In Search of Sexcurity: Does Mindfulness Buffer the Manifestations of Attachment Insecurity in Relationship and Sexual Functioning?

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A thesis submitted in fulfillment of the requirements for the degree of Doctor of Philosophy in Health Sciences (Health Psychology), The University of Auckland, 2022.

Abstract

Attachment insecurities have the potential to interfere with optimal relational and sexual functioning. Despite the established links between attachment characteristics and poorer relational and sexual functioning, evidence regarding how we might seek to buffer the negative manifestations of attachment insecurities in interpersonal functioning is sorely lacking. The work presented in this thesis contributes to this research deficit by using a series of cross-sectional, intensive longitudinal, and interventional studies to investigate whether trait mindfulness and/or mindfulness training (a) buffer the sexual and relational manifestations of attachment insecurities and (b) do so equally for attachment anxiety and attachment avoidance.

The first empirical contribution (Study 1; Chapter 3) found that trait mindfulness reduced the expression of *anxious* attachment in maladaptive sexual motivations, including having sex to affirm the self and cope. In contrast, trait mindfulness *intensified* the link between avoidant attachment and typically less-adaptive sexual motives, including having sex for self-affirmation and coping-based motives. A second study employing an intensive daily diary methodology (Chapter 4) found that facets of trait mindfulness eliminated the relationship between attachment anxiety and daily motives to have sex to prevent a partner from losing interest and reduced the degree to which persons high in attachment anxiety reported having sex to please a partner. Unexpectedly, trait mindfulness also reduced the likelihood that more anxiously attached individuals reported engaging in sex to pursue their own pleasure. However, more consistent with expectation, trait mindfulness appeared to marginally increase more avoidant persons reporting of daily motives to have sex due to feelings of obligation. Using an experimental design to conduct secondary analyses of a large mindfulness intervention study, Study 3 (Chapter 5) found that persons who were more anxiously attached at baseline reported greater reductions in rejection fears and conflict (and

greater increases in connection) following a mindfulness intervention, though, adding a conceptually important caveat, comparable benefits were evident among persons randomized to receive a relaxation intervention. Both interventions appeared to offer *some* slightly greater benefits among more avoidant persons; however, these benefits were not maintained at follow-up. Finally, returning to the focus on sexuality, Study 4 found that a mindfulness intervention increased reports of positive sexuality among more anxious persons over time, though it did not buffer less adaptive sexual motives in this group. Corroborating previous studies in this thesis, however, no benefits of the mindfulness intervention were detected for more avoidant persons.

Taken together, these studies cohere in suggesting that openly attending to (negative) experiences through a lens of acceptance can buffer the degree to which attachment *anxiety* "bleeds out" into typically more detrimental sexual and relational experiences. However, mindfulness may be less well-suited to attenuating the manifestations of attachment avoidance. Further work is required to elucidate the "dose" of mindfulness required for change to occur, especially in relationally threatening situations, and the comparison of mindfulness to active controls continues to be necessary to determine whether (and for which outcomes) mindfulness is specifically beneficial to anxiously attached individuals. Given the difficulties associated with insecure attachment and the relative absence of work testing how the effects of anxiety and avoidance on relational functioning might be buffered, this work represents an important beginning to addressing *whom* mindfulness' interpersonal effects are best suited to. The data thus have the potential to inform interventions and therapies designed to reduce the adverse relational and sexual correlates of attachment insecurity.

Acknowledgements

Central to attachment theory is the notion that close, supportive relationships with others give us a foundation to explore the world, capitalise on our strengths, and be resilient in the face of life stressors. Thus, without others, my ability to start, sustain, and complete the work comprising this thesis would be severely constrained. Accordingly, thanks are due.

First, thanks go to my supervisors. To my lead supervisor, Professor Nathan Consedine, you have prompted the growth of my intellectual rigour, helped me see things from a broader and more nuanced perspective, and offered your time and thoughts with incredible generosity. More than that, however, you have been compassionate and kind, helped me when I struggled with academic and non-academic issues, and created a lab environment characterised by acceptance and a lot of fun. I am a better person for having your guidance. Thank you. To my secondary supervisor, Dr Lisa Reynolds, the depth of your care has been palpable throughout this journey. Thank you for offering a listening ear when things got tough, sharing your insights on the processes under consideration in this thesis, and for all the encouragement along the way. It has been a pleasure and a privilege to have you as a mentor in my life over the past several years.

In a seminal psychological article, Baumeister and Leary (1995) argued that humans have a fundamental need to belong. I have been immensely fortunate to be surrounded by a "PhD Posse" with whom I feel such belonging. To Alina, Tony, Jenn, Katie, Anna, and Jane, thank you for being the best PhD pals anyone could ask for. The care and acceptance you show each other and me, and the amount of laughter we have shared, have contributed to making my PhD journey arguably the best time of my life.

Several others deserve recognition. First, thank you to those who have given their time and energy to participate in the studies comprising this thesis; without your generosity, the studies reported in this thesis would not have arisen. To Professor Nickola Overall, you

planted the seed and ignited the flame of interest in this line of work. I will be forever grateful. To Drs Fiona Moir and Jill Yielder, you helped me find the courage to begin a PhD, something I had long wanted to do but wasn't sure if I could. Thank you. To the University of Auckland, I am deeply grateful for the Doctoral Scholarship that enabled me to complete this work while staying financially afloat. To Ranjeeni Ram, you were a bright light throughout the PhD journey. Thank you for your warmth, direction, and sense of humour; the adventure would have been lacklustre without you. To my parents, thank you for facilitating my curious mind from a young age and instilling in me a desire to make things better for those suffering.

Finally, to my love Michael, your steadfastness throughout the trials of life and, indeed, this PhD provides me with a deep sense of security and assurance. Thank you for the deep care you show me, your patience and humour, for (at times) bearing the brunt of the domestic work so I could work on my PhD, and for being my equal partner in creating a strong, loving relationship. I don't know how it gets better than this.

Holly Claire Dixon, November 2022

Dedicated to young Hol.

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Chapter 1. Attachment and Social Relationships

1.1 Background to Attachment Theory

Attachment theory is one of the most influential theoretical frameworks for understanding social relations thus far (e.g., Cassidy & Shaver, 2016; Mikulincer & Shaver, 2016). Created in the mid-twentieth century, attachment theory emphasizes the importance of the environment as an essential contributor to pathology, personality, and psychological development (Bowlby, 1969, 1973). More specifically, it stresses the importance of early relationships in shaping interpersonal functioning throughout the lifespan, emphasizing how thwarted attempts to draw close to others in times of need can lead to distinct and enduring patterns of social behavior and affect regulation (Bowlby, 1969, 1973).

2.1.1 Regulatory Functions and Consequences of the Attachment Behavioral System

A key component of attachment theory is the notion that humans are born with an innate, evolutionarily designed "attachment behavioral system" that operates unconsciously and automatically (Bowlby, 1969). Bowlby argued that the biological function of this system was to protect an individual from harm by ensuring they seek and maintain proximity to supportive others (i.e., attachment figures). Accordingly, the system was thought to govern motivations, thoughts, feelings, and behaviors in line with its "set-goal" of actual or perceived security and protection (i.e., "felt security") from an attachment figure. Routinely attaining this security was thought to provide a "safe haven" in times of distress and a "secure base" from which to explore the world and develop one's capacities—both essential ingredients for healthy psychological development (Bowlby, 1969). While understandably critical for survival in the early years of life, the attachment system is thought to remain active throughout the lifespan, given the adaptive advantages of continued closeness with others (see Kiecolt-Glaser & Wilson, 2017; Pietromonaco et al., 2013; Uchino, 2009).

An essential feature of the attachment behavioral system is its flexible, adaptive, and goal-correcting nature. That is, attachment goals and strategies can change in light of information from prior encounters with attachment figures (Mikulincer & Shaver, 2012). Imagine, for example, that an individual's proximity-seeking behavior is met with responsiveness and sensitivity from an attachment figure. In such instances, the individual learns that proximity-seeking is a viable regulatory strategy, and their confidence in others' availability and their own resourcefulness increases (Mikulincer & Shaver, 2003). Put another way, they learn that both their desired goals and the strategies used to meet those goals are achievable. However, environmental contingencies are not always so positive; attachment figures may not always be able or willing to provide sensitive and attuned responses to bids for proximity. Where this occurs, an individual is left to regulate distress on their own, as well as manage the pain associated with not being able to attain felt security via an attachment figure. Such a predicament invites doubt regarding the effectiveness of proximity seeking as a viable strategy for achieving felt security, their relational worth, and/or others' trustworthiness (Mikulincer & Shaver, 2003). Accordingly, attachment goals and strategies may be adjusted based on the socio-relational opportunities that appear to be available to them.

Notwithstanding the particular responses the individual receives following their bids for physical or psychological proximity, relational information contributing to mental representations (i.e., "working models") about themselves and others is progressively acquired (Bowlby, 1969). Positive interactions with attachment figures probabilistically build mental representations of the self as worthy and others as reliable and likely to be responsive. In contrast, repeated negative interactions with attachment figures who fail to meet attachment needs contribute to a working model characterized by views about the self as unworthy and/or views of others as unresponsive and untrustworthy (Bowlby, 1969). These

working models guide expectations, concerns, and behaviors within this and subsequent relationships (Mikulincer & Shaver, 2003). Over time, and with repeated interactions that confirm existing mental representations, more generalized and global representations of the self and others are created, which consciously and unconsciously organize interactions across *all* relationships, not just those with attachment figures (Mikulincer & Shaver, 2003). As such, what begins as an innate system that organizes responses to *specific* attachment figures, increasingly becomes a key element of interpersonal functioning that is resistant to change (Bowlby, 1979).

