experimental manipulation of responsibility (Leonhart & Radomsky, 2019b). Nonverbal RS (NVRS) may reinforce symptoms 'under the radar' of those with OCD, loved ones, and/or helping professionals. The lack of research into NVRS may limit the effectiveness of cognitive-behavioural therapy (CBT)–the treatment of choice for OCD. The present mixed-methods doctoral research was conducted to examine the manifestations and functions of NVRS in OCD. A checklist of NVRS behaviours was developed from observations and a review of the literature on RS and nonverbal communication. In Study 1, experimentally increased high ([HR] vs. decreased, low responsibility [LR]) resulted in more verbal RS (VRS) as reported by participants ($N = 86$) and a trained actor from whom reassurance was sought, and critically, in more NVRS according to the actor. As predicted, responsibility beliefs may have similar impacts on checking, VRS, and NVRS. Further, a significant condition × time × person interaction was observed, such that HR participants reported a smaller transfer of responsibility to the actor while LR participants reported a comparatively larger transfer to themselves following the RS opportunity. Study 2 was designed to learn if people with lived experience of seeking and providing reassurance endorsed similar and/or additional NVRS behaviour. Twelve pairs of people who met criteria for OCD and partners of their choosing ($N = 24$) were interviewed. Participants with OCD utilized several NVRS behaviours when given an opportunity to seek reassurance from their partners. Prominent behaviours were those which reportedly occurred during most interactions and were used at least daily to seek reassurance according to participant-partner pairs: close examination of others' reactions, direct eye contact, pauses to allow for reassurance, and forehead wrinkling. NVRS, like VRS, may result in neutralized obsessions, but it may also have unique functions (e.g., avoided social consequences, better effectiveness). Unexpectedly, there was no clear evidence that people with OCD were unaware of their NVRS. Implications for cognitive-behavioural theories of and therapies for RS generally and NVRS specifically are discussed.

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Undoubtedly, Prof. Radomsky took a risk accepting my application. At the time, my career aspirations explicitly excluded academia. My goals were to build on my entry-level professional experience. My research experience at the time focused on knowledge translation of treatment information for anxiety and depression in young adults whereas Adam is renowned for rigorous, clinically applicable, experimental psychopathology research into anxiety, obsessive-compulsive, and related disorders. Unlike most applicants, I was older, married, and raising an infant daughter. All the same, I remain forever grateful to him for the opportunity to complete my degree under his supervision. His mentorship, guidance, support, and good humour have been invaluable to me as I endeavoured to complete this work. I am inspired by his desire to provide the best possible care to people through an interdependence between rigorous science and evidence-based practice of clinical psychology. In my own career, I hope to emulate his standards of excellence, integrity, service, and quality evidence-based knowledge and intervention.

No one is an island. I would not be where I am today without the support of those in the Anxiety & Obsessive-Compulsive Disorders Laboratory, Stefanie Lavoie demonstrated unwavering support. Gillian Alcolado, Jessica Senn, and Hannah Levy welcomed me to the laboratory with kindness. Thank you, Rachael Neal, Jean-Philippe Gagné, Sandra Krause, and Ken Kelly-Turner for always making the lab a place of laughter, support, friendship, and insight.

The doctoral research detailed in this dissertation would not have been possible without the assistance of so many. Olivia Rotondo, Kristen Charles, Alissa Ingerman, and Sally Cuthbertson made the Study 1 experiment possible. Thank you to Bianca Guilliano, Billie Mendel, Isabelle Richard, and James Thompson for their diligence and commitment to their tedious but critical coding.

Clinical recruitment can be difficult in the best of times. I might be so bold as to say that circumstances regarding recruitment in Study 2 were not optimal, including an unexpected global pandemic. Thank you to Adam, Stefanie, and the Anxiety and Obsessive-Compulsive Disorders Laboratory for graciously allowing me to recruit from a clinical trial being conducted at the time. I am also indebted to Dr. Kristin Reynolds and everyone at the Health Information Exchange Laboratory at the University of Manitoba for their assistance in helping me complete clinical recruitment and testing for Study 2 in Winnipeg after exhausting options in Montréal. But for all their assistance, the present research would likely not have been finished.

I am grateful for the guidance of my committee members. My thanks are due to Prof. Roisin O'Connor for her thoughtful feedback to ensure the empirical rigour of my research. I thank Prof. Mark Ellenbogen for his direction to ensure the scientific and clinical relevance of my studies. I am also grateful to my whole committee for their help in adapting Study 2.

Though his support led to my Honours degree and not my graduate education necessarily, I wish to acknowledge the important impact of the late Prof. John R. Walker on my academic and professional career. Prof. Walker was one of the kindest, most well-informed, prolific, well-respected, and passionate research-practitioners of clinical psychology I have ever known. I

credit his guidance and support during my undergraduate years as pivotal in setting me on the path that has led to the completion of this dissertation. I hope to honour his legacy with effective clinical service, meaningful scientific contribution, and/or evidence-based advocacy.

Outside academia, many have supported me. Mom and Dad, from the beginning until now, your love for me was unquestioned, support unwavering, and encouragement continual. You empathized with my frustrations and celebrated my successes. There are so many others in my family to thank. I am grateful for the encouragement of Michael, Baba, Geeda, Mom and Dad Boese, Grandmas and Grandpas Dyck and Boese, and so many other family and friends who have, in their own ways, offered steadfast encouragement throughout this process. I cannot thank each of them enough.

Avery, if you someday read this, my hope is that you know that I cherish you and am so grateful to be your father. My prayer for you is that you may continue to grow in your knowledge of just how high, how wide, and how deep the Lord's love is for you. You have so many gifts to give the world. But I want you to know that, regardless of what you achieve, or do, or accomplish, you have been and always will be the only thing I have ever needed you to be: my daughter.

Lastly, I want to acknowledge the one for whom I am most grateful but least deserve. Stephanie, a brief note cannot possibly encapsulate the depth of my gratitude, thankfulness, and love for you. I am humbled by and have relied on your steadfastness, patience, love, and encouragement throughout this process. Though our lives have taken many unexpected turns, those turns have been taken together. With each year that passes, I continue to learn how precious that is. I love you.

CONTRIBUTION OF AUTHORS

The following thesis is comprised of two manuscripts:

Study 1 (Chapter 2)

Leonhart, M. W., & Radomsky, A. S. (in preparation). *Responsibility causes nonverbal reassurance seeking, also: An experimental examination of responsibility and nonverbal reassurance seeking*.

Study 2 (Chapter 4)

Leonhart, M. W., & Radomsky, A. S. (in preparation review). *More than words: A phenomenological examination of nonverbal reassurance seeking in obsessive-compulsive disorder*.

I conceptualized this doctoral programme of research in collaboration with Prof. Adam Radomsky. I reviewed the literature to explore gaps in present knowledge, posited research questions, derived hypotheses, and planned the required statistics to assess the data. For both studies, I was responsible for recruiting, scheduling, and testing participants (with the assistance of student volunteers). I conducted statistical analyses and interpreted the results. I wrote the primary draft of this dissertation and implemented edits and suggestions provided by members of the Anxiety and Obsessive-Compulsive Disorders Laboratory and Prof. Adam Radomsky.

Prof. Adam Radomsky–my supervisor–and I met regularly throughout all stages of this research to discuss the progress of data collection, interpretation of statistical analyses, and the writing of this document as well as the manuscripts which have been submitted for publication. My committee members, Profs. Roisin O'Connor and Mark Ellenbogen, approved my study designs and statistical analyses at my dissertation proposal meeting on February 14, 2018.

For Study 1, I was assisted by an Honours student (Olivia Rotondo) and by many undergraduate volunteers. Olivia Rotondo played the pivotal role of experimenter. She not collected data but also acted at important moments to facilitate the RS opportunity. Kristen Charles, Alissa Ingerman, and Sally Cuthbertson acted as fellow participants to facilitate RS. James Thompson and Isabelle Richard diligently coded participants' verbal and nonverbal RS. I am also indebted to Rachael Neal, as I adapted certain elements of her experimental study of partner familiarity and reassurance seeking for Study 2. I cleaned and analyzed the data. Finally, with the multiple rounds of helpful editorial comments from Prof. Radomsky, I wrote the manuscript for Study 1 for publication.

For Study 2, I was assisted by several people. Prof. Adam Radomsky graciously aided in the recruitment of the study by allowing me to contact eligible participants who were initially recruited for his clinical trial of cognitive behavioural therapy. Stefanie Lavoie, Prof. Radomsky's laboratory coordinator, conducted several diagnostic assessments of and helped recruit participants for Study 2. Dr. Kristin Reynolds and members of the Health Information Exchange Laboratory at the University of Manitoba assisted in the recruitment for Study 2 in Winnipeg and graciously permitted me the use of laboratory space for data collection. Four volunteers were critically important. James Thompson, Isabelle Richard, Bianca Guilliano, and Billie Mendel tirelessly coded participants' verbal and nonverbal RS. I was responsible for the collection, cleaning, and analysis of its data. I wrote its manuscript in close collaboration with Prof. Radomsky who patiently provided extensive, detailed, and helpful feedback on multiple drafts prior to submission for publication.

The rest of this dissertation is my work, conducted under the supervision of Prof. Adam Radomsky.

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CHAPTER 1: GENERAL INTRODUCTION

Occasional requests for reassurance from others is normal (e.g., prior to an important job interview, before embarking on a long vacation), but reassurance seeking (RS) can become repetitive, excessive, distressing, and unfortunately contribute to the onset and maintenance of many psychological disorders (Rector et al., 2019). In Major Depressive Disorder, RS has been described as the elicitation of affection, confirmation of one's lovability and worthiness, and affirmation of the security of important relationships (Burns et al., 2006; Coyne, 1976; Gillett & Mazza, 2018; Joiner et al., 1999; Joiner & Metalsky, 2001). People with Panic Disorder tend to repeatedly seek reassurance about bodily sensations they fear are dangerous or uncontrollable (Osborne & Williams, 2013). RS is a diagnostic criterion for disorders like Generalized Anxiety Disorder (American Psychiatric Association, 2013; Beesdo-Baum et al., 2012; Cougle et al., 2012), Social Anxiety Disorder (American Psychiatric Association, 2013; Taylor et al., 2019) and Illness Anxiety Disorder (Abramowitz & Moore, 2007; American Psychiatric Association, 2013; Halldorsson & Salkovskis, 2017; Salkovskis & Warwick, 1986), and may play a role in Dependent Personality Disorder and Body Dysmorphic Disorder (American Psychiatric Association, 2013; Gillett & Mazza, 2018; Phillips et al., 2005). In obsessive-compulsive disorder (OCD), excessive RS has been defined as the repeated solicitation of safety-related information about perceived general threats (e.g., contamination; Parrish & Radomsky, 2010). Regardless of its focus within each disorder, RS tends to reinforce maladaptive beliefs and behaviour, especially in the context of OCD.

OCD is characterized by intrusive, recurrent, distressing thoughts, images, or urges (obsessions) and/or repetitive, ritualistic behaviours (compulsions; American Psychiatric Association, 2013; Rachman & Hodgson, 1980). Approximately one in fifty people develops OCD (Kessler et al., 2012), typically in late childhood or early adulthood (Geller et al., 2021). It is often chronic and impacts nearly every aspect of one's life including occupational obligations, romantic relationships, familial bonds, social interaction, sexuality, and religious expression (De Luca et al., 2011; Mantz & Abbott, 2017; Norberg et al., 2008; Salkovskis et al., 1998; Sookman & Fineberg, 2015). Underdiagnosis frequently delays effective treatment (Sookman & Fineberg, 2015). OCD has been listed among the top ten leading causes of disability worldwide in terms of lost quality of life and income (World Health Organization, 2008). Anxiety and obsessive-compulsive disorders have been identified as the sixth largest contributor to non-fatal health loss, globally (World Health Organization, 2017). Pervasive dysfunction and distress may accumulate over a lifetime.

Excessive RS in OCD tends to be focused on safety-related concerns and is often problematic (Kobori et al., 2012; Parrish & Radomsky, 2010; Salkovskis & Warwick, 1986; Warwick & Salkovskis, 1985). Aside from general threats, people with OCD seek reassurance about perceived social threats (e.g., rejection) and/or threats associated with uncertainty (e.g., making decisions) despite having already received the information (Coyne, 1976; Halldorsson & Salkovskis, 2017; Joiner et al., 1999; Kobori et al., 2012; Kobori & Salkovskis, 2013; Parrish & Radomsky, 2010; Rachman, 2002; Radomsky et al., 2021; Warwick & Salkovskis, 1985). For two out of five people with OCD, excessive RS is prominent (Starcevic et al., 2012), and it has been found to be most evident and problematic in their closest relationships (Kataoka & Takizawa, 2019). People with OCD and those close to them have both reported significant ambivalence about RS (Kobori et al., 2012; Parrish & Radomsky, 2010). Those with OCD have reportedly felt desperate for reassurance but also aware of RS' maladaptive nature and fearful of others' criticism in response. Companions have described a desire to alleviate their loved ones'

obsessional distress but also feeling intensely frustrated by and critical of the recurrent RS. Perhaps unsurprisingly, people with OCD and their loved ones have described theirs as an "empty life" (Salkovskis et al., 1998), where RS dominates their interactions.

RS has been thought to be reinforced positively through attainment of desirable outcomes like affection, attention, validation, and safety-related information (Burns et al., 2006; Coyne, 1976; Gillett & Mazza, 2018; Joiner & Metalsky, 2001) and/or negatively reinforced though the absence of a disconfirmatory response, the neutralization of unpleasant thoughts, uncertainty, and other distress (Cougle et al., 2012; Halldorsson & Salkovskis, 2017; Kobori et al., 2012; Parrish & Radomsky, 2010). Because it assesses general threats by requesting information from someone else, it has been described as a form of checking by proxy (Rachman, 1998, 2002; Salkovskis, 1985, 1999).

Reassurance seeking has been thought to occur in two main forms. "Overt" RS has been described as direct questions about an expressed perceived general threat (e.g., "Are you sure the door is properly locked?"; Kobori et al., 2012; Parrish & Radomsky, 2010; Radomsky et al., 2021; Warwick & Salkovskis, 1985). "Covert" RS involves subtle, falsifiable statements about their safety-related concerns (e.g., "It should be OK to leave now because I must have properly locked the door," Kobori et al., 2012; Kobori & Salkovskis, 2013; Parrish & Radomsky, 2010; Radomsky et al., 2021). As companions respond critically to persistent overt RS, people with OCD may seek reassurance in increasingly inconspicuous ways. Unfortunately, the concealment of both obsessions (Newth & Rachman, 2001) and compulsions (Jaeger et al., 2021) has been identified as all too common in OCD.

Concealment may be particularly relevant to RS. Checking, washing, and other rituals are often concealed to avoid embarrassment and criticism (e.g., Newth & Rachman, 2001), but RS necessarily involves interaction with someone else (Coyne, 1976; Halldorsson & Salkovskis, 2017; Joiner et al., 1999; Kobori et al., 2012; Kobori & Salkovskis, 2013; Parrish & Radomsky, 2010). People with OCD may want to ask for safety-related information but also to avoid criticism (Coyne, 1976; Halldorsson et al., 2016; Kobori et al., 2012; Parrish & Radomsky, 2010). Companions may want to reassure their loved one distress but to avoid further and bothersome RS (Halldorsson & Salkovskis, 2017; Kobori et al., 2012; Parrish & Radomsky, 2010). Consistent with Coyne's interactive model of RS in depression, a reciprocal process may occur where increasingly subtle, concealed aspects of RS are reinforced through the receipt of reassurance and mitigation of interpersonal consequences.

However, it may be problematic to assume excessive RS in OCD is limited to direct questions or subtle comments alone. Qualitative studies have provided foundational, detailed descriptions of seeking reassurance and responding to RS (Halldorsson & Salkovskis, 2017; Kobori et al., 2012; Parrish & Radomsky, 2010). Questionnaires have provided useful methods of measuring RS (Kobori & Salkovskis, 2013; Radomsky et al., 2021; Rector et al., 2019). Yet, both qualitative and psychometric studies are based on varied definitions of RS and focus only on questions or comments which prompt reassurance about specified general threats despite no compelling theoretical rationale nor evidence to justify such an exclusive conceptualization (Gillett & Mazza, 2018). It may be that verbal RS (VRS) and verbal reassurance are easier to describe and measure. Nonverbal aspects of RS may have been considered incidental or deemed unintentional cues of anxiety. Regardless of the reason, the assumption that RS is limited to questions or comments about expressed general threats remains without justification.

Moreover, there are compelling reasons to suggest that RS may indeed include nonverbal elements and that it need not necessarily involve explicit reference to obsessional concerns.

Gillett and Mazza (2018) have argued that RS can be understood functionally as any overt question, covert statement, or nonverbal behaviour which (ostensibly) prompts reassurance.

There is evidence that RS need not be specific nor explicit to prompt the desired information. In the context of depression, people have been found to implicitly seek reassurance about the validity of their emotions and of their partner's affection and attention by explicitly asking for reassurance about other issues like their personal worth (Burns et al., 2006; Coyne, 1976; Gillett & Mazza, 2018; Joiner & Metalsky, 2001).

Further evidence of the presence of nonverbal RS (NVRS) is indicated (inadvertently) in existing measures of RS. The Covert and Overt Reassurance Seeking Inventory (CORSI; Radomsky et al., 2021) contains several items which describe RS as a passive inference of safety-related information based upon others' behaviour (e.g., "If I am unsure about the cleanliness of an object, I will wait until somebody else touches it before I do."), a more active provocation of reassurance by approaching a perceived general threat around others (e.g., "When I am anxious about doing something, I often start and if nobody around me warns me to stop, I assume it's OK to continue."), and unspecified indirect strategies to solicit feedback regarding the security of a relationship (e.g., "I often try to find out if others care about me without asking directly."). The Reassurance Seeking Questionnaire (ReSQ; Kobori & Salkovskis, 2013) also appears to include aspects of NVRS: "I try to watch the way other people react to when I do things that worry me."

In qualitative studies, people with OCD reported nonverbal, "hidden ways" of seeking reassurance, such as carefully and silently examining a partner's tone, abruptly switching off a radio and looking a partner to prompt reassurance, or prolonging an off-topic conversation without mentioning an obsessional concern in hopes that the other person nonetheless provides reassurance (Kobori et al., 2012). Companions have reported that their loved ones with OCD have made "happy-looking" glances or fleeting eye contact so they would reassure them that "everything is OK" (Halldorsson et al., 2016).

Participants experimentally led to perceive elevated (vs. diminished) personal responsibility for the proper completion of a novel contamination-related dishwashing task significantly prolonged conversations with and made more off-topic comments to an actor trained for the study (Leonhart & Radomsky, 2019b). Nonverbal RS (NVRS) may be an important if understudied aspect of the safety-seeking compulsion to consider.

NVRS may also share several properties of nonverbal communication (Ekman & Friesen, 1969; Knapp & Hall, 2006; Mandal, 2014). RS may include important, simultaneous nonverbal aspects which do not explicitly mention obsessional concerns. NVRS may also be nearly universally and mutually understood, and could help to clarify the emotional significance of ambiguous statements (Ekman & Friesen, 1969; Hinde, 1972; Mehrabian & Wiener, 1967). People have been observed making "[n]onverbal expressions of concern" (Robinson, 2006) or "non-vocal indications of trouble" (Pajo & Klippi, 2013) to prompt comfort and responses from others when anxious, uncertain, or concerned. Various cues have been understood as prompts for others to provide relief, such as head gestures, facial expressions, postural shifts, hand movements, and changes in the quality, prosody, and pitch of voice (Coan & Gottman, 2007; Ekman & Friesen, 1969; Halldorsson et al., 2016; Hill et al., 2019; Hinde, 1972; Jurich & Jurich, 1974; Kendon, 1990, 1990; Knapp & Hall, 2006; Mahl, 1987; Mandal, 2014; Mehrabian & Wiener, 1967; Pajo & Klippi, 2013; Robinson, 2006; Scherer, 1988; Siegman, 1987; Trager, 1958; Vine, 1971; Waxer, 1977). If nonverbal communication may occur without active awareness of its specific expression or function, then it may be that NVRS is not the result of

active concealment but may inadvertently maintain obsessive-compulsive symptomatology below the attention of people with OCD 'under the radar' of those with OCD, their loved ones, and health professionals who help them.

Cognitive-behavioural treatments for OCD are predicated on the notion that maladaptive, obsessional beliefs, not intrusive thoughts themselves, largely determine psychopathology. Consistently, people without OCD from every surveyed continent, culture, and background have reported intrusive thoughts indistinguishable from those with the disorder (Clark, 2005; Pascual-Vera et al., 2019; Purdon & Clark, 1993; Rachman & de Silva, 1978; Radomsky et al., 2014; Salkovskis & Harrison, 1984). Those with (vs. without) OCD are thought to hold obsessional, maladaptive beliefs such as the overestimated importance of having control over thoughts or the moral equivalence of thoughts and actions (Miegel et al., 2019; Obsessive Compulsive Cognitions Working Group, 2003; Rachman, 2002; Salkovskis, 1985, 1999). Misinterpretations based on maladaptive beliefs, which are thought to result in negative cognitive, emotional, and behavioural sequelae (Barrera & Norton, 2011; Miegel et al., 2019; Obsessive Compulsive Cognitions Working Group, 2003; Rachman, 1997, 1998, 2002; Rachman & Hodgson, 1980; Salkovskis, 1985, 1999).

One of the beliefs thought to be central to OCD and which is most relevant to the present programme of research is responsibility, defined as the perception that one has a pivotal influence to prevent or provoke crucial negative outcomes (Ladouceur et al., 1997; Rhéaume et al., 1995; Salkovskis, 1985). Distressing, unwanted intrusive thoughts may be interpreted as the result of one's own control and intention and/or may be interpreted as indications of harm which one could cause and/or prevent (Rachman, 1997, 1998, 2002; Salkovskis, 1985, 1999). Compulsive checking and excessive RS are thought to (temporarily) neutralize obsessional concerns and validate maladaptive beliefs because they prevent disconfirmatory learning (Parrish & Radomsky, 2010; Rachman, 2002; Radomsky et al., 2021; Salkovskis, 1985, 1999; Salkovskis & Warwick, 1986; Warwick & Salkovskis, 1985). While compulsive checking may directly assess the presence of a perceived threat, excessive RS is thought to do so by proxy (Rachman, 2002; Salkovskis, 1985; Salkovskis & Warwick, 1986). However, because RS is an interpersonal act, it may additionally result in a perceived transfer of responsibility from the seeker to the reassurer (Rachman, 1998, 2002; Salkovskis, 1999; Warwick & Salkovskis, 1985). The (temporary) perceived transfer of responsibility is proposed to be another maintaining mechanism. Because of this unique dual reinforcement, RS may not only exacerbate symptoms but be particularly persistent and problematic. People with OCD have indicated that RS disperses responsibility for harm and blameworthiness and results in improved mood (Halldorsson & Salkovskis, 2017; Kobori et al., 2012; Parrish & Radomsky, 2010). However, experimental evidence for this transfer of responsibility is scarce.

Manipulations of responsibility perceptions and their impact on compulsive-like checking and self-reported urges to seek reassurance have been examined. Responsibility has been experimentally augmented (vs. diminished) by asking participants to sign contracts which assign responsibility for a task and/or potential negative consequences to them (vs. the experimenter; e.g., Leonhart & Radomsky, 2019b; Lopatka & Rachman, 1995; Radomsky et al., 2001). Participants have been told that their performance would directly influence procedures used to manufacture anti-viral medication in a country with poor literacy rates (vs. just a practice or simple colour-sorting task; Arntz et al., 2007; Bouchard et al., 1999; Ladouceur et al., 1995; Parrish & Radomsky, 2006) or to sort out potentially allergenic candies for others (vs. just a practice; Badham, 2012; Reeves et al., 2010). Participants have been led to believe that improper

task completion would result in another person receiving an electric shock (vs. not contingent on task performance; Boschen & Vuksanovic, 2007). They have been told that a computerized sound discrimination task would be used to improve traffic signals for people with disabilities (vs. an examination of percpetion; Ladouceur et al., 1995). They have been asked to imagine themselves in vignettes of increased (vs. decreased) responsibility (Champion & Grisham, 2022; Rhéaume et al., 1995). Clinical participants have been asked to complete exposure and response prevention alone (vs. with an experimenter; Shafran, 1997). Manipulated, augmented (vs. diminished) responsibility has resulted greater self-reported distress and urges to check during an exposure and response prevention task (Ladouceur et al., 1997; Shafran, 1997), greater recall of threat-related information (Radomsky et al., 2001), more replays of auditory stimuli (Ladouceur et al., 1995), more clicks on virtual 3-dimensional stove burners (Boschen et al., 2007), more checking behaviour observed by trained volunteers (Arntz et al., 2007; Bouchard et al., 1999; Reeves et al., 2010), and higher self-reported urges to seek reassurance (Leonhart & Radomsky, 2019b; Parrish & Radomsky, 2006, 2011). However, participants have typically been tested alone (Arntz et al., 2007; Bouchard et al., 1999; Champion & Grisham, 2022; Ladouceur et al., 1995, 1997; Lopatka & Rachman, 1995; Parrish & Radomsky, 2006, 2011; Radomsky et al., 2001; Rhéaume et al., 1995; Shafran, 1997), even when studying RS (Champion & Grisham, 2022; Parrish & Radomsky, 2006, 2011). Some experimental methods have arguably not reflected real-life experiences of people with OCD.

RS behaviour has also been measured directly. Adapting guidelines from Reeves et al., 2010, Badham (2012) counted the number of times children asked their mothers or the experimenter if they were "doing OK" or "doing [the task] right," to check for them, or what would happen if they did not perform the experimental task properly. Badham (2012) also counted the number of times the child participants looked at their mothers or experimenter. To better reflect real-life experiences of people with OCD, Neal and Radomsky (2015) developed a novel method of prompting and measuring RS behaviour. Within a laboratory testing room designed as a fully functional kitchen, participants watched plates get immersed into a bin containing what appeared to be garbage but was actually clean items made to appear dirty. Once the plates had been "contaminated," participants were asked to use common household resources (e.g., dish soap, sponge) to clean the plates according to ambiguous pictorial instructions. After being presented with ambiguous feedback about whether the threat of contamination was removed (i.e., misled to believe that the experimenter could not review the video recording properly), participants were given an opportunity to speak with the person paired with them before deciding if the task was properly done (i.e., safe to eat from the plates). Participants and the person paired with them were then asked to report the total number of times the participant sought reassurance. Trained observers reviewed audio recordings of the conversation for any direct questions regarding the dishwashing task (i.e., overt RS), queries about whether the partner had questions (i.e., overt RS), and subtle comments about the possible threat of contamination (e.g., covert RS). Neal and Radomsky's (2015) method provided a template for prompting and measuring *in vivo* RS in a relatively realistic situation. However, their research was not focused on the impact of responsibility on RS. Further, they noted that participants may have ignored the ambiguous instructions and resorted to typical washing behaviour. How responsibility affected in-person RS behaviour in a relatively realistic situation remained unclear.

Leonhart and Radomsky (2019) attempted to address these gaps. They designed an experiment to examine the impact of responsibility on RS within a relatively realistic context. Instead of being tested alone, participants were paired with a laboratory volunteer trained to act

like a fellow undergraduate participant but according to specific guidelines for crucial moments of the experiment. Participants were misinformed that the purpose of the study was to evaluate a potentially helpful decontamination procedure for people with OCD.

Instead of a virtual scenario, participants were in a testing room designed to be a functional kitchen. They were randomized either to a condition of augmented, high responsibility (HR) or diminished, low responsibility (LR). HR participants were informed that they would be "in charge" meaning they were entirely responsible for the proper completion of the dishwashing task. They were informed they were to decide if steps were properly completed before allowing themselves or the other person to proceed to the next step and therefore, would be solely responsible for any harm related to eventual use of the cups. To enhance the saliency of this manipulation and emphasize the pivotal influence over potentially crucial outcomes, HR participants were misinformed that incomplete or improper completion of the dishwashing procedure had resulted in illness in previous participants. Those in the LR condition were informed that they would not be responsible at all for any harm as they were "just assisting" the HR participant in completing the dishwashing. They were asked to simply follow the instructions and only initiate a next step when the HR participants told them to proceed. Participants were asked to sign a contract to document their agreement to their roles (Lopatka & Rachman, 1995; Radomsky et al., 2001). Participants were informed that they must take turns washing or reading the instructions after every second step. This was done to ensure that HR and LR participants both washed and read instructions aloud, that participants completed similar tasks and relied only on the HR participants' judgment about when to proceed. Detailed, written instructions with multiple steps were provided to complete an unfamiliar dishwashing procedure. Importantly, HR participants alone were to determine when to proceed, and LR participants were to simply follow instructions.

Instead of asking participants to imagine a threat of contamination, they were misinformed that the garbage bin in the kitchen was filled with trash that had accumulated from regular use of the kitchen, such as soiled paper towels, discarded plastic wrap, old coffee grounds, used facial tissues, latex gloves worn while cleaning, and fruit peels. Though these items appeared dirty, they were clean. To reinforce the perceived risk of contamination, participants were given a list of the contents of the garbage bin on the false premise that doing so was a requirement of the university's research ethics committee. The experimenter donned latex gloves and acted reluctant and disgusted as he immersed the cups into the garbage bin to 'contaminate' them. After leading participants to believe that the video camera was unreliable, the experimenter began a recording and left the room to allow participants to complete the dishwashing task with an actor. This task involved immersing cups for specific intervals of time into solutions of mild cleansers mixed in the sink and bowl according to specific steps. After completing the dishwashing task, participants were then asked to complete questionnaires in a separate room from the actor while the experimenter supposedly reviewed the video recording. Participants were then misinformed that a problem occurred with the video recording which prevented the experimenter from verifying whether the dishwashing task had been properly completed.s

Instead of virtual or imagined threat of contamination, participants were presented with a realistic risk of actual contamination, as they were misled to believe that someone would be soon asked to drink water from the cups. However, they were first given an opportunity to discuss concerns or uncertainties with the actor while the experimenter supposedly notified the

supervising professor of the issue. The audio recording of the ensuing conversation was coded for instances of RS according to the guidelines discussed above.

Some results were consistent with predictions, and some were unexpected (Leonhart & Radomsky, 2019b). As predicted, the manipulation was successful: HR (vs. LR) participants reported a significantly greater level of responsibility. Further, as hypothesized, they engaged in more RS overall. It was thought to be the first experiment to demonstrate that responsibility directly impacts actual RS *behaviour* about a relatively credible threat (i.e., contamination) associated with actual (vs. virtual, imagined) stimuli in a somewhat realistic (vs. artificial, unusual) setting. Consistent with predictions, RS appeared to transfer responsibility. A significant time × RS effect was found such that the perceived transfer of responsibility depended on whether people sought reassurance or not. Those who sought reassurance reported a significant decrease in responsibility whereas those who did not reported a significant increase. These findings were later replicated and extended. Champion and Grisham (2022) asked participants to rate their own and a hypothetical reassurer's responsibility for harm in vignettes before and after imagined reassurance. Imagined RS reduced personal responsibility and increased the imagined others' responsibility. However, whether a transfer of responsibility from the seeker to the reassurer following in-person RS occurs is unknown. Unexpectedly, participants utilized nonverbal behaviour (e.g., distressed facial expressions, hand gestures, pauses) to (ostensibly) prompt reassurance and made off-topic comments which prolonged the opportunity to later seek more reassurance were. HR (vs. LR) participants prolonged the opportunity for RS, spent more time seeking reassurance, prolonged off-topic conversation, and made more off-topic comments (Leonhart et al., 2019). Analyses of these behaviours were limited because models and measures of RS do not include consideration of nonverbal elements of RS.

The findings were unexpected and intriguing. Conceptualizations of RS did not explicitly include nonverbal elements. Hypotheses only related to overt and covert verbal RS. It may have indicated that additional elements of RS remained to be understood. In particular, the observations were thought to suggest that there may be important nonverbal aspects of RS which were understudied and poorly understood. If so, then models of RS in OCD may be limited.

Thankfully, effective interventions exist for RS in OCD. Cognitive-behavioural therapy (CBT) and its behavioural component, exposure and response prevention (ERP) demonstrate similar effect sizes in reducing OCD symptoms, although differ in important aspects (Öst et al., 2015). ERP typically involves repeated and/or prolonged exposure to cues (e.g., public doorknob, leaving house without checking items) which prompt obsessions (e.g., contamination, doubt) and then typically require the person refrain from compulsive behaviour (e.g., repeated, ritualized washing or checking). ERP can be adapted to target RS. After obsessions are prompted by exposure to obsessional cues, people with OCD may be asked to refrain from overt or covert RS and partners may be asked to ignore RS.

By contrast, a CBT approach tends to focus on developing more adaptive interpretations of intrusive thoughts as normal and harmless (McLean et al., 2001; Whittal et al., 2005; Whittal & O'Neill, 2003). Guided discovery can help those with OCD identify and reappraise maladaptive beliefs (e.g., overestimation of threat, inflated personal responsibility, overimportance of thoughts, thought-action fusion) and utilize behavioural experimentation when necessary to compare the accuracy and effect of obsessive (vs. adaptive) appraisals of intrusive thoughts.

CBT has been found to significantly reduce OCD symptoms (McLean et al., 2001; Whittal et al., 2005, 2008; Whittal & O'Neill, 2003). ERP is efficacious if completed properly

(Abramowitz, 2018; Foa & Kozak, 1986; Öst et al., 2015), but it remains problematic (Gillihan et al., 2012; Milosevic et al., 2015; Öst et al., 2015). It tends to inadequately address covert or mental compulsions (McLean et al., 2001; Rachman, 1997). On average, 15% of patients refuse to initiate ERP (Öst et al., 2015), though refusal rates for ERP can be as high 63% (Kushner et al., 2007; Öst et al., 2015). Of those with OCD who initiate ERP, an average of 19.1% drop out (Öst et al., 2015), perhaps believing the intervention ineffective, intolerably distressing, and/or less appealing than more acceptable alternatives (Milosevic et al., 2015). Compared to ERP, a cognitively-based CBT approach has demonstrated comparable effectiveness and greater acceptability than ERP (Clark, 2004; Milosevic et al., 2015; Neal et al., 2017; Öst et al., 2015; Whittal et al., 2005). Compared to ERP, nearly twice as many people complete CBT (Öst et al., 2015). Further, CBT (vs. ERP) can perhaps more easily accommodate the judicious use of partner support instead of the elimination of any partner accommodation altogether (Neal & Radomsky, 2020). People with OCD and partners who knew them rated a CBT approach of providing support without reassurance (e.g., "I can see how anxious you are, but you can do this!") as more acceptable, feasible, hopeful, appropriate, reasonable, and justifiable than the traditional behavioural approach which excludes any reassurance and limits support (e.g., "We agreed that I will not respond."; Neal & Radomsky, 2020).

Despite its advantages, CBT may also be limited. If current models of RS may construe RS as only a verbal behaviour which explicitly references concerns (Halldorsson & Salkovskis, 2017; Kobori et al., 2012; Parrish & Radomsky, 2010), then interventions may not address questions or comments that do not explicitly mention an obsessional concern. They may not intentionally target nonverbal aspects of communication which may prompt safety-related information. CBT may be constrained by the lack of information about understudied and potentially important nonverbal aspects of RS. There are no data about the triggers or cues, factors that maintain, unique attributes, and constituent behaviours of NVRS. The extent to which people with OCD are aware of NVRS is not well understood. It may represent highly concealed RS, or it may be almost automatic and below active awareness. Further, the effect of responsibility on NVRS is not known. Perceptions of elevated personal responsibility result in compulsive-like checking, urges to seek reassurance, and VRS, but whether this effect extends to NVRS is an open question. Further, whether RS transfers responsibility remains unclear. If models define RS only as questions or comments about perceived general threats to prompt safety-related information without consideration of nonverbal aspects of the phenomenon, then the effectiveness of cognitive-behavioural interventions for RS may be constrained. Those most impacted by these limitations would be people with OCD who seek reassurance and their loved ones from whom reassurance is so often sought. The present research was designed to address these gaps. To balance empirical rigour and opportunities to gather rich, potentially unexpected data, mixed-methods, programmatically linked mixed-methods studies were conducted. The overall objective was to examine nonverbal aspects of RS in OCD.

Study 1 was designed to examine the impact of augmented (vs. diminished) responsibility on both VRS and NVRS. It was hypothesized that participants in a condition of augmented, high responsibility (HR; vs. diminished, low responsibility [LR]) would engage in more overt VRS, covert VRS, and NVRS. Further, it was hypothesized that RS of any kind would result in a transfer of responsibility from seeker to reassurer, such that those who sought reassurance would report a decrease in personal responsibility and an increase in an actor's responsibility. Finally, it was predicted that those who did not seek any reassurance would report feeling more personally responsible after not seeking reassurance during the RS opportunity. Study 2 was largely

exploratory. It was designed to provide information about what NVRS is, how it manifests, what triggers or cues might evoke it, why it occurs, both generally and in contrast to VRS, and the extent to which people with OCD are aware they are doing it.

CHAPTER 2: RESPONSIBILITY MAY CAUSE NONVERBAL REASSURANCE ALSO: AN EXPERIMENTAL INVESTIGATION

ABSTRACT

In obsessive-compulsive disorder, excessive reassurance seeking (RS) is distressing, maladaptive, and may occur nonverbally. Experimentally augmented "high" responsibility (HR; vs. diminished "low" responsibility [LR]) leads to verbal RS (VRS). However, it is unknown if responsibility affects nonverbal RS (NVRS). It was hypothesized that HR (vs. LR) responsibility would result in more NVRS. Participants (N = 86) randomized to one of two responsibility conditions could seek reassurance following ambiguous feedback about a contamination-related threat after completing a novel dishwashing task with an actor. The multivariate effect of responsibility of VRS was not significant, *Wilks*' λ = .95, $F(3, 82) = 1.57$, p = .202, η_p^2 = .05. However, HR (vs. LR) participants demonstrated significantly more VRS according to the actor, $F(1, 84) = 4.09$, p = . 046, η_p^2 = .05) and marginally more VRS according to participants' self-report, $F(1, 84) = 3.03$, p = .085, η_p^2 = .04, but coders reported no differences, $F(1, 84) = 1.87$, p = .175, η_p^2 = .02. HR (vs. LR) resulted in a trend toward more NVRS overall, *Wilks*'λ = .93, $F(3, 82) = 2.17$, p = .098, η_p^2 = .07 and significantly more NVRS according to the actor, $F(1, 84) = 5.57$, p = .021, η_p^2 = .06 but not according to participants themselves, $F(1, 84) = 2.14$, p = .147, η_p^2 = .03 nor to coders, $F(1, 84) = .75$, p = .390, η_p^2 = .01. Based on a significant condition × time × person multivariate interaction, RS appears to have resulted in a smaller perceived transfer of responsibility from HR participants to an actor and a larger perceived transfer of responsibility from the actor to LR participants, *Wilks'* λ = .92, $F(1, 86) = 7.60$, p = .007, η_p^2 = .08. Implications for cognitive models of and treatment for RS are discussed.

Keywords: obsessive-compulsive disorder; responsibility; beliefs; reassurance seeking; nonverbal; concealment.

Responsibility may cause nonverbal reassurance seeking also: An experimental investigation

Obsessive-compulsive disorder (OCD) is disabling, characterized by recurrent, intrusive, distressing thoughts, images, or urges (obsessions) and/or repetitive behaviour (compulsions; American Psychiatric Association, 2013). Approximately 1%-2% of the population develops OCD (Kessler et al., 2012; Osland et al., 2018). It affects and can disrupt nearly all aspects of life (Norberg et al., 2008; Salkovskis et al., 1998). It has been listed among the 10 most disabling conditions as measured by diminished quality of life and lost income (World Health Organization, 1996) and the most disabling neuropsychiatric disorders (World Health Organization, 2008). Anxiety disorders, including OCD, have been listed as the sixth leading contributors to loss of healthy living to disability worldwide (World Health Organization, 2017).