1.2 Measuring Differences in Adult Attachment Security Using Self-Report

As attachment theory gained momentum within the scientific study of psychology, scholars began developing ways to assess purported individual differences in attachment. Several self-report measures of adult attachment were developed (i.e., Bartholomew & Horowitz, 1991; Collins & Read, 1990; Hazan & Shaver, 1987; Simpson, 1990). Most early measures modeled adult attachment off a three-category measure of *infant* attachment (Ainsworth et al., 1978), grouping adults into one of three categories roughly equating to secure, anxious, or avoidant attachment (Collins & Read, 1990; Hazan & Shaver, 1987). Seeking greater fidelity to Bowlby's theory of working models (1969), however, Bartholomew and Horowitz (1991) proposed that adult attachment should be assessed along two orthogonally intersecting dimensions, indexing positive versus negative views of the self ("self model") and others ("other model"). Variation in individuals' scores on these two dimensions was thought to describe an individual's attachment style: secure (positive self and other models), preoccupied (negative self, positive other models), fearful (negative self and other models), or dismissing (positive self, negative other models; Bartholomew & Horowitz, 1991).

While the measures developed demonstrated reasonable predictive, convergent, and discriminant validity (Collins & Read, 1990; Griffin & Bartholomew, 1994a; Simpson, 1990; Simpson et al., 1992), the categorization of individuals was criticized as psychometrically problematic (Fraley & Waller, 1998). Other research suggested that adult attachment patterns were best conceptualized as latent dimensions rather than as latent categories (Fraley & Waller, 1998). Thus, researchers moved towards measuring adult attachment on two *continuous* dimensions: anxiety, characterized by low self-worth and chronic fears of abandonment and rejection, and avoidance, characterized by compulsive self-reliance and fears of closeness and dependence (Brennan et al., 1998; Simpson, 1990). Individuals could report high scores on one or both attachment dimensions. High scores on either or both dimensions were thought to index attachment "insecurity", whereas low scores on both were thought to index attachment "security". Such measures offered a greater ability to discriminate between varying degrees of insecurity than the earlier categorical models (Brennan et al., 1998; Fraley et al., 2000).

1.3 Psychological Dynamics of Attachment Anxiety and Avoidance

The development and use of self-report measures of adult attachment greatly facilitated scientific understanding of how variation in attachment dimensions contributes to intrapsychic organization. Extensive research in this line has shown that individual differences in attachment anxiety and avoidance shape distress regulation (for a comprehensive review, see Mikulincer & Shaver, 2016). Broadly, more (versus less) securely attached individuals appear to have greater resilience in the face of stressors, rating stressful events as less threatening (Wei et al., 2005) and reporting greater optimism in their ability to cope with distress (Mikulincer & Florian, 1995; Shaver & Hazan, 1993) than their less secure counterparts. Perhaps because of this, more secure individuals use more constructive coping methods, including openly acknowledging and displaying emotions without being

overwhelmed by them (Caldwell & Shaver, 2012; Mikulincer & Orbach, 1995) and reappraising stressors so that they may be used as sources of growth (Karreman & Vingerhoets, 2012).

In contrast, the lack of confidence more insecure individuals have in others' responsiveness and/or in their own lovability and competence incline them towards very different regulatory strategies. More anxious persons have been shown to be chronically concerned about rejection and the accessibility of important others, regardless of whether threats are actually present (Mikulincer et al., 2000). Indeed, the threat of perceived rejection is so serious to more anxious persons that reminders of separation prompt greater accessibility to thoughts of their own death (Mikulincer et al., 2002). In theory, the risk of abandonment leads to a "hyperactivated" (i.e., intensified) attachment response to distress, including focusing intently on the source of their suffering, minimizing distance between themselves and others in a way that can be experienced as clinging or controlling, and using emotion-focused coping strategies that intensify rather than lessen their suffering (Evraire & Dozois, 2014; Kratz et al., 2012; Lanciano et al., 2012). Anxious persons also report rapid retrieval of painful memories and intense emotions linked to these memories, which they struggle to not let cloud other experiences (Mikulincer & Orbach, 1995). Unsurprisingly, these regulatory processes and the working models that underpin them increase more anxious persons' risk of psychopathology (Birnbaum et al., 1997; Dozier et al., 2008) and physical health issues (Jaremka et al., 2013; Kidd et al., 2016; Pietromonaco et al., 2013).

Although the intrapsychic organization is distinct, more avoidant persons also have difficulties regulating distress. In keeping with their goal of maintaining self-sufficiency and avoiding closeness with others, more avoidant persons are thought to respond to relational threats with "deactivated" (i.e., inhibited) attachment strategies (Mikulincer & Shaver, 2019). Accordingly, they distance themselves cognitively and behaviorally from aversive

experiences and sources of distress (Shaver & Mikulincer, 2002). Feelings associated with vulnerability (i.e., fear, sadness, shame, distress, guilt, and anxiety), which normally prompt individuals to seek proximity to an attachment figure, are minimized (Cassidy, 1994). Testament to how ingrained these patterns become, however, distressing material is not merely squashed once it comes into awareness. Rather, evidence suggests that more avoidant persons preemptively distance themselves from threatening experiences and events and inhibiting deep and elaborate encoding of it into memory (Dewitte, 2011; Fraley et al., 2000). Perhaps because of this, they report slower retrieval of (and less intense responses to) distressing memories than less avoidant persons (Mikulincer & Orbach, 1995). Such regulatory strategies come with costs, with some evidence suggesting that more avoidantly attached persons experience increased physiological arousal in response to stress (Diamond et al., 2006; Gouin et al., 2009; cf. Taylor et al., 2018), which may partly explain their often increased likelihood of mental and physical health issues (Bosmans et al., 2011; Kratz et al., 2012; Pietromonaco & Beck, 2019; Puig et al., 2013; Raque-Bogdan et al., 2011).

1.4 "Where the Rubber Meets the Road": The Impact of Attachment Insecurities on Relationship and Sexual Outcomes

While attachment insecurities clearly have significant implications for *intra*personal functioning, their consequences are perhaps most obvious—and most detrimental—when examining *inter*personal dynamics. In other words, this is where the rubber (i.e., attachment concerns) meets the road (i.e., situations most likely to bring those concerns into relief). Descriptively, greater attachment anxiety and avoidance have been linked with smaller social network sizes (Anders & Tucker, 2000; Fiori et al., 2011; Veríssimo et al., 2011) and greater odds of relationship dissolution (Gillath et al., 2017; Kirkpatrick & Hazan, 1994). Numerous studies have also shown that more insecure persons report lower relationship satisfaction (Etcheverry et al., 2013; Feeney, 2002; Keelan et al., 1994) and commitment (Etcheverry et

al., 2013), and report fewer feelings of closeness to their social networks than more secure persons (Omri Gillath et al., 2017; Rowe & Carnelley, 2005).

In terms of process, the working models underscoring attachment insecurities drive "schema-driven" processing of relational information (Dykas & Cassidy, 2011). For example, a large body of research demonstrates that persons higher in anxious and/or avoidant attachment interpret and explain relationship events (e.g., conflict) and their partner's thoughts and feelings in more negative ways (Beck et al., 2013; Brassard et al., 2009; Collins et al., 2006; Mikulincer, 1998; Overall et al., 2015; Rodriguez et al., 2019; Segal & Fraley, 2016; Shallcross et al., 2011). These perceptual biases are likely why more *anxiously* attached persons tend to escalate the severity of conflicts, overreact to issues in conflict discussions (Campbell et al., 2005), and respond to a partner's potentially destructive behavior with greater harmful behaviors in return (i.e., yelling, threatening to leave, sulking, stonewalling; Gaines et al., 1997). Similarly, because more *avoidant* persons' perceptual biases incline them to overestimate the intensity of their partner's negative emotions, they engage in more hostile and defensive relationship behavior (Overall et al., 2015).

A smaller body of work has also linked the concerns and goals underlying attachment anxiety and avoidance to sexual motivations, how they negotiate and satisfy their sexual needs, and the overall quality of sexual experiences (Birnbaum, 2015; 2016). More anxious persons' preoccupation with possible rejection motivates them to engage in sex to satiate their desire for emotional closeness (Davis et al., 2004; Schachner & Shaver, 2004). In line with this goal, they report enjoying the more intimate aspects of sexuality (i.e., kissing, touching, cuddling) more than the explicitly sexual aspects (Hazan et al., 1994), and their fantasies are often characterized by wishes for greater intimacy and affection from others (Birnbaum et al., 2011). More anxiously attached persons' fear of losing a partner also prompts them to engage in consented but unwanted and often risky sex (e.g., unprotected sex,

multiple sexual partners; Impett & Peplau, 2002; Kim & Miller, 2019; Paul et al., 2000; Szielasko et al., 2013), which increases the likelihood of adverse outcomes (i.e., unplanned pregnancies, sexually transmitted diseases; Cooper et al., 1998, 2006). Alongside this, they defer their sexual needs in favor of a partner's (Davis et al., 2006). This inhibition of sexual needs, combined with their chronic attachment concerns, is thought to interfere with the satisfaction normally associated with sexual experiences (Birnbaum, 2007; Butzer & Campbell, 2008; Gewirtz-Meydan & Finzi-Dottan, 2018). In turn, relationship quality is impaired (Birnbaum et al., 2006), and the likelihood of more anxious persons' worst fears being realized increases (Birnbaum, 2015).

In contrast, more avoidantly attached persons report finding the psychologically intimate aspects of sex (e.g., mutual gazing, cuddling; Fraley et al., 1998; Hazan et al., 1994) uncomfortable. Cognitively, this discomfort shows up as a greater likelihood of extradyadic, aggressive, and alienated sexual fantasies (Birnbaum et al., 2011; Fraley et al., 1998; Mizrahi et al., 2018) and more relationship-irrelevant motivations for having sex (e.g., status, prestige, coping; Davis et al., 2004; Impett et al., 2008; Schachner & Shaver, 2004). In terms of behavior, more avoidantly attached persons are more likely to report multiple sexual partners (Kim & Miller, 2019) and greater engagement in "no-strings-attached" sexual arrangements that allow them to maintain their distance and personal control (Paul et al., 2000; Segovia et al., 2019). When in a relationship, they often masturbate (Bogaert & Sadava, 2002) rather than engaging in frequent partnered-sex (Brassard et al., 2007), and when they do engage in partnered sex, they often report it being partly motivated by a sense of obligation (Impett & Peplau, 2002). Again, these attempts to regulate intimacy in line with attachment motivations may well have costs. More avoidant persons and their partners report lower sexual satisfaction (Birnbaum, 2007; Butzer & Campbell, 2008) and more avoidant males report lower orgasmic responsivity (Gewirtz-Meydan & Finzi-Dottan, 2018). Perhaps more

significantly, the regulatory defenses characterizing avoidance may blunt the positive effects of sex on relationship quality (Birnbaum et al., 2006), making it less likely that they benefit from experiences that contradict their negative expectations of others (Birnbaum, 2015). As will become clear, despite research indicating sub-optimal sexual experiences among the more insecurely attached, few studies have explored what might reduce the translation of attachment concerns into poorer sexual experiences.

1.5 Current Interventions to Improve the Relationship and Sexual Outcomes of More Insecurely Attached Persons

As the previous section outlines, research conducted over the past 30 years suggests that attachment concerns interfere with optimal relationship and sexual functioning. Although there remains significant work to do in terms of exploring the development of attachment across the lifespan (Fraley & Roisman, 2019), perhaps the most serious omission is the relative paucity of work that has explored how the manifestations of attachment insecurity might be mitigated, including, in particular, in sexual experience and functioning.

Two bodies of work are the exception to this pattern, however. First are studies testing Bowlby's (1988) expectation that psychotherapy should increase individuals' attachment security, which should, in turn, reduce the extent to which attachment insecurities interfere with relationship and sexual functioning. Consistent with Bowlby's prediction, a range of individual and group-based psychotherapy programs have been associated with pre- to post-intervention increases in participants' attachment security (e.g., Fonagy et al., 1995; Kinley & Reyno, 2013; Kirchmann et al., 2012; Levy et al., 2006; Maxwell et al., 2014; Muller & Rosenkranz, 2009; Tasca et al., 2007). Some evidence shows these changes persist long-term (i.e., for 6 – 12 months; Maxwell et al., 2014; Muller & Rosenkranz, 2009). Significantly, however, it is not known whether these changes benefited an individuals' sexual experiences. Resounding a further note of caution, the majority of these studies relied

on participants with Axis I and/or II psychiatric diagnoses, some of whom were hospitalized (Fonagy et al., 1996; Kinley & Reyno, 2013; Kirchmann et al., 2012; Levy et al., 2006; Muller & Rosenkranz, 2009; Travis et al., 2001). Thus, the results may not generalize to non-psychiatric populations.

Also suggesting we might need to look further afield are the significant practical limitations of psychotherapeutic interventions. First, psychotherapy is often time intensive and, unless provided by the state or covered by insurance, a financially burdensome intervention that precludes many from seeking such a service (Ollerton, 1995). Indeed, psychotherapeutic interventions designed to reduce attachment insecurity frequently last several months and it is not uncommon for them to go on for a few years (Gerber, 2004; Levy et al., 2006). Second, some individuals (perhaps more avoidantly attached persons in particular) may find psychotherapy too threatening and require a less intensive or more indirect intervention to mitigate the effects of their attachment insecurities. Third, less serious attachment insecurities may not be so entrenched as to warrant psychotherapy. Accordingly, while intensive interventions may be required for persons with severe attachment dysfunctions and the associated mental health difficulties, interventions requiring less time, intensity, and financial resources should be explored so that a larger number of individuals may reap the benefits of a more soothed and contained attachment system.

Second, researchers have recently begun examining how the actions of a partner (i.e., "partner-buffering") or the quality of a relationship might buffer the manifestations of attachment insecurity (see Arriaga et al., 2018; Overall et al., 2016; Righetti et al., 2020; Simpson & Overall, 2014). Consistent with the different concerns characterizing anxious versus avoidant attachment insecurities, such investigations have indicated that what buffers anxiety and avoidance differs. Indeed, whereas experiences that affirm an individuals' worth and provide calm in otherwise threatening relationship situations appear to buffer the

expression of anxious attachment, partner behaviors that allow for "safe dependence" (i.e., dependence that minimizes constraints to autonomy) buffer the manifestations of avoidant attachment. For example, among more anxious individuals, affectionate touch from a partner mitigates jealousy (Kim et al., 2018), perceiving a partner to be more committed leads to more positive relationship evaluations (Overall et al., 2014), and having satisfying sex eliminates the relationship between attachment anxiety and marital satisfaction that same day (Little et al., 2010). In contrast, for more avoidant persons, a partner's use of indirect and subtle support strategies can reduce declines in relationship commitment (Girme et al., 2019), and a partner's softened communication strategies can reduce avoidant defenses and make for more successful conflict discussions (Overall et al., 2013). Intimacy-promoting activities can also promote greater relationship quality and self-disclosure (Stanton et al., 2017), and frequent sex eliminates the otherwise-normative link between greater attachment avoidance and lower marital satisfaction (Little et al., 2010).

Such research is significant as it provides evidence in support of Bowlby's (1980, 1988) theory that corrective relationship experiences can reduce attachment insecurity and/or its manifestations. Also heartening is that the techniques for buffering attachment insecurity highlighted in this research capitalize on the everyday relationship-enhancing capacities couples already have within them to regulate insecurity-generated relational and sexual difficulties. With practice, such strategies can be enacted regularly, unobtrusively, without cost, and without the need for a third party, making them accessible to all couples, should they be willing (and able) to employ them.

However, while research on "partner-buffering" of attachment insecurity shows promise for positively affecting the lives of those struggling with attachment insecurities, there are some important limitations. First, as the name suggests, "partner-buffering" strategies rely on an individual being in a romantic partnership, although not everyone who

wishes to mitigate the intra- and interpersonal effects of attachment insecurities is coupled-up. Indeed, at least in Western societies, individuals are single more frequently and for longer than ever before (Girme et al., 2016) and more (versus less) insecurely attached persons are more likely to fall into this 'single' group, given their weaker ties to others and greater likelihood of relationship dissolution (Gillath et al., 2017; Kirkpatrick & Hazan, 1994). Thus, if attempts to mitigate the intra and interpersonal costs of attachment insecurity rely solely on a partner-driven model, those who need support the most may struggle to be in a position to receive it.

Second, "partner-buffering" strategies rely on a partner being willing to transform impulses and instead act in more controlled ways to buffer a partner's attachment anxiety and/or avoidance, which likely comes with costs (Overall et al., 2013). Indeed, regularly holding one's own concerns at bay while attempting to "manage" a partner's concerns requires considerable effort, commitment, and motivation (Rusbult et al., 1991). Such regulatory effort may become tiresome and lead to reduced relationship satisfaction (Overall et al., 2014), especially if "partner-buffering" attempts do not reliably lead to any changes in an insecure partner's behavior.

For these reasons then, it seems prudent to consider other interventional modalities that might buffer the extent to which attachment anxiety and avoidance interfere with healthy relationship and sexual functioning. In particular, research should identify and test the effectiveness of insecurity-buffering strategies that can be enacted independently and with minimal cost. As is discussed more fully below, mindfulness—a process or characteristic encouraging attention to the present moment through a lens of acceptance (Bishop et al., 2004; Kabat-Zinn, 1990)—is one promising strategy.

1.6 Could Mindfulness Buffer the Manifestation of Attachment Insecurities?

Although mindfulness practices go back at least 2500 years (Gunaratana, 1993), clinical applications of and scholarly interest in mindfulness in the Western world have really only gained momentum since the 1980s. Initial studies investigating mindfulness as an antidote to chronic pain showed considerable promise (Kabat‐Zinn, 2003), leading to further applications of mindfulness across a broad range of physical and psychological health issues (e.g., Fordham et al., 2014; Grossman et al., 2004; Kuyken et al., 2015; Miller et al., 1995). With some exceptions (for reviews see Britton, 2019; Van Dam et al., 2018), the results of these studies have generally suggested that mindfulness, whether taught or measured as an inherent capacity, can appreciably improve health and wellbeing (e.g., Brown & Ryan, 2003; Dixon & Overall, 2016; Grossman et al., 2004; McCracken et al., 2007; Zvolensky et al., 2006).

More relevant to the purposes of this thesis, attention is increasingly being paid to how mindfulness may benefit *interpersonal* relationships. As part of this, a nascent body of research has started to consider the conceptual and empirical links between mindfulness and attachment security (e.g., Hertz et al., 2015; Pepping et al., 2015, 2018; Shaver et al., 2007; Siegel, 2016; Walsh et al., 2009). While less well developed, researchers have also started to consider whether mindfulness is comparably beneficial to persons high in attachment anxiety and/or avoidance (see Atkinson, 2013; Brown et al., 2007; Karremans et al., 2017), reducing the extent to which their insecurities "bleed out" into relationship experiences. At the time this thesis was first conceived, only one article had empirically assessed whether mindfulness buffered the manifestations of attachment insecurities (Saavedra et al., 2010). As will become clear, however, while findings were scanty, there was good theoretical grounds to suspect differences in the effects of mindfulness among persons with different attachment characteristics. Given this possibility and the relative accessibility of mindfulness training to

a wide range of people, the following chapter summarizes the benefits of mindfulness in general, in relationships, and then more specifically for persons with different types of attachment concerns. In doing so, a rationale is provided for an initial cross-sectional investigation assessing whether trait mindfulness buffers links between attachment insecurities (i.e., anxiety and avoidance) and a range of sexual motivations associated with adverse personal and relationship outcomes.

Chapter 2. Could Mindfulness Help More Insecure Persons' Successfully Navigate the Challenges of Intimate Relationships?