Reassurance seeking is ubiquitous. It is common for people to repeatedly ask a loved one to reassure them, for example, prior to an important job interview or before embarking on a long vacation (Abramowitz et al., 2014; Gibbs, 1996). However, prompts for reassurance may become excessive, time-consuming, and distressing. RS can dominate interactions and relationships between those with OCD and their loved ones (Halldorsson et al., 2016; Kobori et al., 2012; Salkovskis et al., 1998).

Unfortunately, excessive RS is a common and problematic feature of many mental health disorders. Repetitive questions or subtle comments meant to prompt reassurance can be observed in people suffering from Major Depressive Disorder where they may recurrently desire to evoke affection from others, confirm that they are loved, and reaffirm their self-worth (Burns et al., 2006; Coyne, 1976; Gillett & Mazza, 2018; Joiner & Metalsky, 2001) and in Panic Disorder where RS tends to focus on whether bodily symptoms are dangerous or uncontrollable (Osborne & Williams, 2013). Further, RS is a diagnostic criterion for some disorders like Generalized (Beesdo-Baum et al., 2012; Cougle et al., 2012), Social (Taylor et al., 2019), and Illness Anxiety Disorders (Abramowitz & Moore, 2007; Halldorsson & Salkovskis, 2017; Salkovskis & Warwick, 1986), and may play a critical role in Dependent Personality and Body Dysmorphic Disorders (APA, 2013; Gillett & Mazza, 2018; Phillips et al., 2005). In OCD, people tend to seek reassurance to assess general threats (Parrish & Radomsky, 2010), decision-related threats, and social threats (Orr et al., 2018). Distinctions have been made between overt RS via direct questions (e.g., "Are you sure the door is locked?") or covert RS via subtle statements (e.g., "Surely my hands are clean enough"; Kobori et al., 2012; Parrish & Radomsky, 2010; Radomsky et al., 2021). While the focus of RS may be different in each disorder, the general behaviour is commonly maladaptive and distressing for both the seeker and their loved ones.

Obsessional beliefs are thought to be central to the onset and maintenance of OCD symptoms, including RS (Obsessive Compulsive Cognitions Working Group, 2003; Rachman, 1997, 1998, 2002; Rachman & Hodgson, 1980; Salkovskis, 1985). One of these beliefs is inflated personal responsibility: the perception that one has special pivotal influence to prevent or provoke critical, potentially harmful, outcomes (Ladouceur et al., 1997; Rachman, 1997; Rhéaume et al., 1995; Salkovskis, 1985; Salkovskis et al., 1992). The focus on responsibility in OCD arose when people with OCD reported greater distress and more frequent and severe checking when alone (Rachman, 1976; Rachman & Hodgson, 1980). Without anyone else present, people with OCD are thought to attribute all responsibility for crucial outcomes to themselves. When people with OCD are with someone, they are thought to attribute influence more equitably. Beliefs of augmented personal responsibility have remained central to cognitive-behavioural models of OCD and are consistently used to explain the maladaptive

misinterpretation of intrusive thoughts and compulsive behaviours (Rachman, 1997, 1998, 2002; Salkovskis, 1985, 1999).

Experimental examinations of responsibility and RS have been critical to understanding its role in OCD. Manipulated, augmented, high (HR vs. diminished, low [LR]) responsibility has resulted in greater self-reported urges to seek reassurance (Champion & Grisham, 2022; Parrish & Radomsky, 2011), and more actual RS behaviour (Leonhart & Radomsky, 2019b). Leonhart and Radomsky (2019) utilized a multi-informant measure of RS behaviour adapted from Neal and Radomsky (2015). Neal and Radomsky (2015) found that people reported the number of instances of VRS differently, indicating that multiple informants were required to provide comprehensive information about VRS. When given an opportunity to seek reassurance, participants and a familiar (vs. unfamiliar) partner reported more RS. Volunteers trained to code VRS from audio recordings of the interaction reported no difference. In Leonhart and Radomsky's experiment (2019), HR (vs. LR) participants engaged in more VRS, according to coders, whereas no significant differences were noted by participants or an actor (Leonhart & Radomsky, 2019b). Multi-informant measures of RS are important, as people may identify RS differently. Experiments in the research laboratory have had important implications for the clinic. Experiments designed to study the impact of responsibility on checking and RS have led to effective interventions. Strategies to target responsibility beliefs have been integrated into the treatment of choice for OCD–cognitive-behavioural therapy (CBT; Bennett-Levy et al., 2004; Clark, 2004; Gillihan et al., 2012; Öst et al., 2015)–to reduce compulsive behaviour (Radomsky et al., 2020)

Despite this, CBT has remained limited. Because research has focused on RS as direct questions or subtle comments, nonverbal aspects of RS may 'fly under the radar' of clinicians and researchers. However, important unspoken aspects of RS can be seen in various psychometric and phenomenological studies of RS. The Reassurance Seeking Questionnaire (ReSQ; Kobori & Salkovskis, 2013) and Covert-Overt Reassurance Seeking Inventory (CORSI; Radomsky et al., 2021) contain descriptions of unspoken strategies of seeking and acquiring reassurance (e.g., "I try to watch the way other people react to when I do things that worry me" [ReSQ]; "When I am anxious about doing something, I often start and if nobody around me warns me to stop, I assume it's OK to continue" [CORSI]). Moreover, significant others and helping professionals have reported urges to reassure those with obsessive-compulsive, mood, and anxiety problems who made certain facial expressions (e.g., "happy-looking glances"), hand gestures (e.g., shrugged shoulders), abrupt postural shifts (e.g., stiffened posture, lean toward potential reassurer), or meaningful paraverbal cues (e.g., changes in pitch, prosody, or timbre) which were contextually understood as a request to have concerns and/or distress alleviated (Coan & Gottman, 2007; Hall et al., 1995; Halldorsson et al., 2016; Hinde, 1972; Knapp & Hall, 2006; Mandal, 2014; Mehrabian & Wiener, 1967; Pajo & Klippi, 2013; Poyatos, 1993; Robinson, 2006; Trager, 1958; Vine, 1971; Waxer, 1977). Notably, experimentally increased (vs. decreased) responsibility resulted in more off-topic comments and measurable pauses, seemingly to prompt reassurance (Leonhart et al., 2019). These observations are consistent with nonverbal communication theory, which conceptualizes numerous unspoken behaviours as essentially automatic and nearly universally understood prompts for a response to alleviate distress and/or concerns (Knapp & Hall, 2006; Mandal, 2014). Indeed, within a recent model, a functional definition of RS included any verbal or *nonverbal* behaviour which solicits *or ostensibly solicits* reassurance (Gillett & Mazza, 2018).

Nonverbal reassurance seeking (NVRS), then, may be an important, underexamined aspect of RS which maintains symptoms unbeknownst to those with OCD, loved ones, or even clinicians (Knapp & Hall, 2006; Mandal, 2014). If so, then NVRS, like VRS, may be influenced by responsibility beliefs. However, this remains unknown.

Therefore, designed as a replication and extension of a previous experiment which examined the effect of manipulated responsibility on VRS (Leonhart & Radomsky, 2019b), the present study was conducted to examine the impact of HR (vs. LR) on VRS and NVRS. It was hypothesized that HR (vs. LR) participants would demonstrate both more VRS and more NVRS as reported by participants, actors, and independent coders. Lastly, it was predicted that RS would transfer responsibility, such that seekers would perceive a decrease in their own responsibility and an increase in the reassurer's responsibility following the solicitation/provision of reassurance.

Method

Power Analysis

There have been two previous similar experimental studies of RS. Neal and Radomsky (2015) calculated a medium-low effect size of $f^2 = 0.12$ as a result of an experimental manipulation of familiarity to examine RS about a dishwashing task (Neal & Radomsky, 2015). A more recent experiment yielded a larger effect size of $\eta_p^2 = .134$ (equivalent to $f^2 = .21$; Leonhart & Radomsky, 2019). The experiment manipulated responsibility. An *a priori* power analysis based on the two experimental conditions (i.e. LR vs. HR), three main response variables (i.e., overt VRS, covert VRS, and nonverbal RS), a desired power of .80, and a conservative estimated effect size of $f^2 = .165$ (the mean of the two above-cited effect sizes), 72 participants were required to assess the main hypotheses of the study (G*Power; Faul, Buchner, Erdfelder, & Lang, 2014).

Participants

Participants ($N = 97$) from Concordia University in Montréal, Québec, Canada were recruited from the Psychology Department's Undergraduate Research Participant Pool in exchange for course credit or entry into a cash draw. Participants were included if they were able to read, speak, and understand English and had not participated in experiments where a similar protocol was utilized (see Appendix A for copy of Leonhart & Radomsky, 2019b; Neal & Radomsky, 2015).

Participants were asked to provide demographic information. They indicated being mostly young adults ($M_{age} = 22.42$, $SD = 3.72$). They were asked to select their sex from a list including male, female, or to indicate that they were prefer not to disclose. Most were reportedly female (87.2%). Most participants' primary language was English (69.4%) or French (17.6%). The majority were single (88.4%). Most were students (91.9%). Most were of European (45.3%) or Asian (26.7%) origins. The remainder reported African (9.3%), Latin, Central, or South American (5.8%), Other North American (5.8%), Caribbean (2.3%), Oceania (2.3%), and North American Indigenous origins (1.2%).

Materials

The materials used were the same as those of a previous experiment examining responsibility and VRS (Leonhart & Radomsky, 2019b, see Appendix A for copy of the manuscript).

Responsibility Contract

Participants were asked to sign a contract acknowledging that they were either solely responsible for the proper completion of each step of the dishwashing procedure and for any harm related to eventual use of the cups (HR condition, see below) or that they were to just assist another participant (a trained actor) and were not at all responsible for any harm (LR condition, see below). The contract used was the same as Leonhart and Radomsky (2019; see Appendix A for further information).

Mock Contaminant

A garbage bin was filled with a variety of clean items made to appear dirty. Details can be found in Appendix A. Participants were told that the bin contained used facial tissues, dirty paper towels, used plastic wrap, old coffee grounds, soiled latex cleaning gloves, and fruit peels. The contents of the bin were designed to appear dirty and be perceived as disgusting but were clean and simulated.

List of Contents of Mock Contaminants

Participants were given a list of the contents of the garbage bin to enhance the salience of contamination threat. Items were described as "used facial tissues," "dirty paper towels," "used plastic wrap," "old coffee grounds," "soiled latex cleaning gloves," and "old fruit peels." The list was provided to maximize believability of contamination threat (see Appendix A containing the full manuscript of the study conducted by Leonhart & Radomsky, 2019).

Equipment for Dishwashing Task

Ceramic mugs, a stainless-steel basin, a stainless-steel measuring spoon, containers with various "mild cleansers" (i.e., coloured water, baking soda, and dish soap), a stir stick, and a dish rack were placed on a counter next to a functional kitchen sink. Participants were asked to use the measuring spoon to add cleansers and the stir stick to mix the cleanser solution at certain points in the dishwashing procedure. Mugs were placed on the dish rack after washing (see Leonhart & Radomsky, 2019 detailed in Appendix A).

Written Instructions for Dishwashing Task

Clearly written yet novel dishwashing instructions were given to each participant to promote consistency in task-related behaviour and yet enhance uncertainty about proper task completion (see Appendix A, a copy of Leonhart & Radomsky, 2019).

Actors

Three hypothesis-naïve actors were recruited and trained by the first author (ML). They were educated about OCD and RS. They were given behavioural guidelines and a script for critical moments of the experiment. Additionally, they were trained to complete the measures of participants' VRS and NVRS.

Behavioural Measures

Reassurance Seeking Checklist (RSC)

The RSC (Neal & Radomsky, 2015) is a five-item measure of the number of times participants talked aloud to themselves or sought reassurance verbally about the dishwashing

task. Participants, an actor, and hypothesis- and condition-naïve coders completed the RSC. The RSC authors argued that internal consistency may not be appropriate or even desirable for this measure, given it assesses participants' RS regarding *any* aspect of the dishwashing task (Neal & Radomsky, 2015). Participants' concerns are likely idiographic, so high internal consistency among responses is unlikely.

Nonverbal Reassurance Seeking Checklist (NVRSC)

The NVRSC (Leonhart & Radomsky, 2021) is a 34-item list of nonverbal behaviours which could (ostensibly) be used to seek reassurance during an opportunity to do so. It was developed for the study. Items were based on a combination of observations of nonverbal behaviour from participants during a previous studies of RS (Leonhart et al., 2019) as well as a review of research into nonverbal communication. Many aspects of nonverbal communication have been known to prompt–ostensibly to serve as a signal to prompt–responses from others that are often comforting and reassuring, including abrupt changes in proximity (e.g., getting closer to others; Hinde, 1972; Robinson, 2006; Waxer, 1977), head gestures like shaking or nodding (Hinde, 1972; Jurich & Jurich, 1974; Mahl, 1987; Mandal, 2014; Pajo & Klippi, 2013; Robinson, 2006; Scherer, 1988), facial actions like happy-looking glances, fleeting eye contact, or distressed/fearful expressions described as a wrinkled forehead, eyebrow raising, abruptly opened eyelids, direct or fleeting eye contacts, frequent gulps, lip-biting, and/or drawn lips showing teeth in 'unfelt smile' (Coan & Gottman, 2007; Ekman & Friesen, 1969; Halldorsson et al., 2016; Hinde, 1972; Mehrabian & Wiener, 1967; Vine, 1971), abrupt shifts in posture or orientation toward a potential source of reassurance (Hinde, 1972; Kendon, 1970, 1990; Pajo & Klippi, 2013; Robinson, 2006), touch of a loved one or companion nearby or of one's own face (Knapp & Hall, 2006; Mandal, 2014), fidgeting with one's own hands, hair, objects, touching one's face (Siegman, 1987; Waxer, 1977), and abrupt deviations from typical speech like sudden upward/downward tone inflections, crescendos/diminuendos in the volume of speech, accelerations/decelerations in speech, unexpected/prolonged pauses, or strained timbre of speech (Coan & Gottman, 2007; Hall et al., 1995; Knapp & Hall, 2006; Mahl, 1956; Poyatos, 1993; Robinson, 2006; Scherer, 1988; Siegman, 1987; Trager, 1958). In the present study, participants, an actor, and coders were asked to complete the NVRSC by indicating the number of times each behaviour occurred during the opportunity to seek reassurance.

Coding of RS

RS opportunities were coded by two trained hypothesis- and condition-naïve volunteers. Training was extensive. Each trainee received over 20 hours of training. They learned about OCD and RS. They read important theoretical (Rachman, 1998, 2002; Salkovskis, 1985, 1999; Warwick & Salkovskis, 1985), phenomenological (Halldorsson et al., 2016, 2017; Kobori et al., 2012; Parrish & Radomsky, 2010), and experimental studies (Leonhart & Radomsky, 2019b; Neal & Radomsky, 2015; Parrish & Radomsky, 2006, 2011) related to RS in OCD. As recommended to improve identification of complex behaviour (Blairy et al., 1999; Coan & Gottman, 2007), coders practiced seeking reassurance verbally and nonverbally with the lead author. Then, volunteers observed the lead author code the RS opportunity of a pilot participant according to the procedure. Trained volunteers then coded a pilot interaction under the lead author's active supervision who gave immediate corrective feedback. Agreement was assessed after they coded recordings from pilot participants. Inter-rater agreement was assessed primarily via two-way mixed, absolute agreement, single-measures intra-class correlations (ICC), but

average-measures ICCs were also assessed to describe reliability comprehensively (Hallgren, 2012; McGraw & Wong, 1996).

From five pilot participant recordings, the coders achieved moderate agreement (Koo & Li, 2016) in coding any RS, *ICC* = .559 (average-measures *ICC* = .72. Reliability of coding VRS was good, *ICC* = .80 (average-measures *ICC* = .89). As expected, agreement was strongest for overt VRS, *ICC* = .92 (average-measures *ICC* = .96). Agreement for covert VRS was lower, *ICC* = .55 (average-measures *ICC* = .71 [good]). NVRS had the fair but promising agreement, *ICC* = .45 (average-measures *ICC* = .62 [good]). One volunteer then coded all recordings and a second coded a random 33% of them after they demonstrated acceptable interrater reliability.

Once all coding was completed, inter-rater agreement was evaluated again via two-way mixed, absolute agreement, single-measures intra-class correlations (ICC) and average-measures ICCs were once again calculated to describe reliability comprehensively (Hallgren, 2012; McGraw & Wong, 1996). Agreement for all RS was good, *ICC* = .70, (average-measures *ICC* = .82 [excellent]). For total VRS, agreement was moderate, *ICC* = .52 (average-measures *ICC* = .68 [moderate]). Agreement for overt VRS was excellent, *ICC* = .81 (average-measures *ICC* = .89 [excellent]). Covert VRS had moderate agreement, *ICC* = .54 (average-measures *ICC* = .70 [good]). Agreement for NVRS was fair, *ICC* = .49 (average-measures *ICC* = .65 [good]).

Self-Report Measures

Vancouver Obsessive Compulsive Inventory (VOCI)

The VOCI (Thordarson et al., 2004) was used to assess various aspects of OCD symptomatology. It has excellent psychometric properties with clinical and student populations (Thordarson et al., 2004; Radomsky et al., 2006). Total scale internal consistency in the current sample was excellent, Cronbach's α = .97. The contamination, checking, obsessions, hoarding, just right, and indecisiveness subscales had good internal consistency, Cronbach's α = .90, .94, .90, .86, .89, and .89, respectively.

Obsessional Beliefs Quesitonnaire-44 (OBQ-44)

The OBQ-44 (OCCWG, 2005) was used to assess OCD-related beliefs and thoughts. It has excellent psychometric properties. In this sample, the total scale reliability was excellent, Cronbach's α = .97. The internal consistencies of the responsibility and threat estimation, perfectionism and intolerance of uncertainty, and importance and control of thoughts subscales in this sample were excellent, Cronbach's α = .93, .94, and .93, respectively.

Depression Anxiety Stress Scales-21 (DASS-21)

The DASS-21 (Antony et al., 1998) was used to assess depression, anxiety, and stress symptomatology. It has excellent psychometric properties. In the present study, the total scale's internal consistency was excellent, Cronbach's α = .94. The depression, anxiety, and stress subscales had good internal consistency (Cronbach's α = .88, .85, and .87, respectively).

Ratings of Responsibility

Participants were asked to rate their own and an actor's responsibility for the proper completion of the dishwashing task on visual analogue scales from *Not at all/None* 0 – 100 *Extremely/Completely*.

Credibility Ratings

The perceived dirtiness of the garbage bin and the believability of the actor's responses were rated on a visual analogue scale from *Not at all/None* 0 to 100 *Extremely/Completely*.

Procedure

The present procedure replicated that of Leonhart and Radomsky (2019), except for the addition of the ratings of NVRS (completed after the RS opportunity) and of an actor's responsibility (completed after the dishwashing task and then after the RS opportunity). In brief, participants were asked to complete an unfamiliar dishwashing task with a trained actor after some dishes were 'contaminated' with mock contaminants. Participants were randomized to one of two responsibility conditions, one in which they were given primary responsibility for ensuring that the dishes were properly cleaned (HR), and one in which the actor was given this primary responsibility. For additional details about the procedure and methodology, please consult Leonhart and Radomsky (2019, see Appendix A).

Results

Data Cleaning

Data were collected from 97 participants. Four participants' data were excluded for missing credibility checks. Four more were excluded for missing data on measures of symptomatology. One participant's data were excluded because they contained univariate outliers on actor-reported and coder-reported VRS and on a multivariate outlier comprised of the NVRS measures. Finally, data from two participants were removed because they rated the believability of actor responses as 0 out of 100. The final sample consisted of 86 participants ($n_{LR} = 42$, $n_{HR} = 44$).

Symptomatology and Obsessive-Compulsive Beliefs

To assess if HR (vs. LR) participants differed in obsessional, mood, or anxious symptomatology, independent samples *t*-tests were conducted on scores of OCD symptoms (e.g., VOCI), obsessive beliefs (e.g., OBQ-44), and depression, anxiety, and stress symptomatology (e.g., DASS-21). No significant differences were found (see Table 1), indicating that observed differences in self-reported experiences and observed behaviour are unlikely to be the result of differences in beliefs and symptoms and more likely the result of the experimental manipulation.

Credibility Checks

Descriptive statistical analyses were conducted on the credibility checks to examine the extent to which participants rated the dirtiness of the mock contaminant, believability of the video failure justifying the RS opportunity, and the believability of the actor's responses (see Table 2). Independent samples *t*-tests were conducted to examine whether HR (vs. LR) participants differed on their ratings of the credibility checks. There were no differences regarding the believability of the video failure and the actors' responses. However, there was a trend toward LR (vs. HR) participants rating the mock contaminant of the garbage as marginally dirtier.

Manipulation Checks

A two-way MANOVA was conducted to examine the impact of the experimental manipulation and the person being rated on participants' ratings of responsibility. There was a significant multivariate condition × person interaction, *Wilks'* $\lambda = .71$, $F(1, 84) = 34.86$, $p < .001$,

η_p^2 = .29. A one-way MANOVA was conducted to examine the impact of the experimental manipulation on participants' ratings of their own and the actor's responsibility. The multivariate effect was statistically significant, *Wilks'* λ = .69, $F(2, 83) = 18.97$, $p < .001$, η_p^2 = .31. Follow-up univariate analyses indicated that HR (vs. LR) participants attributed more responsibility to themselves, $F(1, 84) = 25.94$, $p < .001$, η_p^2 = .24 and attributed less responsibility to the actor (vs. LR participants), $F(1, 84) = 9.21$, $p = .003$, η_p^2 = .10.

Further, paired-samples *t*-tests were conducted to examine the extent to which participants within each condition similarly rated their own and the actor's responsibility. HR participants attributed significantly more responsibility to themselves than the actor paired with them, $t(43) = 6.04$, $p < .001$, $d = .91$. LR participants attributed less responsibility to themselves than the actor paired with them, $t(41) = -3.11$, $p = .003$, $d = -.48$. This suggests that the manipulation was successful in changing participants' perceptions about their own responsibility but also effectively impacted their attributions about others' responsibility.

Hypothesis Tests

Participant-, Actor-, and Coder-Reported VRS

High (vs. low) responsibility was hypothesized to result in more VRS. To examine this, a one-way MANOVA was conducted. Experimental condition of responsibility (LR vs. HR) was the independent variable. The dependent variables related to VRS were participant-reported, actor-reported, and coder-reported VRS. The multivariate effect of responsibility on VRS was not significant, *Wilks*' λ = .95, $F(3, 82) = 1.57$, $p = .202$, η_p^2 = .05 (see Table 2, Figure 2), nor did a coder observe a difference in VRS, $F(1, 84) = 1.87$, $p = .175$, η_p^2 = .02. However, HR (vs. LR) participants reported marginally more VRS, $F(1, 84) = 3.03$, $p = .085$, η_p^2 = .04. Further, according to actor reports, HR (vs. LR) participants did engage in significantly more VRS, $F(1, 84) = 4.09$, $p = .046$, η_p^2 = .05.

Participant-, Actor-, and Coder-Reported NVRS

Augmented (vs. diminished) responsibility was predicted to result in more NVRS. A one-way MANOVA was conducted, where responsibility condition (LR vs. HR) was the independent variable, and the NVRS variate was comprised of the participant-reported, actor-reported, and coder-reported NVRS dependent variables. A trend toward a significant multivariate effect was found such that HR (vs. LR) participants did display marginally more NVRS overall, *Wilks*' λ = .93, $F(3, 82) = 2.17$, $p = .098$, η_p^2 = .07 (see Table 2 and Figure 3). Importantly, HR (vs. LR) participants engaged in significantly more NVRS, according to actor reports, $F(1, 84) = 5.57$, $p = .021$, η_p^2 = .06. Although HR (vs. LR) participants reported more NVRS, the difference was not significant, $F(1, 84) = 2.14$, $p = .147$, η_p^2 = .03. Likewise, coders reported more NVRS in HR (vs. LR) participants, but not significantly so, $F(1, 84) = .75$, $p = .390$, η_p^2 = .01.

Transfer of Responsibility

It was predicted that RS would result in a transfer of responsibility from participant to actor. To assess this, a repeated measures MANOVA was conducted, where the independent variables were condition (e.g., LR, HR), person (i.e., participant, actor), and time (e.g., before RS opportunity, after RS opportunity) and the dependent variables were participants' ratings of their own and the actor's responsibility for the proper completion of the dishwashing task.

The multivariate condition × person × time interaction was significant, *Wilks' λ* = .919, $F(1, 86) = 7.60$, $p = .007$, $\eta_p^2 = .08$ (see Table 3 and Figure 4), indicating that the size of the perceived transfer of responsibility as a result of RS depended on the condition and rated person, such that there was a smaller perceived transfer of responsibility from HR participants to actors following RS compared to a larger perceived transfer of responsibility from actors to LR participants as a result of RS.

The two-way interactions were examined. The multivariate condition × time interaction was not significant, *Wilks' λ* = 1.00, $F(1, 84) = .24$, $p = .627$, $\eta_p^2 = .00$. The multivariate condition × person interaction was significant *Wilks' λ* = .71, $F(1, 84) = 34.86$, $p < .001$, $\eta_p^2 = .29$. This suggests that the magnitude of the effect of the responsibility manipulation depended on who the participants were rating: themselves or the actor. The multivariate time × person interaction was marginally significant, *Wilks' λ* = .97, $F(1, 84) = 2.92$, $p = .091$, $\eta_p^2 = .03$; the impact of RS on participants' attributions of responsibility may depend on who they were rating.

Follow-up paired-samples *t*-tests were conducted to examine the extent to which participants in each condition similarly rated their own and an actor's responsibility following the RS opportunity. HR participants still rated themselves as more responsible than actors, $t(43) = 5.51$, $p < .001$, $d = .81$. However, following RS, LR participants attributed more responsibility to themselves and less to the actor such that they were not significant different after the RS opportunity, $t(41) = -1.65$, $p = .106$, $d = -.26$. This suggests that a transfer of responsibility may be small when seeking reassurance in response to a belief of personally augmented responsibility, but it may more relatively larger when the reassurance seeker initially holds a belief of diminished (vs. augmented) responsibility.

Discussion

Previous experiments have examined the effects of responsibility on compulsive-like checking and cleaning (Arntz et al., 2007; Boschen & Vuksanovic, 2007; Bouchard et al., 1999; Ladouceur et al., 1995, 1997; Lopatka & Rachman, 1995), urges to seek reassurance (Leonhart & Radomsky, 2019b; Parrish & Radomsky, 2006, 2011), and VRS (Leonhart & Radomsky, 2019), but little has been done to experimentally examine its effects on NVRS. We examined the effect of responsibility on NVRS and the impact of RS on the perceived responsibility transfer.

The manipulation successfully created conditions where HR (vs. LR) participants reportedly attributed greater responsibility to themselves and less to an actor. According to participants themselves and the actor from whom reassurance was sought, augmented (vs. diminished) responsibility resulted in more VRS. There was a trend toward a multivariate effect of responsibility on NVRS. Importantly, according to actor reports, HR (vs. LR) participants engaged in significantly more NVRS. The differences in NVRS noted by participants and coders were in the predicted direction but not significant. To the best of our knowledge, this is the first demonstration that augmented responsibility results in NVRS. Lastly, there was evidence that the size of a perceived transfer of responsibility depends on whether participants believe they are especially responsible for the proper completion of the task: HR participants reported a smaller but significant transfer from themselves to the reassurer whereas LR participants perceived a greater responsibility transfer from the reassurer to themselves.

Manipulating responsibility beliefs in the laboratory can be difficult (Shafran, 1997) and not always successful (e.g., Badham, 2012). Experiments designed to examine responsibility have typically only measured the impact of a manipulation on participants' ratings of their own responsibility (Leonhart & Radomsky, 2019b; Parrish & Radomsky, 2006, 2011). However,

experimental manipulations of responsibility through vignettes also impact participants' ratings of how responsible a potential reassurer would be (Champion & Grisham, 2022). To the best of our knowledge, the present experiment was the first to affect participants' attributions of responsibility both for themselves and another person with whom they interacted as part of a relatively ecologically valid setting and credible contamination-related threat (i.e., ambiguous feedback following an unfamiliar dishwashing task in a kitchen).

The present study's results are generally consistent with previous experiments which demonstrated similar effects of responsibility on checking. Experimentally manipulated, augmented, high responsibility (HR vs. diminished, low responsibility [LR]) resulted in more compulsive-like checking (Arntz et al., 2007; Boschen & Vuksanovic, 2007; Bouchard et al., 1999; Ladouceur et al., 1995, 1997; Lopatka & Rachman, 1995; Radomsky et al., 2001), urges to seek reassurance (Leonhart & Radomsky, 2019b; Parrish & Radomsky, 2006, 2011), and VRS (Leonhart & Radomsky, 2019). One of these previous experiments found that HR (vs. LR) led to longer conversations overall and more "off-topic" comments (Leonhart & Radomsky, 2019b). In this study, HR (vs. HR) resulted in marginally more VRS, according to participants and significantly more VRS, according to trained actors from whom reassurance was sought. The present research is thought to be the first in which responsibility was observed to also result in significant differences in various nonverbal aspects of RS. Nonverbal actions that presumably prompt safety-related or comforting feedback from others have been incidentally described. Consistent with cognitive-behavioural models of OCD ((Rachman, 1997, 1998, 2002; Salkovskis, 1985, 1999), NVRS may have functional similarities to compulsive checking, as has been observed with VRS (Champion & Grisham, 2022; Leonhart & Radomsky, 2019b; Parrish & Radomsky, 2006, 2011). Though RS has been theorized to result in a perceived transfer of responsibility (Rachman, 1998, 2002; Salkovskis, 1985, 1999), empirical observations of this effect have been lacking. Participants who did not seek reassurance about a contamination threat following a novel dishwashing task reported an increase in perceived responsibility after an opportunity to seek reassurance from a trained actor (Leonhart & Radomsky, 2019b). People reported a perceived transfer of responsibility from themselves to a hypothetical source of reassurance in vignettes (Champion & Grisham, 2022). The present study is thought to be the first to demonstrate evidence of a transfer of perceived responsibility from seeker to reassurer following an *in vivo* experience where participants actually sought reassurance. The magnitude of a perceived transfer of responsibility from RS appears to depend on initial responsibility perceptions and person being rated. The perceived transfer from HR participants to an actor appears to be smaller than the from an actor to LR participants. This finding is intriguing, as it may provide a nuanced perspective of perceptions of responsibility transfer in OCD. Unlike checking, RS is thought to be reinforced by a transfer of responsibility from seeker to reassurer (Kobori et al., 2012; Parrish & Radomsky, 2010; Rachman, 2002; Salkovskis, 1985, 1999; Salkovskis et al., 2000). This finding is consistent with the notion that responsibility may be difficult to manipulate (Shafran, 1997), and may reflect an asymmetry, such that people may more easily be able to take on additional responsibility than they are to relinquish it. This is an empirical question, however, and may help to explain why targeting responsibility in the clinic can sometimes be challenging.

Other aspects of the present data are subtly, yet intriguingly different from previous research. Leonhart and Radomsky (2019) found that coders–not participants nor actors–reported more VRS in HR (vs. LR) participants (Leonhart & Radomsky, 2019b). In the present study, participants noted marginally more, and an actor reported significantly more, VRS and NVRS in

HR (vs. LR) participants. While familiar (vs. unfamiliar) sources of reassurance reported more VRS following a contamination threat, neither participants nor coders who reviewed recordings of the conversations noted significant differences (Neal & Radomsky, 2015). It could be that familiar partners were able to accurately detect more actual RS than the participants themselves, unfamiliar partners, or coders. It could be that they were more sensitive to RS cues that may or may not have been present. Manipulated, augmented (vs. diminished) responsibility resulted in more VRS according to unfamiliar actors who were the source of reassurance and to coders who reviewed recordings of the conversation, but not to participants themselves (Leonhart & Radomsky, 2019b). It is also possible that participants and actors may have overestimated the amount of RS displayed perhaps because they were affected by task-related distress (Sookman, & Pinard, 2002). Another explanation may be that coders failed to adequately identify RS that was present. Unlike an actor or partner who shared the anxiety-provoking experience, coders may have lacked the necessary personal connection to be engaged in a complementary, empathic interpersonal stance, limiting their ability to feel participants' 'pull' and detect subtle cues for reassurance (Hill et al., 2019; Kiesler & Watkins, 1989). In this way, participant-actor interactions may have somewhat mirrored the lived experiences of those with OCD who ask carefully for reassurance and loved ones who become sensitive to subtle RS cues (Halldorsson et al., 2016; Kobori et al., 2012). This may explain why Neal and Radomsky (2015) observed that familiar (vs. unfamiliar) partners indicated more RS. The present condition × time × person interaction further suggests that the those who directly interact with those who seek reassurance tend to report more RS. It may be that NVRS prompts reassurance from a trusted few in a more tolerable way while minimizing detection and potential negative feedback from those less familiar to the seeker. Finally, it is possible that the coders may have coded poorly, unable to identify VRS and NVRS. However, coders completed extensive training to recognize VRS and NVRS, met regularly with the first author for guidance, and demonstrated generally coding reliability (Blairy et al., 1999; Coan & Gottman, 2007; Hallgren, 2012; McGraw & Wong, 1996).

Given our findings that responsibility impacts NVRS in similar ways as on VRS, it may be that NVRS is functionally similar or equivalent to VRS. It has been posited that nonverbal behaviour could prompt feedback to neutralize obsessions (Gillett & Mazza, 2018; Rachman, 2002; Salkovskis, 1985). Both VRS and NVRS appear to respond similarly to responsibility manipulations (Leonhart & Radomsky, 2019b). If so, then box VRS and NVRS may represent a form of checking by proxy (Rachman, 1998, 2002; Salkovskis, 1985, 1999). If NVRS, like nonverbal communication, generally, is nearly universally understood by others and sometimes done without active awareness (Knapp & Hall, 2006; Mandal, 2014), then it may be an effective, furtive RS strategy, consistent with concealment in other aspects of OCD (Jaeger et al., 2021; Newth & Rachman, 2001). However, what governs preferences for NVRS (vs. VRS) remains unknown.

Whereas it is common to assess cognitive mechanisms by conducting experiments with analogue participants (Abramowitz et al., 2014; Gibbs, 1996) and though people with and without OCD experience similar intrusive thoughts (Purdon & Clark, 1993; Rachman & de Silva, 1978), this study's convenience sample limits generalizability largely to young, educated, predominantly English-speaking females of European or of Asian ethnic origins. The scripted responses of an unfamiliar actor are admittedly unlike reassurance provided by a loved one. However, this procedure has been used previously to examine RS in a relatively standardized way (Leonhart & Radomsky, 2019b; Neal & Radomsky, 2015). The RSC and NVRSC are arguably subject to demand effects; however, they are face valid measures of VRS and NVRS,

respectively, and the RSC has been used in previous studies (Leonhart & Radomsky, 2019b; Neal & Radomsky, 2015). Neither the experimenter nor actor was condition-naïve after randomization. They may have inadvertently influenced participants' behaviour. However, the experimenter and actor were hypothesis-naïve, and the interactive nature of the study was necessary.

The findings may have clinical implications. Interventions for VRS (Bennett-Levy et al., 2004; Clark, 2004; Gillihan et al., 2012; Thompson-Hollands et al., 2015) could be modified to address NVRS. Collaboratively, people with OCD could agree to behavioural experiments in which they cease NVRS in response to obsessional doubts, and partners–trained to recognize NVRS–could be prompted to label it when they observe it. Targeting responsibility in cognitive therapy will likely lead to reductions in NVRS as it does in other symptom domains (Radomsky et al., 2020). The present study highlights the importance of multiple reporting sources including significant others when monitoring VRS and NVRS. Lastly, since RS is a transdiagnostic phenomenon, maintaining clinical awareness of NVRS in other disorders could be encouraged, as well as further empirical investigations of NVRS more broadly.

There is room for future research. First, the phenomenology of NVRS in OCD and other disorders could be explored to understand why and how people seek reassurance in this way. A psychometrically sound measure of NVRS could be helpful: either as a stand-alone questionnaire assessment of NVRS or a modified version of a VRS scale (Radomsky et al., 2021). Further, the present experiment could be replicated with a clinical sample and/or in association with other psychopathologies. Lastly, cognitive interventions which target responsibility to reduce NVRS in OCD should be evaluated.

Though effective evidence-based treatments for OCD exist, they can be improved. Further, novel targets of therapy like NVRS can be identified through the keen observations of clinicians who utilize empirically supported treatments; it is our hope that this study may serve to foster such observations, both in the laboratory and in the clinic.

Table 1

Comparison of Symptomatology between Conditions

Subscale	LR[a]		HR[b]		
	M	*SD*	*M*	*SD*	*t*(84)
VOCI[c] Total	91.57	32.49	87.86	30.75	-0.54
VOCI Contamination	20.98	8.87	19.45	8.12	-0.83
VOCI Checking	8.50	4.35	8.98	4.90	0.48
VOCI Obsessions	15.93	6.69	15.77	7.11	-0.11
VOCI Hoarding	9.90	3.82	10.11	3.93	0.25
VOCI Just Right	22.29	8.77	20.00	7.90	-1.27
VOCI Indecisiveness	12.33	5.81	11.82	5.35	-0.43
OBQ-44[d] Total	131.43	50.25	130.75	47.60	-0.06
OBQ-44 Responsibility and Threat Estimation	45.05	19.20	46.32	17.71	0.32
OBQ-44 Perfectionism Certainty	56.71	22.00	55.57	20.78	-0.25
OBQ-44 Importance Control of Thoughts	26.90	13.61	26.18	12.92	-0.25
DASS-21[e] Total	34.38	11.82	32.77	11.55	-0.64
DASS-21 Depression	10.81	4.15	10.45	4.33	-0.39
DASS-21 Stress	12.74	4.81	12.20	4.66	-0.52
DASS-21 Anxiety	10.83	4.08	10.11	3.69	-0.86

Note. None of the comparisons was statistically significant.

[a]$n = 42$. [b]$n = 44$. [c]Vancouver Obsessive-Compulsive Inventory. [d]Obsessive Beliefs Quesionnaire-44. [e]Depression Anxiety Stress Scales-21.

Table 2
Means and Standard Deviations of Ratings related to Credibility and Manipulation Checks, Responsibility, VRS, and NVRS

	LR[a]		HR[b]		$t(84)$	d
	M	*SD*	*M*	*SD*		
Dirtiness of the Garbage	49.31	24.37	40.57	20.92	-1.79†	-.39
Believability of Video Failure Justifying RS Opportunity	23.69	32.89	29.55	36.06	.79	.17
Believability of Responses from Actor	71.93	25.66	71.43	29.23	-.08	-.02
Rating of Personal Responsibility prior to RS Opportunity	44.90	26.32	71.23	21.47	5.09***	1.10
Rating of Actor's Responsibility prior to RS Opportunity	62.10	22.65	47.34	22.42	-3.04**	.18
Rating of Personal Responsibility following RS Opportunity	50.31	22.02	69.36	25.80	3.68***	.79
Rating of Actor's Responsibility following RS Opportunity	57.64	23.54	47.64	24.45	-1.93*	-.42
					$F(1,84)$	η_p^2
Participant-reported VRS	7.07	4.75	9.39	7.26	3.03†	.04
Actor-reported VRS	5.05	2.92	6.34	3.00	4.09*	.05
Coder-reported VRS	3.24	2.43	4.00	2.72	1.87	.02
Participant-reported NVRS	29.14	24.42	38.23	34.36	2.14	.03
Actor-reported NVRS	18.64	12.65	25.30	13.46	5.57*	.06
Coder-reported NVRS	3.19	2.49	3.80	3.83	.75	.01

Note. LR = low responsibility beliefs condition. HR = high responsibility beliefs condition.
[a]$n = 42$. [b]$n = 44$. †$p < .10$, *$p < .05$., **$p < .01$, ***$p < .001$.