2.1 Introduction

As was briefly noted in the previous chapter, one possible means by which to buffer the unhelpful manifestations of attachment anxiety and avoidance on relationship outcomes is mindfulness. Growing evidence suggests that mindfulness can improve psychological and physical health (e.g., Fordham et al., 2014; Grossman et al., 2004; Kuyken et al., 2015; Miller et al., 1995), and, more recently, relationship outcomes (e.g., Carson et al., 2004; Kappen et al., 2018; Kimmes et al., 2018; Laurent et al., 2016; Wachs & Cordova, 2007). However, as is discussed more fully below, while mindfulness appears to be of benefit "in general," there is also reason to suspect it may be of particular benefit among more insecure persons, notably that it may be of distinct benefit for more anxious versus more avoidant insecurities. In laying the platform for the empirical consideration of these possibilities, this chapter briefly defines mindfulness and reviews evidence for its intra- and interpersonal benefits, providing both a general rationale for mindfulness' potential utility in buffering attachment insecurities as well as for its particular utility regarding anxious attachment.

2.2 A Brief History and Characterization of Mindfulness

Modern Western conceptualizations of mindfulness are generally thought to have their footing in Buddhist ideology. The word 'mindfulness' is said to come from the Pali term *sati*, meaning to "remember" or "call to mind" (Anālayo, 2010; Gethin, 1998; Nanamoli & Bodhi, 2005; Ţhānissaro, 2012). However, rather than being a function of memory, *sati* involves close and repeated observation of the mind and its contents (Purser & Milillo, 2015). More specifically, sati is thought to enable recollection and discernment of skillful and unskillful mental phenomena and actions in the past and present (Gethin, 1998; Ţhānissaro, 2012). Cultivating this quality is thought to facilitate "an undistorted vision of reality" (p.

267), wherein the contents of experience are not suppressed but neither are impulsive reactions automatically enabled (Anālayo, 2010). Continued practice of this way of being is thought to facilitate a deep presence of mind that contributes to the mitigation of suffering, the essential goal of the Buddhist path (Gethin, 1998).

Though some have argued that contemporary Western definitions of mindfulness operationalize it in ways that substantively differ from Buddhist canonical sources (see Purser & Milillo, 2015), overlaps remain. Indeed, Western conceptualizations characterize mindfulness as a two-component practice or characteristic requiring (1) sustained awareness of experiences occurring in the present moment and (2) the adoption of an open, curious, and accepting orientation toward those experiences (Bishop et al., 2004; Kabat-Zinn, 1990; Van Dam et al., 2018). Experientially, the former component is often described as being fully alive and present in each moment; it involves maintaining awareness of thoughts, feelings, and behaviors without elaborating on their meaning or getting caught up in rumination about their content (Bishop et al., 2004). Supporting this non-elaborative awareness, the second component requires individuals to relinquish attempts to force their experience to be anything other than what it is. Instead, individuals are encouraged to be open to and accepting of what arises in awareness, notwithstanding their intensity or discomfort (Baer et al., 2006; Bishop et al., 2004; Brown & Ryan, 2003). The combination of these two factors is thought to de-couple experience from habituated or automatic judgments and behavioral responses (Kang et al., 2013), freeing an individual up to new ways of thinking and being in the world that are perhaps healthier, more fulfilling, and—to borrow a translated Buddhist phrase—more skillful (Garland et al., 2015; Siegel, 2009).

To further characterize mindfulness, briefly distinguishing it from similar constructs is worthwhile. First, mindfulness, as it has come to be known in the West, is distinct from Langer and colleagues' (1989) construct by the same name. Langer's mindfulness is best

understood in terms of drawing distinctions between novel stimuli (Langer & Moldoveanu, 2000), a process that is thought to facilitate greater openness to ideas and enhanced problem-solving. While similar to Western definitions of mindfulness insofar as it includes an element of "wakefulness", Langer's mindfulness requires cognitive operations such as categorizing, evaluating, and appraising, which are distinct from the non-evaluative awareness implicit in modern Western characterizations of mindfulness. Second, mindfulness is distinct from self-awareness. Theories of self-awareness or self-consciousness focus on the content of consciousness (i.e., thoughts, motives, defenses; Buss, 1980; Duval & Wicklund, 1972; Fenigstein et al., 1975), whereas mindfulness is more concerned with the *quality* of consciousness (i.e., the *way* we pay attention to the contents of our mind). Finally, mindfulness is not synonymous with self-regulation, which involves comparing one's current and desired state and then initiating actions that facilitate the realization of the desired state (Carver & Scheier, 1998). While mindfulness involves the regulation of attention and may prompt more skillful management of experience that helps to realize goals, it is (paradoxically) not about reaching a goal per se.

As noted, mindfulness can be considered both a practice and dispositional characteristic. As a practice, mindfulness can be cultivated through formal meditation practices in which a person attempts to direct non-judgmental attention to stimuli within awareness (e.g., the breath, sounds, thoughts, physical sensations) or, informally, by bringing this quality of attention to bear on everyday tasks (Hanley et al., 2015). This way of being can be difficult to attain (Karremans & Papies, 2017), likely because large parts of our lives are dictated by habitual and unconscious processes (Bargh & Chartrand, 1999; Hicks & McNulty, 2019). Perhaps for this reason, several standardized interventions of varying intensities and lengths have been established to support the development of mindfulness (e.g., Mindfulness-Based Stress Reduction, Mindfulness-Based Cognitive Therapy; Kabat-Zinn,

1982; Teasdale et al., 2000). Inherent to all of these is an attempt to support an individual's ability to turn attention toward moment-to-moment experiences and relate to them with openness, curiosity, and non-reactivity (Creswell, 2017).

Importantly, in terms of the empirical contributions this thesis will make, rather than being a quality only established through practice or via interventions, mindfulness also varies in strength between people. While some individuals, either due to capability, inclination, or discipline, are dispositionally more aware of and attentive to the present moment with curiosity and acceptance, others struggle to deploy this kind of awareness (Brown & Ryan, 2003). Given such variations, several self-report measures have been developed to measure this "trait mindfulness" and examine its correlates (e.g., Baer et al., 2004, 2006; Brown & Ryan, 2003). As would be expected, there is variation across the measures, with some operationalizing mindfulness as a single factor (Brown & Ryan, 2003) and others arguing that trait mindfulness should be measured in ways that reflects its multi-dimensional nature (Baer et al., 2004, 2006; Feldman et al., 2007; Lau et al., 2006) and the way it is defined (e.g., Bishop et al., 2004; Dimidjian & Linehan, 2003; Segal et al., 2002). In line with this view, the most commonly used trait mindfulness measure—the Five Factor Mindfulness Questionnaire (Baer et al., 2006)—assesses mindfulness in terms of five key components: observing, describing, acting with awareness, non-reactivity, and non-judgment. Though all facets are recognized as essential to mindfulness, different mindfulness components may develop at different rates or in an interdependent sequence (Heeren et al., 2021) and/or have differential relevance to health outcomes (Medvedev et al., 2021; Roca et al., 2019). Analysis of mindfulness at the facet level is thus useful for the studies comprising this thesis as it permits a finer-grained understanding of the nature of mindfulness' relationship to attachment dimensions and interpersonal outcomes, and sheds light onto potential mechanisms for these relationships.

2.3 Mindfulness as an *Intra*personal Resource

Since the initial success of mindfulness interventions among persons with chronic pain (Kabat-Zinn, 2003), a large body of research has demonstrated that mindfulness is associated with positive effects across a spectrum of *intra*personal issues (e.g., Cavanagh et al., 2018; Chin et al., 2019; Hofmann et al., 2010; Murphy et al., 2012; Webb et al., 2019). In terms of physical health, for example, mindfulness interventions have been found to reduce pain sensitivity (Zeidan et al., 2010), systolic blood pressure (Scott-Sheldon et al., 2020), markers of inflammatory disease (Creswell et al., 2012; Malarkey et al., 2013), and HIV-pathogenesis (Creswell et al., 2009; Seyedalinaghi et al., 2012) relative to control interventions. Studies examining the effects of *trait* mindfulness are consistent with such findings, showcasing mindfulness' links with positive indices of cardiovascular health (Loucks et al., 2015; Tomfohr et al., 2015), the ability to cope with physical pain (Harrison et al., 2019; Senders et al., 2018), and sleep quality (Bogusch et al., 2016; Garland et al., 2013). The likelihood that individuals engage in health-promoting behaviors has also been shown to increase with greater trait mindfulness (Sala et al., 2020).

Considerable evidence has also accumulated over the past 25 years attesting to the benefit of mindfulness on *mental* health. For example, in a meta-analysis of over 200 interventional studies, mindfulness-based interventions led to moderate-sized reductions in anxiety, stress, and depressive symptoms compared to other active treatments (e.g., psychoeducation; Khoury et al., 2013), and these effects appear to be even stronger among persons suffering from anxiety and mood disorders (Hofmann et al., 2010; Khoury et al., 2013). Mindfulness interventions have also shown promise in treating or managing the symptoms of other psychological illnesses or conditions (e.g., Bowen et al., 2017; Chien et al., 2022; Hopwood & Schutte, 2017; Jasbi et al., 2018; Li et al., 2017; Schmidt et al., 2021), so much so that mindfulness now features heavily in mainstream psychotherapy (Harrington

& Dunne, 2015). In line with these findings, greater *trait* mindfulness has also routinely been associated with better mental health outcomes. Indeed, a meta-analysis of 148 studies showed a large, negative relationship between trait mindfulness and negative affectivity with specific mindfulness facets of non-judgment and acting with awareness exhibiting the most significant effects (Carpenter et al., 2019). Similar negative relationships have been found between trait mindfulness and other indices of poor psychological health (Boelen & Lenferink, 2018; Collins et al., 2018; Selby et al., 2016).