Table 3

Participants' Ratings of Responsibility Prior to and Following RS

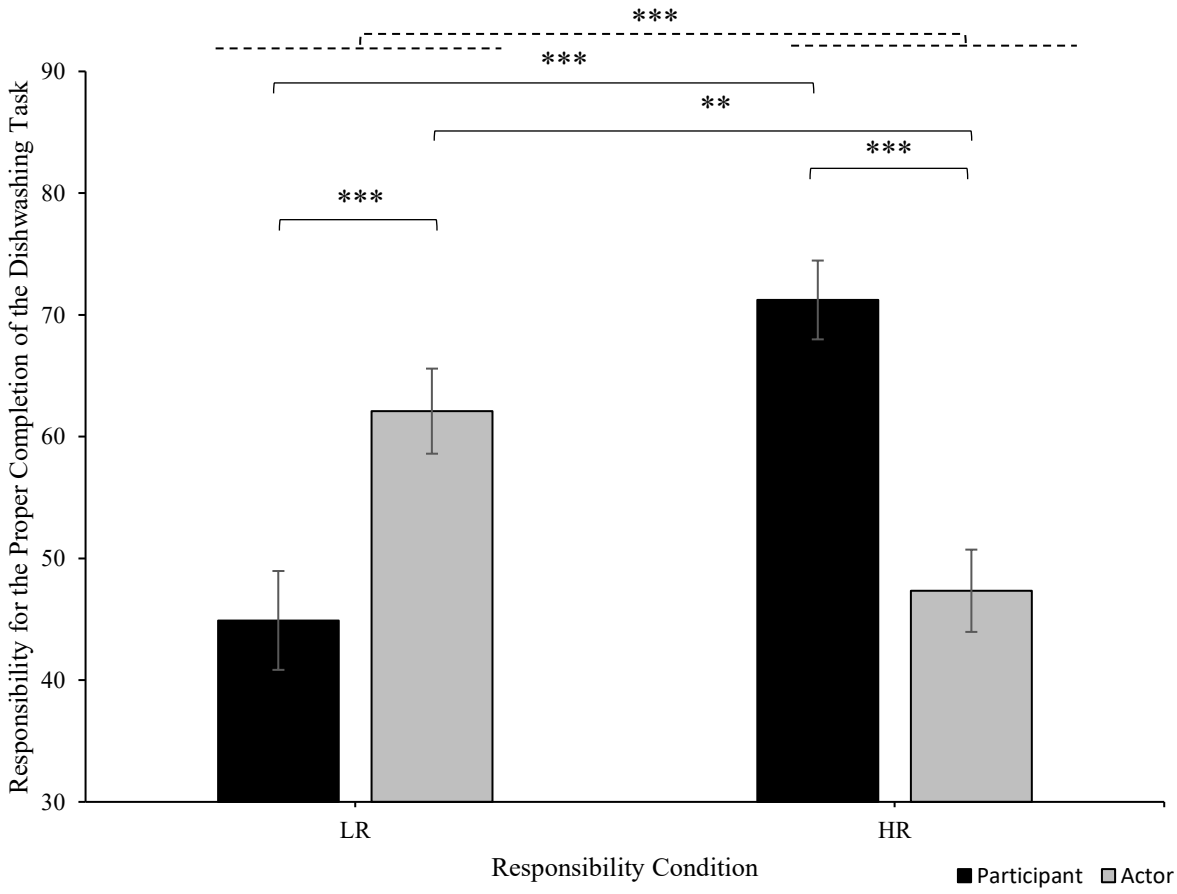
		Prior to RS Opportunity		Following RS Opportunity			
		M	*SD*	*M*	*SD*	*t*	*d*
Participants' Ratings of Their Own Responsibility	*LR*[a]	44.90	26.32	50.31	22.02	-1.85†	-.29
	HR[b]	71.23	21.47	69.36	25.80	1.11	.17
Participants' Rating of Actor's Responsibility	*LR*[a]	62.10	22.65	57.64	23.54	1.73†	.27
	HR[b]	47.34	22.42	47.64	24.45	-.12	-.02

Note. LR = low responsibility beliefs condition. HR = high responsibility beliefs condition. The time × condition × person interaction is significant.

[a]$n = 42$. $df = 41$. [b]$n = 44$. $df = 43$. †$p < .10$. *$p < .05$. **$p < .01$, ***$p < .001$.

Figure 1

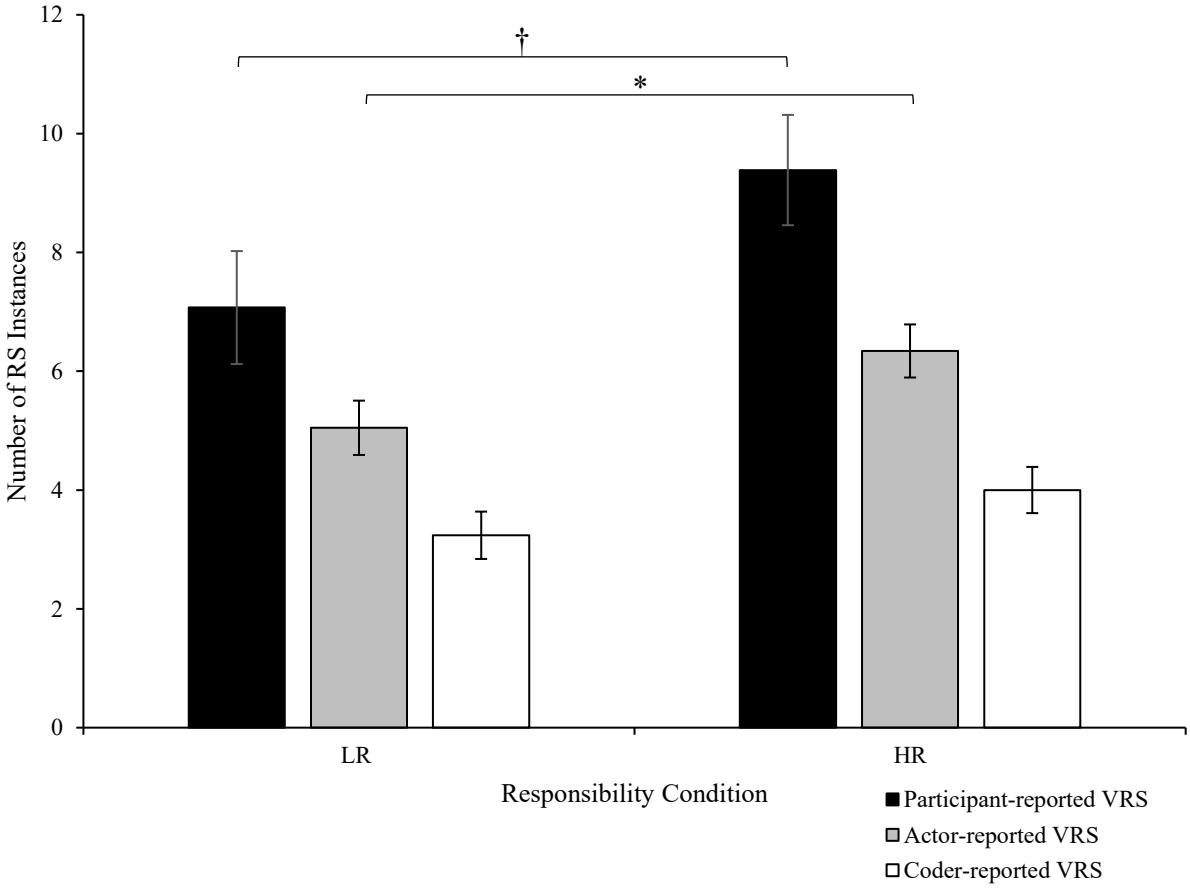
Manipulation Checks: Participants' Ratings of Their Own and of an Actor's Responsibility for the Proper Completion of the Dishwashing Task Prior to the RS Opportunity



Note. $N = 86$. $n_{LR} = 42$. $n_{HR} = 44$. (Error bars show standard errors).
$^{***}p < .001$, $^{**}p < .01$.

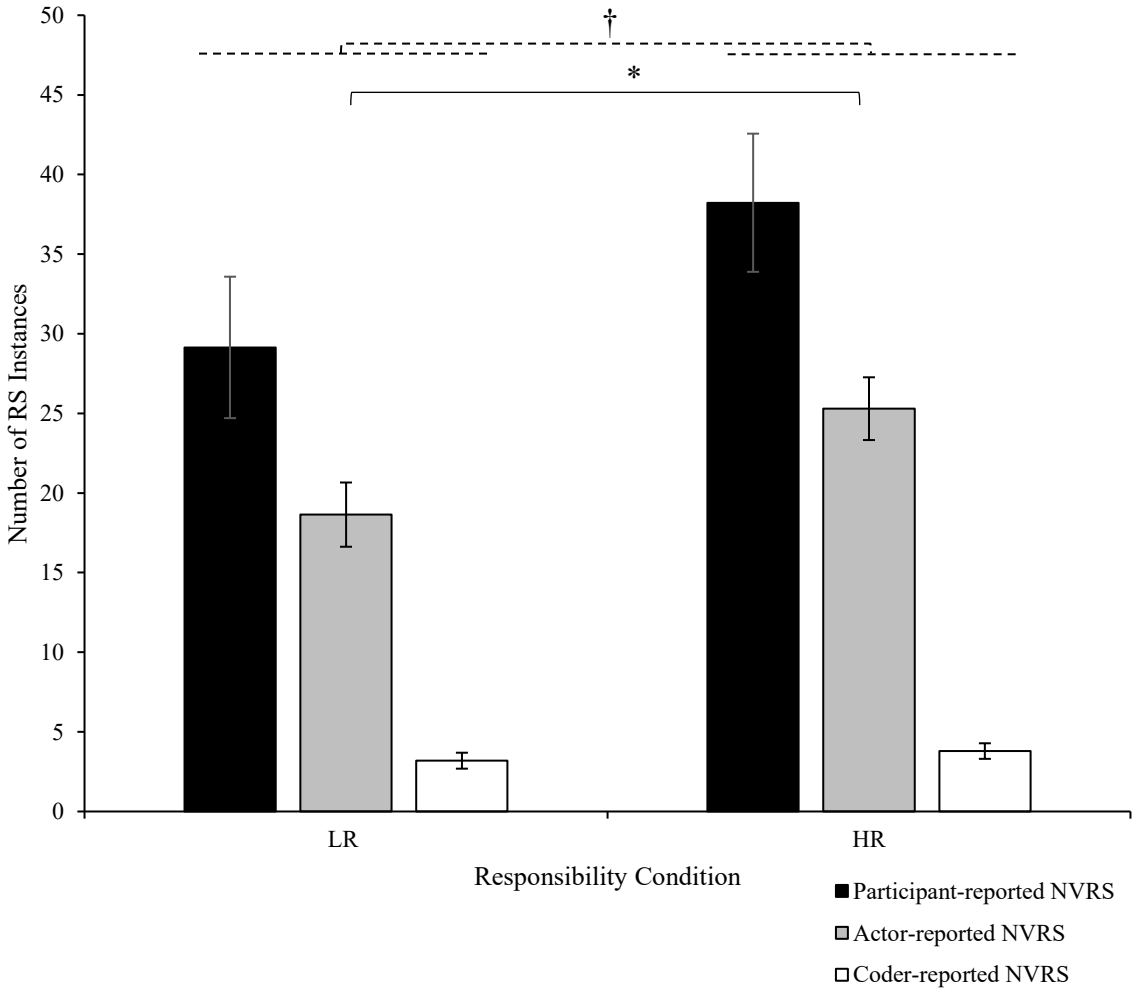
Figure 2

Participant-, Actor-, and Coder-reported VRS



Note. $N = 86$, $n_{LR} = 42$, $n_{HR} = 44$. (Error bars show standard errors).
$^{\dagger}p < .10$, $^{*}p < .05$.

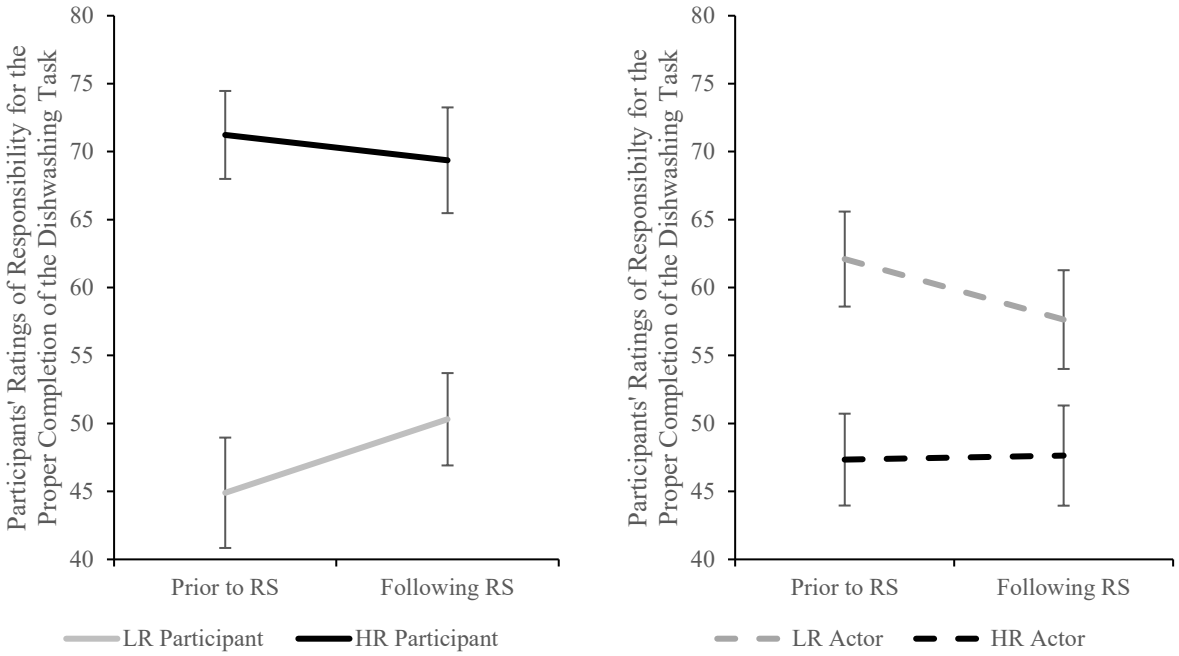
Figure 3
Participant-, Actor-, and Coder-reported NVRS



Note. N = 86, n_{LR} = 42, n_{HR} = 44). (Error bars show standard errors).
*$^{\dagger}p < .10$, *$p < .05$.*

Figure 4

Participants' Ratings of Their Own and an Actor's Responsibility Prior to and Following RS.



Note. Participants' ratings of their own responsibility on the left. (Error bars show standard errors). Participants' ratings of the actor's responsibility on right. The time × condition × person interaction was significant, *Wilks'* $\lambda = .919$, $F(1, 86) = 7.603$, $p = .007$, $\eta_p^2 = .081$

CHAPTER 3: BRIDGE

Beliefs of augmented personal responsibility over crucial outcomes impact checking (Arntz et al., 2007; Boschen & Vuksanovic, 2007; Bouchard et al., 1999; Ladouceur et al., 1995, 1997; Lopatka & Rachman, 1995; Radomsky et al., 2001), urges to seek reassurance (Parrish & Radomsky, 2006, 2011), and verbal reassurance seeking (VRS) behaviour (Leonhart & Radomsky, 2019b). Study 1 was conducted to replicate Leonhart and Radomsky's (2019) experiment and extend the examination of the impact of responsibility to nonverbal reassurance seeking (NVRS). Included was a novel multi-informant measure of nonverbal aspects of RS developed from a summary of participant behaviour and feedback, case studies of OCD, and a literature review on nonverbal communication. Participants' attributions of an actor's responsibility were measured in addition to their own perceived responsibility before and after an RS opportunity to further examine the impact RS on attributions and previous proposed transfer of responsibility.

Overall, the results of Study 1 were consistent with those of Leonhart and Radomsky (2019). Experimentally augmented, high (HR; vs. diminished, low) responsibility (LR) resulted in marginally more participant-reported VRS and significantly more actor-reported VRS. The HR (vs. LR) condition also resulted in marginally more NVRS overall and significantly more NVRS as reported by actors from whom reassurance was sought. A significant time × condition × person interaction was observed, such that RS may have resulted in a relatively smaller transfer of responsibility from HR participants to an actor compared to a larger transfer of responsibility from an actor to LR participants. Study 1 is thought to be the first study to demonstrate that NVRS can be measured with multiple reporting sources, as has been done with VRS in other studies (Leonhart & Radomsky, 2019b; Neal & Radomsky, 2015), and the first to demonstrate that manipulated, augmented (vs. diminished) responsibility affects NVRS. It is also believed to be among the first to demonstrate the hypothesized transfer of responsibility from RS (Rachman, 1997, 1998, 2002; Salkovskis, 1985, 1999).

However, the results prompted further questions. It is unknown whether the nonverbal aspects of RS are present in a clinical population. It could be argued that the VRS behaviour of unfamiliar undergraduate volunteers during a controlled situation as described and reported in the previous study does not accurately reflect the lived experiences of those with OCD. Nonetheless, the importance of the study lies in its focus on the mechanism (i.e., responsibility) and the target (i.e., NVRS) rather than on the sample employed. People with OCD hold beliefs and engage in behaviour which differ in degree, not type, from those without OCD (Abramowitz et al., 2014; Gibbs, 1996; Purdon & Clark, 1993). Beliefs of special responsibility are a key cognitive mechanism in OCD (Obsessive Compulsive Cognitions Working Group, 2003; Rachman, 1997, 1998, 2002; Salkovskis, 1985, 1999; Salkovskis et al., 2000). If people with OCD who hold beliefs of special responsibility struggle with over intrusive thoughts and compulsively seek reassurance, and if the beliefs of those with OCD differ in severity but not in substance, then Study 1 would remain clinically relevant. That said, the phenomenology of NVRS in a clinical population remains understudied.

An examination of the phenomenology of NVRS as it is expressed and observed in a clinical sample is therefore warranted. Qualitative studies have investigated RS by interviewing those with OCD (Halldorsson & Salkovskis, 2017; Kobori et al., 2012; Parrish & Radomsky, 2010) or their loved ones (Halldorsson et al., 2016). Observing live RS interactions between and interviewing both people with OCD and those close to them could provide an excellent opportunity to garner information about the extent to which NVRS behaviours identified in the

laboratory are endorsed and/or observed. Those with lived experience of the relatively understudied phenomenon were sought as an optimal sample for Study 2 of this work. Results of such a study could be used to refine the measure of NVRS and provide opportunities for expanding the present conceptualization of NVRS in OCD.

Chapter 4 is a description of Study 2 which was designed to examine the phenomenology of NVRS in people with OCD. It was designed to answer several broad research questions: What is NVRS in terms of its phenomenology? What are its cues and triggers? Why do people utilize NVRS both in general, and perhaps importantly, in contrast to VRS? To what extent are people with OCD aware of their NVRS?

CHAPTER 4: MORE THAN WORDS: A PHENOMENOLOGICAL EXAMINATION OF NONVERBAL REASSURANCE SEEKING IN OBSESSIVE-COMPULSIVE DISORDER

ABSTRACT

Excessive reassurance seeking (RS) is common in mood, anxiety, and obsessive-compulsive disorders (OCD). Manipulated, augmented (vs. diminished) responsibility resulted in more spoken and unspoken actions (ostensibly) to prompt reassurance (Leonhart & Radomsky, 2019b). However, models of RS have not typically underscored nonverbal aspects of RS (e.g., Gillett & Mazza, 2018). In this study, after obsessional concerns were primed, twelve participants diagnosed with OCD were video recorded seeking reassurance from people who knew them well ($N = 24$). Each person in the pair was then individually asked to describe triggers, functions, and unique attributes of NVRS (vs. VRS). Quantitative analyses supplemented by phenomenological analyses were conducted to identify NVRS behaviours during the opportunity to seek reassurance reported by participants with OCD, their chosen partners, the researcher, and volunteers trained to code NVRS from recordings. Analyses were also performed to identify cues/triggers, general functions, and unique functions of NVRS. Prominent NVRS behaviours were identified: close examination of others' reactions, direct eye contact, pausing, and forehead wrinkling. NVRS and VRS reportedly shared many similar triggers and functions. However, NVRS (vs. VRS) was said to uniquely mitigate social risk and more effectively prompt safety-related information. No compelling evidence was found that people with OCD were unaware of their NVRS. Implications for cognitive-behavioural models of and clinical interventions for RS are discussed.

Keywords: obsessive-compulsive disorder; reassurance seeking; nonverbal, clinical sample; phenomenological analysis

More Than Words: A Phenomenological Examination of Nonverbal Reassurance Seeking in Obsessive-Compulsive Disorder

People commonly seek reassurance from others they trust when they feel anxious (Kobori & Salkovskis, 2013). Before embarking on a trip, they may repeatedly ask a loved one to confirm if they have their passports, for example. However, reassurance seeking (RS) can also become self-perpetuating, maladaptive, and excessive. Excessive RS has been defined as the repeated solicitation of safety-related information from others (Halldorsson & Salkovskis, 2017; Kobori et al., 2012; Parrish & Radomsky, 2010; Rachman, 2002; Salkovskis & Warwick, 1986).

Excessive RS is common in many mental health problems. People with Major Depressive Disorder may repetitively ask for another person's affection and reconfirmation of their love to (briefly) assuage doubts about personal worth (Burns et al., 2006; Coyne, 1976; Gillett & Mazza, 2018; Joiner & Metalsky, 2001). In illness anxiety disorder, RS about feared health implications of bodily symptoms is a diagnostic criterion (Abramowitz & Moore, 2007; Salkovskis & Warwick, 1986). In Generalized Anxiety Disorder, it is common to worry and seek reassurance to (temporarily) reduce anxiety associated with uncertainty (Beesdo-Baum et al., 2012; Cougle et al., 2012). Those with Social Anxiety Disorder commonly seek reassurance about self-perceptions and feared negative evaluation from others (Grant et al., 2014). RS is observed in many disorders.

However, in obsessive-compulsive disorder (OCD), excessive RS may be more than just a symptom. It is thought to be a key mechanism which perpetuates disorder, as well (Salkovskis, 1989; Smith et al., 2022). RS tends to be focused on safety information about general threats (e.g., accidental harm; Parrish & Radomsky, 2010). Those with OCD may desire reassurance to neutralize distressing doubts and obsessions but may also be reluctant to seek it fearing criticism for recurrently doing so. Loved ones and close friends may desire to alleviate the distress of those with OCD but may nonetheless be frustrated by repetitive prompting (Halldorsson & Salkovskis, 2017; Kobori et al., 2012; Parrish & Radomsky, 2010).

OCD is a common and disabling psychological disorder characterized by recurrent, distressing obsessions and/or repetitive compulsions (APA, 2013; Rachman & Hodgson, 1980). Approximately one in fifty people develops OCD (Kessler et al., 2012). Onset tends to be either in childhood or early adulthood (De Luca et al., 2011). OCD can be debilitating, interfering with occupational obligations, romantic relationships, familial bonds, sexuality, and religious expression (Norberg et al., 2008). It prevents close to 75% of sufferers from their typical occupational and recreational pursuits (Mantz & Abbott, 2017). It has consistently been identified as a leading cause of lost healthy life and income, globally (World Health Organization, 1996, 2008, 2017). Because its impact is so great, understanding OCD is critical.

Though compulsive checking maintains symptomatology (Rachman, 1976, 1997, 1998, 2002; Salkovskis, 1985, 1989, 1999), RS may particularly exacerbate OCD. Obsessional beliefs, such as inflated responsibility to prevent harm to others, promote anxiety and compulsive behaviour when they interact with intrusive thoughts, images, or urges (Rachman, 2002; Salkovskis, 1985). Checking and RS (temporarily) neutralized obsessions, reduce obsessional anxiety, and provide desired comfort. Checking directly assesses threat while RS is proposed to do so by proxy (Rachman, 2002; Salkovskis, 1985).

Models of RS in OCD suggest that it may not only temporarily reduce perceived obsessional threat but also briefly relieve perceptions of inflated responsibility for potential threat (Rachman, 2002; Salkovskis, 1985, 1999). Two primary forms of RS have been described:

overt (e.g., direct questions about an obsessional threat) and covert (e.g., subtle statements about an obsessional threat; Kobori et al., 2012; Parrish & Radomsky, 2010). However, multiple lines of evidence suggest that current conceptualizations of RS may be limited (Gillett & Mazza, 2018; Halldorsson et al., 2016; Halldorsson & Salkovskis, 2017; Kobori et al., 2012; Kobori & Salkovskis, 2013; Leonhart & Radomsky, 2019b; Parrish & Radomsky, 2010; Radomsky et al., 2021).

Reassurance seeking in the form of nonverbal behaviour (e.g., facial expressions, gestures, etc.) and paraverbal cues (e.g., rate, tone, prosody of speech, etc.), may represent an understudied aspect of this interpersonal compulsion which is likely to be functionally similar to overt and covert verbal RS (VRS). Nonverbal and paraverbal behaviour may be nearly automatic, understood by almost everyone, and highly effective at communicating meaning in addition to words themselves, such as the emotional significance or perceived urgency of what is being said (Ekman & Friesen, 1969; Knapp & Hall, 2006; Mandal, 2014; Mehrabian & Wiener, 1967). Though there is ample rationale and empirical evidence to suggest that certain nonverbal behaviour can be understood as RS, cognitive-behavioural interventions traditionally target VRS which directly references obsessions.

There are several reasons to believe that NVRS may be a part of OCD symptomatology and its maintenance. The integrative functional model of RS (Gillett & Mazza, 2018) conceptualizes RS not as specific, discrete behaviours but as any verbal or nonverbal behaviour which functions (ostensibly) to prompt safety-related information. Concealment is a common strategy in OCD. Those with the disorder tend to conceal their obsessions (e.g., Newth & Rachman, 2001) and compulsions (Jaeger et al., 2021) use increasingly inconspicuous strategies or "hidden ways" like making covert, falsifiable comments about safety-related concerns or making off-topic conversations to prompt reassurance immediately or later, respectively, while avoiding detection and negative evaluation by others (Kobori et al., 2012; Parrish & Radomsky, 2010). Concealment may progress. Caregivers noted that their loved ones with OCD made "happy-looking" glances and fleeting eye contact which compelled them to reassure them that 'everything is OK' (Halldorsson et al., 2016). People with OCD indicated using subtle, hidden methods to seek reassurance and nonverbal strategies to seek support from loved ones (Halldorsson & Salkovskis, 2017). RS may become so concealed that verbal output may be avoided entirely in favour of nonverbal strategies to prompt reassurance from others to decrease the risk of detection. The Covert and Overt Reassurance Seeking Inventory (CORSI; Radomsky et al., 2021) contains items which describe examining others' behaviour for reassurance (e.g., "If I am unsure about the cleanliness of an object, I will wait until somebody else touches it before I do"), closely examining others' reactions for reassuring information (e.g., "When I am anxious about doing something, I often start and if nobody around me warns me to stop, I assume it's OK to continue"), and subtly prompting reassurance about the security of a relationship (e.g., I often try to find out if others care about me without asking directly"). The Reassurance Seeking Questionnaire (ReSQ; Kobori & Salkovskis, 2013) also describes nonverbal elements: "I try to watch the way other people react to when I do things that worry me." Analogue undergraduate participants in a condition of manipulated, augmented (vs. diminished) responsibility prolonged conversations with more pauses and off-topic comments after receiving ambiguous feedback about a contamination-related threat (Leonhart & Radomsky, 2019b). Participants in that study indicated that they did not seek reassurance verbally to avoid offending the source of potential reassurance with continued VRS (e.g., "I did not want to look like I was accusing her of not doing [the experimental task] properly"), to avoid confusion with an unfamiliar source of

potential reassurance (e.g., "I didn't want to pry as to whether they were satisfied with how they performed because they're a stranger"), or to prevent embarrassment (e.g., "I did not want to seem too anxious").

Research into communication appears to provide convergent evidence that nonverbal strategies may be important to consider in the context of RS. Nonverbal communication has been argued as a critical but often overlooked aspect of interactions (Robinson, 2006) which involves multiple, simultaneous "channels" (Knapp & Hall, 2006; Mandal, 2014) and is thought to be universally understood, nearly automatic, and highly effective at providing important emotional context to ambiguous statements (Ekman & Friesen, 1969; Harré, 1973; Mehrabian & Wiener, 1967). Nonverbal ways of prompting responses from others have been examined (Coan & Gottman, 2007; Harré, 1973; Pajo & Klippi, 2013; Robinson, 2006; Scherer, 1988; Siegman, 1987; Trager, 1958). If reassurance can be prompted using similar unspoken cues, then it may be important to examine understudied nonverbal elements of RS.

The absence of detailed, empirically derived descriptions of NVRS is a noteworthy gap. Despite consistency between empirical observations and theoretical possibility of NVRS, the treatment of choice for OCD, cognitive-behavioural therapy, remains potentially limited, as it traditionally targets only *verbal* forms of RS (e.g., Clark, 2004). It typically does not conceptualize the role of nor target nonverbal actions and/or paraverbal cues which may solicit safety-related feedback. If NVRS, like other forms of nonverbal communication, is difficult to detect but effective at evoking responses from others, then it may represent a particularly pernicious and problematic behaviour that may exacerbate psychopathology 'under the radar', potentially unbeknownst to the person with OCD, reassurer, and/or professionals involved in treatment. Therefore, there is a need for an evidence-based description of NVRS in OCD.

The overall purpose of the present study was to systematically examine nonverbal aspects of RS in OCD. Specifically, the study conducted to identify nonverbal behaviours, triggering stimuli, general functions, and functions which make NVRS preferable instead of or in addition to VRS. The study was also designed to examine the extent to which people with OCD are aware of their NVRS. To provide a more comprehensive, empirically derived description of nonverbal aspects of RS in OCD, the study incorporated multiple methods (e.g., direct interview and live observation) to collect and analyze information from multiple sources (i.e., participants with OCD, partners, researcher, trained coder) with different perspectives (i.e., first-, second-, and third-person).

Method

Participants

The present study included two non-independent groups of participants: (i) people who met criteria for OCD according to the *Diagnostic and Statistical Manual of Mental Disorders–Fifth Edition* (APA, 2013) and who repeatedly sought reassurance and (ii) partners of their choosing who knew them well and from whom reassurance had been repeatedly sought. All clinical participants were assessed via the *Anxiety Disorders Interview Schedule for the DSM-5* (ADIS-5; Brown & Barlow, 2014) and *Yale-Brown Obsessive-Compulsive Scale* (Goodman et al., 1989; see measures below) under the close supervision of the second author (AR)–a registered clinical psychologist and full professor of psychology at Concordia University.

Clinical participants with OCD were recruited in a variety of ways. The primary method of recruitment was through the Anxiety and Obsessive-Compulsive Disorder Laboratory registry of people diagnosed with OCD and related disorders who had consented to being contacted for participation in research. People were also recruited after being diagnosed with OCD by a trained

examiner under the supervision of the second author as part of a concurrent randomized controlled trial study. Prospective participants were provided with a pamphlet with information about the present study and were given the opportunity to contact the researcher (ML). Psychologists in Montréal, QC were emailed information about the study if deemed to potentially interact with people with OCD. Sixty-one psychologists in Winnipeg, MB were similarly contacted. A Facebook page was created on April 1, 2019 to describe the study and provide contact information. Flyers with were placed around the Concordia University and University of Manitoba campuses and in public locations in Montréal and Winnipeg. Further notices about the study were placed into online forums dedicated to Montréal and Winnipeg.

Participants with OCD and partners of their choosing were included if they could both speak, read, write, and understand English. Clinical participants were included if they met the diagnostic criteria for OCD (see below), reported that RS was prominent and problematic, did not meet criteria for a Substance Use Disorder, Bipolar 1 or 2 Disorder, or Schizophrenia, and had a person who knew them well from whom they regularly sought reassurance willing to participate in the study. In total, the data from 12 participant-partner pairs were included in the analyses ($N = 24$).

Demographic information is summarized in Table 4. The clinical participants' average age was 38.58 years ($SD = 16.93$). Participants were asked to indicate their sex as male, female, or to indicate that they would prefer not to disclose. Half of the participants with OCD indicated that they were female. Their most common primary language was English (75.0%). The majority of participants with OCD indicated having completed an undergraduate degree (41.7%) or CÉGEP programme (25.0%). Participants with OCD reportedly represented diverse employment statuses including full-time employment (25.0%), retired (25.0%), unemployment / looking for work (16.7%), and student (16.7%). Half (50.0%) described themselves as single and the other half (50.0%) married/common-law. Partners were reportedly near the same average age as the participants with OCD, $M = 42.25$ ($SD = 18.12$) years. Exactly half of the partners were reportedly female. Most reported English as their primary language (83.3%). The most commonly reported ethnicities among partners were European Origins (66.7%) and Other North American Origins (25.0%). Many had completed an undergraduate degree (50.0%) or Master's degree (25.0%). The majority of partners were reportedly employed full-time (58.3%), and others were students (16.7%) or retired (16.7%). Partners reported being mostly married/common-law (58.3%) or single (33.3%).

Clinical participants' diagnostic information and obsessive-compulsive symptom severity is summarized in Table 5. All clinical participants met criteria for OCD, and for the majority, OCD was the primary diagnosis (75.0%; see Table 6). Chosen partners did not complete the ADIS-5 nor the Y-BOCS. Overall, clinical participants reported moderate OCD symptom severity based on the Y-BOCS.

To assess the familiarity of participant-partner pairs, they completed the *Network of Relationships Inventory-Social Provisions Version* (NRI-SPV; Furman & Buhrmester, 1985*)*. The Support dimension of inventory was reviewed, see below. Familiarity and trust were also assessed on visual analogue scales from *Not at all/None* 0-100 *Completely/Extremely*. On average, the relationships were in a range indicating a strong degree of perceived mutual support, familiarity, and trust (see Table 7 for means and standard deviations).

Participants with OCD and partners of their choosing also completed measures of anxious, depressive, socially anxious, and obsessive-compulsive symptoms (see Table 7).

Participants (vs. chosen partners) indicated more severe anxious, depressive, and obsessive-compulsive symptoms.

Interview Measures

Anxiety Disorders Interview Schedule for DSM-5 (ADIS-5; Brown & Barlow, 2014)

The ADIS-5 is a diagnostic interview which assesses present and lifetime prevalence of mental disorders, as described by the DSM-5. It has been extensively utilized in research and clinical settings and has been found to have very good interrater reliability for diagnosing OCD (κ = .62; Tolin et al., 2016).

Those who conducted the ADIS-5 interviews completed extensive training. Interviewers had to first demonstrate absolute agreement on applicable diagnoses and the ordinal rating of diagnostic assignment (e.g., primary, secondary, etc.) and provide a clinical severity rating within +/- 1 of the rating of a rater already evaluated as proficient in the interviewing on at least two pre-recorded diagnostic interviews, one live diagnostic interview as an observer, and at least one diagnostic interview as the primary interviewer. All interviewers in the present study met these standards.

Yale-Brown Obsessive-Compulsive Scale (Y-BOCS; Goodman et al., 1989)

The Y-BOCS is a widely used semi-structured interview designed to assess the severity of obsessions and compulsions. The Y-BOCS has demonstrated excellent psychometric properties. Its internal consistency is excellent (α = 0.88), and its interrater reliability is excellent as well (r = .98). Its test-retest reliability is good (r = .61). It demonstrates good convergent reliability with other measures of OCD symptomatology and good divergent validity with measures of depression and anxiety.

Those who conducted the Y-BOCS interviews first completed training. After reading the Y-BOCS procedures and watching videos of laboratory members already trained to administer the Y-BOCS, raters were permitted to conduct Y-BOCS interviews with participants only once they had demonstrated agreement with an already proficient interviewer (+/- 1 of the rating on obsessions and compulsions subscales) from a live interview as an observer, and at least one interview as the primary interviewer. All interviewers for the present study demonstrated proficiency in this way.

Nonverbal Reassurance Seeking Interview (NVRSI; Leonhart & Radomsky, 2019a)

The NVRSI is a semi-structured interview developed for this study designed to be completed by both participants with OCD and partners of their choosing in the same visit (see Appendix B to view the NVRSI). It was constructed to clarify factors associated with the onset, maintenance, preferential use of NVRS as well as constituent behaviours. The NVRSI consists of multiple sections which are comprised of structured responses based on various conditions, semi-structured questions, and open-ended queries. It includes an introductory section with general definitions of RS (Halldorsson et al., 2016; Kobori et al., 2012; Leonhart & Radomsky, 2019b; Parrish & Radomsky, 2010).

After being provided a thorough description, participants with OCD and the partners were given an opportunity to ask questions and receive information to clarify the meaning of excessive reassurance seeking in OCD. To ensure their comprehension each participant and partner was given a brief scenario and asked to identify whether these involved RS and why. In a

next section, the presence of RS was screened. Participants and partners were asked to indicate if any overt, covert, and nonverbal RS occurred in the last month. Disagreements were noted.

To focus attention on obsessional concerns and increase the likelihood and intensity of urges to seek reassurance, participants with OCD were asked series of semi-structured questions. Questions are designed to collect detailed information about participants with OCD's external and internal cues, thoughts, and emotions associated with a salient obsession about which they would want to seek reassurance. If elaboration is needed, they can be prompted with additional questions (see Section 6, Question 1 of NVRSI in Appendix B for details). The NVRSI then contains a script with which interviewers can ask participants to close their eyes and reflect in detail upon circumstances, physical sensations, external cues, thoughts, emotions, and people associated with the obsession and associated RS urges. The procedure was designed to draw attention to internal and external triggers, enhance the saliency of the obsession, and augment compulsive urges to seek reassurance.

To examine the extent to which the priming procedure prompted RS urges, a series of questions were developed to assess "in-the-moment" emotions and urges prior to an opportunity to seek reassurance.

To collect information about actual NVRS behaviour, the NVRSI included instructions to help the interviewer provide an opportunity for participants to seek reassurance from a partner while being recorded and a checklist for an interviewer to note instances of NVRS. The RS opportunity was planned to continue until participants indicate they have finished seeking reassurance. After, people with OCD are asked again to provide ratings of "in-the-moment" emotions and urges to urges to seek reassurance. The order in which participants and partners are then individually interviewed is counterbalanced to minimize order effects.

NVRSI questions have been developed to examine constituent behaviours (e.g., "Thinking about the conversation you just had, did you do _____ to seek reassurance?), triggers (e.g., "Does _____ typically prompt urges to seek reassurance nonverbally?"), general functions (e.g., "Does nonverbal reassurance seeking typically result in _____?"), and unique functions of NVRS not shared by VRS ("Is nonverbal reassurance seeking used instead of or in addition to verbal reassurance seeking because _____?"). Listed options to these questions are based upon qualitative research on RS conducted by Parrish and Radomsky (2010) in which obsessional content associated with, triggers, and consequences of RS (conceptualized verbally) were examined. In addition, each section includes standardized open-ended question (e.g., "Are there any other ____ aside from the ones I've already mentioned?") to balance potential bias in the close-ended questions. The combination of listed options and prompts for open-ended responses allows for quantitative and phenomenological analyses, respectively.

To collect information about the general frequency that NVRS may be used, the questions were included to permit participants with OCD and partners to verbally rate how often the NVRS behaviour occurred generally, using a 6-point Likert-type scale (0 = *Not at all, never*, 1 = *Very rarely, once or twice per month*, 2 = *Rarely, once or twice per week*, 3 = *Occasionally, oncer per day*, 4 = *Very frequently, two to five times per day*, 5 = *All the time, more than five times per day*; see page 20 of the NVRSI in Appendix A).

The questions and ratings were developed by the co-authors of the present paper. Revisions were made following feedback from pilot testing members of the laboratory team and clinical participants.

Behavioural Measures

Nonverbal Reassurance Seeking Checklist (NVRSC; Leonhart & Radomsky, 2017)

The NVRSC is a 34-item, multi-informant checklist designed to measure nonverbal or paraverbal cues during an opportunity to seek reassurance from another person. Items in the NVRSC were compiled from a combination of sources. Prompted by observations of unexpected nonverbal behaviours during a previous study examining the effect of experimentally manipulated responsibility on RS (Leonhart & Radomsky, 2019b), the authors reviewed the literature for nonverbal actions associated with prompting responses from others. Many were found: moving close to potential reassurer (Hinde, 1972; Robinson, 2006; Waxer, 1977), meaningful head gestures (Hinde, 1972; Jurich & Jurich, 1974; Mahl, 1987; Mandal, 2014; Pajo & Klippi, 2013), certain facial expressions (Coan & Gottman, 2007; Ekman & Friesen, 1969; Halldorsson et al., 2016; Hinde, 1972; Mehrabian & Wiener, 1967; Vine, 1971), postural shifts (Hinde, 1972; Kendon, 1970, 1990; Pajo & Klippi, 2013; Robinson, 2006), repetitive fidgeting (Siegman, 1987; Waxer, 1977), and abrupt alterations in paraverbal cues like tone, rate, and volume of speech (Coan & Gottman, 2007; Hall et al., 1995; Knapp & Hall, 2006; Poyatos, 1993; Robinson, 2006; Scherer, 1988; Siegman, 1987; Trager, 1958). The NVRSC is a compilation of these nonverbal cues thought to potentially prompt reassurance. In the present study, participants with OCD, their chosen partners, the researcher, and a coder were asked to indicate the presence (vs. absence) of the listed behaviours since the purpose of the present study was to examine which NVRS behaviours are endorsed by people with first- and second-hand lived experience of NVRS to provide understand its forms and functions.

In the present study, internal consistency of the NVRSC differed greatly depending on whether the conversation being observed occurred after participants with OCD's concerns about general threats to safety were discussed. In the conversation without such a prompt, internal consistency of the NVRSC when completed by the researcher, primary coder, and secondary coder was poor, *Cronbach's α*'s = .12, .26, and .66, respectively. In the conversation following a discussion about safety-related concerns, internal consistency of the NVRSC was good. When completed by the researcher, primary coder, secondary coder, participants with OCD, and partners of their choosing, the internal consistency was better, *Cronbach's α*'s .85, .54, .83, .81, and .80, respectively.

Coding of NVRS

Recordings of the RS opportunity were coded by two trained volunteers who were naïve to the study's purpose and specific research questions. They were given extensive education about OCD and RS, and, in accordance with best practice for coding behaviour (Blairy et al., 1999; Coan & Gottman, 2007), were asked to imagine people engaging in NVRS and to emulate the phenomenon in practice with the researcher to enhance their recognition of instances of NVRS. They were trained to utilize standardized, step-by-step coding instructions to first help identify any instances where safety-related information is solicited (i.e., RS) versus non-RS talk, and then determine the form of RS (i.e., overt, covert, and nonverbal; see Appendix C). Finally, they were provided with a supplemental coding guide containing examples of overt, covert, nonverbal RS, and non-RS to further aid them if needed (see Appendix D).

Once coders were trained on these tools, the researcher assisted them in rating NVRS in a small sample of the recordings of pilot participant and answered any of their questions. Once comfortable with the coding procedure, the coder then coded a sample of recordings separately, without the experimenter's assistance. Once the pilot recordings were coded, agreement was

reviewed. Coders received extensive constructive feedback to encourage adherence to the coding procedures and consistency in ratings. Coders met with the researcher biweekly with the researcher to resolve any confusion or discuss any issues that arose throughout the process.

A primary coder coded all recordings. The second coder coded a sample of 33% of the recordings to provide a measure of coding reliability. The dummy-coded variables were used to compute categorical interrater reliability with Cohen's Kappa (κ). Coder agreement on the presence of listed NVRS during the conversation without an obsessional prompt was slight, κ = .13 (Cohen, 1960; McHugh, 2012). During the conversation with an obsessional prompt, average agreement for all NVRSC-listed behaviours was minimally acceptable, κ = .23. Results should therefore be interpreted with caution.

Self-Report Measures

Network of Relationships Inventory- Social Provisions Version (NRI-SPV; Furman & Buhrmester, 1985)

The NRI-SPV is a 30-item measure relationship quality. It was designed to measure the extent to which respondents' relationship with each other meets their social needs (i.e., *Support*; affection, reliable alliance, reassurance of worth, intimate disclosure, instrumental aid, companionship, and nurturance), is characterized by negative qualities (i.e., *Negative Interaction*; conflict, antagonism), and to which each perceives the an ability to influence the other (i.e., *Relative Power*) in the relationship. The NRI-SPV has been used in college-aged students (Furman & Buhrmester, 1996). Descriptions of friends' relationship quality using the NRI have been associated with behavioural indices of relationship quality (Furman & Buhrmester, 1996; Gavin & Furman, 1992). Retest reliability has been shown to be good, with *r's* ranging from .66 to .70. The *Support* dimension has demonstrated excellent internal consistency (*Cronbach's* α > .90; Furman & Buhrmester, 1996). The *Support* dimension was used in the present study as an indicator of the closeness of the participant-partner pairs. The internal consistencies on the *Support* dimension were good to excellent, *Cronbach's α's* = .88, .93, respectively, in relation to the responses from participants with OCD and their chosen partners.

Covert-Overt Reassurance Seeking Inventory (CORSI; Radomsky et al., 2021)

The CORSI is s 26-item measure and was used to assess the degree to which people generally sought reassurance regarding the presence of various perceived threats. It has demonstrated excellent internal consistency (*Cronbach's* α = .93). The internal consistency of the factors with a sample of people with OCD has ranged from good to excellent: overt-social/relational threat (O-SR; *Cronbach's* α = .70), covert-social/relational threat (*Cronbach's* α = .88), overt-general threat (*Cronbach's* α = .90), covert-general threat active (*Cronbach's* α = .67), covert-general threat passive (*Cronbach's* α = .72). These factors have been determined to have moderately strong convergent validity with the Vancouver Obsessive-Compulsive Inventory (VOCI; Thordarson, Radomsky, Rachman, Shafran, Sawchuk, & Hakstian, 2004), Obsessional Beliefs Questionnaire (OBQ; OCCWG, 2005) and Beck Anxiety Inventory (BAI; Beck & Steer, 1994). It has further demonstrated good divergent validity by low (r = -.16) to moderate (r = -.42) negative correlations with a measure of self-esteem (Rosenberg Self-Esteem Scale; Rosenberg, 1965), thought to be negatively related to RS. In this study, internal consistencies of responses from participants with OCD and partners of their choosing were excellent, *Cronbach's α's* = .91, .95, respectively.

Reassurance Seeking Questionnaire (ReSQ; Kobori & Salkovskis, 2013)

The ReSQ was designed to assess the degree to which people seek, extent to which they trust different sources of, how often in a week they seek, and how carefully they seek reassurance. It has excellent internal consistency (*Cronbach's α* = .82), and its five factors' retest reliability ranges from fair (*r* = .53) to excellent (*r* = .92). The internal consistencies of the responses from participants with OCD and partners of their choosing in the present study were excellent, *Cronbach's α's* = .97, .95, respectively.

Vancouver Obsessional Compulsive Inventory (VOCI; Thordarson et al., 2004)

The VOCI is a 55-item self-report measure of OCD symptomatology. Its six subscales measure different OCD symptoms: checking, contamination, obsessions, hoarding, indecisiveness, and having things "just right." It has exhibited excellent internal consistency in OCD, anxiety/depression, community adults, and student populations (*Cronbach's α* = .94, .98, .90, and .96, respectively; Thordarson, et al., 2004). It has also demonstrated excellent retest reliability in OCD and student populations (*r* = .96, *p* < .001; *r* = .91, *p* = .001, respectively; Thordarson, et al. 2004; Radomsky et al., 2006). Its convergent and discriminant validity have also been established (Thordarson, et al., 2004). In the present study, the VOCI demonstrated excellent internal reliability in both the participants with OCD and the partners of their choosing, *Cronbach's α's* = .95 and .99, respectively.

Obsessional Beliefs Questionnaire-44 (OBQ-44; OCCWG, 2005)

The OBQ-44 is a self-report questionnaire which assesses beliefs and thoughts strongly associated with obsessions in OCD. It has been found to have excellent internal consistency (*Cronbach's α* = .95; OCCWG, 2005), and it has demonstrated good criterion validity. The present internal reliabilities for the responses of the participants with OCD and the partners of their choosing were excellent, *Cronbach's α's* = .96 and .97, respectively.

Beck Anxiety Inventory (BAI; Beck & Steer, 1994)

The BAI is a 21-item self-report measure of the severity of anxiety within the previous week. It has been considered to be highly reliable and valid (Beck & Steer, 1994), and has been used extensively in research and clinical settings. The internal consistencies of the BAI in the present study for participants with OCD and partners of their choosing were good, *Cronbach's α's* = .88 and .93, respectively.

Beck Depression Inventory-II (BDI-II; Beck et al., 1996)

The BDI-II is a widely used 21-item measure of depressive symptoms over the previous two weeks. Used in clinics and research, it has been shown to be highly reliable and valid (Beck, Steer, Brown, 1996). The internal consistency for this study's participants with OCD and partners of their choosing was excellent, *Cronbach's α's* = .93 and .89.

Ratings of Familiarity and Trust

Two 100-point visual analogue scales created for this study were used to assess the extent to which participants with OCD and partners of their choosing were familiar with the other person (i.e., *Not at all* 0-100 *Extremely*) and trusted the other person (i.e., *Not at all* 0-100 *Extremely*).

Brief Fear of Negative Evaluation (BFNE; Leary, 1983***)***

The BFNE is a widely used measure of fear about being criticized by others. The BFNE is a 12-item, shortened version of the Fear of Negative Evaluation scale (FNE; Watson & Friend, 1969). It was designed to ask respondents to rate the degree to which they characteristically worry about various aspects of impression management and fear of the potential negative opinions of others on a five-point Likert-type scale ranging from 1, meaning *Not at all characteristic of me*, to 5, meaning *Extremely characteristic of me*. The BFNE has demonstrated excellent internal consistency (*Cronbach's α* = .90), a strong correlation with the FNE (*r* = .96) and good retest reliability (*r* = .75). In the present study, internal consistencies for the participants with OCD and partners of their choosing were fair, *Cronbach's α*'s = .76 and .74, respectively.

Materials

Video/Audio Recording Equipment

Participant-partner interviews were recorded with a video camera and audio recorder. The recordings were used to create transcripts of the interview and be later viewed to by coders to identify NVRS behaviour.

Procedure

Overview

Participants screened for OCD were individually interviewed by the experimenter during the diagnostic assessment while being video- and audio-recorded. Participants diagnosed with OCD and their chosen partners were then interviewed. Initially, they were interviewed together to allow for a RS opportunity. Then, each was interviewed in turn while the other completed questionnaires.

Diagnostic Assessment

The ADIS-5 (Brown & Barlow, 2014) was administered to assess the primary diagnoses of the participant screened for OCD. The Y-BOCS (Goodman et al., 1989) was administered to assess for the presence, form and severity of OCD symptomatology.

Administration of NVRSI

The NVRSI (Leonhart & Radomsky, 2019a) was administered by the researcher to collect information from participants with OCD and their chosen partners regarding various aspects of NVRS. After participants with OCD indicated that they were done seeking reassurance, the researcher randomized participants with OCD and their partners to either complete the NVRSI semi-structured interview or complete a set of computerized questionnaires.

Administration of Self-Report Measures

Participants with OCD and their chosen partners were asked to complete an online questionnaire package consisting of the NRI-SPV, CORSI, RESQ, VOCI, OBQ-44, BAI, BDI-II, BFNE, and ratings of familiarity and trust. Once the interviews and questionnaires were completed, both the participants with OCD and the partners of their choosing were thanked and provided compensation for their participation in the study.

Analytical Approaches

Quantitative Data Analysis

Descriptive statistics for all NVRSC-listed behaviours were generated. Four of these were endorsed as present in at least half of the conversations following an obsessional prompt and rated as occurring at least once or more daily by the participants with OCD or partners of their choosing (see Table 9). Quantitative analyses focused on these, as they were thought to represent the most common forms of NVRS.

Qualitative Data Analysis

Phenomenological analysis as outlined by Braun and Clarke (2006) was chosen to identify theoretical and clinically meaningful understandings of NVRS. It was also utilized to provide clinicians, practitioners, and other helping professionals with a thematically bound understanding of the lived experiences of NVRS phenomenon and to help inform their clinical decision-making (Braun & Clarke, 2006; Starks & Brown Trinidad, 2007). Differences between qualitative analytic methods can be flexible and porous (Davidsen, 2013). The various "ideal" approaches often share common features and specific methods tend to be adapted by individual researchers to meet the objectives of their study (Davidsen, 2013). However, phenomenological analysis was thought to more flexibly accommodate observations of *in vivo* interactions whereas discourse analysis and grounded theory rely on dialogue about general experiences.

The researcher created verbatim transcripts (including nonverbal and paraverbal information such as coughs, pauses, etc.) from the recordings of the NVRSI, and organized them by question and participant-partner pair. Phenomenological analysis was conducted on the resulting transcripts according to the guidelines provided by Braun and Clarke (2006): 1) familiarization with the data, 2) generating initial codes, 3) searching for themes, 4) reviewing themes, 5) defining and naming themes, and 6) producing the report. In the familiarization phase, all transcripts were read and re-read multiple times to ensure that the researcher fully and deeply understood the data. Initial codes were generated from the transcribed responses from participants with OCD and partners. Individual codes were compared to the associated extracts from the transcripts to ensure that each code only contained one unit of meaning. Similar codes were assembled into categories which collectively capture the essence of a concept related to NVRS.

Once the codes and corresponding data extracts were sorted, a search for potential themes was conducted. As per the guidelines of Braun and Clarke (2006), codes and associated extracts were reviewed and re-organized until themes and subthemes were optimized. All data extracts were reviewed to ensure they remained accurate to the recordings, had been coded properly, organized, and placed into themes. Themes were reviewed multiple times to ensure the internal homogeneity and distinction from other themes.

In the final phase, themes were defined to reflect one concept reflected by grouped codes rather than latent meanings. Descriptions of each theme and subthemes were written to best understand the phenomenon of NVRS.

Results

Data Cleaning

Interview responses and questionnaire data were examined for missing data and outliers. No missing data or outliers were identified.

Two items of the NRI-SPV required adjustment. In adapting the questionnaires to an online platform, the response sets were programmed incorrectly, such that the NRI Item 9 (i.e., "Who tells the other person what to do more often, you or this person?") and NRI Item 29 (i.e., "In your relationship with this person, who tends to take charge and decide what should be done?") had incorrect anchors. To address this, average values per participant on the NRI-SPV were computed and utilized for the two values for each participant in the scale calculations.

Integrity Check

Recordings of the interviews were reviewed to check if interview protocols, participant instructions, and proper prompts and probes were properly conducted. There were no substantive errors in administration.

Credibility Checks: Closeness, Familiarity, Trust

Participants and partners of their choosing provided responses regarding the extent to which they were familiar with each other (see Table 7). In general, participants with OCD and their partners rated their relationships with each other as mutually supportive, close, and trusting.

Symptom Measures

Descriptive statistical analyses were completed on symptom questionnaire responses from participants with OCD and partners of their choosing. The mean scores and group comparison statistics are displayed in Table 7. Participants with OCD (vs. chosen partners) reported significantly greater symptoms of anxiety, depression, and obsessive-compulsive disorder. They (vs. partners) also reported marginally more RS, as measured by the CORSI.

What Is NVRS?

Descriptive statistical analyses were conducted on observations of *in vivo* interactions between participants with OCD and partners of their choosing following an obsessional prompt. Observations were provided by participants with OCD, partners of their choosing, the researcher, and the coder (see Table 8). All sources indicated that multiple NVRS-listed nonverbal behaviours and paraverbal cues were used to seek reassurance during the opportunity to do so. To identify the potentially most important expressions of NVRS, those that were reported by at most participants with OCD or partners following the obsessional prompt and those indicated as at least daily by participants with OCD and the partners (see Table 9) were considered *most prominent*: closely examining the reactions of others, making direct eye contact, pausing to allow for reassurance, and wrinkling the forehead.

Closely Examine the Reactions of Others

Instead of asking aloud or making explicit comments about obsessions, nearly all participants with OCD (91.7%) and most partners (83.3%) affirmed that reassurance was sought through scrutinizing the partner's reactions regarding a perceived threat to safety (e.g., contamination; see Table 8). An absence of changes to a partner's reaction(s) was described by participants with OCD as reassurance that there is no significant risk or threat. However, the researcher and coder identified it in far fewer interactions (25% and 16.7%, respectively). Participants with OCD indicated this was the most frequently employed form of NVRS, done *very frequently, two to five times per day*. Chosen partners rated it only slightly less frequent, as *occasionally, once per day* (see Table 9).

Make Direct Eye Contact

Making eye contact was another prominent form of NVRS during the conversation following the obsessional prompt (see Table 8). Most of the participants with OCD (75%) and all of the partners (100%) reported direct eye contact was used to seek reassurance during the reassurance seeking opportunity. A lack of subtle cues indicating concern in the shared gaze (which may be interpreted as confirming the presence of a general threat) was described as confirmation of safety-related information. The coder also noted it in the vast majority of observed conversations (91.7%). However, the researcher observed it in less than half of the interactions (41.7%). Making direct eye contact with a potential source of reassurance was reported by participants with OCD and their chosen partners as at least occurring *occasionally, once per day* (see Table 9).

Pause to Allow for Reassurance

Pausing to allow for reassurance was the most prevalent paraverbal cue used to seek reassurance. These pauses to prompt reassurance occurred in the majority of the conversations following an obsessional prompt, according to most participants with OCD (75%), their chosen partners (75%), and the researcher (66.7%; see Table 8). The coder observed participants with OCD pausing to allow for reassurance in fewer observed conversations (41.7%). Participants with OCD indicated that they typically paused to prompt reassurance at least *Occasionally, once per day* whereas their chosen partners indicated that this happened *Rarely, once or twice per week* (see Table 9).

Wrinkle the Forehead

People with OCD reported they prompted reassurance by creating an expression of fear, uncertainty, and/or apprehension with a wrinkled forehead. Half (50%) of the participants with OCD and most (66.7%) of the partners reported this NVRS occurred during the conversation following the obsessional prompt (see Table 8). However, according to the researcher and coder, the behaviour happened much less frequently, in only 33.3% and 16.7% of the conversations, respectively. Participants with OCD and partners of their choosing rated it as the second most frequent form of NVRS, indicating it occurred more than or as much as *Occasionally, once per day* (see Table 9).

Other Noteworthy NVRS Behaviours

Other behaviours were observed/reported in most interactions by partners, the researcher, or coder (see Table 8). Distressed facial expressions, abrupt tonal or pitch changes, raised eyebrows, head shaking or nodding, avoided eye contact, and abrupt volume changes were identified as RS in at least half of the observed opportunities.

Additional NVRS Behaviours Identified by Phenomenological Analysis

As part of the exploratory nature of the present study, phenomenological analysis was conducted on the observation notes of the researcher and coder and the open-ended responses of participants with OCD and partners of their choosing about nonverbal or paraverbal RS strategies not listed in the NVRSI. The analysis is summarized in Table 11. Seven themes emerged.

The first theme was *Head Gestures / Facial Expressions.* It reflected the use of meaningful gestures and expressions to prompt reassurance. Participants with OCD reportedly prompted reassurance by grimacing consistent with pain, fear, and/or distress. The researcher and partners observed participants with OCD ostensibly seeking reassurance by abruptly tilting or shaking their heads. Partners said they interpreted 'nonchalant' expressions as RS. When asked, participants with OCD reported that such gestures and expressions were a primary NVRS strategy. The next theme was *Hands,* understood as the use of semantically laden and mutually understood gestures, actions, and/or touches which prompt reassurance. The researcher and coder noted singular or repetitive hand gestures (e.g., pointing) tended to result in reassurance from partners. The researcher also observed participants with OCD ostensibly prompted reassurance by manipulating objects in their hands (e.g., squeezing armrests on chairs, fidgeting). The researcher and coder both observed participants prompt reassuring responses by touching themselves (e.g., hold their faces or cheeks) or their partner (e.g., partner's legs). *Postural Change* was summarized as meaningful changes to the ways participants with OCD carried their bodies. Partners noted that a singular change in posture (e.g., slouching) cued reassurance. The researcher observed people with OCD rock repetitively after an obsessional prompt until partners responded with reassurance. Summarized as *Unusual Activity,* participants with OCD described seeking reassurance by engaging in personally unexpected actions (e.g., abruptly starting chores) or socially atypical behaviour (e.g., suddenly lying down in a public place). The theme of *Off-Topic Comments* was understood as comments or statements that do not reference obsessional concerns but nonetheless prompt reassurance, encourage others' engagement, and prolong opportunities for reassurance. Participants with OCD said they sometimes blamed partners for specific things (e.g., moving items) to prompt reassurance while mitigating negative feedback from partners who tended to respond defensively and/or distance themselves. Participants with OCD and the researcher observed the use of humour and sarcasm to prompt and prolonging opportunities for reassurance without explicit mention of general threats. The penultimate theme was *Careful Observation*. Participants with OCD described inferring safety-related information from others' unprompted reactions. The researcher observed participants looking carefully and directly at partners' reactions during the RS opportunity. The final theme was *Interpersonal Tone*, understood as combinations of paraverbal cues used to signal dominance or submissiveness to prompt reassurance. Participants with OCD described the former as making strong, passionate, declarative statements about general threats with a combination of paraverbal cues like smoother prosody, louder volume, steadier tonal inflection, fewer paralinguistic sounds, and less disjointed speech to prompt others' attention and respond reassuringly. Participants with OCD described the latter strategy as attempting to present more child-like, vulnerable, non-threatening, and small by utilizing a quieter, higher pitch, and soft-timbred tone of voice which reportedly influenced others to respond more empathically and less critically.

What Triggers NVRS?

To determine what triggers NVRS, descriptive statistical analyses were conducted on cues endorsed by participants with OCD and partners of their choosing (see Table 10). Nearly all the listed cues were reported by the majority of both participants with OCD and partners of their choosing. Statistical analyses were also conducted to examine the degree of participant-partner agreement and interrater reliability. Average percent agreement was fair, 63.7% (but mean interrater reliability was poor, κ = -.02). Caution should be taken when interpreting the results

given the mixed evidence of agreement and reliability. Upon closer examination of the descriptive statistics, two themes emerged.

Concerns about General Threats

One set of triggers endorsed by the participants with OCD and partners of their choosing relates to concerns about general threats to safety. The most prominent of these triggers was doubt about personal performance/competence, which was defined as doubts about whether a person with OCD had done something properly or well-enough. This was endorsed by 83.3% of both the participants with OCD and partners of their choosing. Doubts about perception–doubts about what they saw, heard, touched, etc.–were also reported by the majority of participants with OCD (75%) and half of the partners (50%). A similar trigger, doubts about memory, was identified as a cue for NVRS by just over half of participants with OCD (58.3%) and two-thirds (66.7%) of partners. Further, the inability to check and doubts about whether a general threat to safety (e.g., harm, contamination) was reduced or removed were reported by two-thirds of both participants with OCD and their chosen partners (66.7%).

Concerns about Self-Worth and Relational Security

A second set of triggers endorsed by participants with OCD and partners of their choosing was related to depressive themes. For example, the second-most prominent trigger of NVRS was doubt about one's personal worth (e.g., likeability, appearance, and normality) which was endorsed by most participants with OCD and their chosen partners (both 83.3%). The third-most prominent trigger of NVRS was the perceived threat of loss of or rejection and abandonment by others, endorsed by the majority of participants with OCD (75%) and partners (66.7%). Additionally, just over half of the participants with OCD (58.3%) and two-thirds of the partners (66.7%) indicated that negative, depressed mood triggered NVRS.

Additional Triggers of NVRS Identified by Phenomenological Analysis

A phenomenological analysis of open-ended responses of participants with OCD and partners of their choosing was conducted to examine the possibility of additional antecedent factors not included in the provided list. Five themes emerged. The first theme of *Desire for Authentic Reassurance* relates to how reassurance in response to VRS may be perceived by those with OCD as unsatisfactory or unconvincing. Participants with OCD indicated that verbal responses may be disingenuous, used to dissuade RS rather than genuinely allay concerns about general threats. They described nonverbal responses as more sincere. They further noted that while VRS tended to result in verbal reassurance, NVRS tended to prompt nonverbal responses. As such, they noted the urge to seek reassurance nonverbally arose in response to desires for authentic, genuine reassurance. *Stress and Anger* was the second theme. Partners observed that when the participants with OCD more often sought reassurance nonverbally when angry or if they were stressed before urges to seek reassurance arose. A third theme was the *Inability to Verbalize* RS. Participants with OCD indicated that sometimes an obsession can be so overwhelming, complex, or distressing that it is difficult to seek reassurance verbally. A fourth theme was *Avoid Social Problems of VRS through Concealment*. Participants with OCD described self-criticism associated with continued VRS and sensitivity to its impact on their relationships with others. Concerns were expressed about how continued VRS could erode the trust and security of relationships, be met potentially with disapproval, or result in rejection. When these concerns arise, urges to conceal RS and seek reassurance nonverbally reportedly

increase. The final identified theme was *Acute Uncertainty*. In situations of pronounced unfamiliarity, novelty, and/or ambiguity, NVRS is reportedly prompted. Participants with OCD and partners noted that new spaces or situations tend to prompt NVRS. They both indicated that strong distress associated with acutely uncertain situations tends to cue NVRS, as VRS was associated with relatively less likelihood of receiving satisfactory reassurance and more risk of criticism and relational instability at a time when certainty was of considerable value.

What Are the Functions of NVRS?

Descriptive statistical analyses were conducted on responses of participants with OCD and the partners of their choosing regarding the functions of NVRS (see Table 11). Most of the listed functions of NVRS were endorsed by the majority of participants with OCD and partners of their choosing. Average percent agreement was 63.7% (but mean interrater reliability was poor, κ = -.02). Given the mixed evidence of agreement, caution should be taken in drawing conclusions from the data. Three primary themes emerged in the results.

NVRS Neutralizes OCD-Related Concerns

All participants with OCD (100%) and partners of their choosing (100%) indicated that significant others provided safety-related information (i.e., reassurance) in response to NVRS. All participants with OCD (100%) and most partners of their choosing (75%) endorsed the reduction of uncertainty about an obsessional threat (e.g., contamination, harm). Most (91.7%) participants with OCD and partners (83.3%) indicated that NVRS resulted in reduced perceptions of the severity of threat. The majority of the participants with OCD (83.3%) and three-quarters of the partners (75%) indicated that NVRS reduced the perceived likelihood of threat and that NVRS felt like checking by confirming with a significant other. Most participants with OCD (84.6%) and half of the partners (50%) affirmed that NVRS neutralized obsessions (i.e., unwanted thoughts/images/obsessions go away). NVRS was also associated with reduced doubt about properly/adequately addressing a general threat and an improved sense of control. Just over half of the participants with OCD and partners (both 58.3%) indicated that NVRS transferred responsibility from the seeker to reassurer.

NVRS Improves Mood

Following NVRS, anxiety was reportedly reduced, according to nearly all participants with OCD and partners of their choosing (both 91.7%). Mood reportedly improved following NVRS as well, according to most of the participants with OCD (91.7%) and partners (75%).

NVRS Mitigates Social Concerns

Most of the sample indicated that NVRS mitigated social concerns. Most of participants with OCD (83.3%) and partners (66.7%) indicated that NVRS alleviated a fear of rejection. NVRS resulted in support, encouragement, and comfort, according to most participants with OCD (75%) and nearly all partners (91.7%). Just over half the participants with OCD (58.3%) and two-thirds of partners (66.7%) indicated that those with OCD perceived themselves as more adequate/likable after NVRS. Interestingly, while over half of participants (58.3%) indicated that the reaction from others is less negative, only a quarter of the partners (25%) indicated that NVRS had that impact.

Additional Functions of NVRS Identified by Phenomenological Analysis

A phenomenological analysis of open-ended responses of participants with OCD and partners of their choosing was conducted to examine the possibility of additional functions of NVRS. Two main themes emerged. The first was *OCD-Related Functions*. This theme reflected the tendency for NVRS to ultimately reinforce obsessions about general threats. NVRS reportedly resulted in (sometimes nonverbal) reassurance. People with OCD indicated that some nonverbal responses (e.g., sitting calmly) were interpreted as an expression of support and of reassurance that there was no threat. Partners echoed when they described approaching and sitting with the participants with OCD in response to NVRS. NVRS was described by the participant-partner pairs as a form of permission-seeking for VRS. Partners reported that they generally responded to NVRS positively and that they typically responded by inviting conversations about the person's obsessional concerns. Participants with OCD reportedly interpreted this response as permission for VRS. Lastly, NVRS reportedly resulted in less precise and sometimes unsatisfactory reassurance. Participants with OCD described NVRS as imprecise, such that others may not accurately interpret it and may respond in less reassuring ways that in response to VRS. Partners' responses echoed this. They noted NVRS could prompt them to provide reassurance, help the participant with OCD tolerate the obsessional uncertainty, or not respond at all. The second theme was *Interpersonal Functions.* NVRS reportedly had some interpersonal benefits and costs. Participants with OCD and partners indicated that NVRS avoids or mitigates interpersonal conflict. Participants with OCD described NVRS as kinder and less confrontational. Partner responses suggested that NVRS resolved interpersonal tension immediately. However, NVRS was described by participants with OCD an indication of diminished power within a relationship and less control over themselves. They reported a perceived loss of equality and power in relationships with partners who tend to respond more negatively and less attentively to continued RS. Partners described interpreting NVRS as an indication of greater than normal need for reassurance.

Why Do People Seek Reassurance Nonverbally Instead of or in Addition to Seeking It Verbally?

To examine this question, descriptive statistical analyses were conducted on the reasons to uniquely prefer NVRS endorsed by participants with OCD and the partners of their choosing (see Table 12). The majority of the sample, overall, endorsed almost all of the listed unique functions of NVRS. Average participant-partner agreement was low (53.3%), and there was poor interrater reliability $\kappa = 0.01$, indicating that people with OCD and partners of their choosing did not reliably agree on the reasons as to why NVRS was preferred in addition to or instead of VRS. The listed reasons were sorted into two broader categories for ease of communication in this document: *NVRS (vs. VRS) Mitigates Negative Social Consequences* and *NVRS (vs. VRS) Is More Effective*.

NVRS (vs. VRS) Mitigates Negative Social Consequences

Overall, functions relating to mitigating the impact of RS on others were the most strongly endorsed. Nearly all participants with OCD (91.7%) and over half of partners (58.3%) indicated that NVRS (vs. VRS) avoids offending, irritating, or annoying the other person with RS. Two-thirds of participants with OCD (66.7%) and most of the partners (83.3%) affirmed that NVRS avoided embarrassment and humiliation associated with VRS. According to just over half of the participants with OCD (58.3%) and three-quarters (75%) of the partners, NVRS also selectively elicited reassurance from a trusted few people, meaning unintended recipients who

may react negatively will be less likely to detect that RS occurred. Additionally, according to two-thirds of the participants with OCD (66.7%) and around half of the partners (41.7% to 50.0%), NVRS (vs. VRS) avoids embarrassment and expressing oneself, anxiety, and uncertainty around unfamiliar people from whom reassurance may be sought.

NVRS (vs. VRS) Is More Effective

Most of the participants with OCD (66.7%) and the partners (75.0%) indicated that NVRS is preferred because it is more effective than VRS alone. Approximately half of the sample (41.7% of the participants with OCD and 58.3% of the partners) affirmed that NVRS required less effort than VRS.

Additional Unique Functions of NVRS (vs. VRS) Identified by Phenomenological Analysis

A phenomenological analysis was conducted on the open-ended responses of participants with OCD and partners of their choosing to examine the possibility of additional reasons why NVRS would be preferred instead of or in addition to VRS. Six themes emerged. The first was that NVRS (vs. VRS) resulted in *More Believable (Often Nonverbal) Reassurance***.** Participants with OCD and partners described verbal reassurance as often insufficient in satisfying obsessional concerns, and that reassurance needed to be seen as well as heard. Both described reassurance as more believable, genuine, and convincing when in response to NVRS because it occurs in a stronger emotional context and tends to be supplemented by nonverbal cues. Additionally, participants with OCD described using nonverbal cues to subtly shape and reinforce reassurance as it was being given to be more convincing. The next theme was that NVRS (vs. VRS) *Enhanced Urgency*. Participants with OCD and partners described VRS as increasingly inefficient, tiresome, and unconvincing over time. Those with OCD indicated that partners may not respond urgently in response to VRS. Both described NVRS as having a greater 'pull' for reassurance. They described NVRS (vs. VRS) as more emotionally salient and expressive of the severity of concern and urgency. The third theme was *Enhanced Completeness.* Participants with OCD and partners described NVRS (vs. VRS alone) as a more complete response to general threats. VRS alone was characterized by participants with OCD as too quick, cursory, and insufficient. Partners similarly suggested that NVRS (vs. VRS alone) likely helps participants with OCD more completely convey their request for reassurance. *Greater Versatility and Durability* was another theme. Participants with OCD said that VRS tends to be useful only with familiar situations and people for a limited time. NVRS, however, was described as usable in more situations and to reassurance from unfamiliar people. Further, people with OCD noted that VRS (vs. NVRS) more quickly becomes ineffective, especially with people familiar with it. NVRS (vs. VRS) reportedly prompts reassurance and avoids negative feedback longer. Next, unlike VRS, NVRS *Mitigated Thought-Fusion/Magical Thinking Concerns*. People with OCD and partners noted that VRS requires explicit mention of perceived general threats, which could prompt thought-action fusion and magical thinking related concerns. NVRS, by contrast, reportedly avoids these issues. Participants with OCD indicated that NVRS (vs. VRS) is a form of *Selective Reassurance Seeking and Provision*. VRS was described as problematic because distressing concerns can be heard by anyone. People unfamiliar with the meaning of the NVRS can reportedly respond in ways that are not adequately reassuring or miss the cues entirely. NVRS (vs. VRS) was described by participants with OCD as advantageous because it can be detected in social situations by certain trusted people who could make specific subtle and nonverbal cues to provide reassurance nonverbally. The last theme was that NVRS (vs. VRS)

Mitigated Risk of Criticism and Rejection. Participants with OCD and their partners noted that unlike VRS, NVRS is less embarrassing and tends to be met with less critical feedback from partners or from less familiar people. People with OCD described a belief that NVRS is less burdensome and less likely to result in hurtful criticism or rejection by others, especially by those closest to them.

Are People with OCD Aware of Their NVRS?

We sought to explore whether participants with OCD were aware of their NVRS. Several analyses were conducted comparing their own reports of NVRS against reports of partners, the researcher, and coder. Percent agreement and categorical interrater reliability (κ) were calculated to assess the extent to which participants with OCD indicated similar NVRS to partners of their choosing, the researcher, and coder.

Participants with OCD and Their Chosen Partners Similarly Indicated the Presence of NVRS in Past Month Similarly

To assess the extent to which participants with OCD were aware of their NVRS, their and their chosen partners' responses were compared regarding RS in the past month. Descriptive statistical analyses were conducted (see Table 13). Percent agreement was calculated, and categorical interrater reliability was also assessed (see Table 14).

Overall, agreement was good. Average percent agreement was strong across all types of RS, 93.8%. Because all partners indicated "Any RS" and "Overt VRS" had occurred in the past month, categorical interrater reliability (κ) could not be computed. Excluding those two, the average interrater reliability was excellent, $\kappa = .81$. When all comparisons were considered, average interrater reliability was fair, $\kappa = .40$. Percent agreement on any comparison between participants with OCD and partners of their choosing regarding the presence of NVRS, any RS, and Overt VRS in past month was consistently high, at least (91.7%). Regarding Covert VRS, there was perfect agreement (100.0%).

Participants with OCD and Their Chosen Partners Similarly Indicated At Least Daily Use of the Majority of the Most Prominent Forms of NVRS

To examine the extent to which people with OCD are aware of their NVRS, their ratings were compared to those of their chosen partners with independent samples *t*-tests regarding how often they typically seek reassurance with the most prominent forms of NVRS (see Table 9). Among them, none of the tests was statistically significant, indicating no evidence of significantly different ratings of how often the nonverbal actions or paraverbal cues were used to seek reassurance. Partners rated the use of making distressed facial expressions to seek reassurance as significantly more frequent (i.e., more than *Occasionally, once per day*) than participants (i.e., more than *Rarely, once or twice per week*). However, this was not one of the most prominent NVRS behaviours as it was not observed by at least half of the participants or chosen partners during an opportunity to seek reassurance following an obsessional prompt and rated as occurring at least daily by participants with OCD and the partners.

Participants with OCD and Their Chosen Partners Similarly Reported Some of the Most Prominent NVRS following an Obsessional Prompt, Especially Close Examination the Others' Reactions and Direct Eye Contact

To further assess whether people with OCD are aware of their NVRS, descriptive statistics were computed for the endorsement of the most prominent NVRS during an opportunity to seek reassurance following an obsessional prompt (see Table 8). Most participants with OCD reported using at least three of the most prominent NVRS behaviours (see Table 8). Most partners reportedly observed all four.

The percent agreement and interrater reliability between participants with OCD and chosen partners were calculated based on their endorsement of NVRS following an obsessional prompt (see Table 14). Overall, evidence was mixed. Average percent agreement was fair when all listed NVRS behaviours were considered (67.6%), but categorical interrater reliability was poor (κ = .01). However, this metric may not accurately reflect their agreement because there was significant variability with respect to participant-partner agreement and reliability on individual NVRS behaviours. When just the four most prominent NVRS behaviours were considered, average percent agreement was low (58.3%) and interrater reliability was poor (κ = -.26). However, again, there was significantly variation in the agreement and reliability among individual prominent NVRS behaviours. There was fair percent agreement (75.0%) regarding close examination of the reactions of others and direct eye contact. However, the interrater reliability for the former NVRS behaviour was poor, κ = -.13 and for the latter was not computed because of uniform endorsement by all partners. These results indicate that participants with OCD and their chosen partners may be more similarly aware of some expressions of NVRS, such as direct eye contact to seek reassurance and close examinations of partner reactions, than others.

Participants with OCD and the Researcher Similarly Reported Some of the Most Prominent NVRS following an Obsessional Prompt, Direct Eye Contact

Participants' endorsements were compared to observations from the researcher regarding NVRS following an obsessional prompt. Descriptive statistical analyses were conducted of the most prominent NVRS (see Table 8). Participants with OCD and the researcher noted pauses to allow for reassurance in most of the interactions. However, while participants with OCD endorsed the other most prominent NVRS behaviours in most conversations, the researcher did not.

Overall, there was mixed evidence of similar awareness of NVRS. Percent agreement was computed, and interrater reliability analyses were conducted (see Table 14). The average percent agreement between participants with OCD and the researcher was fair (74.5%) regarding the occurrence of all listed NVRS, but the categorical interrater reliability was minimal (κ = .12). However, because of variability in agreement, this may not adequately reflect the level of agreement and reliability. When only the four most prominent NVRS behaviours and paraverbal cues were considered together, there was less agreement (52.1%) and interrater reliability (κ =.11). However, agreement and interrater reliability varied even among the most prominent NVRS behaviours. The participants with OCD and the researcher may be somewhat similarly aware of NVRS generally, but it appears they most similarly recognized NVRS in the form of direct eye contact, given the fair agreement (66.7%) and low-moderate interrater reliability (κ = .39).