The profusion of research attesting to mindfulness' benefits on *intra*personal health outcomes has led researchers to consider *why* these benefits exist (e.g., Brown et al., 2007; Creswell & Lindsay, 2014; Garland et al., 2015; Kang et al., 2013; Lindsay & Creswell, 2017; Teper et al., 2013; Vago & David, 2012). While commentary regarding potential mechanisms varies, one underlying thread is the idea that mindfulness facilitates a greater ability to see events and experiences objectively. That is, instead of being engrossed *within* experience—as is often the case in habitual modes of daily life—with mindfulness, an individual is thought to be more able to step *outside* of experience and look upon it as a third-party might (Bernstein et al., 2015). Often referred to as "decentering" (Bernstein et al., 2015), this process of seeing things more objectively is thought to facilitate more effective emotional regulation and actions grounded in intentionality rather than impulsivity (Feldman et al., 2010; Papies et al., 2015; Sahdra et al., 2011). This, in turn, is thought to enhance an individual's ability to cope constructively with challenging experiences (Brown et al., 2012; Bullis et al., 2014; Creswell & Lindsay, 2014). Consistent with this view, brief and intensive mindfulness training has been shown to improve emotion- and self-regulation, as indexed by reduced reactivity to intrusive thoughts (Feldman et al., 2010) and improved response inhibition (Sahdra et al., 2011). Cross-sectional studies also attest to the positive associations between mindfulness and improved regulatory ability. For example, evidence suggests the

greater an individual's trait mindfulness, the greater their self-reported positive reappraisal (Hanley & Garland, 2014) and acceptance of difficult emotions (Pepping, O'Donovan, Zimmer-Gembeck, et al., 2014), the more benign their stress appraisals (Weinstein et al., 2009), and the less they engage in uncontrollable ruminative thinking (Raes & Williams, 2010). Thus, mindfulness appears to enhance individuals' inner resources which, in turn, improves overall mental and physical health.

2.4 Mindfulness as an Aid to Healthy Romantic Relationships

Despite the proliferation of studies examining mindfulness' effects on *intra*personal outcomes, considerably less research has investigated whether mindfulness may be of benefit *inter*personally, and in particular in romantic relationships. There are several reasons to suspect mindfulness may be of benefit in romantic relationships, though the interpersonal benefit of mindfulness is perhaps best illustrated by considering the impact of its absence. That is, the consequences of acting *without* an open and non-judgmental attention to present-moment experiences. Most couples experience relationship threats (i.e., conflict, attractive alternatives, outside stressors). More to the point, while the threats themselves are not *inherently* problematic, *how* individuals deal with those threats can be. In some views, when (as is often the case) responses to relationship threats are governed by unconscious and automatic negative processes (Hicks & McNulty, 2019; Karremans & Kappen, 2017), relationships can become caught in downward spirals of negativity that increase the likelihood of relationship unhappiness and dissolution. As an alternative to this habitual mode of operating, mindfulness may help to develop individuals' capacity to pause and engage in more deliberative evaluations and actions that foster greater relationship health.

At the time this thesis was conceived of, however, studies of mindfulness as applied to the interpersonal domain were relatively few. Early findings suggested that mindfulness interventions improved reports of relationship satisfaction and reduced relationship distress

(Carson et al., 2004), and were correlated with reports of better sexual functioning in women seeking treatment for sexual difficulties (Brotto et al., 2012; Brotto & Basson, 2014). Studies exploring the correlates of *trait* mindfulness corroborated and extended these early findings, showing that trait mindfulness was associated with lower rejection sensitivity and hostile attribution bias (Heppner et al., 2008; Peters et al., 2016), greater forgiveness (Johns et al., 2015), and higher sexual (Khaddouma et al., 2015; Pepping et al., 2018) and relationship satisfaction (e.g., Barnes et al., 2007; Jones et al., 2011; Pakenham & Samios, 2013), the latter potentially through greater partner acceptance (Kappen et al., 2018) and perceived partner responsiveness (Adair et al., 2018). Finally, experimental lab-based conflict studies also showed that greater trait mindfulness predicted less intense emotional and physiological stress responses to relationship conflict (Barnes et al., 2007; Kimmes et al., 2018; Laurent et al., 2013).

Interpretatively, the search for an understanding of why mindfulness may be of benefit to relational outcomes is ongoing (see Karremans et al., 2017; Ryan et al., 2007). Similar to ideas around why mindfulness produces *intra*personal benefits, Karremans (2017) has suggested that the greater awareness mindfulness affords should promote access to otherwise unconscious internal experiences, and this awareness, coupled with an acknowledgment that experiences are transient, should promote greater emotion- and self-regulatory capacities that improve the health of relationships (Karremans et al., 2017). More specifically, Karremans (2017) argues that the basic processes associated with mindfulness (e.g., awareness of otherwise unconscious and automatic responses, emotion- and self-regulation) should reduce the often-automatic translation of retaliatory impulses into behavior, improve individuals' ability to cope with stress within and outside of the relationship, and alter relationship cognition such that individuals' are more accepting of a partners' shortcomings and more tolerant of fluctuations in relationship functioning.

Studies showcasing the differential relationships between facets of trait mindfulness and relational outcomes also shed light onto the mechanisms behind mindfulness' interpersonal effects. Collective interpretation of the few studies in this line indicate that the acting with awareness facet of mindfulness (i.e., acting with conscious intention rather than impulsivity) is particularly beneficial to relationship satisfaction and stability, though the observing facet appears important too (Adair et al., 2018; Johns et al., 2015; Khaddouma et al., 2015; Khaddouma & Gordon, 2018). That acting with awareness appears most linked to salutary relationship outcomes is consistent with research in the *intra*personal domain, which indicates acting with awareness mindfulness is the most potent facet (Heeren et al., 2021) and is particularly beneficial in improving mental health (Chien et al., 2020; Raphiphatthana et al., 2018; Webb et al., 2019). Whether these facets continue to drive mindfulness' benefits vis-à-vis more insecurely attached individuals sexual and relationship experiences of, however, remains to be seen.

2.4.1 Does Mindfulness Offer Particular Interpersonal Benefit to more Insecure Persons?

More than being of *general* benefit in romantic relationships however, some theorists have argued that mindfulness may be of *particular* benefit to more insecure individuals. Specifically, it has been argued that mindfulness may increase attachment security by altering the cognitions underscoring attachment anxiety and avoidance (Karremans et al., 2017; Ryan et al., 2007; though see Stevenson et al., 2021 for experimental evidence that challenges this idea). Of greatest relevance to this thesis, it has also been suggested that mindfulness may increase more insecure individuals ability to *contain* attachment-related distress, such that their attachment concerns are less likely to "bleed out" in personally and relationally unhelpful ways (Karremans et al., 2017). Although empirical tests are lacking, this latter proposition implies a buffering argument: that mindfulness reduces the degree to which

insecure individuals' biases are brought to bear on their relational and sexual experiences. While a promising notion, at the time this thesis was conceived of only one study had tested this idea. Specifically, Saavedra (2010) found that the link between attachment anxiety (but not avoidance) and relationship dissolution across a year was eliminated when individuals were high in trait mindfulness.

Although only limited evidence had investigated the potential buffering role of mindfulness on links between attachment insecurity and adverse relationship and sexual outcomes prior to the publication of evidence reported in this thesis, studies in the *intra*personal domain had attested to mindfulness' buffering effects more generally. For instance, experimental evidence had already shown that mindfulness interventions and trait mindfulness reduced psychological and physiological reactivity *to* (Arch & Craske, 2006; Bullis et al., 2014; Creswell et al., 2014; Fogarty et al., 2015; Nyklíček et al., 2013; Taylor et al., 2011) and improved recovery *from* (Fogarty et al., 2015), experimentally-induced stressors. Also telling was that the health benefits of mindfulness interventions had been observed almost exclusively in persons with stress-sensitive conditions, such as chronic inflammation, HIV infection, and depression (Creswell et al., 2009; Hofmann et al., 2010; Khoury et al., 2013; Rosenkranz et al., 2013; Seyedalinaghi et al., 2012), leading researchers to surmise that mindfulness may improve health by buffering (1) the degree to which individuals appraise events as stressful, and (2) resulting stress responses when stressors *are* detected (Creswell & Lindsay, 2014). Put another way, at the time this thesis was conceived there were strong empirical and theoretical reasons to suspect that mindfulness could act as a buffer between events and adverse *intra*personal outcomes, giving credence to the notion that mindfulness may buffer links between attachment insecurities and detrimental relational and sexual outcomes in the *inter*personal domain.

In sum, despite the paucity of research into the potential buffering effects of mindfulness on the manifestations of attachment insecurity at the time this thesis was conceived, the implications of the available work, corroborating theoretical reasoning, and convergent evidence from the *intra*personal domain, had significant implications for persons high attachment insecurities and, arguably, their romantic partners. As was outlined in Chapter 1, attachment insecurities drive "schema-driven" processing of relational information (Dykas & Cassidy, 2011), which leads more insecure persons to interpret, explain, and respond to relationship and sexual experiences in more personally and interpersonally costly ways (Birnbaum, 2015; Birnbaum et al., 2011; Collins et al., 2006; Overall et al., 2015). Increasing more insecurely attached persons' capacity to be aware of attachment concerns with a lens of acceptance might offer protection against the often-detrimental consequences of attachment dynamics that are no longer suited to the contingencies of a current relationship. Mindfulness, therefore, may support more adaptive relationship functioning among more insecure persons, helping them manage how concerns are expressed by offering awareness and insight in situations where their attachment concerns are activated. In providing a much-needed test of this possibility, the following chapter presents the results of a preliminary, cross-sectional investigation testing whether trait mindfulness moderates the links between attachment insecurities and maladaptive sexual motivations. This study is, therefore, an important first step in establishing an evidence base for the potential buffering effect of mindfulness.

Chapter 3. Containing Attachment Concerns: Does Trait Mindfulness Buffer the Links Between Attachment Insecurity and Maladaptive Sexual Motivations?

3.1 Preface

As discussed in the preceding chapters, attachment anxiety and avoidance have the potential to interfere with optimal relational and sexual functioning. However, despite the established links between these characteristics and poorer relational and sexual functioning, little research has explored what might buffer these manifestations, notably as they pertain to sexuality.