Participants with OCD and a Trained Coder Similarly Reported Some of the Most Prominent NVRS following an Obsessional Prompt, Especially Making Direct Eye Contact

In this final analysis, participants with OCD's and a trained coder's awareness were compared regarding NVRS during an opportunity to seek reassurance. Descriptive statistical

analyses were conducted (see Table 8). Where most participants with OCD indicated closely examining their partners' reactions (91.7%), making direct eye contact (75%), and pausing to allow for reassurance (75%), the trained coder noted primarily that most participants (91.7%) made direct eye contact.

To further examine the extent to which participants with OCD were aware of their NVRS, percent agreement and interrater reliability analyses were conducted on their and the coder's endorsement (see Table 14). Generally, there was relatively good average agreement between participants and the trained coder on all NVRS (75.5%), but the categorical interrater reliability was minimal, $\kappa = .11$ (see Table 14). However, agreement and interrater reliability among the nonverbal behaviours and paraverbal cues were not uniform. When only the four most prominent NVRS behaviours were considered, agreement (47.9%) and interrater reliability ($\kappa = .06$) were low. Variability in agreement and reliability even among the most prominent NVRS behaviours varied and required additional analysis. When considered individually, there was evidence of good agreement (83.3%) and moderate reliability ($\kappa = .43$) regarding instances of direct eye contact to seek reassurance. On the remainder of the most prominent NVRS behaviours, participants with OCD and the coder had agreement at or below 50% and interrater reliability at or below $\kappa = .04$. People with OCD and those trained to identify NVRS from video recordings may have a similar awareness of NVRS, generally, and of direct eye contact, specifically.

Discussion

The present study was conducted to address limitations in current conceptualizations of excessive RS in OCD. It is currently understood as the solicitation of safety-related information via direct overt questions and subtle covert comments about (explicitly mentioned) safety-related concerns (Halldorsson et al., 2016; Halldorsson & Salkovskis, 2017; Kobori et al., 2012; Kobori & Salkovskis, 2013; Parrish & Radomsky, 2010; Radomsky et al., 2021). Such conceptualizations are arguably limited, though, as they exclude nonverbal aspects of RS which have been identified in qualitative descriptions (Halldorsson & Salkovskis, 2017; Kobori et al., 2012; Parrish & Radomsky, 2010), items within questionnaires (Kobori & Salkovskis, 2013; Radomsky et al., 2021; Rector et al., 2011), participant behaviour in experiments (Leonhart & Radomsky, 2019b), and observations of patient behaviour in the clinic. Nonverbal actions and paraverbal cues which could (ostensibly) prompt safety-related information without mention of obsessional concerns had not been systematically examined. Further, the extent to which people with OCD are aware that they were utilizing nonverbal strategies to seek reassurance was also unclear. Intentional concealment of obsessions and compulsions has been identified (Jaeger et al., 2021; Newth & Rachman, 2001), but nonverbal actions are also thought to be nearly automatic and below the level of active awareness (Knapp & Hall, 2006; Mandal, 2014; Robinson, 2006). The present study was designed to systematically identify specific expressions of NVRS, cues that triggered it, its general functions, and potentially unique and preferable functions (vs. VRS). It was also conducted to explore the extent to which people with OCD are aware of NVRS.

NVRS may involve many nonverbal behaviours and paraverbal cues but some appear to be more prominent. NVRS behaviours were identified that were reported by at least half of participants with OCD and chosen partners as having occurred during a live opportunity to seek reassurance following an obsessional prompt and rated as being used at least daily to seek reassurance: closely examining the reactions of others when doing or discussing something

related to obsessional concerns, making direct eye contact with a potential source of reassurance, wrinkling the forehead, and deliberately pausing to allow for reassurance. The most reliably identified NVRS behaviour was making direct eye contact. The phenomenological analysis revealed many other actions or cues may be used to seek reassurance. NVRS may also include head and facial expressions, hand gestures, abrupt or repetitive postural changes, unusual activity, off-topic comments, careful passive observation of others, and combinations of paraverbal cues consistent with dominance or submissiveness.

The second main finding was that NVRS has many similar triggers and functions as VRS. Perceived general threats (e.g., to safety) and threats to relational security and self-worth were the primary triggers of NVRS, similar to those identified for VRS (Halldorsson et al., 2017; Kobori et al., 2012; Parrish & Radomsky, 2010). The phenomenological analyses revealed additional triggers of NVRS: a desire for authentic (nonverbal) reassurance, difficulty expressing obsessional concerns, a desire to avoid social consequences from VRS, and acute uncertainty. Several prominently endorsed functions of NVRS that were similar to those of VRS: neutralized perceived general threats, prompted safety-related information, and improved mood. The phenomenological analyses indicated multiple, conflicting consequences from NVRS which simultaneously reinforced and discouraged it. It was said to mitigate interpersonal strain, promote empathy and desired attention, and attenuate self-criticism. Nonetheless, it also reportedly resulted in distress, self-criticism, and a perceived loss of interpersonal influence, as well as criticism, unsatisfactory reassurance, or ostracization from others who may experience negative emotions. Given that the list of possible triggers and functions of NVRS was adapted from an analysis of VRS (Parrish & Radomsky, 2010), NVRS may be functionally similar.

Important insights were gained into why NVRS may be used instead of or in addition to VRS. NVRS reportedly avoided or mitigated negative social consequences often prompted by VRS such as complaints from, conflict with, or rejection by others. It was described as more effective at soliciting safety-related information in some cases, especially when others no longer responded favourably to VRS. NVRS may also uniquely prompt more believable, often nonverbal, reassurance from others, who reportedly interpret NVRS (vs. VRS alone) as a greater need and urgency for reassurance. NVRS might effectively prompt reassurance in more situations and do so after VRS is no longer effective. Further, NVRS was said to mitigate thought-action fusion and magical thinking concerns associated with VRS. It was reputed to selectively prompt (more convincing) nonverbal reassurance from a trusted few people aware of specific NVRS cues and who can provide reassurance unbeknownst to others around.

There was mixed evidence about the extent to which participants with OCD were aware of their NVRS. There was no significant evidence that participants with OCD were unaware of their NVRS, but there was also evidence of poor agreement and interrater reliability. There was strong agreement and fair reliability between participants with OCD and their partners regarding the occurrence of overt VRS, covert VRS, and NVRS in the past month. Following an opportunity to seek reassurance about a prompted obsessional concern, participants with OCD did not significantly disagree but also had measurably low interrater reliability in identifying NVRS compared to their partners, the researcher, or a trained coder. Participants with OCD had a fair level of agreement and reliability with their partners, the researcher, and a trained coder regarding instances of making direct eye contact to seek reassurance. Participants with OCD and their partners had relatively good reliability and agreement about carefully examining reactions for indications of safety. Lastly, participants with OCD and partners of their choosing rated the general frequency of the most prominent NVRS similarly. However, the agreement and

interrater reliability ranged significantly among the listed NVRS behaviours, even among the most prominent expressions. There was also evidence of poor average agreement and interrater reliability. When averaged, agreement about the four most prominent forms of NVRS was lower than acceptable. There was poor agreement and reliability between participants with OCD, the researcher, and the coder about the occurrence of close examinations of the reactions of others and forehead wrinkling. Overall, evidence was inconclusive regarding whether participants with OCD were aware of their NVRS.

Some models have suggested that RS could theoretically involve any verbal or nonverbal action which (ostensibly) prompts safety-related information (Gillett & Mazza, 2018). The results of the present study are consistent with such a definition. Nonverbal behaviours and paraverbal cues may be used in addition to or instead of overt and covert VRS to solicit safety-related information to neutralize obsessions about general threats. Compulsive checking and VRS are thought to be functionally similar (Rachman, 1997, 1998, 2002; Salkovskis, 1985, 1999; Salkovskis & Warwick, 1986). VRS has been described as a form of checking by proxy (Rachman, 1998; Salkovskis, 1985, 1999). Indeed, people with OCD endorse that both checking and RS neutralize general threats (Halldorsson & Salkovskis, 2017; Kobori et al., 2012; Parrish & Radomsky, 2010). Experimentally manipulated augmented (vs. diminished) responsibility results in more checking (Arntz et al., 2007; Boschen & Vuksanovic, 2007; Bouchard et al., 1999; Lopatka & Rachman, 1995; Radomsky et al., 2001; Reeves et al., 2010; Shafran, 1997), greater urges to seek reassurance (Leonhart & Radomsky, 2019b; Parrish & Radomsky, 2006, 2011), and more actual verbal RS behaviour (Leonhart & Radomsky, 2019b). In the present study, the listed functions of NVRS were derived from those identified in VRS (Parrish & Radomsky, 2010). Given the finding that VRS and NVRS share many triggers and functions, they may be functionally similar. If so, then conceptualizations of RS may need to be updated to incorporate the role of nonverbal elements which similarly prompt reassurance without explicit mention of perceived general threats.

It could be argued that the behaviours described by participants with OCD and their partners simply reflect unintentional behaviour associated with obsessive-compulsivity or OCD-related anxiety and do not represent an additional and meaningful aspect of the disorder. However, such an explanation would not be entirely consistent with the results. NVRS reportedly served multiple functions. There was no conclusive evidence that participants with OCD were unaware of NVRS, as might be expected with incidental anxious behaviour. Lastly, participants with OCD and their chosen partners noted several unique advantages of NVRS , indicating that NVRS may be closer to a learned, concealed, compulsive strategy rather than incidental emotional expression. Such an interpretation of the present results would be consistent with the established tendency of those with OCD to conceal obsessions (Newth & Rachman, 2001) and compulsions (Jaeger et al., 2021). Concerns about negative feedback motivate increasingly subtle RS strategies (Halldorsson & Salkovskis, 2017; Kobori et al., 2012; Parrish & Radomsky, 2010; Radomsky et al., 2021). Covert VRS is thought to be preferred by people when they are concerned that asking directly for reassurance may result in negative consequences and may be active or passive ((Radomsky et al., 2021). Even more subtle strategies than covert VRS may be utilized in certain circumstances. In the present study, NVRS was preferred because it reportedly mitigated possible social problems associated with VRS. Concealment rather than anxiety may be a better explanation.

There are many reasons why the present results are theoretically meaningful. This study is thought to represent the first systematic examination of nonverbal aspects of RS in OCD.

Though overt and covert forms of VRS have been identified (Halldorsson & Salkovskis, 2023; Kobori et al., 2012; Kobori & Salkovskis, 2013; Parrish & Radomsky, 2010; Radomsky et al., 2021), the present results indicate that RS may also extend to nonverbal actions and paraverbal cues which (ostensibly) prompt safety-related information without necessarily mentioning obsessional concerns. Several prominent expressions of NVRS were identified and can now be more closely examined. VRS and NVRS were found to have functional overlap, suggesting theoretical models of RS may need to be updated. However, NVRS (vs. VRS) may more effectively mitigate negative social consequences and solicit reassurance. There was no significant evidence that people with OCD were unaware of their NVRS, but there was also low agreement and reliability with partners, the researcher, and a coder regarding its occurrence. These results could suggest that NVRS may generally not be incidental and unknown to those with OCD. Instead, it may be that people with the disorder engage in sophisticated judgments about not only whether to seek reassurance but also how best to do it. In the present study, NVRS was reportedly impacted not only by obsessional concerns but depressive and social concerns, as well. Important intrapersonal and interpersonal processes which contribute to concealment (e.g., Newth & Rachman, 2001) may be critical, if understudied, aspects of RS. The various perceptions of NVRS may differ and play an important role in the development of models to understand the interpersonal process during RS.

The present research may also have clinical implications. Nonverbal aspects of RS may be important to incorporate into cognitive-behavioural interventions for RS in OCD. Increased awareness of NVRS may help people with OCD, their loved ones, and clinicians identify it. Recent experimental research described above (See Study 1) suggests that cognitive interventions targeting beliefs about responsibility may be promising clinical strategies in reducing NVRS. In the present study, nonverbal provisions of reassurance were described by those with OCD as more valuable at times. Direct eye contact was a form of NVRS similarly identified by participants with OCD, their chosen partners, the researcher, and the coder. Further, people with OCD and their partners were similarly able to note when the person with OCD closely examined the partner for indications of reassurance. People have reported the provision of support preferable to complete response prevention when targeting RS in therapy (Neal & Radomsky, 2020). Eliminating nonverbal reassurance while offering support may be an important if difficult balance to achieve. Lastly, there may be implications for clinicians. NVRS may be a difficult-to-observe but important aspect RS in OCD. Increased awareness may help clinicians identify, target, and avoid reinforcing NVRS in the clinic. However, direct eye contact and close examination may be NVRS behaviours to target initially, given their more reliable identification.

The present study was not without limitations. Its small sample size constrained the power of statistical comparisons and prevented some of the analyses of interrater reliability from being conducted. Percent agreement can be a useful and intuitive measure of agreement between observers, but it does not account for agreement that could occur by chance. Categorical interrater reliability can be a useful alternative measure of agreement, but it is strongly affected by sample size, often underestimating reliability in small samples, on which clinical research often relies. Despite extensive training and oversight, the interrater reliability and agreement between coders was less than desired. Further, the small sample size, limited response options, and potential for demand effects limit the generalizability of the possible complexity and richness of the phenomenological analyses, and confidence in the results, respectively. The

study's limitations reduce the extent to which definitive and broad conclusions can be made, but they also serve as opportunities for future research.

Larger examinations of nonverbal aspects of RS in clinical samples should be conducted to replicate and extend the present findings. More reliable and accurate measures of NVRS behaviour could be developed to examine NVRS behaviour in the laboratory and the clinic. Larger clinical samples and more reliable measures of NVRS could also be used to further examine the extent to which people with OCD are aware of their NVRS. Experimental studies of the impact of beliefs about the unique benefits of NVRS (vs. VRS) could be conducted to examine their impact on overt, covert, and nonverbal expressions of RS.

Despite its limitations, the present study is thought to represent progress toward a deeper understanding of RS in OCD. Its results seem consistent with the notion that NVRS is a distinct and important but understudied aspect of RS in OCD. Primarily, the present study acts to highlight it and represents a call for further examination of the nonverbal aspects of RS. In this way, it is hoped to lead to improved clinical interventions for the benefit of people with OCD and their loved ones.

Table 4

Demographic Information of Participants with OCD and Partners of Their Choosing

	Participants with OCD		Partners	
	M	*SD*	*M*	*SD*
Age	38.58	16.93	42.25	18.11
	%	*N*	*%*	*N*
Sex				
Female	50.0	6	50.0	6
Male	50.0	6	50.0	6
Primary Language				
English	75.0	9	83.3	10
French	8.3	1	8.3	1
Other	16.7	2	8.3	1
Ethnicity				
European Origins	66.7	8	66.7	8
Latin, Central, or South American Origins	16.7	2	0	0
Other North American Origins	0	0	25.0	3
Asian Origins	16.7	2	8.3	1
Highest Educational Attainment				
High School/Vocational Training	16.7	2	0	0
CÉGEP	25.0	3	16.7	2
Undergraduate	41.7	5	50.0	6
Master's Degree	16.7	2	25.0	3
Doctoral Degree	0	0	8.3	1
Employment Status				
Full-time Employed	25.0	3	58.3	7
Part-time Employed	8.3	1	0	0
Unemployed / Looking for Work	16.7	2	8.3	1
Student	16.7	2	16.7	2
Stay-at-Home	8.3	1	0	0
Retired	25.0	3	16.7	2
Civil Status				
Single	50.0	6	33.3	4
Married/Common-law	50.0	6	58.3	7
Separated/Divorced	0	0	8.3	1

Note. Collège d'enseignement général et professionnel (CÉGEP) is a publicly funded post-secondary educational system which offers technical, vocational, or academic programmes in Québec.

Table 5

Diagnostic Information and OCD Symptom Severity of Participants with OCD

	%	*N*
OCD Diagnosis		
OCD	100.0	12
Primary Diagnosis		
OCD	75.0	9
PDD	25.0	3
Co-morbid Diagnoses (Other than OCD)		
Panic Disorder	25.0	3
Without Agoraphobia	8.3	1
With Agoraphobia	16.7	2
Agoraphobia	8.3	1
Social Anxiety Disorder	66.7	8
Generalized Anxiety Disorder	50.0	6
Post-traumatic Stress Disorder	8.3	1
Persistent Depressive Disorder	33.3	4
Without current MDE	25.0	3
With current MDE	8.3	1
Alcohol Use Disorder–Past use and dependence	8.3	1
	M	*SD*
Y-BOCS[a]		
Total	22.67	6.07
Obsessions Subscale	12.92	4.66
Compulsions Subscale	11.75	3.14

[a]Yale-Brown Obsessive-Compulsive Scale.

Table 6

Participants with OCD's and Partners' Scores on Self-Report Measures of Relationship Closeness and Psychopathology

	Participants with OCD		Partners		*t*(22)
	M	*SD*	*M*	*SD*	
NRI-SPV[a] Support Dimension	3.71	0.87	3.68	0.88	0.09
Familiarity rating	91.00	14.47	90.75	10.08	0.05
Trust rating	86.67	15.58	88.50	15.44	-0.29
BAI[b] Total	43.58	9.83	34.17	11.61	2.15*
BDI-II[c] Total	47.75	14.80	36.25	12.79	2.04*
BFNE[d] Total	36.67	12.21	32.00	13.50	0.89
CORSI[e] Total	78.00	18.03	63.83	23.19	1.67†
OBQ-44[f] Total	202.08	50.31	175.92	62.43	1.13
Responsibility/Threat Estimation Scale	71.08	24.09	60.17	25.27	1.08
Perfectionism/ Certainty Scale	81.67	17.76	76.92	21.87	0..584
Importance of / Control of Thoughts Scale	42.58	13.73	33.83	16.74	1.40
VOCI[g] Total	156.75	39.97	113.58	58.17	2.12*
Contamination Scale	26.00	11.49	21.92	11.57	0.87
Checking Scale	18.33	10.11	13.33	8.88	1.29
Obsessions Scale	38.08	14.56	21.33	11.88	3.09**
Hoarding Scale	15.92	8.98	14.33	8.62	0.44
Just Right Scale	37.92	11.88	27.00	14.40	2.03†
Indecisiveness Scale	20.50	6.20	15.67	7.58	1.71†

Note. The NRI-SPV is rated on Likert-type scale: *Little or None* (1), *Somewhat* (2), *Very Much* (3), *Extremely Much* (4), *the Most* (5). Self-reported ratings of familiarity and trust were rated on visual analogue scales: *Not at all* 0–100 *Extremely*.

[a]Network of Relationships- Social Provision Version. [b]Beck Anxiety Inventory. [c]Beck Depression Inventory-II. [d]Brief Fear of Negative Evaluation Scale. [e]Covert-Overt Reassurance Seeking Scale. [f]Obsessive Beliefs Questionnaire-44. [g]Vancouver Obsessional Compulsive Inventory.

†p<.10, *p<.05, **p<.01.

Table 7

Nonverbal Behaviours and Paraverbal Cues Used (Ostensibly) to Seek Reassurance from Partners following Obsessional Prompt

	Participants with OCD		Partners		Researcher		Coder	
	%	*N*	*%*	*N*	*%*	*N*	*%*	*N*
Closely examined the reactions of others	91.7	11	83.3	10	25.0	3	16.7	2
Made direct eye contact	75.0	9	100.0	12	41.7	5	91.7	11
Paused to allow for reassurance	75.0	9	75.0	9	66.7	8	41.7	5
Forehead wrinkling	50.0	6	66.7	8	33.3	4	16.7	2
Distressed facial expression	41.7	5	58.3	7	25.0	3	33.3	4
Abruptly changed tone/pitch of voice	41.7	5	58.3	7	25.0	3	16.7	2
Raised eyebrows	41.7	5	33.3	4	25.0	3	50.0	6
Shook/nodded head at partner	33.3	4	41.7	5	50.0	6	58.3	7
Avoided direct eye contact	33.3	4	16.7	2	25.0	3	66.7	8
Suddenly spoke louder or quieter than usual	25.0	3	58.3	7	8.3	1	33.3	4

Note. Behaviours observed by at least half one of the reporting sources listed in descending order by participant. See Appendices D and E for all nonverbal behaviours and paraverbal cues, respectively. Bold text indicates behaviours used to seek reassurance following an obsessional prompt according to the majority of participants with OCD and partners of their choosing. Nonverbal behaviours and paraverbal cues are sorted by participants with OCD, partners, interviewer, and then coder.

Table 8

Nonverbal Behaviours and Paraverbal Cues Used at Least Once per Day to Seek Reassurance

	Participants with OCD		Partners		*t*(22)
	M[a]	*SD*	*M*[a]	*SD*	
Closely examine the reactions of others	4.00	1.21	3.50	1.57	0.88
Forehead wrinkling	3.23	1.42	3.00	1.96	0.00
Make direct eye contact	3.15	1.63	3.46	1.56	-0.39
Pause to allow for reassurance	3.15	1.14	2.69	1.75	0.69
Abruptly changed tone/pitch of voice	2.85	1.41	3.23	1.42	-0.71
Distressed facial expression	2.58	1.24	3.54	1.05	-2.10*

Note. In descending order by participant. The behaviours noted as at least daily by the participants with OCD and partners of their choosing are bolded.

[a]Rated on a 6-point Likert-type scale where 0 = *Not at all, never*; 1 = *Very rarely, once or twice per month*; 2 = *Rarely, once or twice per week*; 3 = *Occasionally, once per day*; 4 = *Very frequently, two to five times per day*; 5 = *All the time, more than five times per day*.

*$p < .05$

Table 9
Triggers of NVRS

	Participants with OCD		Partners		Percent Agreement	κ
	%	*N*	*%*	*N*		
Doubt re: personal performance/competence	83.3	10	83.3	10	83.3	0.40
Doubt re: personal worth (e.g., likeability, appearance, "normality")	83.3	10	83.3	10	66.7	-0.20
Perceived threat of loss/rejection/abandonment	75.0	9	66.7	8	91.7	0.80**
Doubt re: perception	75.0	9	50.0	6	41.7	-0.17
Physical environment/location	66.7	8	50.0	6	83.3	0.67*
Negative mood (anxious)	66.7	8	100.0	12	66.7	0.00[a]
Inability to check	66.7	8	66.7	8	66.7	0.25
Doubt re: removal/reduction of perceived general threat (safety/harm/contamination)	66.7	8	66.7	8	50.0	-0.13
Unwanted thoughts/images/obsessions	66.7	8	83.3	10	50.0	-0.29
Perceived responsibility for preventing harm	58.3	7	66.7	8	91.7	0.82**
Negative mood (depressive)	58.3	7	66.7	8	58.3	0.12
Doubt re: memory	58.3	7	66.7	8	58.3	0.12
Perceived loss of control	41.7	5	66.7	8	41.7	-0.11

Note. Triggers endorsed by at least half one of the reporting sources listed in descending order by participant, percent agreement, and kappa.
Average percent agreement = 63.7%. Average κ = -0.02.
*p < .05, **p <.01.

Table 10

Functions of NVRS

	Participants with OCD		Partners		Percent Agreement	κ
	%	*N*	%	*N*		
Significant others provide information (e.g., safety-related)	100.0	12	100.0	12	100.0	-[a]
Reduced uncertainty about presence of threat	100.0	12	75.0	9	75.0	0.00
Reduced anxiety	91.7	11	91.7	11	100.0	1.00
Improved mood	91.7	11	75.0	9	100.0	-0.14
Reduced perception of severity of threat	91.7	11	83.3	10	91.7	0.63
Reduced perception of the likelihood of threat	83.3	10	75.0	9	75.0	0.25
Felt like you checked by confirming with significant other	83.3	10	75.0	9	75.0	0.25
Alleviated fear of rejection	83.3	10	66.7	8	50.0	-0.29
Unwanted thoughts/images/obsession go away	83.3	10	41.7	5	41.7	-0.05
Significant others provide support (i.e., encouragement, comfort)	75.0	9	91.7	11	75.0	0.43[†]
Reduced doubt about personal performance/competence	75.0	9	83.3	10	75.0	0.25
Improved sense of control	66.7	8	83.3	10	66.7	0.14
Alleviated perception of personal inadequacy/unlikability/etc.	58.3	7	66.7	8	91.7	0.82
Responsibility transferred from you to significant others	58.3	7	58.3	7	50.0	-0.03
The reaction from others is less negative (vs. VRS)	58.3	7	25.0	3	33.3	-0.23
Improved perception of memory	50.0	6	41.7	5	75.0	0.50

Note: Functions endorsed by at least half one of the reporting sources listed in descending order by participant, percent agreement, and kappa.

[a]Interrater reliability not computed because the because there was no variation in Participants with OCD's and Partners' responses.

Average percent agreement = 73.4%. Average κ = .24.

[†]$p < .10$.

Table 11

Unique Functions of NVRS (vs. VRS)

	Participants with OCD		Partners		Percent Agreement	κ
	%	*N*	%	*N*		
Avoid offending/irritating/annoying the other person with verbal RS	91.7	11	58.3	7	66.7	0.23
Avoid being embarrassed/humiliated	66.7	8	83.3	10	50.0	-0.29
More effective than verbal RS alone	66.7	8	75.0	9	58.3	0.00
Avoid expressing self with an unfamiliar person	66.7	8	50.0	6	50.0	0.00
Avoid expressing anxiety to unfamiliar person	66.7	8	50.0	6	50.0	0.00
Avoid expressing uncertainty to unfamiliar to person	66.7	8	41.7	5	41.7	-0.11
Selectively elicits reassurance from a trusted few	58.3	7	75.0	9	66.7	0.27
Avoid being perceived as an anxious person	58.3	7	50.0	6	58.3	0.17
Avoid being perceived as paranoid	50.0	6	75.0	9	41.7	-0.17
Less effort to seek reassurance without words	41.7	5	58.3	7	50.0	0.03

Note: Unique or additional functions of NVRS endorsed by at least half one of the reporting sources listed in descending order by participant, percent agreement, and kappa. None of the comparisons were statistically significant.
Average percent agreement = 53.3%. Average κ = .01.

Table 12

Reassurance Seeking in Past Month

	Participants with OCD		Partners		Percent Agreement	κ
	%	*N*	%	*N*		
Covert VRS	91.7	11	91.7	11	100.0	1.00***
NVRS	91.7	11	83.3	10	91.7	.63*
Any RS	91.7	11	100.0	12	91.7	-[a]
Overt VRS	91.7	11	100.0	12	91.7	-[a]

Note. In descending order by endorsement by participants with OCD and percent agreement.
[a]Interrater reliability not computed because there was no variation in Partners' responses.
Average percent agreement = 93.8%. Average κ = .81.
*p < .05. ***p < .001.

Table 13

Agreement and Interrater Reliability with Participants with OCD regarding NVRS following Obsessional Prompt

	Partners		Researcher		Coder	
	Percent Agreement	κ	Percent Agreement	κ	Percent Agreement	κ
All Listed NVRS (Mean)	67.6	0.01	74.5	0.12	75.5	0.11
Four Most Prominent[a] (Mean)	58.3	-0.26	52.1	0.11	47.9	0.06
Closely examine the reactions of others	75.0	-0.13	33.3	0.06	25.0	0.04
Direct eye contact	75.0	-[b]	66.7	0.39	83.3	0.43
Pause to allow for reassurance	50.0	-0.33	58.3	0.00	33.3	-0.23
Forehead wrinkling	33.3	-0.33	50.0	0.00	50.0	0.00

[a]Reported by at least half of the participants with OCD or partners following obsessional prompt and reported as more than once daily by participants with OCD or partners.
[b]Interrater reliability unable to be computed because partners' responses were all affirmative.

CHAPTER 5: GENERAL DISCUSSION

Excessive RS has been defined as the repeated solicitation of safety-related information via overt, direct questions or covert, subtle statements (Halldorsson & Salkovskis, 2017; Kobori et al., 2012; Kobori & Salkovskis, 2013; Parrish & Radomsky, 2010; Radomsky et al., 2021). Unaddressed, it can lead to an 'empty life' (Salkovskis et al., 1998), where RS dominates most interpersonal experiences (Kobori & Salkovskis, 2013; Salkovskis et al., 1998). However, RS may involve more furtive strategies than previously thought. It has been suggested that RS understood as any verbal or nonverbal behaviour that attempts to prompt or result in reassurance (Gillett & Mazza, 2018). Measures of RS include very few items which probe nonverbal behaviour (Kobori & Salkovskis, 2013; Radomsky et al., 2021). Caregivers have reported feeling compelled to reassure loved ones with OCD who make "happy-looking glances" or fleeting eye contact in obsessional contexts (Halldorsson et al., 2016). People in conditions of experimentally augmented (vs. diminished) responsibility proFlonged opportunities to seek reassurance and made more off-topic comments during a conversation with an actor following ambiguous feedback about a contamination-related threat. However, cognitive-behavioural models of RS appear to be based on an assumption that RS manifests only as verbal questions or comments which explicitly reference an obsessional concern; at best, non-verbal forms of RS are a notable omission. There is a need to identify the various nonverbal ways that people with OCD seek reassurance and to investigate the impact of obsessional beliefs on NVRS. The programme of research yielded several noteworthy findings.

In Study 1, the experimental manipulation was successful in not only modifying perceptions of personal responsibility but also attributions of an actor's responsibility. Prior to RS, HR participants also reported significantly greater personal responsibility than the actor whereas LR participants attributed more responsibility to an actor. Experimentally augmented (vs. diminished) responsibility resulted in significantly more VRS as reported by participants and marginally more VRS as reported by an actor. Moreover, it also resulted in a trend toward more NVRS overall and in significantly more NVRS as reported by an actor from whom reassurance was sought. Additionally, the study provided evidence that RS resulted in a perceived transfer of responsibility. A significant multivariate condition × time × person interaction suggested that HR participants perceived a smaller transfer of responsibility from themselves to an actor from whom they sought reassurance compared to LR participants who seemed to perceive a larger transfer of responsibility from the actor onto themselves.

In Study 2, when participants with OCD were given an opportunity to seek reassurance from a partner of their choosing after obsessional concerns were prompted, they used various, sometimes simultaneous nonverbal actions and cues to solicit safety-related information without explicit mention of obsessional concerns. Several were used during the opportunity and were rated as occurring at least once daily according to the participant-partner pairs: direct eye contact, pauses to allow for reassurance, close examination of others' reactions, and forehead wrinkling. NVRS appears to share most of the triggers and functions of VRS, suggesting functional overlap. NVRS, like VRS, was reportedly prompted by general threats (e.g., safety), relational threats (e.g., rejection), and concerns about self-worth (e.g., worthlessness). NVRS reportedly neutralizes these threats by prompting safety-related information, and it also purportedly results in better mood and fewer negative social consequences. Unlike VRS, several unique attributes may uniquely reinforce NVRS. Compared to VRS, NVRS may be perceived as less socially risky, able to prompt reassurance more effectively and for longer into an interaction, able to prompt more genuine (often nonverbal) reassurance, and/or as more efficient. There was

not strong evidence that people with OCD were less aware of their NVRS than partners of their choosing. However, there was not compelling evidence of interrater reliability. Pairs similarly reported the 1-month occurrence and general frequency of the most prominent forms of NVRS. Making direct eye contact to prompt reassurance was most reliably identified by participants with OCD, their chosen partners, the researcher, and a trained coder. Participant-partner pairs also reliably identified instances of people with OCD closely examining the reactions of their chosen partners when discussing their obsessional concerns. Altogether, the findings indicate that people with OCD may well be aware of at least some of their NVRS.

The research re-affirms the central role of responsibility in OCD. Central to most models of the disorder (Rachman, 2002; Salkovskis, 1985; Salkovskis et al., 2000), beliefs of special responsibility are thought to be key cognitive mechanisms in the onset and maintenance of symptoms. Experimentally manipulated responsibility results in more compulsive-like checking (Boschen & Vuksanovic, 2007; Bouchard et al., 1999; Ladouceur et al., 1997; Lopatka & Rachman, 1995), urges to seek reassurance (Leonhart & Radomsky, 2019b; Parrish & Radomsky, 2006, 2011), and VRS (Leonhart & Radomsky, 2019b). Study 1 offers direct evidence that augmented (vs. diminished) responsibility may similarly impact nonverbal aspects of RS, as well. Further, in Study 2 people with first- and second-hand lived experience with OCD and excessive RS affirmed that NVRS can be motivated by desires to attenuate distressing perceptions of inflated responsibility.

Excessive RS has long been thought to be problematic in OCD since it has been proposed not only to increase a sense of safety but may also involve a perception of transferred responsibility (Gillett & Mazza, 2018; Rachman, 2002; Salkovskis, 1985). However, experimental studies designed to examine such a transfer have largely failed to measure participants' appraisals of multiple sources of responsibility (Leonhart & Radomsky, 2019b) or have used vignettes to examine perceptions to hypothetical situations (Champion & Grisham, 2022). Clinical participants in Study 2 indicated that responsibility prompts RS and that RS is perceived to transfer responsibility to the reassurer. However, it is thought that Study 1 may offer the first experimental evidence of a transfer of responsibility as the result of *in vivo* RS regarding a potential contamination-related threat. Further, the extent of perceived responsibility transfer may depend on the initial discrepancy between one's initial perception of one's own responsibility, the responsibility of their potential reassurer, and as a result of RS. Given initial perceptions of diminished (vs. augmented) responsibility, RS may result in a larger transfer of responsibility from the reassurer to the seeker, whereas in a state of initially augmented (vs. diminished) responsibility, RS may result in a minimal transfer of responsibility from seeker to reassurer. Excessive RS may therefore transfer responsibility but may be more effective at reinforcing personal responsibility than transferring it away.

The collection of findings may enhance theoretical understandings of RS in OCD. People with first- and second-hand experience with OCD affirmed the presence of NVRS, only incidentally and briefly described in a range of published studies. Study 2 offers a preliminary description of NVRS.

This work serves as a call for the consideration of the integration of NVRS into models of RS (Gillett & Mazza, 2018; Kobori et al., 2012; Kobori & Salkovskis, 2013; Parrish & Radomsky, 2010; Rachman, 2002; Salkovskis, 1985). Discrepancies between informant ratings of NVRS may provide important information about extent to which interpersonal "pull" (Akin et al., 1970; Hill et al., 2019; Kiesler & Watkins, 1989) is an important understudied aspect of NVRS. It may be important to consider factors that modulate this pull for reassurance and

experimentally examine their effect. Indeed, a theme emerged that NVRS (vs. VRS alone) more urgently, believably, and efficiently prompted reassurance. . Cognitive-behavioural models of OCD (Rachman, 2002; Salkovskis, 1985; Thordarson et al., 2004) already incorporate cognitive mechanisms related to threat estimation, evaluations of the importance and extent to which one can control thoughts, and perceived control. The present research indicates that people with OCD may adjust the concealment of RS based on evaluations of risks and benefits of VRS, distress, perceived urgency, and the extent to which the potential reassurer will believe the authenticity of RS. Second, it may be important to consider not only the beliefs of those with OCD but also those of the people from whom reassurance is sought. Certainly, the interpersonal quality RS which distinguishes it from other compulsive behaviour has been noted (Haciomeroglu, 2020; Kobori et al., 2012; Kobori & Salkovskis, 2013).

Transactional models of RS may better account for the "pull" for reassurance as a function of the partner's beliefs about the veracity of the person's distress, need for reassurance, perceived urgency for reassurance, and likely others. Including consideration of partners' beliefs about and responses to RS may improve understanding how RS is reinforced, further concealed, or reduced. The present work may have implications for the assessment of RS. While measures of RS exist, they implicitly limit definitions of RS to verbal responses. It may be worth considering how to accommodate the findings of the present research into measures. One option may be to develop measure limited to NVRS behaviours and related beliefs. Benefits may include increased information about factors which underlie the construct and a useful tool for other researchers to examine NVRS with different methods. However, it may further inflate arguably artificial distinctions between functionally similar behaviours. An alternative, functional integration-based approach may be to incorporate NVRS into existing measures of RS. Doing so may better recognize the apparent functional equivalence and simply broaden the scope of the measures to account for an additional aspect of RS. However, there was large variability in the endorsement rate of certain items of the NVRSC which may indicate that some nonverbal behaviours are more relevant and useful indicators of NVRS than others. Items related to gaze, large body movements, and pitch/tone/volume/prosody of voice may be more useful as they were most endorsed by participants with OCD and their partners. The theoretical implications of this programme of research may be transdiagnostic. Given that RS is a feature of a variety of mental health disorders, it may be important to examine the form and function of nonverbal communication in other disorders.

The present programme of research had several strengths. The experimental manipulation effectively created measurable differences in responsibility attributed to the participant and to the actor and non-significant differences in all measures of symptomatology and maladaptive beliefs, ruling out confounding explanations of the results. This was important, as experimental manipulations of responsibility can be difficult or fail (Badham, 2012; Shafran, 1997). Because participants rated their own responsibility as well as the actor's responsibility before and after the opportunity to seek reassurance, Study 1 provided an empirical examination of the previously understudied question of whether RS transfers responsibility. The transfer of responsibility from people with OCD who seek reassurance to people who provide reassurance has been theorized extensively (Kobori & Salkovskis, 2013; Rachman, 1998, 2002; Salkovskis, 1999; Warwick & Salkovskis, 1985). People with OCD (Halldorsson & Salkovskis, 2017; Kobori et al., 2012; Parrish & Radomsky, 2010) and their loved ones (Halldorsson et al., 2016) say a transfer of responsibility underlies, in part, why RS persists. However, few experiments have been conducted to examine this. Leonhart and Radomsky (2019) found that, those who sought

reassurance (vs. those who did not seek reassurance) reported a significant decrease (vs. increase) in responsibility personal responsibility. People have reported that they would expect to feel less responsible after seeking reassurance and attribute more responsibility to the person who reassured them (Champion & Grisham, 2022). However, a strength of Study 1 is that the methods allow for a more rigorous examination of the responsibility transfer hypothesis.

In both studies, external validity was a priority. The experiment detailed in Chapter 2 used an externally valid contamination threat in a testing room which is a functional kitchen to create *in vivo* experience with a similarly aged partner who acted believably like a similarly naïve peer. In the study detailed in Chapter 4, people with OCD were asked to participate alongside someone who knew them well, and the testing space resembled a typical psychology clinic rather than an unusual laboratory to best represent typical situations where NVRS may occur. Clinical participants were interviewed as part of Study 2 to tap the lived experience of NVRS from multiple perspectives. People were diagnosed by an interviewer who completed extensive training and evaluation in the use of the ADIS-5 (Brown & Barlow, 2014), a well-validated, reliable diagnostic interview widely used in research and clinical settings. Partners were included in the interviewing process. Previous studies of RS phenomenology tended either to interview those with OCD (Kobori et al., 2012; Parrish & Radomsky, 2010) or people who knew them well (Halldorsson & Salkovskis, 2017) but not both. Both studies in the present dissertation were based upon a measurement methodology which emphasized observing *in vivo* NVRS, whether this was a live conversation between clinical participant and partner following obsessional prompt or the live conversation between experimental participants and actor following the contamination-related dishwashing task in actual kitchen. In either case, the goal was to glean information about actual NVRS behaviour and not just self-report. A method of measuring NVRS was created which can be improved with further study. Additionally, its emphasis on multiple observers may offer several advantages over self-report alone (Vazire, 2006). Differences in responses may provide insight into how perspectives affect measurement of interpersonal compulsions, especially those which are concealed. Multiple perspectives tend to measure an *in vivo* phenomenon more comprehensively. Variations in responses to the NVRSC allows for more contextualized, richer information about NVRS that could not be measured by existing and/or self-report measures of NVRS alone.

The present programme of research also had weaknesses. Though the NVRSC was created because no measures of NVRS exist, mixed evidence of its reliability is a limitation. In Study 1, the NVRSC measure permitted a poor-moderate interrater reliability between coders and fair to good agreement. In Study 2, the agreement was fair, though interrater reliability was relatively low. However, this pattern is not unusual for coding schemes of behaviours in health research and may reflect the relatively low frequency of behaviours during a limited opportunity for observation (McHugh, 2012). Additionally, some items of the listed NVRSC have relatively higher levels of interrater reliability which may indicate potential items for a questionnaire to measure NVRS. Second, while naïve to hypotheses, participants and an actor were unaware of conditions only until randomization in Study 1, and the diagnostic status of participants in Study 2 was known explicitly by the participants and the researcher and likely inferred by the partners and a coder. Such awareness may have influenced the ratings of various informants in ways that true diagnosis- and hypothesis-naïveté would not. Problematic sampling methodology represents a significant weakness for the present programme of research. Clinical participants in an extant clinical trial were recruited for Study 2 and the response rate from clinical recruitment in the community was extremely low, resulting in a small, unrepresentative community sample of those

with OCD and significant others. Study 1 utilized undergraduate analogues from a participant pool. In both studies, non-random sampling violates key assumptions of statistical tests used to evaluate the data. Further, generalization cannot be done accurately, given that those who participated (i.e., mostly university educated, open to participation in clinical study for little compensation, persistent to endure the screening, open to involving someone who knows them well when most of the initially contacted people refused for this reason) are possibly different from the general population of those with OCD.

Cognitive-behavioural therapy, the first-line treatment for OCD, may benefit from expanding the conceptualization of RS to include nonverbal behaviours and paraverbal cues. Improved awareness could help to identify NVRS behaviour to guide exposure and response prevention guidelines. Further, cognitive therapy may target responsibility beliefs to reduce NVRS. Lastly, the present research has potentially important transdiagnostic implications, given that RS is a feature of myriad disorders. Clinical interventions may be adapted to target NVRS in these other disorders to improve outcomes.

CHAPTER 6: CONCLUSIONS AND FUTURE DIRECTIONS

Excessive RS is a prominent feature of OCD (Rachman, 2002; Salkovskis, 1985, 1999; Salkovskis et al., 1998). The lived experience of RS has been described by qualitative examinations from the perspective of those seeking reassurance (Halldorsson & Salkovskis, 2017; Kobori et al., 2012; Parrish & Radomsky, 2010) or caregivers who provide reassurance in response (Halldorsson et al., 2016). Experiments have examined various factors which affect it (Champion & Grisham, 2022; Leonhart et al., 2019; Leonhart & Radomsky, 2019b, 2018; Neal & Radomsky, 2015; Parrish & Radomsky, 2006, 2011). Despite observations of nonverbal aspects of RS in the laboratory and clinic, there has been little theoretical consideration and empirical examination of nonverbal RS (NVRS). The present programme of research was designed to explore its phenomenology and experimentally examine one of its hypothesized functions in OCD.

NVRS may be understood as unspoken actions or paraverbal cues which (ostensibly) prompt safety-related information explicit mention to neutralize perceived general threats, reduce anxiety, and mitigate concerns about self-worth and relational security not necessarily by identifying such concerns explicitly. It has significant functional overlap with VRS, but NVRS uniquely involves fewer social risks and can be more effective. The most prominent examples were examination of reactions, direct eye contact, pauses to allow for reassurance, and forehead wrinkling. People with OCD are likely aware of their NVRS. Participants with OCD and their partners similarly reported NVRS in terms of its occurrence within the past month, general frequency, and use after an obsessional prompt. They reported the most prominent and reliable NVRS was direct eye contact and close examination of reactions. Participants with OCD, the researcher, and a trained coder reported NVRS comparably, especially direct eye contact. Special responsibility was found to impact VRS and NVRS overall, especially as reported by those from whom reassurance was sought. A transfer to a reassurance seeker with initially diminished responsibility was larger than the significant but smaller transfer from a seeker with initially augmented responsibility. Overall, the results indicate the NVRS could be best understood as a highly concealed, nonverbal or paraverbal form of RS.

The present results could serve as a basis and call for future empirical examinations of nonverbal aspects of RS in OCD and other disorders. There is a need for independent replication: evaluating the extent of nonverbal aspects of RS in OCD and of their response to experimental manipulations of responsibility. Larger, more representative, and random samples are needed for more robust interpretations of statistical comparisons. There is a need for a better, psychometrically sound measure of NVRS, and it may be advantageous to involve multiple informants. The development of such a measure may provide insights into underlying factors, used to measure the impact of various beliefs on NVRS, and examine factors associated with the extent to which various informants agree. Some of the items used to measure NVRS in the present studies may be useful in the development of a questionnaire that could be used to measure the phenomenon in research and the clinic. Beliefs associated with increased concealment of RS may be important to explore. Study 2 indicated that those with lived experience did not utilize NVRS to simply avoid social consequences, but the exploration of potential additional positive beliefs about why NVRS would be preferred (e.g., more authentic/believable reassurance) could be examined experimentally for their effects on the proportion of VRS to NVRS. For example, the effect of manipulating beliefs about expected authenticity of reassurance could be manipulated to examine their impact on the differential use of NVRS (vs. VRS). Insight into such beliefs could be targeted in therapy to mitigate urges

toward concealment. Future studies could examine the extent to which VRS and NVRS are perceived to transfer responsibility and what level of concerns related to verbal RS (e.g., negative evaluation, personal embarrassment) risk they are willing to tolerate to better transfer responsibility before utilizing NVRS. Investigations could be conducted to compare the extent to which VRS and NVRS result in a perceived transfer of responsibility. In the clinic, such a measure could be used to monitor progress. Informants like loved ones or close friend could provide additional information. By targeting NVRS and related beliefs may help improve the effectiveness of therapy.

In a distressing cycle, people with OCD can seek reassurance repetitively to neutralize distressing obsessions even when aware of its negative impact, and loved ones may provide reassurance to respond to immediate distress even when they are bothered by it and know of its maladaptive nature. Models of RS could benefit from incorporating non-verbal aspects of this compulsion. It is hoped that the present research may contribute to understanding of and interventions for OCD, ultimately to the benefit of those with OCD and their loved ones.

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Appendix A: Leonhart & Radomsky (2019) Manuscript

Responsibility Causes Reassurance Seeking, Too: An Experimental Investigation

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Abstract

Excessive reassurance seeking (RS) in obsessive-compulsive disorder (OCD) has been conceptualized as compulsive checking by proxy. Manipulations of responsibility augment a range of OCD symptoms; however, their impact on RS behaviour has not been examined. We hypothesized that under conditions of high responsibility (HR), participants would report greater urges to seek reassurance and more actual reassurance seeking (RS) compared to low responsibility (LR) participants. Participants (N=72) were randomized to HR or LR conditions, completed a dishwashing task with a confederate, and were given an opportunity to seek reassurance. HR participants reported feeling more responsible for the task, $t(76)=5.440$, $p<.001$, $d=1.23$, and greater urges to seek reassurance, $t(76)=-2.891$, $p=.005$, $d=1.23$. HR resulted in more RS than LR, according to confederates, $F(1,76)=10.741$, $p=.002$, $\eta_p^2=.124$, and coders, $F(1,76)=6.872$, $p=.011$, $\eta_p^2=.083$. LR and HR participants' overt RS was similar, $F(1,76)=1.258$, $p=.266$, $\eta_p^2=.016$, but HR resulted in more covert RS than LR, $F(1,76)=18.079$, $p<.001$, $\eta_p^2=.192$. A significant interaction between responsibility condition and time, such that those who sought reassurance reported a decrease in responsibility, whereas those who did not reported an increase, suggests that RS transfers responsibility, *Wilks' λ*=.872, $F(1,76)=11.130$, $p=.001$, $\eta_p^2=.128$. Implications for cognitive models of and treatments for RS in OCD are discussed.

Keywords: obsessive-compulsive disorder; responsibility; reassurance seeking; beliefs; anxiety disorders; cognitive mechanisms.

Responsibility Causes Reassurance Seeking Too: An Experimental Investigation

Obsessive-compulsive disorder (OCD) is characterized by intrusive, anxiety-provoking thoughts (obsessions), and/or repetitive behaviour (compulsions; American Psychiatric Association, 2013; Rachman & Hodgson, 1980). It is a leading cause of disability globally and is present across populations, cultural groups, and genders (APA, 2013; Radomsky et al., 2014; WHO, 2008). A key component of OCD symptomatology is excessive reassurance seeking (RS).

Excessive RS is the repeated solicitation of safety-related information despite having already received it (Kobori, Salkovskis, Read, Lounes, & Wong, 2012; Parrish & Radomsky, 2010; Salkovskis, 1999; Rachman, 2002). RS can take the form of overt, repetitive direct questions (e.g., "Do you think these dishes are clean enough? Are you sure?"). Covert RS refers to seeking reassurance via the use of subtle statements (e.g., "It's fine for us to leave our house and go on our trip now without checking for our passports again." or "Surely it is safe for me to give our child a drink from this bottle because you saw me clean it properly"; Neal & Radomsky, 2015; Parrish & Radomsky, 2010; Rachman & Hodgson, 1980). Eventually, RS can become highly ritualized and can come to dominate interpersonal interactions, leading to social difficulties for those who seek reassurance (Kobori et al., 2013; Salkovskis, Forrester, Richards, & Morrison, 1998). RS can be immensely distressing for the seeker: s/he may feel increasingly dependent on others for anxiety relief and feel embarrassed by continual attempts to evoke safety-related information from others. It can be highly distressing for those from whom reassurance is sought, too, as they see their loved ones so distraught and as they deal with the irritation of being repeatedly asked for safety-related information in various ways.

A transdiagnostic phenomenon, RS is seen in depression, generalized anxiety disorder, panic disorder, illness anxiety, body dysmorphic disorder, and is a hallmark behaviour in OCD (Halldorsson, 2015; Kobori, Salkovskis, Read, Lounes, & Wong, 2012; Kobori & Salkovskis, 2013; Parrish & Radomsky, 2010; Phillips, Menard, Fay, & Weisberg, 2005; Salkovskis, 1991; Wells & King, 2006). In depression, RS is thought to gain information about perceived social threats (e.g., fear of losing a romantic relationship, loss of companionship; Coyne, 1976; Parrish & Radomsky, 2010; Kobori, et al. 2012). Those with generalized anxiety disorder tend to seek reassurance about various sources of worry (Wells & King, 2006). In specific phobia, safety-related information about the particular feared object/situation is sought (Joiner & Metalsky, 2001). Reassurance is sought to alleviate perceptions of imminent threat in panic (Osborne & Williams, 2013; Salkovskis, 1991). In illness anxiety, information about the condition of a person's body and symptoms is typically sought (Salkovskis & Warwick, 1986). Those with body dysmorphic disorder may seek reassurance about their body shape or appearance (Phillips et al., 2005). In OCD, excessive RS involves repeatedly asking others for threat- or anxiety-reducing information about general threats (e.g., jeopardized personal safety, property damage, etc.; Parrish & Radomsky, 2010). RS is likely the most common way that OCD is observed in an interpersonal encounter (Kobori, et al., 2012; Kobori & Salkovskis, 2013).

That compulsive checking and RS share a similar counterproductive nature in OCD led Rachman to conceptualize RS as a form of compulsive checking by proxy (2002). In fact, compulsive checking and RS may be functionally similar, as they both serve to decrease perceptions of harm and feelings of anxiety temporarily (Kobori et al., 2012; Parrish & Radomsky, 2010). Given that their function may be similar, compulsive checking and RS may be maintained by similar mechanisms, although this has yet to be demonstrated empirically

(Parrish & Radomsky, 2011). Though the overall aim of RS is to gain a sense of certainty, it is also thought to transfer some perceived responsibility from the person with OCD to the person from whom s/he is seeking reassurance (Kobori et al., 2012). RS, then, may not only provide an opportunity for decreasing perceptions of harm, but may also disperse responsibility, making it a particularly persistent and problematic behaviour in OCD (Kobori et al., 2012; Kohlenberg & Vanenberge, 2007; Parrish & Radomsky, 2010; Rachman, 2002; Salkovskis, 1985; Whittal & O'Neill, 2003).

Central to most cognitive-behavioural conceptualizations of OCD is the idea that those with the disorder feel especially responsible for preventing harmful outcomes, especially to others (Salkovskis, 1985). Rachman (2002) further developed Salkovskis' theory of OCD by proposing a specific cognitive model of compulsive checking. In this model, perceptions of responsibility to prevent harm were proposed to interact with other cognitive domains (i.e., perceived probability and severity of harm) to promote checking and/or RS behaviour. For example, an intrusive doubt about whether a stove was accidentally left on when leaving one's home is thought to produce more checking if one perceives her/himself as more responsible to prevent the harm because s/he was the last one to leave, interprets the doubt as indicative of increased risk that s/he left the stove on, and perceives a catastrophic outcome, like losing the whole house and all of their possessions in the fire.

The critical role that responsibility plays in compulsive checking has been experimentally demonstrated. Multiple methods for manipulating responsibility have been employed. These include contracts to assign blame in case of improper task completion (Lopatka & Rachman, 1995; Radomsky, Rachman, & Hammond, 2001), the presence (vs. absence) of the experimenter (Shafran, 1997), whether the task was a mundane laboratory test or could have real-world

implications (Arntz, Voncken, & Goosen, 2007; Bouchard, Rhéaume, & Ladouceur, 1999; Ladouceur, Rhéaume, Freeston, Aublet, Jean, Lachance, Langlois, & De Pokomandy-Morin, 1995), and leading participants to believe that incorrect task performance could result in (mild and temporary) harm to another person (Boschen & Vuksanovic, 2007; Reeves, Reynolds, Coker, & Wilson, 2010). Across the above-mentioned studies, increased responsibility resulted in increased urges to check and checking behaviour.

Experimental research in the domain of RS is relatively new. The few extant studies have examined the role of responsibility on *urges* to seek reassurance (Parrish & Radomsky, 2006, 2011) and the impact of partner familiarity on actual RS (Neal & Radomsky, 2015). In 2006, Parrish and Radomsky found that participants who were led to believe that their performance on a colour-sorting task would have real-world implications (i.e., be used to create a pill dispensing protocol for a Third World pharmacy) reported significantly greater *urges* to seek reassurance than those told the task was for basic research (Parrish & Radomsky, 2006). In another experiment, HR participants reported significantly greater *urges* to seek reassurance when asked to indicate how they would act in written scenarios which implied increased responsibility (Parrish & Radomsky, 2011).

Neal and Radomsky (2015) developed an ecologically valid contamination-related dishwashing task to elicit RS in the laboratory. After washing dishes with ambiguous pictorial instructions, participants were given an opportunity to seek reassurance from their partner (i.e., familiar other vs. confederate). Actual RS was measured with a checklist developed for the study in which instances of RS about various aspects of the dishwashing task were reported by the participants themselves, by the dishwashing partner, and by trained coders. They found that participant- and partner-reported RS were greater in the familiar (vs. unfamiliar) partner

condition, but objective coding revealed no differences. They concluded that familiarity may affect perceived RS but not actual RS behaviour, however, the impact of responsibility was not measured in this study.

Thus, to the best of our knowledge, a study designed to assess whether augmented responsibility causes more RS *behaviour* has not been conducted. The present experiment was designed to test four hypotheses. Hypothesis 1 was that participants in conditions of high responsibility (HR) would report greater urges to seek reassurance than those in the low responsibility condition (LR). Hypothesis 2 was that, overall, there would be more total instances of RS behaviour in the HR than LR as measured by participants, confederates, and objective coders. For Hypothesis 3, we wished to more closely examine the type of RS (i.e., overt vs. covert) which was measured by trained coders. Specifically, we predicted that coders would observe both more overt and covert RS in the HR condition than in the LR condition. Our final Hypothesis (4) was that RS would facilitate a transfer of responsibility, such that participants who actually sought reassurance would report a decrease in perceived responsibility following the RS opportunity. In contrast, we expected that participants who did not seek reassurance would not demonstrate this decrease in perceived responsibility.

Method

Participants

Seventy-two undergraduate participants were recruited via Concordia University Psychology Department's Participant Pool or in-class recruitment by the experimenter. The mean age of participants was 23.658 (*SD* = 6.06.13, range = 19-52) years. Sixty-eight (94.4% of the) participants were female. Most were single, never married (91.7%). Most described their ethnicity as Caucasian/White (51.4%), 6.9% as African-Canadian, 5.6% as Middle Eastern, and

36.1.2% as various other ethnicities including Indian, Chinese, Filipino, and Korean. English was the most common mother tongue of the sample (47.29%), followed by French (13.91%). The most commonly reported achieved education level was College-level (77.8%), followed by a university bachelor's degree (11.1%), and high school (8.3%).

Participants were eligible to participate if they were able to read, speak, and understand English. They were unable to sign-up for the study if they participated in a previously conducted experiment in which a similar protocol was used (Neal & Radomsky, 2015).

Materials

Mock contaminant: garbage bin. A garbage bin was used as the source of contamination. It was filled with objects that appeared to be dirty and were described as used facial tissues, dirty paper towels, used plastic wrap, old coffee grounds, soiled latex cleaning gloves, and fruit peels. Participants were given a list of the contents of the garbage bin to enhance the salience of contamination threat. All of the contents of the garbage were clean but were made to appear dirty.

Equipment for dishwashing task. Coffee mugs were placed next to the laboratory sink. Fill lines were indicated on the sink and a wash basin. Several different plastic containers were filled with mild cleansers (i.e., dish soap, baking soda, and water). A measuring spoon and stir stick were used to measure and mix the cleaning solutions. Cups were placed on a regular kitchen dish rack following the washing procedure.

Written instructions for dishwashing task. Instructions were provided to the participant on laminated paper. They indicated how to complete the dishwashing task developed for this study from beginning to end in a step-by-step fashion. Participants were asked to take turns with the confederate every two steps of the task, such that they would switch from washing

dishes to reading the instructions, or vice versa. The dishwashing task and instructions were designed to standardize participant behaviour and to be unfamiliar to increase the probability that participants may be uncertain as to whether the cups were sufficiently clean.

Confederate. Three volunteer undergraduate confederates were recruited and trained by the experimenter. They were given extensive training, scripts, and behavioural guidelines to ensure that they would act consistently so as to lead participants to believe that confederates were fellow unfamiliar undergraduate participants new to the study, maximizing the possibility of RS. To ensure that all participants completed the same dishwashing procedure, confederates were instructed to read the instructions clearly and to covertly correct variations in participant dishwashing behaviour. Confederates were asked to note any occurrence of major deviations from the procedure, but none occurred. These scripts and guidelines were adapted from those of a previous RS study in which participants sought reassurance from a confederate (Neal & Radomsky, 2015). There was a specific script for the experiment, informing confederates to say specific things at certain points in the experiment (i.e., while entering the experiment, while washing the dishes, answering the questionnaires).

Confederates began every RS opportunity by stating, “The cups seem clean to me”. This assurance was given so that any subsequent requests for information about the proper completion of the task, the cleanliness of the cups, or the safety of others could be considered *re*assurance seeking. When responding to RS from participants, confederates were trained to respond with a true but vague statement which contained factual information but would be inconclusive and did not provide any reassuring information about the task (e.g., I saw you put the cups into the water, but I could not tell if you got all of the dirt off of them by stirring, so I am not totally sure if they are clean.”).

Responsibility Contract. A contract similar to those used by Lopatka and Rachman (1995) and Radomsky, Rachman, and Hammond (2001) was employed to manipulate responsibility. HR participants signed to indicate that they understood they were completely responsible for the proper completion of the dishwashing task and would be held completely responsible for any harm that may occur from eventual use of the cups if the procedure was not correctly followed. LR participants signed the contract to indicate that they understood that they would be not at all responsible for any harm that may have occurred from the eventual use of the cups if the task was not completed correctly. Whichever section not completed by the participant was completed by the confederate.

Measures

Symptomatology and belief measures. Participants were asked to complete measures of obsessive-compulsive symptomatology (Vancouver Obsessive-Compulsive Inventory; Thordarson, Radomsky, Rachman, Shafran, Sawchuk, & Hakstian, 2004), obsessional beliefs (Obsessive Beliefs Questionnaire-44; OCCWG, 2003) as well and depression, anxiety, and stress (Depression Anxiety Stress Scales; Antony, Bieling, Cox, Enns, & Swinson, 1998). Each of these measures has strong psychometric properties and has been extensively used in research.

Rating of responsibility. Participants were asked to rate the extent to which they felt responsible for the proper completion of the dishwashing task on a scale from 0 – 100, such that 0 represented feeling not at all responsible and 100 represented feeling completely responsible.

Credibility ratings. Two credibility ratings were obtained for both the degree to which the participants felt the garbage was dirty and the degree to which they believed the responses from the confederate, each on a scale from 0 to 100, such that 0 represented not at all believable and 100 represented completely believable.

Rating of urges to seek reassurance. Participants were asked to rate their urges to seek reassurance on a scale from 0 – 100, wherein 0 represented no urge whatsoever and 100 represented an extreme urge to seek reassurance.

Reassurance Seeking Checklist (RSC). The RSC is a five-item measure developed by Neal and Radomsky (2015) to assess instances of RS during a conversation with another person or while talking aloud to themselves. The RSC was designed to be completed by the participant and by the person from who they sought reassurance following a conversational opportunity for RS. An objective coder, blind to the study's hypotheses also used the RSC to provide an objective measure of participants' overt and covert RS.

The RSC is a measure of RS behaviour which asks respondents to indicate the number of times that the participant asked direct, obvious questions to cue safety-related information (Overt RS) or made subtle statements to obscure their intention to solicit safety-related information, despite having already received it (Covert RS). It was designed to be completed by the participant, confederate, and a hypothesis-blind coder.

The authors of the RSC argued that internal consistency may not be appropriate and may actually be undesirable in this measure, given that participants are allowed to express *any* concerns about any aspect of the dishwashing task. Given the idiographic nature participants' concerns, it was argued that a high internal consistency among responses is unlikely.

Objective-coding. The audio recording of the conversation (see below) was coded by two trained raters who were blind to condition assignment and to the study's hypotheses. The primary experimenter (ML) provided psychoeducation about RS to the coders. They were given a standardized coding procedure which was adapted from Neal & Radomsky (2015). It included step-by-step instructions on how to code each audio recorded instance of RS. It first instructed

coders to identify RS (instances where safety-related information was solicited after having already received it). It then helped coders identify the topic of RS (e.g., cleanliness of the cups). RS was then categorized by type (i.e., overt, obvious questions vs. covert, statements intended to be dis/confirmed by the partner) with the aid of examples. Additionally, it asked coders to identify the amount of time the participant spent seeking reassurance, heard the provision of reassurance, and the total length of the RS opportunity. A supplemental guide was provided to help coders discriminate non-RS from RS, and overt from covert RS. It gave examples of overt RS (i.e., direct questions) and covert RS (i.e., subtle statements), as well as what did not constitute RS. Once the coders were trained to use these tools, they and the primary experimenter listened to five recordings from pilot testing together. The experimenter helped guide coders through the coding procedure and answered any questions. After this, they completed the ratings of RS for the other recordings of the RS opportunity for the reliability analysis.

Interrater reliability for the total number of instances of objectively-coded overt and covert RS was assessed using two-way mixed, absolute agreement, average-measures intra-class correlations (ICCs) to indicate the degree to which coders agreed on how many instances of overt and covert RS occurred during the recorded conversation between participants and the confederate (Hallgren, 2012; McGraw & Wong, 1996). The interrater reliability for coding of overt RS was excellent (*ICC* = .846). Reliability for covert RS was good (*ICC* = .666).

Procedure

Each participant was tested individually but was always paired with a confederate. Once both the participant and confederate were present, the experimenter falsely stated that the study's purpose was to collect normative data about the efficacy of a new dishwashing procedure, such that the data could be used to better understand how people with OCD follow specific

instructions to complete highly structured tasks. Once informed consent was obtained from the participant, the dishwashing procedure was explained. The experimenter informed the participant that s/he would be videotaped during the dishwashing procedure. Every participant was then randomized to either the LR or HR conditions.

In the HR condition, the participant was told that s/he was "in charge", which meant that s/he was responsible for the proper completion of the dishwashing task. S/he was told that s/he would take turns with the confederate every two steps "actually washing" or "just reading" the instructions for the procedure. S/he was reminded to take the task seriously as illness had resulted in the past by careless completion of the task. S/he was asked to sign the contract acknowledging the above.

In the LR condition, the participant was given the same instructions about the dishwashing procedure. However, s/he was told that s/he would "just assist" the HR participant and that s/he would not be responsible for any harm that may occur from eventual use of the cups. S/he was asked to sign the contract acknowledging this.

The confederate was given complementary information (e.g., confederates paired with HR participants were given LR information and *vice versa*). Once the contract was signed, participants were told that the cups would be clean if the instructions were followed exactly as written.

The experimenter put on gloves and submerged the cups into the garbage. He provided the participant with a list of the contents of the garbage bin, and then he placed the 'contaminated' cups next to the kitchen sink. The experimenter then left the room before the dishwashing procedure began.

Following the completion of the dishwashing task, the participant was asked to complete a questionnaire in a separate testing room, preventing her/him from checking the cups. This first questionnaire consisted of ratings of responsibility and urges to seek reassurance. Upon completion of the questionnaire, the experimenter returned and said that there had been a problem with the video recording, preventing confirmation of the proper completion of the task. The participant was then asked to discuss the task with the confederate, specifically to ask any questions or talk with the confederate to resolve any uncertainty s/he may have about the procedure and/or the cleanliness of the cups. If in the HR condition, the participant was told that s/he would make the final decision as to whether the task was completed exactly as the instructions dictated. In the LR condition, the confederate was to make the final decision. To increase the salience of contamination threat and reinforce the importance of this decision, the experimenter led the participant to believe that either s/he, the confederate, or the experimenter would soon be randomly assigned to drink from one of the cups. In fact, neither the participant, confederate, nor experimenter ever used the cups to drink anything. The confederate began each conversation by stating, "The cups seem clean to me". The ensuing audio-recorded conversation was later coded (using the objectively-coded version of the RSC) for instances of and time spent reassurance seeking as well as talking without seeking reassurance. The researcher returned and asked the participant to complete a battery of questionnaires, which included ratings of responsibility and urges to seek reassurance, the RSC, and the credibility checks. Once the participant completed the questionnaires, s/he was fully debriefed.

Results

Data cleaning

Key variables contained no missing values or univariate outliers. Skewness and kurtosis values for all variables were all within acceptable limits of +/- 2 (George & Mallery, 2010; Tabachnick & Fiddel, 2007). There were univariate outliers on objectively-coded overt (n = 1) and covert RS (n = 1), as well as on the confederate-rated (n = 1), and participant-rated RSC (n = 2). All univariate outliers were converted into the next greatest value within +/- 3.29 standard deviations, as recommended by Tabachnick & Fiddell (2007). When examined, there were no multivariate outliers.

Symptomatology and Belief Measures

HR and LR participants did not differ in terms of obsessive-compulsive symptomatology (Vancouver Obsessive-Compulsive Inventory; Thordarson, Radomsky, Rachman, Shafran, Sawchuk, & Hakstian, 2004), $t(69) = 1.010$, $p = .316$, obsessive beliefs (Obsessive Beliefs Questionnaire; OCCWG, 2003), $t(65.46) = 1.728$, $p = .089$, depression, $t(69) = .919$, $p = .361$, anxiety, $t(69) = -.113$, $p = .910$, or stress, $t(69) = .202$, $p = .840$ (Depression Anxiety Stress Scales; Antony, Bieling, Cox, Enns, & Swinson, 1998).

Manipulation check

An independent samples t-test indicated that HR participants perceived themselves as significantly more responsible for the proper completion of the dishwashing task (M = 85.55, SD = 19.07) than those in the LR condition (M = 57.16, SD = 27.68), $t(64.105) = 5.091$, $p < .001$, d = 1.27.

Credibility Checks

Two credibility checks were conducted: one on the believability of the confederate's responses and one on the perceived dirtiness of the mock contaminant. All participants rated the confederate's responses as at least somewhat believable. (M = 76.43, SD = 21.64). However,

when the credibility check of the mock contaminant was conducted, the data for one participant was excluded from analyses because s/he rated the dirtiness of the garbage as 0 of out 100, and five more participants were excluded from analyses because they did not respond to this credibility check. Participants perceived the mock contaminant as dirty (M = 62.23, SD = 28.62). HR and LR participants reported similar ratings of the garbage bin's dirtiness, $t(70) = -.273$, $p = .786$, $d = -.065$, and their ratings of the confederate's believability, $t(70) = .116$, $p = .908$, $d = .028$.

Urges to seek reassurance

In Hypothesis 1, we predicted that HR would result in greater urges to seek reassurance. An independent samples t-test indicated that HR participants reported a greater urge to seek reassurance (M = 53.66, SD = 31.78) than LR participants (M = 33.28, SD = 31.78), $t(70) = -2.891$, $p = .005$, $d = -0.69$ (see Figure 1).

Reassurance seeking

Hypothesis 2 predicted that HR participants would engage in more RS overall, as reported by themselves, confederates, and objective coders. To assess this, a one-way MANOVA was conducted wherein condition was the independent variable and participant-reported, confederate-reported, and objectively-coded RS were the dependent variables.

The multivariate test indicated a significant difference between the HR and LR conditions, *Wilk's* $\lambda = .849$, $F(3, 68) = 3.775$, $p = .011$, $\eta_p^2 = .151$ (see Table 2 and Figure 2). Univariate analyses indicated no differences in participant-reported RS between the HR and LR conditions, $F(1, 70) = .379$, $p = .540$, $\eta_p^2 = .005$. However, those in the HR condition sought more reassurance than LR condition participants according to both confederate ratings of RS,

$F(1, 70) = 11.603$, $p = .001$, $\eta_p^2 = .142$, and objectively-coded RS, $F(1, 70) = 7.725$, $p = .007$, $\eta_p^2 = .099$.

Overt vs. covert reassurance seeking

Hypothesis 3 predicted that HR participants would engage in more overt and covert RS, as reported by objective coders. To evaluate this, a one-way MANOVA was conducted with condition as the independent variable and objectively-coded overt and covert RS as the dependent variables.

There was a statistically significant multivariate difference between the HR and LR conditions, *Wilk's* $\lambda = .769$, $F(2, 69) = 10.339$, $p < .001$, $\eta_p^2 = .231$. Univariate analyses indicated that HR participants ($M = 1.20$, $SD = 1.60$) did not seek more overt RS than LR participants ($M = .74$, $SD = 1.29$), $F(1, 70) = 3.752$, $p = .186$, $\eta_p^2 = .025$. However, HR participants sought significantly more covert RS ($M = 1.40$, $SD = 1.06$) than LR participants ($M = .45$, $SD = .76$), $F(1, 70 = 19.328$, $p < .001$, $\eta_p^2 = .216$ (see Table 3 and Figure 3).

Other possible indicator of reassurance seeking

We also compared the total length of the RS opportunity between those in HR and LR conditions. Results indicated that responsibility had a large significant effect on conversation length. HR participants had longer conversations than LR participants, $t(57.414) = -4.259$, $p < .001$, $d = -.1.124$ (see Table 3 and Figure 4).

Transfer of responsibility

The final hypothesis was that RS would foster a transfer of responsibility, such that those seeking reassurance would report a decrease in responsibility and those who did not seek reassurance would not. A mixed between-within ANOVA assessed responsibility ratings between those who did ($n = 46$) and did not ($n = 26$) seek reassurance over time (i.e., pre-RS

opportunity, post-RS opportunity). There was a significant interaction between time and whether or not participants sought reassurance, *Wilk's* $\lambda = .863$, $F(1, 70) = 11.119$, $p = .001$, $\eta_p^2 = .137$ (see Table 4 and Figure 5). To examine how responsibility changed over time, follow-up paired-samples *t*-tests were conducted on participants' ratings of responsibility across time split by RS status (i.e., whether or not they sought reassurance). Those who sought reassurance reported a statistically significant decrease in responsibility, $t(45) = 2.212$, $p = .032$, $d = .330$, and those who did not seek reassurance indicated a statistically significant increase in responsibility, $t(25) = -2.176$, $p = .039$, $d = .435$. This is entirely consistent with the hypothesis that RS transfers perceived responsibility.

Discussion

We sought to experimentally examine the impact of augmented (vs. diminished) responsibility on RS. Experimental examinations (e.g., of responsibility) in the context of OCD symptomatology are an important area of research (Arntz et al., 2007; Boschen & Vuksanovic, 2007; Ladouceur et al., 1995; Ladouceur et al., 1997; Lopatka & Rachman, 1995; Radomsky et al., 2001; Shafran, 1997). Experimental examinations of responsibility in the onset and maintenance of OCD symptomatology allow for the evaluation of cognitive models of OCD which describe how beliefs of special responsibility to prevent harm can cause compulsive checking and reassurance seeking (Rachman, 2002; Salkovskis, 1985). They uniquely help to establish causality and consistency with cognitive theory. The body of experimental literature which evaluates the effects of responsibility on compulsive checking is relatively new but it has yielded findings consistent with the above-discussed theory suggesting that responsibility beliefs play a key and causal role in the development and maintenance of compulsive checking and urges to seek reassurance. Experimental research on the role responsibility is particularly rare in

the context of RS (Parrish & Radomsky, 2006, 2011). These experiments found that increased responsibility could lead to increased *urges* to seek reassurance. The present study extends these findings by demonstrating that responsibility also directly changes RS behaviour.

Experimental examinations of responsibility are known to be challenging as such beliefs are difficult to manipulate (Shafran, 1997). Badham (2012) did not report whether her responsibility manipulation (LR vs. HR) was successful and found no between-condition differences in the incidences of maternal reassurance provision and children's RS. Furthermore, we suspect that many unsuccessful protocols remain unpublished.

New Insights

The present experiment resulted in the successful manipulation of perceived responsibility and replicated previous research which examined the relationship between responsibility and *urges* to seek reassurance. Participants in the HR condition reported feeling significantly more responsible for the proper completion of the dishwashing task than those in the LR condition. This demonstrates that responsibility can be experimentally manipulated in a more ecologically valid setting. Participant-reported urges to seek reassurance were greater in the HR condition than in the LR condition. This finding replicates previous research in which experimental manipulations of responsibility resulted in corresponding changes to urges to seek reassurance (Parrish & Radomsky, 2006, 2011).

Importantly, we also found significant differences in actual RS behaviour. To the best of our knowledge, this is the first study to observe significant differences in RS *behaviour* as the result of a manipulation of responsibility. According to confederates and the objective coders, HR participants sought significantly more RS than LR participants. Although not statistically significant, HR participants reported more RS than LR participants. The discrepancy between

participant-reported RS and confederate- or coder-reported RS is interesting and has been observed in other RS research (Neal & Radomsky, 2015). When coder-reported RS was more closely assessed, it was found that HR participants sought significantly more covert, but not overt RS.

In addition, we found that HR participants had significantly longer conversations (including pauses, hesitations, and task-irrelevant small talk) with confederates during the RS opportunity than did LR participants. This suggests that HR participants utilized more than just direct questions (i.e., overt RS) or subtle statements (i.e., covert RS) to solicit safety-related information. As such, RS may encompass nonverbal acts (e.g., facial expressions, hand gestures) and paralinguistic cues (e.g., tone, prosody) which are used solicit safety-related information without being as noticeable. Nonverbal RS may represent an unstudied maintaining factor worthy of further phenomenological and experimental investigation.

There was a significant interaction between reassurance seeking and changes in perceived responsibility. Participants who sought reassurance reported a significant decrease in responsibility while those who did not seek reassurance reported an increase in their responsibility. This likely transfer of responsibility from seeker to reassurer due to RS has been posited but had not been empirically demonstrated (Kobori et al., 2012; Parrish & Radomsky, 2010). To the best of our knowledge, this is the first experiment to empirically examine this prediction of the cognitive model of responsibility in the context of RS. Temporary reductions in anxiety have been thought to reinforce compulsive checking and RS (Rachman, 2002; Salkovskis, 1985, 1999; Parrish & Radomsky, 2010). It may be that reductions in distressing perceptions of responsibility also reinforce RS and that failing to seek reassurance when given

the opportunity to do so leads to and strengthens perceptions of responsibility, potentially motivating later compulsive behaviour.

A closer look at the RS analysis for Hypothesis 2 indicates that, consistent with Neal and Radomsky (2015), perceptions of RS may differ depending on who is asked. Participants may have perceived more RS overall than either the confederate or coder. While HR participants did report more RS than LR participants, this did not reach statistical significance. This should be investigated in future research.

It could be that HR participants were motivated by interpersonal concerns (Kobori et al., 2012; Parrish & Radomsky, 2010). People who compulsively seek reassurance report strong desires to avoid RS because they know it is countertherapeutic and is very distressing and embarrassing. At the same time, they also are very distressed without reassurance, and thus go to great lengths to carefully ask for it (Kobori et al., 2012; Parrish & Radomsky, 2010). In the present study, both HR and LR participants may have been distracted from accurately encoding instances of RS by desires to prevent embarrassment and carefully ask for reassurance, which may have affected their recall for the frequency of their RS. In a previous experiment (Neal & Radomsky, 2015), when familiarity of the source of reassurance was manipulated, participants and confederates reported seeking significantly more reassurance with a familiar other than an unfamiliar other (i.e., a trained confederate participant), but objective coding revealed no difference. It could be that, because both HR and LR participants were paired with an unfamiliar partner, they may have been equally embarrassed to seek reassurance and thus self-reported similar amounts of RS when asked. The contrast between the present experiment's findings and these results may indicate that familiarity affects RS differently than responsibility. It may be

that that responsibility affects RS behaviour more than perceptions of RS; whereas familiarity may affect perceptions of RS more than it does RS behaviour.

A related explanation may be that participants were attempting to carefully ask for reassurance. Objectively-coded covert RS was greater in the HR condition than the LR condition. However, there was no between-condition differences in objectively-coded overt RS. This indicates that participants preferred to utilize subtle statements instead of direct questions to solicit reassurance. It is possible that participants felt compelled to seek safety-related information yet avoid negative social consequences (e.g., embarrassment, being perceived as bothersome, damage to their working relationship with the confederate) with an unfamiliar person. This is consistent with qualitative descriptions of RS in people with OCD (Kobori et al., 2012; Parrish & Radomsky, 2010). In one such study, themes associated with excessive RS included the reluctance to seek reassurance for its potential negative impact on the relationship they had with other people and the careful asking for reassurance to avoid detection, embarrassment, guilt, shame, and/or offending the source of reassurance (Kobori et al., 2012). Indeed, when asked why they did not seek more reassurance during post-experiment debriefing questions, some participants in the present study indicated that they felt they had to carefully solicit safety-related information from the other person in such a way that minimized the detection of RS and minimize negative repercussions (e.g., embarrassment to self, offending confederate, etc.). A small selection of participant-reported reasons for withholding from seeking more reassurance are as follows: “Only discussed what I thought was necessary and relevant”, “I did not want to seem too anxious”, “She was a stranger, I didn’t want her to feel like I didn’t trust her ability to handle a task”, “I did not want the other person to feel uncomfortable”, and “I didn’t want it to look like I was accusing her of not doing it properly”.

This preference for covert RS in the presence of unfamiliar others may explain why HR participants sought more covert RS but not overt RS and is consistent with patterns of concealment in OCD (Neal & Radomsky, 2015; Newth & Rachman, 2001). In summary then, increased responsibility may increase RS behaviour and partner-reported RS but may occur mostly through subtle means to avoid easy detection.