In this regard, a central guiding idea for this thesis is that mindfulness may support more insecure individuals to manage attachment-related concerns, making them less likely to "bleed out" into typically less-adaptive thoughts, feelings, motives, and behaviors. There are two possible reasons that such "buffering" might occur. First, it has been suggested that mindfulness may enable more adaptive emotion- and self-regulatory strategies, including facilitating a greater recognition of otherwise unconscious and automatic responses and greater ability to inhibit these responses in the service of broader relationship goals (Karremans et al., 2017). These processes may be particularly beneficial to more insecure persons who typically experience greater relationship challenges (e.g., Beck et al., 2013; Campbell et al., 2005; Mikulincer, 1998; Overall et al., 2015; Rodriguez et al., 2019), which they struggle to regulate effectively (e.g., Campbell et al., 2005; Lanciano et al., 2012; Mikulincer & Orbach, 1995). Second, it has been suggested that mindfulness alters relationship cognitions, including those underlying anxious and avoidant attachment (Karremans et al., 2017). Change in attachment cognitions may, in turn, reduce the degree to which attachment insecurities manifest in affect, motivation, and behavior.

At the time the published article presented in the next chapter was conceived however, evidence testing the potential buffering effect of mindfulness on more insecure persons' relational and sexual functioning was negligible. Only one study had tested mindfulness' potential buffering effects, though this was on rates of relationship break-up rather than experiences *during* a relationship (Saavedra et al., 2010). Furthermore, there had been no prior studies testing the potential buffering effect of mindfulness on the *sexual* manifestations of attachment insecurities. This is a significant omission as sexual experiences can have stabilizing and enhancing effects on relationships (Birnbaum & Reis, 2019). However, more insecure persons may be less likely to reap such benefits because their attachment concerns unhelpfully "guide" both their sexual motivations and how they negotiate and satisfy sexual needs. Bringing mindfulness into the sexual domain may attenuate the degree to which attachment insecurities influence sexual functioning, thereby allowing more insecure individuals to benefit from sex to a greater degree than they might otherwise.

In further testing this possibility, the following chapter presents the second empirical test of whether mindfulness buffers the interpersonal manifestations of attachment insecurities, as well as the first test of whether trait mindfulness buffers the sexual manifestations of attachment concerns in sexual motivations. Previously published in the *Journal of Sex Research,* this study is a novel contribution that highlights how the potential utility of mindfulness in relational and sexual contexts depends on attachment characteristics.

Citation

Dixon, H. C., Reynolds, L. M., & Consedine, N. S. (2022). Containing attachment concerns: Does trait mindfulness buffer the links between attachment insecurity and maladaptive sexual motivations? *Journal of Sex Research*. Advance online publication. doi:10.1080/00224499.2022.2043229

3.2 Abstract

Individuals reporting greater insecure attachment are more likely to report maladaptive sexual motivations, such as sex to avoid negative relational and personal outcomes (e.g., conflict). Despite the costs of such sexual motivations, research is less clear regarding what might buffer the extent to which attachment insecurities manifest in such motives. The current study examined whether trait mindfulness moderates the links between attachment insecurity and maladaptive sexual motives. Participants (N = 194) completed measures of trait mindfulness, general sexual motivations, and attachment. As predicted, the links between attachment anxiety and having sex to cope and affirm the self were eliminated among individuals reporting higher levels of the acting with awareness facet of trait mindfulness. No such buffering effects were seen for attachment avoidance. Instead, acting with awareness mindfulness appeared to increase the extent to which more avoidantly attached individuals reported coping and self-affirmation-based sexual motives. These findings contribute to knowledge regarding the potential utility and limits of mindfulness in relational and sexual contexts, perhaps suggesting that mindfulness may help anxiously attached individuals manage the extent to which attachment concerns manifest in maladaptive sexual motivations. Findings of the study may inform both theory regarding mindfulness in interpersonal functioning and how mindfulness interventions might be deployed in sex therapy contexts.

3.3 Introduction

The extent to which sexual contact leads to increased versus decreased personal and relationship wellbeing depends partly on the sexual motivations people report (Cooper et al., 2011). As might be expected, sex to avoid negative personal or relational experiences is associated with lower sexual satisfaction and increases the likelihood of break-up (Cooper et al., 2011; Impett et al., 2005). Dispositional styles of relating to others—attachments—are

increasingly linked with variation in sexual motivations (e.g., Cooper et al., 2006). Research in this line indicates that persons high in attachment anxiety and/or avoidance are more likely to report sexual motivations indicative of issues with insecurity and intimacy (Davis et al., 2004; Schachner & Shaver, 2004). However, despite the costs associated with such motives, to our knowledge, no research has explored what might buffer the extent to which dimensions of insecure attachment manifest in potentially maladaptive sexual motivations. To address this gap, we test whether trait mindfulness—the tendency to bring attention to present experiences in a non-judgmental and accepting way (Baer et al., 2006; Bishop et al., 2004)—attenuates the degree to which individuals high in attachment insecurity use sex to fulfill maladaptive motives (i.e., sex to affirm the self, gain a partner's approval, or cope with difficult experiences).

3.3.1 The Impact of Sexual Motivations

Sex is often engaged in to pursue pleasure and intimacy (Meston & Buss, 2007). However, this is not always the case. Indeed, the personal and relational outcomes of a sexual experience depend, at least in part, on the motivations behind sexual activity (Cooper et al., 1998). Evidence suggests that individuals who engage in sex on the basis of 'approach' motivations (i.e., to seek a positive outcome or satiate needs) report higher sexual and relationship satisfaction, while those who engage in sex on the basis of avoidance motivations (e.g., to avoid partner anger or rejection) report lower sexual satisfaction and more negative attitudes toward sex (Cooper et al., 2011). For example, a daily diary study showed that on days when sex was used to satisfy avoidance-based goals like sex to avoid relationship conflict, prevent a partner from becoming upset, getting angry, or losing interest in them, participants reported greater negative affect, less satisfaction, closeness, fun, and more relationship conflict (Impett et al., 2005). In contrast, the opposite was true when individuals engaged in sex to pursue approach goals (Impett et al., 2005); prospectively, the

more individuals engaged in sex for avoidance-goals, the more likely they were to have broken up with their partner a month later (Impett et al., 2005).

3.3.2 Attachment Theory

While there are many ways to explain variations in sexual motivation, attachment theory presents a useful framework (Feeney & Noller, 2004). Adult attachment is stratified along two orthogonal dimensions: anxiety and avoidance (Brennan et al., 1998; Simpson et al., 1996). High attachment anxiety is characterized by low self-worth, greater worries about the possibility of rejection, concerns about the availability of close others, and hyperactivation (i.e., intensification) of emotion when attachment concerns are active (Mikulincer et al., 2003). In contrast, high scores on the avoidance dimension are characterized by concerns about the trustworthiness of others, discomfort with intimacy and interpersonal dependence, and a deactivation of emotion systems, in theory to manage attachment concerns (Mikulincer et al., 2003). Theory and empirical evidence suggest that variation on both dimensions is linked to different outcomes in situations of distress and/or dependence (i.e., attachment-relevant situations; Mikulincer et al., 2002; Simpson et al., 1996). Indeed, in attachment-relevant situations, individuals high in attachment anxiety tend to energetically prioritize closeness and intimacy in an attempt to secure proximity, love, and support (Blatt et al., 2003; Simpson et al., 2006). They are also more likely to ruminate on perceived relationship threats and their own shortcomings and excessively seek reassurance of their worth and their partner's availability (e.g., Hepper & Carnelley, 2012; Mikulincer et al., 2000; Peterson, 2014; Shaver et al., 2005). Conversely, those high in attachment avoidance tend to de-prioritize attachment-related goals for closeness and dependence and, instead, prioritize self-sufficiency (Blatt et al., 2003; Collins & Feeney, 2000). Consistent with their tendency toward deactivation strategies, they also tend to be less attentive to potentially threatening information (Edelstein & Gillath, 2008; Fraley et al., 2000) and can

avoid attachment-related thoughts and feelings during experiences of separation and loss (e.g., suppress thoughts of losing a partner or distract from them; Fraley & Shaver, 1997)

3.3.3 Attachment and Sexual Motivations

Given sexual behavior is normatively intimate, it has been suggested that the sexual and attachment behavioral systems are closely linked (Shaver & Mikulincer, 2006); sex can be used to satiate attachment needs by offering opportunities for increased proximity, protection, approval, and intimacy (Birnbaum & Reis, 2019). Consistent with this view, attachment anxiety and avoidance are associated with differences in sexual motives (e.g., Cooper et al., 2006; Impett et al., 2008). For instance, research suggests that the low self-worth and rejection fears typical of those high in attachment anxiety follow them into the bedroom, prompting them to engage in sex to reassure themselves of their value, receive care, and/or hold on to a partner. Attachment anxiety is associated with reports of a higher interest in sex *when* feelings of relationship insecurity are active (Davis et al., 2004) and their motivations for sex often reflect a need to gain favor with, or proximity to, their partner (Schachner & Shaver, 2004). For example, such individuals report using sex as a way to elicit nurturance, please their partner, gain protection from their partner's anger, and/or make their partner love them more (Davis et al., 2004; Impett et al., 2008; Schachner & Shaver, 2004). In addition, consistent with their typically negative views of the self, they report engaging in sex to feel confident and desirable and to cope better with uncomfortable emotions (Schachner & Shaver, 2004).

Attachment avoidance also manifests in potentially maladaptive sexual motivations (Cooper et al., 2006). Existing research indicates that avoidantly attached individuals explicitly avoid using sex as a means of building intimacy with their partner (Schachner & Shaver, 2004) and they report sexual motivations linked to autonomy goals. For example, attachment avoidance is associated with reports of using sex to affirm the self and one's

power (Cooper et al., 2006; Davis et al., 2004; Schachner & Shaver, 2004), avoid the emotional aspects of relationships (Schachner & Shaver, 2004), and avoid negative relational outcomes (e.g., conflict; Impett et al., 2008).

3.3.4 Trait Mindfulness, Attachment Insecurity, and Maladaptive Sexual Motivations

Despite the personal and interpersonal costs of the sexual motivations characterizing anxious and avoidant attachment, there appears to be no research examining what might buffer such motives. In contributing to this gap, the current study tests whether trait mindfulness—the tendency to be aware and attentive to the present moment in a non-judgmental manner (Bishop et al., 2004)—may attenuate the extent to which insecure attachment characteristics manifest in potentially maladaptive sexual motivations.

Prior work demonstrates that trait mindfulness predicts better psychological and physical health (Brown & Ryan, 2003; Grossman et al., 2004) and confers benefits in relational (Barnes et al., 2007; Carson et al., 2004; Dixon & Overall, 2018) and sexual situations (Leavitt, Maurer, et al., 2021; Pepping et al., 2018; Velten et al., 2020). Multiple cross-sectional studies have linked trait mindfulness to greater attachment security (for a review and meta-analysis, see Stevenson et al., 2017) and noted that trait mindfulness and attachment security are associated with many of the same beneficial outcomes (Pepping, O'Donovan, & Davis, 2014; Shaver et al., 2007), such as greater and more stable self-worth (Heppner & Kernis, 2007; Pepping, O'Donovan, et al., 2013), better emotion-regulation (Hill & Updegraff, 2012), greater relationship satisfaction (Quinn-Nilas, 2020), and lower reactivity to personal and interpersonal stress (Barnes et al., 2007; Dixon & Overall, 2016; Kimmes et al., 2018).

The positive association between attachment security and high trait mindfulness has led scholars to hypothesize that the qualities of mindfulness may be particularly beneficial for persons whose attachment-concerns make it more difficult for them to engage constructively

in challenging relationship situations (Karremans et al., 2017; Ryan et al., 2007). Karremans et al. (2017), for example, argue that four key processes associated with mindfulness—namely awareness, emotion-regulation, executive-control, and self-other connectedness—should help with managing challenging relationship situations, specifically impacting key relationship processes, such as the inhibition of unhelpful impulses and the management of stressors that may otherwise lead to patterns of negative reciprocity.

In theory, mindfulness-linked enhancement of the ability to navigate relational challenges should be particularly relevant to those high in attachment insecurity. It has been suggested that mindfulness may alter relationship cognitions, including those regarding attachment. Specifically, it has been suggested that mindfulness may reduce the extent to which cognitions underlying insecure individuals' attachment orientation/s manifest in affect, motivation, and behavior (Karremans et al., 2017). Mindfulness may act as a "safe haven", allowing individuals to 'hold' attachment discomforts rather than letting their attachment concerns "bleed out" in potentially unhelpful ways (Karremans et al., 2017). In the context of sexual decision-making, these processes may reduce the extent to which attachment insecurities result in sex being used to avoid relationship threats and negative feelings.

However, evidence supporting this theorizing has only shown that trait mindfulness buffers the manifestation of attachment anxiety, not avoidance. Specifically, Saavedra et al. (2010) found that trait mindfulness reduced the likelihood of relationship dissolution among individuals high in attachment anxiety. More broadly, given the different concerns underlying these attachment dimensions and the different strategies used to manage these concerns (Mikulincer et al., 2003), it is possible that mindfulness will differentially moderate the links between (1) attachment anxiety and relational outcomes and (2) attachment avoidance and relational outcomes. Consistent with this possibility, theory suggests that attachment anxiety and avoidance and their manifestations are likely reduced under different conditions (Arriaga

et al., 2018). Whereas more anxiously attached individuals are thought to become more secure or at least operate in more secure-functioning ways when self-confidence and the ability to tolerate negative feelings increases, more avoidantly attached individuals are thought to become more secure when they experience and internalize situations that contradict their negative views of others (Arriaga et al., 2018). While not designed to explain how *mindfulness* fosters more secure attachment per se, but rather how relational situations may do so, this theory makes a salient point: the factors that buffer attachment anxiety may or may not have the same effects on attachment avoidance (Arriaga et al., 2018).

Given only one study has explored the potential buffering effect of mindfulness on the manifestations of attachment insecurities (Saavedra et al., 2010) and little is known about whether buffering effects are comparable for anxious versus avoidant attachment, the current study tests whether trait mindfulness buffers the degree to which attachment anxiety and avoidance predict maladaptive sexual motivations. Based on prior evidence, we predicted that trait mindfulness would decrease the extent to which anxious attachment predicted self-affirmation-based, coping-based, and partner-approval-based sexual motives. Predictions regarding potential buffering of the relationship between attachment avoidance and sexual motivations were less clear. As mentioned, there is no prior evidence of mindfulness buffering the links between attachment avoidance and relationship outcomes. However, it is possible that mindfulness may reduce the concerns more avoidantly attached individuals hold regarding the trustworthiness of others and/or help them manage the way their concerns are expressed by offering awareness and insight into instances where their attachment concerns are activated (Karremans et al., 2017). Such processes may reduce the experience or reporting of more maladaptive sexual motivations in more avoidantly attached individuals.

3.4 Methods

3.4.1 Participants

The University of Auckland Human Participants Ethics Committee provided ethical approval (Reference Number: 024533). People fluent in English, aged 18+ years, living in New Zealand, and who were currently or previously in a romantic relationship were invited to participate in a cross-sectional study on "Relationships, Sexuality, and Health". Study advertising was distributed via email, word-of-mouth, and social media (i.e., posting on community Facebook pages). Participants were required to "opt-in" to the study; no direct recruitment occurred. Prospective participants were informed that participation was voluntary, responses would be anonymous, they could withdraw from the study at any time, and they could opt-in to a prize draw to win one of two $100 shopping vouchers.

Two-hundred and fifty-three participants consented to participate. However, participants that were not in a current relationship (n = 32), only partially completed the questionnaire (n = 25), or who had never had a sexual relationship were excluded from analyses (n = 2), leaving a final sample of 194. Participants in the final sample ranged from 18 to 63 years of age (M = 29.48, SD = 9.48) and were in a current romantic relationship that had an average length of 71.38 months (SD = 74.84). Demographic data can be found in Table 3.1.

3.4.2 Procedure

Following ethical approval, data was collected between June and August 2020. Prospective participants responded to study advertising by emailing the researcher, who then asked them to confirm eligibility and sent an information sheet. This email also contained a link to a Qualtrics-administered consent form, which prospective participants could navigate to if they were eligible and still interested. Following this, participants completed a battery of questionnaires assessing demographics, trait mindfulness, attachment, and sexual motivations. Completing the questionnaires took approximately 35 minutes. Participants who completed the questionnaires had the opportunity to enter the prize draw.

Table 3.1

Sample demographics

	n	%
Gender		
Female	165	85.1
Male	23	11.9
Gender Diverse	6	3.1
Relationship Status		
Dating	58	29.9
Not Married but Living Together as a Couple	87	44.8
Married or in a Civil Union	49	25.3
Sexual Orientation		
Heterosexual	146	75.3
Bisexual	36	18.6
Gay, Lesbian, Queer	7	3.6
Other	5	2.6
Relationship Type		
Monogamous	181	93.3
Polyamorous	3	1.5
Open	8	4.1
Other	2	1.0
Ethnicity		
NZ European/Pākehā	143	73.7
NZ Māori	31	16
European	23	11.9
Asian	12	6.2
Pacific	5	2.6
Indian	4	2.1
Other	12	6.2

3.4.3 Measures

All questionnaire measures were scored and averaged so that higher scores reflect greater levels of the construct. Descriptive statistics and correlations across the questionnaire measures are shown in Table 3.2.

Table 3.2

Descriptive Statistics and Correlations Between Study Measures

	Mean (SD)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Attachment Anxiety	3.29 (1.18)	-									
2. Attachment Avoidance	2.54 (.94)	.53***	-								
3. TM – Observe	3.38 (.68)	-.02	-.15*	-							
4. TM – Describe	3.42 (.78)	-.33***	-.33***	.21**	-						
5. TM – Act Aware.	3.04 (.72)	-.20**	-.24**	.02	.23**	-					
6. TM – Non-Judgement	2.95 (.91)	-.45***	-.21**	-.23**	.23**	.37***	-				
7. TM – Non-Reactivity	2.90 (.67)	-.33***	-.22**	.25***	.34***	.37***	.42***	-			
8. SM – Intimacy	3.83 (.88)	-.01	-.30***	.35***	.18*	.30***	-.10	.10	-		
9. SM – Self-Affirmation	2.33 (.86)	.25***	.03	.16*	-.07	-.14*	-.30***	-.02	.25***	-	
10. SM – Coping	1.87 (.78)	.22**	.08	.14*	.01	-.14*	-.22**	.04	.11	.60***	-
11. SM – Partner Approval	1.72 (.91)	.46***	.30***	-.16*	-.30***	-.22**	-.25***	-.27***	-.05	.40***	.17*

* p <.05 **p < .01 ***p < .001 *Note.* TM = Trait Mindfulness, SM = Sexual Motivation, Act Aware = Acting with Awareness

Trait Mindfulness.

Trait mindfulness was assessed with the 39-item Five Factor Mindfulness Questionnaire (FFMQ; Baer et al., 2006), which has good psychometric properties (Christopher et al., 2012). The FFMQ has 5 facets, including observing (being aware of inner and outer stimuli), describing (mentally putting experience into words), acting with awareness (taking considered action as opposed to acting absent-mindedly (i.e., "reacting")), non-judging (refraining from evaluating or criticizing an experience), and non-reactivity (resisting impulsive reactions). Items were rated on a 5-point scale from 1 (never or very rarely true) to 5 (very often or always true). Reliabilities ranged from 0.78 to 0.91.

Attachment Insecurity.

Attachment anxiety and avoidance were measured using the Revised Experiences in Close Relationships Questionnaire (ECR-R; Fraley et al., 2000), which has good factor structure and internal reliabilities (Sibley & Liu, 2004). Participants rated two 18-item subscales assessing attachment avoidance (e.g., "I find it difficult to allow myself to depend on romantic partners") and attachment anxiety (e.g., "I'm afraid that I will lose my partner's love") on a 7-point scale from 1 (strongly disagree) to 7 (strongly agree). Each subscale demonstrated good internal reliability (both were 0.92). Participants reported, on average, relatively low levels of attachment anxiety and avoidance. As is typical, levels of attachment anxiety and avoidance were positively correlated ($r = .53$, $p < .001$).