The present study's findings are generally consistent with previous theoretical and experimental work in this domain. In line with predictions from Rachman's cognitive model of compulsive checking (2002), and with the conceptualization of RS as a form of checking by proxy, HR participants reported greater urges to seek reassurance and actually sought more reassurance than LR participants. The data also highlight the key role that responsibility plays in OCD (Parrish & Radomsky, 2010; Salkovskis, 1985, 1999). There are a large number of OCD symptoms which are cause by manipulations of responsibility. The present experiment replicates previous research, which found that increased responsibility leads to increased compulsive checking (Arntz et al., 2007; Boschen & Vuksanovic, 2007; Bouchard et al., 1999; Ladouceur et al., 1995, Parrish & Radomsky, 2006, 2011; Reeves et al., 2010) and urges to seek reassurance (Parrish & Radomsky, 2006, 2011). Importantly, the present study extended these findings by observing that responsibility causes *actual* RS, as well, especially using a somewhat more ecologically valid scenario (e.g., dishwashing and decision-making about the cleanliness of cups from which someone may drink). It utilized not only self-report measures of RS but also behavioural measures of both overt and covert RS with an objectively-coded version of the RSC (Neal & Radomsky, 2015). Findings suggest that responsibility may have more effect on behavioural outcomes (as observed in the objectively-coded and confederate-reported RS) and less effect on self-reported RS.

Challenges faced

The present study had some challenges which limited the generalizability of our findings. The sample consisted mostly of undergraduate women recruited from a department-run pool of participants, which limits generalizability. There may have been demand characteristics such that the observed differences in responsibility between the HR and LR participants in the manipulation check reflected participants' intentions to comply with their perception of the experimenter's expectations shortly after having been assigned to their responsibility condition and/or purpose of the experimental manipulation rather than reflecting deep changes in how responsible for the proper completion of the task they really felt. That is, they may have perceived that the experiment was attempting to manipulate responsibility, and because they were in a given assigned condition, they answered in a way that was consistent with their expectations but not with their actual perceptions of how responsible they felt. Additionally, responsibility and urges to seek reassurance were measured with only single item prompts. Although these measures and methods of measurement were adapted from previous experiments of responsibility and RS (Neal & Radomsky, 2014; Parrish & Radomsky, 2006, 2011), they may have been too simplistic a method to fully encapsulate these complex constructs. We did not ask the participants to report the degree to which they felt the confederates were responsible; this somewhat limits our ability to conclude that the observed interaction between time and reassurance seeking behaviour was the result of a perceived transfer of responsibility. While all participants rated the believability of the confederate's responses as at least somewhat believable, the interaction may have been perceived as more artificial than conversations participants may have with significant others. Additionally, questions to assess the believability of other aspects of the experiment (e.g., video recording failure) were not included. That being

said, no participant gave a believability rating of 0 and only one participant gave a credibility rating of 0 and five were missing data for the credibility check and thus excluded from the analyses, which indicates that all participants were at least somewhat convinced by the dirtiness of the garbage and the believability of the confederate. Finally, a similarly-designed study could be conducted with a clinical sample to collect more conclusive evidence of the functional role of perceptions of responsibility to prevent harm in leading to and maintaining excessive RS in those suffering from OCD. Therefore, the obtained results should be interpreted with caution.

Solutions

Future investigators may wish to consider several possible adjustments when examining RS in a similar context. A video-recorded RS opportunity would allow for a more sophisticated analysis of nonverbal behaviour indicative of RS. The present experiment focused on the relationship between responsibility and RS. Responsibility conditions did not differ on various measures of symptomatology. However, it is entirely possible that some of the symptoms or maladaptive beliefs measured by the screening tools could interact with state-induced manipulations of responsibility to produce patterned differences in RS. Future research could investigate these possible interactions.

Additionally, this experiment provides further evidence in support of cognitive interventions that target responsibility in the clinic to decrease RS. An examination of the impact of a clinical intervention to reduce responsibility on subsequent RS symptomatology is warranted. Based on this and previous literature in this area, interventions could be improved and more strategically implemented to better target responsibility in the context of RS. Their impact on RS has the potential to expand the scope of existing CBT interventions for OCD and foster new research into the phenomenology, function, and treatment of excessive RS in OCD.

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Table 1.
Instructions for dishwashing procedure.

Step	Instruction
1	Fill sink water from **Tap 1** up to **Fill Line 1**.
2	Add 2 measures of **Green Cleanser** to sink.
3	Add 2 measures of **Red Cleanser** to sink.
4	Stir cleanser solution in sink gently with **Stir Spoon** for 10 seconds
5	Add 5 measures of **Blue Cleanser** to sink.
6	Wait 10 seconds.
7	Add water from **Tap 1** to **Basin** up to **Fill Line 1**.
8	Immerse one cup in cleanser solution in the sink, and then wait 10 seconds.
9	Stir cleanser solution in the sink vigorously with **Stir Spoon** for 5 seconds.
10	Wait 5 seconds.
11	Remove the cup from sink and immerse into water in **Basin**.
12	Wait for 10 seconds.
13	Remove the cup from **Basin** and place on **Drying Rack**.
14	Repeat steps 8-13 for remaining cups.

Table 2.
Participant-reported, confederate-reported, and objectively-coded reassurance seeking behaviour.

Responsibility Condition	Reporter	*M*	*SD*
LR	Participant	5.54	5.00
	Confederate	1.67	2.17
	Objective Coders	2.53	2.19
HR	Participant	7.15	6.61
	Confederate	3.72	3.26
	Objective Coders	3.96	2.69

Table 3.

Mean Number of Instances of RS and Mean Conversation Length (Seconds) with Confederate

Responsibility Condition	Type of RS	*M*	*SD*
HR	Overt RS	1.09	1.55
	Covert RS	1.35	1.13
	Conversation Length	209.16	126.86
.LR	Overt RS	.73	1.27
	Cover RS	.42	.75
	Conversation Length	101.51	81.40

Table 4.

Mean responsibility for the proper completion of the task (N = 72)

	Sought Any Reassurance	*n*	*M*	*SD*
Pre-RS Opportunity	No	26	55.34	30.00
	Yes	46	79.78	22.12
Post-RS Opportunity	No	26	65.93	25.40
	Yes	46	75.55	26.25

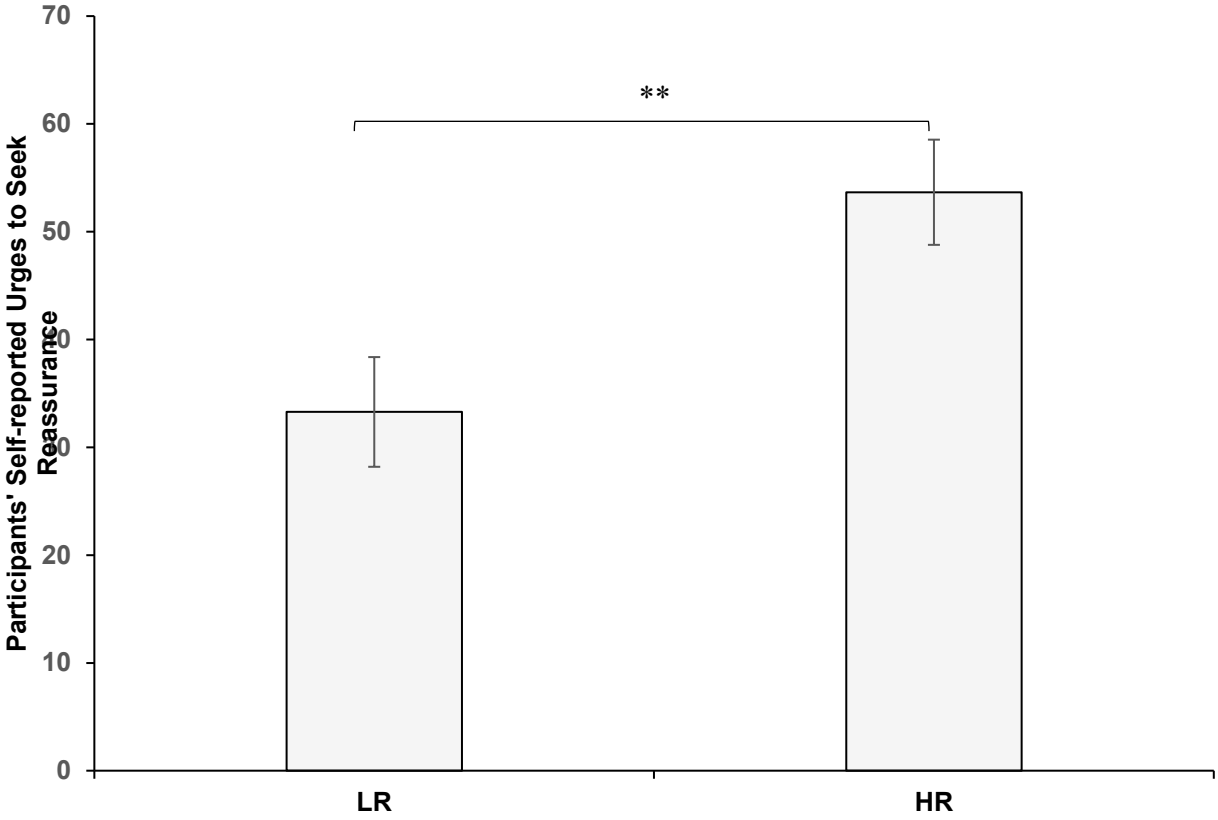

Figure 1. Mean self-reported urges to seek reassurance.
**$p < .01$

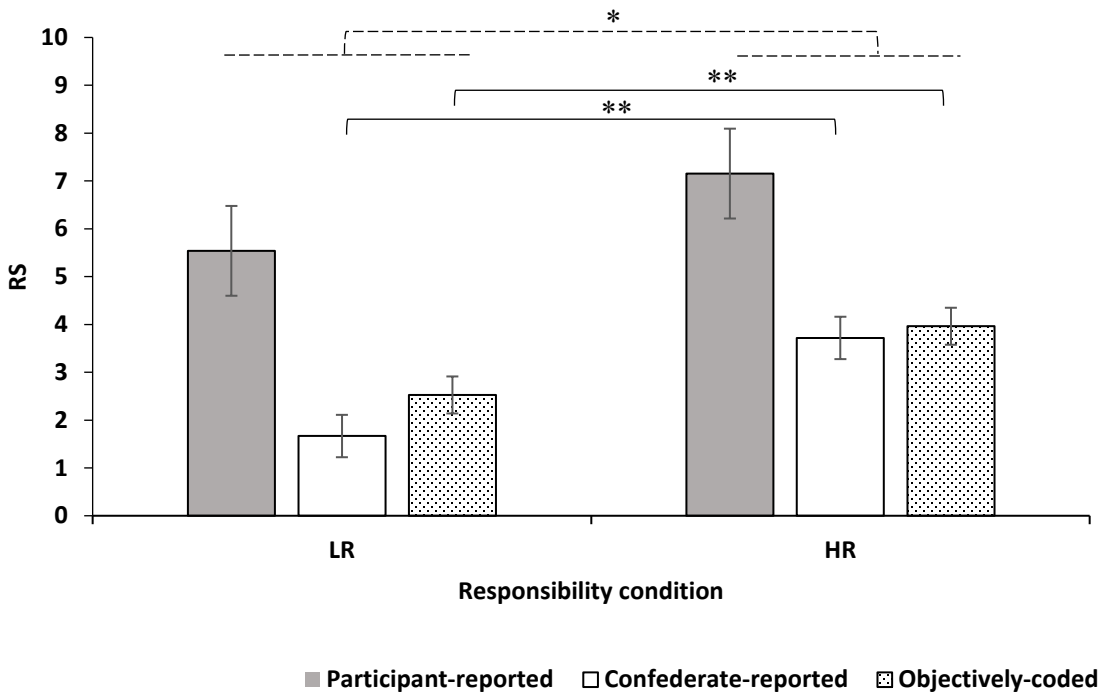

Figure 2. Mean number of reassurance seeking instances by condition.
Dotted lines indicate the multivariate effect; solid lines indicate univariate effects.
** $p < .01$, * $p < .05$

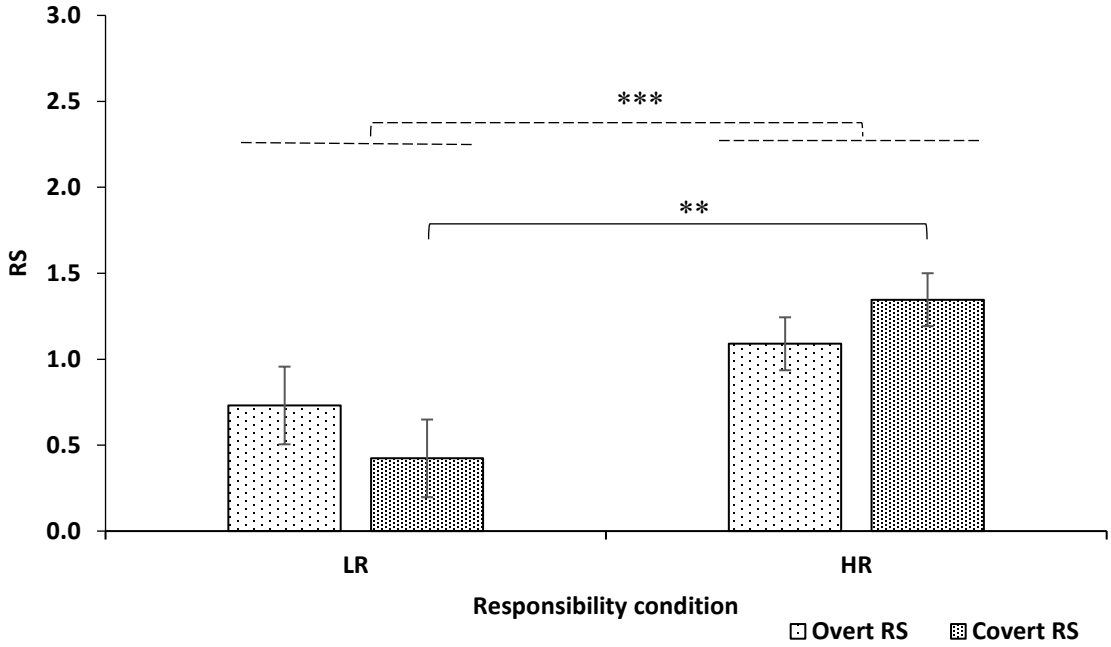

Figure 3. Mean objectively-coded overt and covert reassurance seeking by condition. Dotted lines indicate the multivariate effect; solid lines indicate the univariate effect. *** $p < .001$, ** $p < .01$.

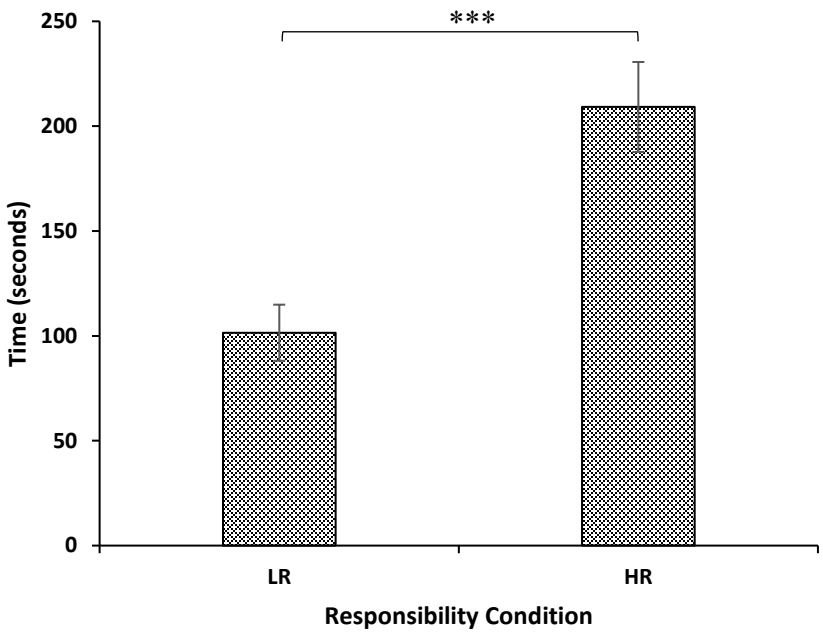

Figure 4. Mean conversation length.

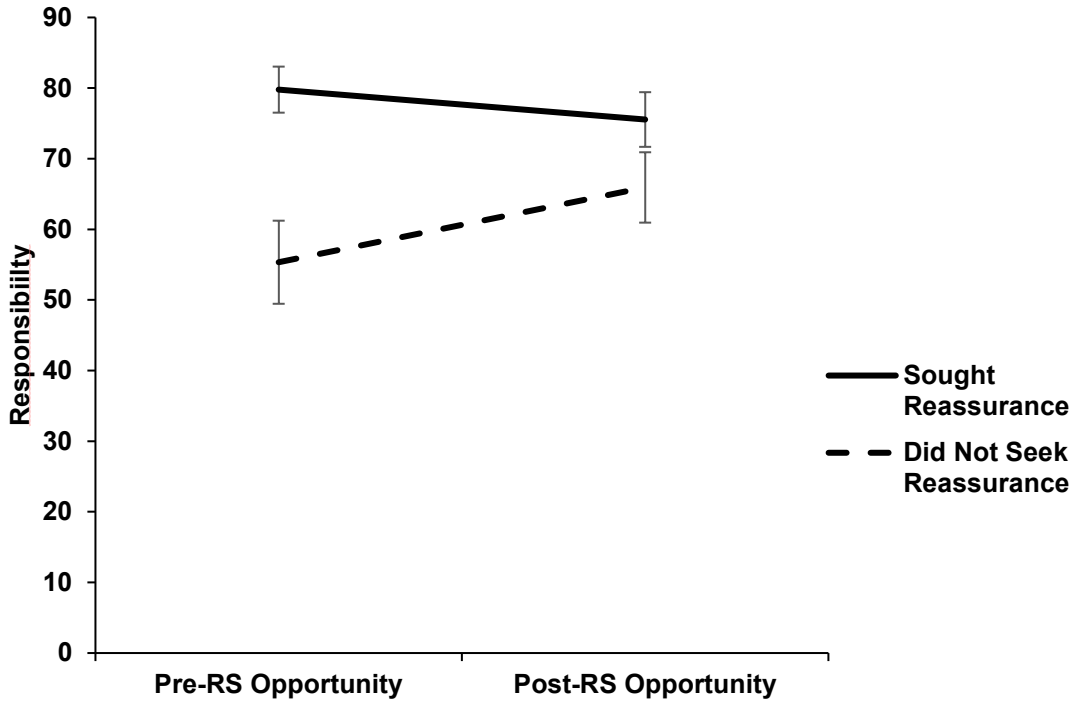

Figure 5. Perceived responsibility for the proper completion of the task prior to and following the RS opportunity. Significant time by RS interaction effect, $p = .001$.

Appendix B: Nonverbal Reassurance Seeking Interview (NVRSI)

Nonverbal Reassurance Seeking Interview (NVRSI)

Assessing the form and function of nonverbal reassurance seeking in obsessive-compulsive disorder

Participant ID#: _____ Date:_____

Section 1: Introduction (Both)

Interviewer reads to both the participant and partner: "Thank you for coming today. I would like to ask both of you some questions about some ways (**Participant)** may or may not behave when s/he are feeling anxious. Specifically, I'd like to learn how (**Participant)** might cope with these feelings."

Interviewer reads to both the participant and partner: "First, I'd like to see how you normally interact with each other. Then, I'd like to briefly review what "reassurance seeking" is. I'll then ask you to show me how you both interact when (**Participant**) seeks reassurance from (**Partner)**. Afterward, I'll ask each of you about when, why, and how (**Participant)** interacts when s/he is anxious. You may have different perspectives on these behaviours. In fact, research has shown that people who seek reassurance and their significant others may experience or perceive these behaviours very differently. You may disagree with each other about what you see. This is normal. In fact, your different perspectives might be very helpful in providing insight into these understudied behaviours."

Section 2: Non-Anxiety Conversation (Both)

Interviewer reads to both the participant and partner: "I will start the interview by asking you to talk to each other about something that makes both of you feel good or feel happy. I'm asking you to discuss a topic that makes you both feel good. This could be something good that recently happened, a person you both like, or something like that. I'll give you a few minutes. While you're having your conversation, I'll be making some observations while you do so."
Interviewer instructions: Set timer to 3 minutes. Note instances of nonverbal prompts.

Table 2: Section 2 Non-Anxiety NVRS Behaviours

Nonverbal Behaviours	Observed	
	Y	N
Proximity		
a. Move closer to the potential reassurer		
Head		
b. Shake/nod head		
Face		
c. Direct distressed/fearful facial expressions toward the person		
d. Wrinkled forehead indicative of fear/uncertainty		
e. Make direct eye contact with the potential reassurer		

f. Avoid direct eye contact with the potential reassurer
g. Raise eye brows
h. Fully widen eyes
i. Draw lips back and down, expose teeth in "unfelt smile"
j. Make 'happy-looking' glances at the person
k. Closely examine the way that people react when you do things that worry you (ReSQ, CORSI)

Hygiene

l. Abruptly change appearance/hygiene

Shoulders

m. Shrug your shoulders
n. Orient shoulders to square potential reassurer

Posture/Torso

o. Over-correct or overly straight/rigid posture
p. Lean towards the potential reassurer

Hips

q. Orient hips to square potential reassurer

Hands

r. Touch protentional reassurer with hand(s)
s. Extend upward, open palm
t. Palms up, signaling "I don't know"
u. Wring your hands
v. Fidget with your hands
w. Fidget with objects in your hands
x. Fidget with your hair

In/Action

y. Abruptly stop all movement
z. Wait and examine whether something bad happens to someone else who does something that worries you (e.g., eat off a plate, etc.) before you do it (ReSQ)
aa. Do a small portion of something that worries you, and examine the reactions of others to see if anyone reacts negatively, and if no one does then you are reassurance it is safe to proceed (CORSI)

Legs

bb. Fidget with legs

Other NVRS

cc. Other (please explain)

Paraverbal Cues	Observed Y	N
dd. Abrupt change in tone/pitch (i.e., Inflect your tone upwards like a question or drastically down to cue attention)		
ee. Noticeably speed up or slow down your rate of speech		
ff. Pause to allow for reassurance		
gg. Suddenly speak louder or quieter than usual		
hh. Disjoint or break up fluid speech		
ii. Make more paralinguistic sounds (e.g., uh, umm, etc.)		
Other Paralinguistic Cues		
jj. **Other (please explain)**		

Section 3: Describing RS (Both)

Interviewer reads to participant and partner: "In the study today, I will be asking you about excessive reassurance seeking. It is important that you understand what I mean by this. Reassurance seeking is the repeated requesting of safety-related after having already received it. Research has shown us that people sometimes repeatedly ask for reassurance about:

- "threats to relationships ("Do you still love me?"; "Are we OK?" **[MDD]**)
- " things about which people persistently worry ("Is everything OK?" **[GAD]**)
- "perceived threat from a feared object/scenario ("Are you sure there are no spiders?" **[specific phobia]**)
- "the condition of one's body or symptoms ("Are you sure this mole isn't growing?" **[illness anxiety]**)
- "the shape/size of one one's body ("Are you sure I'm not getting bigger?") **[BDD)**]
- "general threats ("Are you sure I locked the door properly?" **[OCD]**)

1. **Interviewer reads to participant:** "Do you have any questions about what I am referring to when I say, 'reassurance seeking'?"

☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*

Interviewer instructions: YES ➔ **Explanation** *and examples then proceed to next question. NO* ➔ *Proceed to next question.*

❖ **Explanation**: **Interviewer reads to participant/partner**: When I say, "excessive reassurance seeking" I mean repeatedly prompting someone for reassurance about a concern you have even after having received assurance. Each time, you may know what your partner going to say, but you ask for reassurance anyway. You may feel briefly less anxious each time you are reassured. Reassurance seeking is the repeated prompting for that already-known information."

2. **Interviewer reads to partner:** "Do you have any questions about what I am referring to when I say, 'reassurance seeking'?"

☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*

Interviewer instructions: If yes, then answer any questions using variations of the definitions/examples provided above. If not, then proceed to Section 3.

- **Explanation**: **Interviewer reads to participant/partner**: When I say, "excessive reassurance seeking" I mean repeatedly prompting someone to let you know that the thing(s) you fear might happen will not, that everything is OK. For example, let's say you were anxious to make sure you had everything before leaving on a long trip. You may repeatedly ask a loved one if you have your passports and tickets several times on the way to the airport. Each time, you know your partner is likely to say that everything is OK, but you nonetheless you ask for reassurance anyway. You may feel briefly less anxious each time you are reassured. Reassurance seeking is the repeated prompting for that already-known information."

Section 4: Comprehension Test- RS (Both)

Interviewer reads to participant and partner: "To ensure that I have been entirely clear in defining reassurance seeking for you, I would like you to tell me whether the following examples would constitute reassurance seeking, and if not, why not."

1. **Interviewer reads to the participant**: "You make a habit of asking your boss whether you are doing OK at work, even though your boss tells you each time that you are doing fine. Is this reassurance seeking?"

☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*

Interviewer instructions: *If Yes* ➔ *a.* **Correct answer**
If No ➔ *b.* **Incorrect answer**

a. **Correct answer***:* **Yes (Interviewer reads to the participant and partner)** "Very good. Let's move onto the next item."

Interviewer Instructions: Proceed to 2.

b. **Incorrect answer***:* **No (Interviewer reads to both the participant and partner)**: "In this case, we would consider this an example of RS because you continue asking whether your work is OK even after you have already received assurance. So, it would be reassurance seeking.

Interviewer Instructions: *Answer any questions until participant and/or partner understand(s) why* a) *represents RS. Then proceed to 2.*

2. **Interviewer reads to the partner**: "Let's try another example. You notice a large mole on your arm after a day at the beach and go to the doctor to ask if it might be cancerous. She informs you that the mole is harmless, and you are satisfied with this response, so you don't worry about it anymore. Is this reassurance seeking?"

☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*

Interviewer instructions: *If Yes* ➔ *b.* **Incorrect answer**
If No ➔ *a.* **Correct answer**

a. **Correct answer***:* **No (Interviewer reads to both the participant and partner)**: "Very good. Let's continue."

Interviewer Instructions: Proceed to Section 5.

b. **Incorrect answer**: **Yes (Interviewer reads to the participant and partner**): "In this case, because you only asked for assurance once, and did not seek additional ***re***assurance, we would not consider it reassurance seeking. Do you have any questions about that?"

Interviewer Instructions: Answer any questions until participant and/or partner understands why b. *does not represent RS. Proceed to Section 5.* **(Interviewer reads to the participant and partner**): "Great! Let's continue."

Section 5: Assessing the Presence of any Overt RS, Covert RS, and Nonverbal RS (Both)
Interviewer reads to the participant: "Now I would like to ask you some questions about your reassurance seeking. The questions in this section are focused specifically on **re**assurance seeking."

1. **Interviewer reads to participant**: "In the last month, have you sought reassurance ***in any way*** from someone?"

☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*
Interviewer instructions: If Yes ➔ Proceed to the next question
If No ➔ Probe

Probe: **Interviewer reads to participant:** "Have you sought reassurance regarding the something that made you anxious? Have you asked someone to reassure you that they care about you or that you are not disappointing them? Have you asked someone to reassure you that you have not forgotten something important? Have you asked someone whether things are properly cleaned or arranged? Have you made ambiguous or critical comments about yourself or what you do and waited for someone to reassure you? Have you made comments about your relationship and waited for your partner to disconfirm them? Have you mentioned an item you think you forgot or task you thought you might not have done properly and anticipated a reassuring response? Have you made small talk, gestures, body posture, gestures, body posture, glances, facial expressions, touch, or used the tone, volume, or flow of your speech to prompt someone to reassure you about your concerns? Have you sought reassurance **in any way** during the last month?"

☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*
Interviewer instructions: Proceed to the next question

2. **Interviewer reads to partner**: "Would you agree that s/he did (not) seek reassurance in some way?"

☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*
Interviewer instructions: If Yes ➔ Proceed to the next question
If No ➔ **Interviewer reads to partner**: "Why not?"

3. **Interviewer reads to participant**: "In the last month, have you sought reassurance by ***directly asking*** someone?"

☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*
Interviewer instructions: If Yes ➔ Proceed to the next question
If No ➔ Probe

- *Probe*: **Interviewer reads to participant:** "Have you sought reassurance about something that made you anxious? Have you asked someone to reassure you that they care about you or that you are not disappointing them? Have you asked someone to reassure you that you have not forgotten something important? Have you asked someone whether things are properly cleaned or arranged? Have you sought reassurance without words by directly asking **at all** during the last month?"

☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*
Interviewer Instructions: Proceed to next question.

4. **Interviewer reads to partner**: "Would you agree that s/he did (not) seek reassurance by directly asking someone?"
   ☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*
   Interviewer instructions: *If Yes* ➔ *Proceed to the next question*
   If No ➔ **Interviewer reads to partner**: "Why not?

5. **Interviewer reads to participant**: "In the last month, have you sought reassurance by making ***subtle statements or comments*** about a concern meant to be confirmed or disconfirmed by someone else?"
   ☐ **YES** ☐ **NO** *Interviewer instructions: Check the response*
   Interviewer instructions: *If Yes* ➔ *Proceed to the next question*
   If No ➔ *Probe*
   - *Probe*: **Interviewer reads to participant:** "Have you made an ambiguous or critical comment about something that made you anxious or uncertain in the hope that someone would reassure you? Have you made comments about your relationship and waited for your partner to disconfirm them? Have you mentioned an item you think you forgot and anticipated a reassuring response? Have you sought reassurance with subtle statements about a concern which you said in the hope that someone would confirm or disconfirm them **at all** during the last month?"
     ☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*

6. **Interviewer reads to partner:** "Would you agree that s/he did (not) seek reassurance by making subtle comments or statements meant to be confirmed or disconfirmed by someone else?"
   ☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*
   Interviewer instructions: *If Yes* ➔ *Proceed to the next question*
   If No ➔ **Interviewer reads to partner**: "Why not?"

7. **Interviewer reads to participant**: "In the last month, have you sought reassurance with ***body language, facial expressions, gestures, or the way you spoke*** to **(partner)**?
   ☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*
   Interviewer Instructions: *If Yes* ➔ *Proceed to the next question*
   If No ➔ *Probe*
   - *Probe*: **Interviewer reads to participant:** Have you made small talk to prolong contact with someone you find reassuring, or used the tone of your voice to cue someone to reassure you? Have you used gestures signifying confusion or uncertainty, body posture indicative of concern, concerned or falsely-happy glances, facial expressions of unfelt smiles or distress, touches to cue comfort, or spoke with an upward inflected tone to signal uncertainty, gotten louder as you spoke, spoke unusually faster or slower than normal, spoke with broken pauses or hesitations to communicate that you wanted someone to reassure you about your concerns? Are you sure you have not sought reassurance without words **at all** during the last month?"

☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*

8. **Interviewer reads to partner:** "Would you agree that s/he did (not) seek reassurance with body language, gestures, or the way s/he spoke?"
   ☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*
   Interviewer instructions: *If Yes* ➔ *Proceed to the next question*
   If No ➔ **Interviewer reads to partner**: "Why not?"

Possible Outcomes

AGREE RS**: Interviewer Instructions: If the participant and partner **AGREE** in Section 4 Questions 1-8 that **RS occurs ➔ **Interviewer reads to participant:** "Great! Let's move on to the next section."

AGREE NO RS**: Interviewer Instructions: If participant and partner **AGREE** in Section 4 Questions 1-8 that **NO RS occurs ➔ **Interviewer reads to both:** "It sounds like you are both sure that **(Participant)** does not seek reassurance. In that case, we can finish the interview here. Thank you very much for your time today. The study is over."

DISAGREE RS**: Interviewer Instructions: If participant and partner **DISAGREE** in Section 1 Questions 1-8 **regarding whether RS occurs ➔ **Interviewer reads to partner:** "It looks like there are two perspectives here. As I said at the outset of the interview, this is perfectly normal. Your two different perspectives might be very helpful in providing insights into this behaviour about which we still have so much to learn. Let's move on to the next section."

Section 6: Preparation for NV/RS Opportunity (Both)

Interviewer reads to the participant: "I would like you to take a minute to think about something that concerns you, make you feel uncertain, something about which you would like to seek reassurance."

Interviewer Instructions: Pause to allow participant to reflect.

1. **Interviewer reads to the participant**: "Do you have something in mind?"
   ☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*
   If YES ➔ Continue to next question
   If NO ➔ Probe
   - **Probe**: **Interviewer reads to participant:** "You mentioned that you have sought reassurance of some kind in the last month. Is there something you would like to seek reassurance about? This could be something related to unwanted thoughts, images, or urges or because of the way you feel. Perhaps you are uncertain about someone's health and are worried they may be sick. Are you concerned about being contaminated or being unable to check something important to you right now? Perhaps you feel responsible to prevent harm to yourself or others. Do you have any doubts about yourself or whether you did something properly? Do you have any concerns that others might reject you or maybe you have doubted your worth as a person because of your appearance, personality, or because you felt 'abnormal' in some way? Are you concerned about losing control of yourself? Are you bothered by not knowing whether something is 'just so', the way it should be? Are you concerned about having morally wrong, blasphemous, disgusting, or anxiety-

provoking thoughts, images, or urges? Are you concerned that you may be a bad person, going crazy, or possibly dangerous to others? Do you have something in mind?

If YES ➔ Continue to next question
If NO ➔ Probe

2. **Interviewer reads to the participant**: "***Before*** you tell me about it, ***close your eyes***, remember the specific details of this concern: where you are, what you are doing, who you are with, what you are thinking and feeling, and the events that lead up to your urges to seek reassurance when it is most salient.

Interviewer Instructions: Allow participant to recite details ➔ Probe for details listed above not specified by the participant. ***Ensure the participant is describing reassurance seeking.***

a. **Interviewer reads to the participant**: "What is the basic nature of this concern? What are you anxious about?"

b. **Interviewer reads to the participant**: "**Where** did this concern/situation occur?"

c. **Interviewer reads to the participant**: "**With whom** did this concern/situation occur?"

d. **Interviewer reads to the participant:** "What were you **thinking**? What were you **feeling**?"

e. **Interviewer reads to the participant**: "What **events** led up to this concern?"

f. **Interviewer reads to the participant**: "OK, so if I understood you correctly… (*general summary*)"

Interviewer Instructions: No leadings statements (i.e., only reflect exact words).
Interviewer instructions: Give participant handout: Not/None at all 0 ---------- 100 Extremely

3. "On a scale of 0 to 100, where 0 represents *Not at all* and 100 represents *Extremely*, how **anxious** do you feel when you think about this topic?"
Interviewer instructions: Indicate response here _____

4. "On the same scale, how strong is your **urge to seek reassurance** about this topic?"
Interviewer instructions: Indicate response here _____

5. "On the same scale, how strong is your **urge to resist seeking reassurance** about this topic?"
Interviewer instructions: Indicate response here _____

6. "On the same, how **responsible** do you feel potentially harmful outcome regarding this topic?"
Interviewer instructions: Indicate response here _____

7. "On the same scale, how **responsible** do you feel **(Partner)** is for the potentially harmful outcome regarding this topic?"

Interviewer instructions: Indicate response here _____

Interviewer reads to the participant: "Great. I'd like you to keep this episode in mind as we go through the next few sections."

Section 7: NV/RS Opportunity (Both)

Interviewer reads to the participant: "I would like to give you an opportunity to ask for reassurance about this topic from **(Partner)** now. Take as long as you would like."

Interviewer reads to the partner: "Please respond to your partner's reassurance seeking as you normally do."

Interviewer reads to the participant: "You may begin."

Interviewer instructions: Start timer. Note all instances of NVRS RS opportunity

Interviewer Instructions: Wait until RS is completely done. This may take some time. Be patient.

Interviewer reads to participant: "It looks like you're all done. Thank you for doing that."

Nonverbal Behaviour	Observed Yes	Observed No
Proximity		
a. Move closer to the potential reassurer		
Head		
b. Shake/nod head		
Face		
c. Direct distressed/fearful facial expressions toward the person		
d. Wrinkled forehead indicative of fear/uncertainty		
e. Make direct eye contact with the potential reassurer		
f. Avoid direct eye contact with the potential reassurer		
g. Raise eye brows		
h. Fully widen eyes		
i. Draw lips back and down, expose teeth in "unfelt smile"		
j. Make 'happy-looking' glances at the person		
k. Closely examine the way that people react when you do things that worry you (ReSQ, CORSI)		
Hygiene		
l. Abruptly change appearance/hygiene		
Shoulders		
m. Shrug your shoulders		
n. Orient shoulders to square potential reassurer		
Posture/Torso		
o. Over-correct or overly straight/rigid posture		
p. Lean towards the potential reassurer		
Hips		

q. Orient hips to square potential reassurer

Hands

r. Touch protentional reassurer with hand(s)
s. Extend upward, open palm
t. Palms up, signaling "I don't know"
u. Wring your hands
v. Fidget with your hands
w. Fidget with objects in your hands
x. Fidget with your hair

In/Action

y. Abruptly stop all movement
z. Wait and examine whether something bad happens to someone else who does something that worries you (e.g., eat off a plate, etc.) before you do it (ReSQ)
aa. Do a small portion of something that worries you, and examine the reactions of others to see if anyone reacts negatively, and if no one does then you are reassurance it is safe to proceed (CORSI)

Legs

bb. Fidget with legs

Other NVRS

cc. Other (please explain)

Paralinguistic Cues	**Observed**	
	Yes	**No**
dd. Abrupt change in tone/pitch (i.e., Inflect your tone upwards like a question or drastically down to cue attention)		
ee. Noticeably speed up or slow down your rate of speech		
ff. Pause to allow for reassurance		
gg. Suddenly speak louder or quieter than usual		
hh. Disjoint or break up fluid speech		
ii. Make more paralinguistic sounds (e.g., uh, umm, etc.)		
Other Paralinguistic Cues		
jj. Other (please explain		

Interviewer reads to both: "Great! Thank you for doing that. In a minute, I will to ask one of you to complete some questionnaires while I interview the other. I have a randomized list here which will tell me who I will interview first."

If **(Participant)** *first* ➔ **Interviewer reads to the participant**: OK. **(Participant)**, I will interview you first. Could you please wait here while I get **(Partner)** started on the questionnaires? Thank you. **(Partner)**, could you please come with me?
Interviewer Instructions: Set up the **(Partner)** on the questionnaires. ➔ **Section 9** with **(Participant)**.

If **(Partner)** *first* ➔ **Interviewer reads to the partner**: OK. **(Partner),** I will interview you first. Could you please wait here while I get **(Participant)** started on the questionnaires? Thank you. **(Participant),** could you please come with me?
Interviewer Instructions: Set up the **(Participant)** on the questionnaires. ➔ **Section 16** with **(Partner)**.

Section 8: Self-reported Emotions/Behaviour after RS (Participant)

Interviewer reads to participant: "I would like to ask you some questions about your experience with the conversation you just had."
Interviewer instructions: Give participant handout: Not/None at all 0 ---------- 100 Extremely

1. **Interviewer reads to participant**: "On a scale of 0 to 100, where 0 represents *not at all* and 100 represents *Extremely*, how **anxious** do you feel when you think about **[the topic of RS]** now?"

Interviewer instructions: Indicate response here _____

2. **Interviewer reads to participant**: "On the same scale, how strong is your **urge to seek reassurance** about this topic now?

Interviewer instructions: Indicate response here _____

3. **Interviewer reads to participant:** "On the same scale, how strong is your **urge to resist** seeking reassurance about this topic now?"

Interviewer instructions: Indicate response here _____

4. "On a scale from 0 to 100, where 0 represents *Not at all* and 100 represents *Extremely*, how **responsible** do you feel for the potentially harmful outcome regarding this topic now?"

Interviewer instructions: Indicate response here _____

5. "On a scale from 0 to 100, where 0 represents *Not at all* and 100 represents *Extremely*, how **responsible** do you feel **(Partner)** is for the potentially harmful outcome regarding this topic now?"

Interviewer instructions: Indicate response here _____

Section 9: NVRS Strategies (Participant)

Interviewer instructions: Participants to refer to handout with list of behaviours and frequency scale.
Interviewer reads to participant: "Now I would like to ask you some more questions about the conversation you just had with **(Partner)**."

1. **[NVRS Opp] Interviewer reads to the participant:** "Thinking about the conversation you just had, which of the following nonverbal and paraverbal cues did you utilize to seek reassurance from **(Partner)**?"

Interviewer instructions: From a. *to* rr., *state each possible NVRS behaviour and indicate with a checkmark whether* **participant** *recalled such behaviour. the Indicate response by placing a mark in the appropriate row under the NVRS Opp column.*

2. **[Frequency] Interviewer reads to participant**: "Using the scale in front of you as a guide, how often do you typically use each of the following nonverbal or paraverbal cues to seek reassurance from someone?"

Interviewer instructions: For each, place the frequency indicated by the **(Participant)** *on the following scale into the above table:*

0 = Not at all, never
1 = Very rarely, once or twice per month
2 = Rarely, once or twice per week
3 = Occasionally, once per day
4 = Very frequently, two to five times per day
5 = All the time, more than five times per day

3. **[Primary] Interviewer reads to participant**: "Of the behaviours you mentioned here, which is your ***primary*** method to seek reassurance?"

Interviewer Instructions: Indicate this response by placing a mark in the appropriate row under the Primary column.

4. **[Successful] Interviewer reads to participant**: "Of the methods you discussed, which is the ***most successful*** in soliciting reassurance from others?"

Interviewer Instructions: Indicate this response by placing a mark in the appropriate row under the Successful column.

Table 3: Section 9 NVRS Behaviours- Participant

Nonverbal Behaviour	**1. NVRS Opp**		**2. Frequency**						**3. Primary**	**4. Successful**
	Yes	**No**	**0**	**1**	**2**	**3**	**4**	**5**		
Proximity										
a. Move closer to the potential reassurer										
Head										
b. Shake/nod head										
Face										
c. Direct distressed/fearful facial expressions toward the person										
d. Wrinkled forehead indicative of fear/uncertainty										
e. Make direct eye contact with the potential reassurer										
f. Avoid direct eye contact with the potential reassurer										
g. Raise eye brows										
h. Fully widen eyes										
i. Draw lips back and down, expose teeth in "unfelt smile"										
j. Make 'happy-looking' glances at the person										

k. Closely examine the way that people react when you do things that worry you (ReSQ, CORSI)									
Hygiene									
l. Abruptly change appearance/hygiene									
Shoulders									
m. Shrug your shoulders									
n. Orient shoulders to square potential reassurer									
Posture/Torso									
o. Over-correct or overly straight/rigid posture									
p. Lean towards the potential reassurer									
Hips									
q. Orient hips to square potential reassurer									
Hands									
r. Touch protentional reassurer with hand(s)									
s. Extend upward, open palm									
t. Palms up, signaling “I don’t know”									
u. Wring your hands									
v. Fidget with your hands									
w. Fidget with objects in your hands									
x. Fidget with your hair									
In/Action									
y. Abruptly Stop all movement									
z. Wait and examine whether something bad happens to someone else who does something that worries you (e.g., eat off a plate, etc.) before you do it (ReSQ)									
aa. Do a small portion of something that worries you, and examine the reactions of others to see if anyone reacts negatively, and if no one does then you are reassurance it is safe to proceed (CORSI)									
Legs									
bb. Fidget with legs									
Other NVRS									
cc. Other (please explain)									
Paralinguistic Cues	**1. NVRS Opp**		**2. Frequency**						**3. Primary**	**4. Successful**
	Yes	**No**	**0**	**1**	**2**	**3**	**4**	**5**		

dd. Abrupt change in tone/pitch (i.e., Inflect your tone upwards like a question or drastically down to cue attention)						
ee. Noticeably speed up or slow down your rate of speech						
ff. Pause to allow for reassurance						
gg. Suddenly speak louder or quieter than usual						
hh. Disjoint or break up fluid speech						
ii. Make more paralinguistic sounds (e.g., uh, umm, etc.)						
Other Paralinguistic Cues						
jj. Other (please explain)						

List of Behaviours

a. Move closer to the potential reassurer
b. Shake/nod head
c. Direct distressed/fearful facial expressions toward the person
d. Wrinkled forehead indicative of fear/uncertainty
e. Make direct eye contact with the potential reassurer
f. Avoid direct eye contact with the potential reassurer
g. Raise eye brows
h. Fully widen eyes
i. Draw lips back and down, expose teeth in "unfelt smile"
j. Make 'happy-looking' glances at the person
k. Closely examine the way that people react when you do things that worry you (ReSQ, CORSI)
l. Abruptly change appearance/hygiene
m. Shrug your shoulders
n. Orient shoulders to square potential reassurer
o. Over-correct or overly straight/rigid posture
p. Lean towards the potential reassurer
q. Orient hips to square potential reassurer
r. Touch protentional reassurer with hand(s)
s. Extend upward, open palm
t. Palms up, signaling "I don't know"
u. Wring your hands
v. Fidget with your hands
w. Fidget with objects in your hands
x. Fidget with your hair
y. Abruptly Stop all movement
z. Wait and examine whether something bad happens to someone else who does something that worries you (e.g., eat off a plate, etc.) before you do it (ReSQ)
aa. Do a small portion of something that worries you, and examine the reactions of others to see if anyone reacts negatively, and if no one does then you are reassurance it is safe to proceed (CORSI)
bb. Fidget with legs
hh. Abrupt change in tone/pitch (i.e., Inflect your tone upwards like a question or drastically down to cue attention)
ii. Noticeably speed up or slow down your rate of speech
jj. Pause to allow for reassurance
kk. Suddenly speak louder or quieter than usual
ll. Disjoint or break up fluid speech
mm. Make more paralinguistic sounds (e.g., uh, umm, etc.)

Frequency of Behaviours

0	1	2	3	4	5
Not at all, never	*Very rarely, once or twice per month*	*Rarely, once or twice per week*	*Occasionally, once per day*	*Very frequently, two to five times per day*	*All the time, more than five times per day*

Section 10: NVRS Onset/Triggers (Participant)

Interviewer reads to participant: "Now, I would like to ask you some questions about the **reasons** you seek reassurance with hand gestures, facial expressions, body language, deliberate pauses, or with the way you speak."

1. **[Participant] Interviewer reads to the participant**: "What usually prompts you to seek reassurance without words in the first place? Please say yes or no to the following."

Interviewer instructions: From a. *to t.*, *state each possible NVRS behaviour and indicate with a checkmark whether* **[Participant]** *recalled such behaviour under Participant column.*
Interviewer instructions: If participant is unsure ➔ Probe

- ***Probe*** ➔ **Interviewer reads to the partner**: "What things make you seek reassurance in this way? What concerns most prompt a desire to use your body language, gestures, facial expressions, or sound or flow of your speech to solicit reassurance from someone? What changes your thoughts and feelings typically occurs just before you feel the urge to seek reassurance in these specifically nonverbal ways? What changes in the environment or the situation? What fears, worries, surprises, or concerns make you feel like you need to seek reassurance in these ways? Are you sure there is nothing that prompts you to seek reassurance through body language and/or verbal cues?"

2. **[Other] Interviewer reads to the participant**: "Are there any other situations, thoughts, or feelings that typically trigger your urges to seek reassurance through **actions** or with the **way** your talk to someone else?"

☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*

Interviewer Instructions: Place additional causes in the "Other" rows.
Interviewer Instructions: *If* **YES** ➔ *Place additional causes in "Other" rows. Proceed to next question*
If **NO** ➔ *Attempt to summarize again until* **Participant** *confirms summary.*

3. **[Primary] Interviewer reads to the Participant**: "Of the reasons you have indicated, which would you say is the **primary reason** you seek reassurance with nonverbal behaviour and/or paralinguistic cues?

Interviewer Instructions: Place checkmark under Primary.

4. **Interviewer reads to the Participant**: "OK. So, if I understand correctly **(Insert summarized responses)**. Is this correct?"

☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*

Table 4: Section 10 Possible Triggers of NVRS- Participant

Possible Triggers of NVRS	Participant Y	Participant N	Primary
a. Unwanted thoughts/images/obsessions			
b. Negative mood (anxious) ➔ Specify:_____			
c. Negative mood (depressive) ➔ Specify:			
d. Doubt re: removal/reduction of perceived general threat (safety/harm/contamination)			
e. Inability to check			
f. Perceived responsibility for preventing harm			
g. Doubt re: personal performance/competence			
h. Perceived threat of loss/rejection/abandonment			
i. Doubt re: personal worth (e.g., likeability, appearance, "normality")			
j. Perceived loss of control			
k. Doubt re: memory			
l. Doubt re: perception			
m. Physical environment/location			
n. Most effective			
o. Other possible causes of NVRS			
p. Other: (explain)			

Section 11: Consequences of NVRS (Participant)

Interviewer reads to participant: "Now I would like to ask about what happens after you seeking reassurance with hand gestures, facial expressions, body language, deliberate pauses, or with the way your speak."

1. **[Participant] Interviewer reads to participant:** "What happens after you seek reassurance with hand gestures, facial expressions, body language, deliberate pauses, or with the way your speak? Please say yes or no to the following."
   - ❖ ***If no behaviour is identified, then probe*** ➔ **Interviewer reads to the participant:** "When you are looking for reassurance from your partner, did you use other strategies that did not involve asking directly, mentioning the subject, or speak at all? Did you use any body language, gestures, facial expressions, or actions, or did you change the rate, tone, fluidity of your speech to get reassurance from someone else?"

   ☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*

Interviewer instructions: *If Yes ➔ Ask participant to indicate which behaviour*
If No ➔ Proceed to 2.

2. **[Most Common] Interviewer reads to the participant:** Of these outcomes, which is the most common?

Table 5: Section 11 Possible Consequences of NVRS

Consequences	1. Participant	2. Most Common
a. Unwanted thoughts/images/obsession go away		

b. Reduced anxiety
c. Improved mood
d. Reduced perception of severity of threat
e. Reduced perception of the likelihood of threat
f. Felt like you checked by confirming with significant other
g. Reduced uncertainty about presence of threat
h. Responsibility transferred from you to significant others
i. Significant others provide information (e.g., safety-related)
j. Significant others provide support (i.e., encouragement, comfort)
k. Reaction from significant other less negative than response to VRS
l. Reduced doubt about personal performance/competence
m. Alleviated fear of rejection
n. Alleviated perception of personal inadequacy/unlikability/etc.
o. Improved sense of control
p. Improved perception of memory
Other possible consequences of NVRS
q. Other: (explain)

Section 12: NVRS Preference (Participant)

Interviewer reads to participant: "I would like to explore why you seek reassurance with body language, facial expressions, gestures, or based on the way you say what you say **instead of or in addition to** asking directly for reassurance or subtly mentioning your concern."

1. **(Participant) Interviewer reads to participant:** "Please indicate which of the following are reasons you seek reassurance with behaviour and/or the way you talk."

Interviewer instructions: From a. *to o.*, *state each possible NVRS preference and indicate with a checkmark whether* **(participant)** *indicated such preference. the Indicate response by placing a mark in the appropriate row under the Participant column.*
Interviewer instructions: If reason not listed ➔ place in one of the "Other" rows.

2. **(Primary) Interviewer reads to participant:** "Which of the above reasons would you say is your ***primary*** reason for seeking reassurance without questions or subtle statements?"

Interviewer Instructions: Place a check mark in the appropriate box under the 'Primary' column.

Table 6: Section 12 Possible Reasons to Prefer NVRS- Participant

Possible Reasons to Prefer NVRS	Participant	Primary
a. Avoid offending/irritating/annoying the other person with verbal RS		
b. Avoid being embarrassed/humiliated		
c. Avoid expressing self with an unfamiliar person		
d. Avoid expressing anxiety to unfamiliar person		
e. Avoid expressing uncertainty to unfamiliar to person		
f. Avoid being perceived as an anxious person		
g. Avoid being perceived as paranoid		
h. More effective than verbal RS alone		
i. Less effort to seek reassurance without words		

j. Selectively elicits reassurance from a trusted few

Other Possible Reasons to Prefer NVRS

k. Other (explain):

Section 13: NVRS Definition (Participant)

1. **Interviewer reads to participant**: "Now that we have talked about it in some detail, I would like your input. Based on your experience, what is nonverbal RS?"

Section 14: Reflection (Participant)

1. **Interviewer reads to participant:** "Finally, is there anything important related to reassurance seeking that we have not yet discussed? Is there anything important about nonverbal or paralinguistic reassurance seeking that we have not yet discussed, such as what makes you start, how you seek reassurance without words or with how you speak, or what makes you prefer nonverbal reassurance seeking?"

Section 15: Switching Interviewees

Interviewer reads to participant: "Great. Thank you for providing me with all that great information. Those were all the questions I had for you. Now that we are done, you can begin the questionnaires. I'll get you started on them and then ask (Partner) similar questions about reassurance seeking. I'll come get you after we're done."

Interviewer Instructions: Set up participant with questionnaires. Bring in partner to begin interview.

Section 16: NVRS Strategies (Partner)

Interviewer instructions: Partners to refer to handout with list of behaviours and frequency scale.

Interviewer reads to participant: "Now I would like to ask you some more questions about the conversation you just had with **(Participant)**."

1. **[NVRS Opp] Interviewer reads to the partner:** "Thinking about the conversation you just had, which of the following nonverbal and paraverbal cues did **(Partcipant)** utilize to seek reassurance from you?"

Interviewer instructions: From a. *to* rr., *state each possible NVRS behaviour and indicate with a checkmark whether* **participant** *recalled such behaviour. the Indicate response by placing a mark in the appropriate row under the NVRS Opp column.*

2. **[Frequency] Interviewer reads to the partner:** "Using the scale in front of you as a guide, how often does **(Partner)** typically use each of the following nonverbal or paraverbal cues to seek reassurance from someone?"

Interviewer instructions: For each, place the frequency indicated by the **(Partner)** *on the following scale under the 'Frequency' column:*

0 = Not at all, never
1 = Very rarely, once or twice per month
2 = Rarely, once or twice per week
3 = Occasionally, once per day
4 = Very frequently, two to five times per day
5 = All the time, more than five times per day

3. **[Primary] Interviewer reads to partner**: "Of the behaviours you mentioned here, which is **(Participant)'s *primary*** method to seek reassurance?"

Interviewer Instructions: Indicate this response by placing a mark in the appropriate row under the 'Primary' column.

4. **[Successful] Interviewer reads to partner**: "Of the methods you discussed, which is the ***most successful*** in soliciting reassurance from you or others?"

Interviewer Instructions: Indicate this response by placing a mark in the appropriate row under the 'Successful' column.

Table 7: Section 16 NVRS Behaviours- Partner

Nonverbal Behaviour	1. NVRS Opp		2. Frequency						3. Primary	4. Successful
	Yes	No	0	1	2	3	4	5		
Proximity										
a. Move closer to the potential reassurer										
Head										
b. Shake/nod head										
Face										
c. Direct distressed/fearful facial expressions toward the person										
d. Wrinkled forehead indicative of fear/uncertainty										
e. Make direct eye contact with the potential reassurer										
f. Avoid direct eye contact with the potential reassurer										
g. Raise eye brows										
h. Fully widen eyes										
i. Draw lips back and down, expose teeth in "unfelt smile"										
j. Make 'happy-looking' glances at the person										
k. Closely examine the way that people react when you do things that worry you (ReSQ, CORSI)										
Hygiene										
l. Abruptly change appearance/hygiene										
Shoulders										
m. Shrug your shoulders										
n. Orient shoulders to square potential reassurer										
Posture/Torso										
o. Over-correct or overly straight/rigid posture										

p. Lean towards the potential reassurer

Hips

q. Orient hips to square potential reassurer

Hands

r. Touch protentional reassurer with hand(s)
s. Extend upward, open palm
t. Palms up, signaling “I don’t know”
u. Wring your hands
v. Fidget with your hands
w. Fidget with objects in your hands
x. Fidget with your hair

In/Action

y. Abruptly Stop all movement
z. Wait and examine whether something bad happens to someone else who does something that worries you (e.g., eat off a plate, etc.) before you do it (ReSQ)
aa. Do a small portion of something that worries you, and examine the reactions of others to see if anyone reacts negatively, and if no one does then you are reassurance it is safe to proceed (CORSI)

Legs

bb. Fidget with legs

Other NVRS

cc. Other (please explain)

Paralinguistic Cues

dd. Abrupt change in tone/pitch (i.e., Inflect your tone upwards like a question or drastically down to cue attention)
ee. Noticeably speed up or slow down your rate of speech
ff. Pause to allow for reassurance
gg. Suddenly speak louder or quieter than usual
hh. Disjoint or break up fluid speech
ii. Make more paralinguistic sounds (e.g., uh, umm, etc.)

Other Paralinguistic Cues

jj. Other (please explain)
kk. Other (please explain)

Section 17: NVRS Onset/Triggers (Partner)

Interviewer reads to partner: "Now, I would like to ask you some questions about the **reasons [Participant]** seeks reassurance in this way."

1. **[Partner] Interviewer reads to the partner**: "What usually prompts **[Participant]** to seek reassurance without words in the first place? Please say yes or no to the following."

Interviewer instructions: From a. *to t., state each possible NVRS behaviour and indicate with a checkmark whether* **(Partner)** *confirms such behaviour.*
Interviewer instructions: If participant is unsure ➔ Probe

- ***Probe*** **➔ (Interviewer reads to the partner)**: "What things typically make her/him seek reassurance in this way? What concerns most prompt a desire to use her/his use of body language, gestures, facial expressions, or sound or flow of your speech to solicit reassurance from someone? What changes her/his thoughts and feelings typically occur just before s/he feels the urge to seek reassurance in these specifically nonverbal ways? What changes in the environment or the situation? What fears, worries, surprises, or concerns make you feel like you need to seek reassurance in these ways? Are you sure there is nothing that prompts her/his to seek reassurance through body language and/or verbal cues?"

2. **[Other] Interviewer reads to the participant**: "Are there any other situations, thoughts, or feelings that typically trigger **(Partner)**'s urges to seek reassurance through **actions** or with the **way** s/he talks to someone else?"

☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*

Interviewer Instructions: Place additional causes in the "Other" rows.
Interviewer Instructions: *If* **YES** ➔ *Proceed to next question*
If **NO** ➔ *Attempt to summarize again until* **Participant** *confirms summary.*

3. **[Primary] Interviewer reads to the Partner**: Of the reasons you have indicated, which would you think is the **primary reason (Participant)** seeks reassurance with nonverbal behaviour and/or paralinguistic cues?

Interviewer Instructions: Place checkmark under Primary.

4. **Interviewer reads to the Participant**: "OK. So, if I understand correctly, you're her/his desire to seek reassurance with nonverbally or with the way s/he speaks is **(Insert summarized responses)**. Is this correct?"

☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*

Table 8: Possible Triggers of NVRS- Partner

Possible Triggers of NVRS	Participant Y	Participant N	Primary
a. Unwanted thoughts/images/obsessions			
b. Negative mood (anxious)			

➔ Specify:_____

c. Negative mood (depressive)
➔ Specify:
d. Doubt re: removal/reduction of perceived general threat (safety/harm/contamination)
e. Inability to check
f. Perceived responsibility for preventing harm
g. Doubt re: personal performance/competence
h. Perceived threat of loss/rejection/abandonment
i. Doubt re: personal worth (e.g., likeability, appearance, "normality")
j. Perceived loss of control
k. Doubt re: memory
l. Doubt re: perception
m. Physical environment/location
n. Most effective
Other possible causes of NVRS
o. Other: (explain)

Section 18: Consequences of NVRS (Partner)

Interviewer reads to participant: "Now I would like to ask about what typically happens after **(Participant)** seeks reassurance without words or based on how s/he speaks."

1. **[Partner] Interviewer reads to partner:** "What happens after you seek reassurance with nonverbal acts or paralinguistic cues? Please say yes or no to the following."
   - ***If no behaviour is identified, then probe*** ➔ **Interviewer reads to the partner:** "When you are looking for reassurance from your partner, did you use other strategies that did not involve asking directly, mentioning the subject, or speak at all? Did you use any body language, gestures, facial expressions, or actions, or did you change the rate, tone, fluidity of your speech to get reassurance from someone else?"

☐ **YES** ☐ **NO** *Interviewer instructions: Check the response.*

Interviewer instructions: *If Yes* ➔ *Ask participant to indicate which behaviour*
If No ➔ *Proceed to 2.*

2. **[Most Common] Interviewer reads to the participant:** "Of these outcomes, which is the most common?

3.

Table 9: Section 18 Possible Consequences of NVRS

Consequences	1. Partner	2. Most Common
a. Unwanted thoughts/images/obsession go away		
b. Reduced anxiety		
c. Improved mood		
d. Reduced perception of severity of threat		
e. Reduced perception of the likelihood of threat		
f. Felt like you checked by confirming with significant other		

g. Reduced uncertainty about presence of threat
h. Responsibility transferred from you to significant others
i. Significant others provide information (e.g., safety-related)
j. Significant others provide support (i.e., encouragement, comfort)
k. Reaction from significant other less negative than response to VRS
l. Reduced doubt about personal performance/competence
m. Alleviated fear of rejection
n. Alleviated perception of personal inadequacy/unlikability/etc.
o. Improved sense of control
p. Improved perception of memory
Other possible consequences of NVRS
q. Other: (explain)
r. Other: (explain)
s. Other: (explain)
t. Other: (explain)
u. Other: (explain)

Section 19: NVRS Preference (Partner)

Interviewer reads to participant: I would like to explore why you think **(Participant)** seeks reassurance with body language, facial expressions, gestures, or based on the way you say what you say **instead of or in addition to** asking directly for reassurance or subtly mentioning your concern.

1. **(Partner) Interviewer reads to partner:** "Please indicate which of the following are reasons you think **(Participant)** seeks reassurance with behaviour and/or the way s/he talk."

Interviewer instructions: From a. *to* m., *state each possible NVRS preference and indicate with a checkmark whether* **participant** *indicated such preference. the Indicate response by placing a mark in the appropriate row under the Partner column.*
Interviewer instructions: If reason not listed ➔ place in one of the "Other" rows.

2. **(Primary) Interviewer reads to participant:** "Which of the above reasons would you say is your ***primary*** reason for seeking reassurance without questions or subtle statements?"

Interviewer Instructions: Place a check mark in the appropriate box under the 'Primary' column.

Table 10: Section 19 Possible Reasons to Prefer NVRS- Partner

Possible Reasons to Prefer NVRS	Partner	Primary
a. Avoid offending/irritating/annoying the other person with verbal RS		
b. Avoid being embarrassed/humiliated		
c. Avoid expressing self with an unfamiliar person		
d. Avoid expressing anxiety to unfamiliar person		
e. Avoid expressing uncertainty to unfamiliar to person		
f. Avoid being perceived as an anxious person		
g. Avoid being perceived as paranoid		

h. More effective than verbal RS alone
i. Less effort to seek reassurance without words
j. Selectively elicits reassurance from a trusted few

Other Possible Reasons to Prefer NVRS

k. Other (explain):

Section 20: NVRS Definition (Partner)

1. **Interviewer reads to partner**: "Now that we have talked about it in some detail, I would like your input. Based on your experience, what is nonverbal RS?"

Section 21: Reflection (Partner)

2. **Interviewer reads to the partner:** "Finally, is there anything important related to reassurance seeking that we have not yet discussed? Is there anything important about nonverbal or paralinguistic reassurance seeking that we have not yet discussed, such as what makes you start, how you seek reassurance without words or with how you speak, or what makes you prefer nonverbal reassurance seeking?"

Section 22: Conclusion

Interviewer Instructions: Bring the participant into the room with the partner

Interviewer reads to the participant and the partner: "That's it. The interview is all done. Thank you very much for your time."

Appendix C: Nonverbal Reassurance Seeking Checklist Used in Study 1

Nonverbal Reassurance Seeking Checklist- Participant

Please clearly indicate the number of times [you/the participant] did the following things to seek reassurance or ostensibly seek reassurance from the other person.

Nonverbal Reassurance Seeking Checklist

Nonverbal Behaviour	Number of times
Proximity	
a. Moved closer to your partner	
Head	
b. Shook/nodded head at your partner	
Face	
c. Directed distressed/fearful facial expressions at partner	
d. Wrinkled forehead indicative of fear/uncertainty	
e. Made direct eye contact with partner	
f. Avoided direct eye contact	
g. Raised eye brows	
h. Fully widened eyes	
i. Drew lips back and down, exposed teeth in "unfelt smile"	
j. Made 'happy-looking' glances	
k. Closely examined the way your partner reacted when you did things or discussed things that worry you	
Hygiene	
l. Abruptly changed appearance/hygiene	
Shoulders	
m. Shrugged your shoulders	
n. Oriented shoulders to face your partner	
Posture/Torso	
o. Over-corrected or overly straightened/rigid posture	
p. Leaned towards your partner	
Hips	
q. Oriented hips to square your partner	
Hands	
r. Touched your partner with your hand(s)	
s. Extended upward, open palm(s)	
t. Opened your palms up, signaling "I don't know"	
u. Wringed your hands	
v. Fidgeted with your hands	
w. Fidgeted with objects in your hands	
x. Fidgeted with your hair	
In/Action	
y. Abruptly stopped all movement	
z. Waited and examined whether something bad happened to someone else who did or discussed something that worries you (e.g., eat off a plate, etc.) before you do it	

aa. Did a small portion of something that worries you and examined the reactions of your partner to see if s/he reacted negatively, and if s/he didn't react negatively, then you were reassured it was safe to proceed

Legs

bb. Fidgeted with legs

Other NVRS

cc. Other (please explain)
dd. Other (please explain)
ee. Other (please explain)
ff. Other (please explain)
gg. Other (please explain)

Paralinguistic Cues	**Number of times**
hh. Abruptly changed tone/pitch of your voice (i.e., Inflect your tone upwards like a question or drastically down to cue attention)	
ii. Noticeably sped up or slowed down your rate of speech	
jj. Paused to allow for reassurance	
kk. Suddenly spoke louder or quieter than usual	
ll. Disjointed or broke up fluid speech	
mm. Made more paralinguistic sounds (e.g., uh, umm, etc.)	

Other Paralinguistic Cues

nn. Other (please explain)
oo. Other (please explain)
pp. Other (please explain)
qq. Other (please explain)
rr. Other (please explain)

Appendix D: Nonverbal Reassurance Seeking Checklist Used in Study 2

Nonverbal Behaviour	Present	Absent
Proximity		
a. Moved closer to your partner		
Head		
b. Shook/nodded head at your partner		
Face		
c. Directed distressed/fearful facial expressions at partner		
d. Wrinkled forehead indicative of fear/uncertainty		
e. Made direct eye contact with partner		
f. Avoided direct eye contact		
g. Raised eye brows		
h. Fully widened eyes		
i. Drew lips back and down, exposed teeth in "unfelt smile"		
j. Made 'happy-looking' glances		
k. Closely examined the way your partner reacted when you did things or discussed things that worry you		
Hygiene		
l. Abruptly changed appearance/hygiene		
Shoulders		
m. Shrugged your shoulders		
n. Oriented shoulders to face your partner		
Posture/Torso		
o. Over-corrected or overly straightened/rigid posture		
p. Leaned towards your partner		
Hips		
q. Oriented hips to square your partner		
Hands		
r. Touched your partner with your hand(s)		
s. Extended upward, open palm(s)		
t. Opened your palms up, signaling "I don't know"		
u. Wringed your hands		
v. Fidgeted with your hands		
w. Fidgeted with objects in your hands		
x. Fidgeted with your hair		
In/Action		
y. Abruptly stopped all movement		
z. Waited and examined whether something bad happened to someone else who did or discussed something that worries you (e.g., eat off a plate, etc.) before you do it		
aa. Did a small portion of something that worries you and examined the reactions of your partner to see if s/he reacted negatively, and if s/he didn't react negatively, then you were reassured it was safe to proceed		
Legs		
bb. Fidgeted with legs		
Other NVRS		

cc. Other (please explain)
dd. Other (please explain)
ee. Other (please explain)
ff. Other (please explain)
gg. Other (please explain)

Paralinguistic Cues	**Present**	**Absent**
hh. Abruptly changed tone/pitch of your voice (i.e., Inflect your tone upwards like a question or drastically down to cue attention)		
ii. Noticeably sped up or slowed down your rate of speech		
jj. Paused to allow for reassurance		
kk. Suddenly spoke louder or quieter than usual		
ll. Disjointed or broke up fluid speech		
mm. Made more paralinguistic sounds (e.g., uh, umm, etc.)		

Other Paralinguistic Cues

nn. Other (please explain)
oo. Other (please explain)
pp. Other (please explain)
qq. Other (please explain)
rr. Other (please explain)

Appendix E: Ethics Approval Certificates

CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant: Dr. Adam Radomsky

Department: Faculty of Arts and Science\Psychology

Agency: Canadian Institutes of Health Research

Title of Project: Experimental Investigation of the Effect of Responsibility Appraisals on Reassurance Seeking in Association with a Dishwashing Task

Certification Number: 30004362

Valid From: May 27, 2015 to: May 26, 2016

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

Dr. James Pfaus, Chair, University Human Research Ethics Committee

CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant: Dr. Adam Radomsky

Department: Faculty of Arts and Science\Psychology

Agency: Canadian Institutes of Health Research

Title of Project: Experimental Investigation of the Effect of Responsibility Appraisals on Reassurance Seeking in Association with a Dishwashing Task

Certification Number: 30004362

Valid From: May 17, 2016 to: May 16, 2017

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

Dr. James Pfaus, Chair, University Human Research Ethics Committee

CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant:	Dr. Adam Radomsky
Department:	Faculty of Arts and Science\Psychology
Agency:	Canadian Institutes of Health Research
Title of Project:	Experimental Investigation of the Effect of Responsibility Appraisals on Reassurance Seeking in Association with a Dishwashing Task

Certification Number: 30004362

Valid From: April 19, 2018 To: April 18, 2019

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

_____

Dr. James Pfaus, Chair, University Human Research Ethics Committee

CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant: Mark Leonhart

Department: Faculty of Arts and Science\Psychology

Agency: N/A

Title of Project: Nonverbal reassurance seeking: A phenomenological investigation.

Certification Number: 30009460

Valid From: August 08, 2019 To: August 07, 2020

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

Richard DeMont

Dr. Richard DeMont, Chair, University Human Research Ethics Committee

Re:

"Nonverbal reassurance seeking: A phenomenological Investigation"

Effective: August 27, 2019 **Expiry:** August 27, 2020

Psychology/Sociology Research Ethics Board (PSREB) has reviewed and approved the above research. PSREB is constituted and operates in accordance with the current *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans.*

This approval is subject to the following conditions:

1. Approval is granted for the research and purposes described in the application only.

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Human Ethics
208-194 Dafoe Road
Winnipeg, MB
Canada R3T 2N2
Phone +204-474-7122
Email: humanethics@umanitoba.ca

PROTOCOL APPROVAL

TO: **Mark Leonhart** **(Advisor: Adam Radomsky)**
Researcher

FROM: **Jonathan Marotta, Chair**
Psychology/Sociology Research Ethics Board (PSREB)

Protocol #P2019:103 (HS23200)

2. Any modification to the research or research materials must be submitted to PSREB for approval before implementation.
3. Any deviations to the research or adverse events must be submitted to PSREB as soon as possible.
4. This approval is valid for one year only and a Renewal Request must be submitted and approved by the above expiry date.
5. A Study Closure form must be submitted to PSREB when the research is complete or terminated.
6. The University of Manitoba may request to review research documentation from this project to demonstrate compliance with this approved protocol and the University of Manitoba *Ethics of Research Involving Humans*.

Funded Protocols:

- **Please e-mail a copy of this Approval, identifying the related UM Project Number, to the Research Grants Officer at researchgrants@umanitoba.ca**

CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant: Mark Leonhart

Department: Faculty of Arts and Science\Psychology

Agency: N/A

Title of Project: Nonverbal reassurance seeking: A phenomenological investigation.

Certification Number: 30009460

Valid From: August 07, 2020 To: August 06, 2021

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

Dr. Richard DeMont, Chair, University Human Research Ethics Committee

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Winnipeg, MB R3T 2N2
T: 204 474 8872
humanethics@umanitoba.ca

RENEWAL APPROVAL

Date: **August 17, 2020** **New Expiry: August 27, 2021**

To: **Mark Leonhart** **(Advisor: Adam Radomsky)**
Researcher

From: **Jonathan Marotta, Chair**
Psychology/Sociology Research Ethics Board (PSREB)

Re: **Protocol # P2019:103 (HS23200)**
Nonverbal Reassurance Seeking: A Phenomenological Investigation

---

Psychology/Sociology Research Ethics Board (PSREB) has reviewed and renewed the above research. PSREB is constituted and operates in accordance with the current *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans.*

This approval is subject to the following conditions:

i. Any modification to the research must be submitted to PSREB for approval before implementation. ii. Any deviations to the research or adverse events must be submitted to PSREB as soon as possible.

iii. This renewal is valid for one year only and a Renewal Request must be submitted and approved by the above expiry date.

iv. A Study Closure form must be submitted to PSREB when the research is complete or terminated.

Appendix F: Coding Step by Step Instructions

Video Coding Rubric

You are going to be coding the videos to determine whether reassurance was sought, and if so, how much of the conversation was comprised of this behaviour. Please use the following criteria to determine whether the behaviours entail reassurance. Please note that the behaviour need only meet one of the following criteria in order to be considered reassurance.

Step 1: Observe all verbal behaviours

1) Determine whether the verbal behaviour is reassurance seeking or not.
    a. Reassurance seeking: the repeated solicitation of safety-related information regarding general threats (e.g., contamination, proper completion of task)
    b. **Not** reassurance seeking: comments/questions not made to repeatedly solicit safety-related information regarding general threats (e.g., contamination, etc.)
    c. Refer to **RS Blurb for Coders** to help guide your decision
    d. Examples of verbal RS
        i. The participant poses a question to the partner regarding the correctness or completeness of steps carried out as parts of the dishwashing task (e.g., "Did you see me do X?") (OVERT)
        ii. The participant poses a question to his/her partner regarding the safety of the dishes for use (e.g., "I don't know if the dishes are safe; what do you think?") (OVERT)
        iii. The participant poses a question to the partner regarding responsibility for threat (e.g., "Do you think someone could get sick from eating off the plate?") (OVERT)
        iv. Any questions asked more than once, either in the same way or in a different way [e.g., "You were standing over here, right?" (response) "Against the wall?"] (OVERT)
        v. The participant makes a statement about something they've done that appears to anticipate a response (e.g., "I followed the instructions, but step 2 was confusing...[pause]"), especially if such statements are repeated (COVERT)
        vi. The participant pauses to allow for a reassuring response regarding a concern (PARAVERBAL)
        vii. The participant inflects their tone upward to suggest a question/uncertainty/desire for response (PARAVERBAL)

viii. The participant makes an off-topic comment/question (e.g., "So, what are you studying?" "That's not how I would wash dishes!" (NON-RS)

2) If verbal RS, then determine form (i.e., overt, covert)
    a. Overt RS: Direct questions to solicit safety-related information regarding general threats (e.g., contamination, proper completion of task)
    b. Covert RS: Subtle comments to solicit safety-related information regarding general threats (e.g., contamination, proper completion of task)
    c. Paraverbal RS: Paralinguistic cues (e.g., pauses, disjointed speech, abrupt changes in tone, speed, pitch of voice) to solicit safety-related information regarding general threats (e.g., contamination, proper completion of task.
    d. Refer to **RS Blurb for Coders** to help guide your decision
3) If overt RS or covert RS, then determine topic of concern
    a. Garbage, amount of time spent washing the cups, germs, the instructions, or the cleanliness of the cups (already be outlined in Coding_Template_Experiment.Study_Individual.Participant.xlsx

Step 2: Observe all nonverbal behaviours

1) Determine whether the nonverbal behaviour is reassurance seeking or not.
    a. Reassurance seeking: the repeated solicitation of safety-related information regarding general threats (e.g., contamination, proper completion of task)
    b. Refer to **RS Blurb for Coders** to help guide your decision
    c. Examples of nonverbal RS
        i. The participant made a "happy-looking glance" or "unfelt smile" toward the other person suggesting they want a response. (NONVERBAL)
        ii. The participant extends and upward open palm in reference to the concern (NONVERBAL)
2) If nonverbal RS, then determine form (i.e., nonverbal, paraverbal)
    a. Nonverbal RS: Bodily behaviours (e.g., gestures, facial expressions, etc.) to solicit safety-related information regarding general threats (e.g., contamination, proper completion of task)
    b. Paraverbal RS: Paralinguistic cues (e.g., pauses, disjointed speech, abrupt changes in tone, speed, pitch of voice) to solicit safety-related information regarding general threats (e.g., contamination, proper completion of task).
    c. Refer to **RS Blurb for Coders** to help guide your decision

Step 4: Calculate the number of times each kind of reassurance seeking is observed. The Excel spreadsheet I've created should automatically add the sum total of overt, covert, and nonverbal RS from each category, but please double check the automated addition.

Step 5: Calculate how long each reassurance seeking episode lasted in seconds, including 1) the amount of time the participant spent seeking reassurance (overt, covert, nonverbal), 2) the amount of time the partner spent responding/providing reassurance, and 3) the total reassurance-related interaction time (i.e., duration of question and answer)

Step 6: Calculate how long the entire conversation lasted, in seconds. This will be from the moment the one person says, "The cups seem clean to me" until either you hear a bell ring or door open on the recording.

Step 7: Calculate the proportion of the conversation that was taken up by reassurance seeking. Divide the amount of time taken up by reassurance seeking over the total conversation time (this will produce two proportions: the proportion of time spent seeking RS to total time, and the time spent in RS-related interactions to total time).

Step 8: Keep track of how many times each type of reassurance was sought about each category (i.e., garbage can, instructions, etc.)

Step 9: Keep an accurate record. Record the participant's ID number, number of times RS was observed, and the two proportions of time spent seeking reassurance, and your initials in the spreadsheet kept on the lab's shared folder. ****Remember to save** and upload the *updated* copy of the spreadsheet each time you finish with it!**

Appendix G: Coding Decision Guide

Coding Guide for Study

1. Any direct questions regarding the washing task were coded as overt reassurance.
2. Asking whether the partner had questions was coded as overt reassurance.
3. When many questions were strung together, these were each coded separately.
4. When many subtle comments about the general threat (i.e., contamination) were strung together, these were each coded separately.
5. Rhetorical questions, where no pause was given for a response were not coded as reassurance seeking.
6. Covert reassurance was coded anytime reassurance was sought without a direct question. Again, a small pause was needed to separate reassurance seeking from normal stream of consciousness.
    a. If the participant says, "_____. Right?" then this was coded as a single instance of OVERT RS, as in "Is it true that_____?"
        i. Example: "We got all of the dirt off. Right?" <- one instance of OVERT RS.
7. If the participant says, Do you think that…. (trails off). To me it was… (trails off). Did I/we do _____ properly?"
    a. Conceptualized the trailing off (not finished the question) as a form of impression management/mitigating social risk/anxiety
    b. Trailing off was coded as two instances of nonRS
    c. The last question is overt RS.
8. Nonverbal reassurance seeking was coding anytime reassurance was sought through body language, gestures, facial expressions, long pauses, etc.
9. Any questions relating to the current logistics of the study (most often related to turning off the recorder or going to get Olivia) were not coded as reassurance seeking.
    a. If a question is obviously to resolve confusion about "What to do next in the experiment" or "How do we get the experimenter to come back", then that was coded as NON-RS.
    b. If a question is not **obviously** geared toward the seeking of reassurance (e.g., "Are we done, then?", "Are we done?", "Is there anything else to discuss?"), then it was coded as NON-RS
    c. If a question is focused on resolving uncertainty about whether or not the task has been properly completed (i.e., whether there is agreement about the decision, whether it was done properly, etc.), then this was coded as RS.
10. The length of the reassurance was judged from the time the subject was mentioned until an opportunity for a reply was given.
11. The length of reassurance provision was judged as the time the person providing reassurance spent providing reassurance.