Sexual Goals.

To measure motivations for engaging in sex, we used 4 of the 6 subscales in Cooper and colleagues' (1998) Sexual Motivations Scale. Self-enhancement and peer-pressure-based sexual motives subscales were not administered as they were not deemed as theoretically relevant to the study questions and intended sample. Items tapped the degree to which a participants' engagement in sexual activity was motivated by a desire to gain intimacy (e.g.,

"I have sex to be more intimate with my partner"), affirm the self (e.g., "I have sex to feel more confident"), cope with stressors (e.g., "I have sex to feel better when low"), and/or gain partner approval (e.g., "I have sex because I fear my partner won't love me if I don't have sex"). The 19-items were rated on a 5-point scale from 1 (almost never) to 5 (almost always). Subscale reliabilities ranged from 0.81 to 0.90.

3.4.4 Statistical Analysis

Data were analyzed using IBM SPSS Version 26. Analyses began by assessing the relationship between the study measures using Pearson correlations. Next, a series of multivariate linear regressions were used to assess whether attachment, trait mindfulness, and their interaction(s) predicted sexual motivations.

3.5 Results

3.5.1 Correlations Between Study Measures

Descriptive statistics and correlations between all measures are presented in Table 3.2. As predicted, both attachment anxiety and avoidance were inversely related to describe, act with awareness, non-judgment, and non-reactivity mindfulness facets, although only attachment avoidance was associated with observe facet scores. Attachment avoidance and anxiety were also consistently related to sexual motivations. In particular, both attachment dimensions were associated with a greater motivation to have sex to gain a partner's approval (attachment anxiety $r = .46$; attachment avoidance $r = .30$). Attachment anxiety but not attachment avoidance was associated with greater motivation to have sex to affirm the self ($r = .25$) and cope ($r = .22$), while attachment avoidance but not attachment anxiety was associated with a lower motivation to have sex to build intimacy ($r = -.30$).

All mindfulness facets were inversely related to motivations to have sex to gain a partner's approval. Acting with awareness and non-judgment were associated with lower self-affirmation and coping sexual motivations, whereas the observe facet was associated

with a greater motivation to have sex to affirm the self and cope. Finally, the observe, describe, and acting with awareness facets of mindfulness were associated with greater motivation to have sex to build intimacy.

3.5.2 Trait Mindfulness, Attachment, and Sexual Motivations - Main and Moderation Effects

To follow, a set of regression analyses were conducted in which attachment facets, trait mindfulness facets, the interactions between all attachment and mindfulness variables, as well as age, relationship length, and two dummy coded gender variables (as covariates) were simultaneously entered. The results of these multivariate linear regressions predicting each of the four sexual motivations are presented in Table 3.3.

The overall models predicting motivations to have sex to build intimacy ($F(21, 172) = 4.40$, $R^2 = .35$, $p < .001$), affirm the self ($F(21, 172) = 2.33$, $R^2 = .22$, $p = .002$), cope ($F(21, 172) = 2.58$, $R^2 = .24$, $p < .001$), and to gain a partner's approval ($F(21, 172) = 4.46$, $R^2 = .35$, $p < .001$) were all significant. Consistent with predictions and prior research, attachment anxiety predicted greater motivation to have sex to affirm the self, cope, and gain a partner's approval. Attachment avoidance, on the other hand, only predicted a lower motivation to have sex to build intimacy. In terms of trait mindfulness, observe and acting with awareness mindfulness predicted a greater motivation to have sex to build intimacy. Observe mindfulness also predicted less motivation to have sex to gain a partner's approval. As predicted, greater non-judgment scores predicted a lower motivation to have sex to affirm the self but, unexpectedly, also less motivation to have sex to build intimacy. Finally, non-reactivity predicted more motivation to have sex to cope.

Table 3.3 *Multivariate Linear Regressions Predicting the Four Sexual Motivation Variables, Controlling for the Effect of Gender, Age, and Relationship Length*

	SM – Intimacy			**SM – Self-Affirmation**			**SM – Coping**			**SM – Partner Approval**		
	B	***SE***	***t***	***B***	***SE***	***t***	***B***	***SE***	***t***	***B***	***SE***	***t***
Female or not	.31	.32	.96	.28	.34	.85	.53†	.29	1.84	-.14	.31	-.46
Male or not	.55	.35	1.55	.14	.38	.37	.36	.32	1.13	.08	.34	.23
Age	-.00	.01	-.10	-.01	.01	-1.05	-.00	.01	-.16	-.01	.01	-1.09
Relationship Length	-.00	.00	-.76	.00	.00	.75	.00	.00	.28	.00†	.00	1.79
Attachment Anxiety	.04	.07	.51	.16*	.08	2.04	.15*	.07	2.21	.26***	.07	3.67
Attachment Avoidance	-.19*	.09	-2.23	-.03	.09	-.38	.05	.08	.69	.01	.08	.07
TM – Observe	.29**	.09	3.13	.03	.10	.35	.04	.08	.51	-.18*	.09	-1.99
TM – Describe	.09	.08	1.10	.02	.09	.21	.10	.07	1.32	-.15†	.08	-1.90
TM – Act with Awareness	.36***	.09	3.94	-.10	.10	-.99	-.14†	.08	-1.71	-.14†	.09	-1.63
TM – Non-Judgement	-.17*	.08	-2.01	-.22*	.09	-2.48	-.11	.08	-1.49	-.06	.08	-.72
TM – Non-Reactivity	.01	.11	.12	.19†	.11	1.71	.23*	.10	2.37	.01	.10	.07
Attanx X Observe	-.14	.10	-1.42	-.12	.11	-1.12	.10	.09	1.12	-.07	.10	-.74
Attanx X Describe	.11	.09	1.27	.02	.09	.21	-.02	.08	-.27	-.11	.08	-1.35
Attanx X Act with Awareness	-.07	.10	-.68	-.22*	.10	-2.20	-.27**	.09	-3.16	-.13	.09	-1.36
Attanx X Non-Judgment	-.04	.09	-.47	-.07	.09	-.81	.24**	.08	3.04	-.11	.08	-1.37
Attanx X Non-Reactivity	-.12	.11	-1.04	.10	.12	.86	-.09	.10	-.85	.01	.11	.13
Attavd X Observe	.22†	.12	1.93	.06	.12	.52	-.06	.11	-.60	.01	.11	.08
Attavd X Describe	-.18	.11	-1.57	-.06	.12	-.47	-.05	.10	-.50	-.05	.11	-.49
Attavd X Act with Awareness	.09	.12	.76	.35**	.13	2.71	.33**	.11	2.93	.12	.12	1.00
Attavd X Non-Judgment	.02	.11	.14	.13	.11	1.17	-.05	.10	-.52	-.00	.10	-.01
Attavd X Non-Reactivity	.08	.15	.54	-.04	.16	-.24	.09	.14	.63	.06	.15	.37

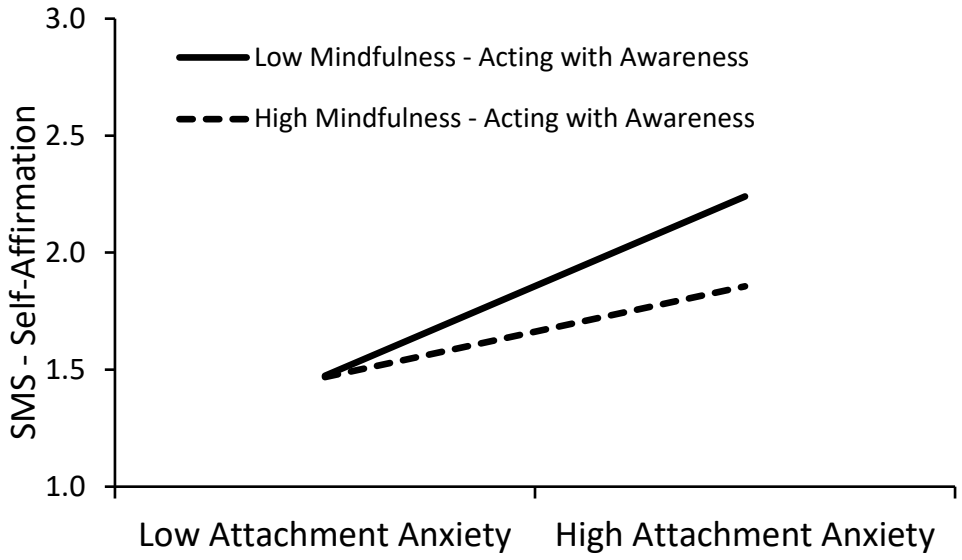
† $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$ *Note*. Gender was dummy coded so that it could be controlled for in the models. SM = Sexual Motivation, TM = Trait Mindfulness, Attanx = Attachment Anxiety, Attavd = Attachment Avoidance

3.5.3 Mindfulness Facets Moderate Attachment Anxiety—Sexual Motivation Links

Importantly in terms of the primary question guiding this research, the main effects of attachment on sexual motivations were qualified by several interactions between attachment dimensions and mindfulness facets. For attachment anxiety's effects, analyses revealed that the effect of attachment anxiety in predicting a greater motivation to have sex to affirm the self was moderated by acting with awareness. Simple slopes decomposing this interaction (Cohen et al., 2003) revealed that while self-affirmation motivations increased with attachment anxiety among those with lower acting with awareness mindfulness (-1 *SD*; b = .34, SE = .10, t = 3.59, $p < .001$), attachment anxiety was only marginally related to self-affirmation motivation among those with greater acting with awareness scores (+1 *SD*; b = .17, SE = .10, t = 1.83, p =.069; see Figure 3.1).

Figure 3.1

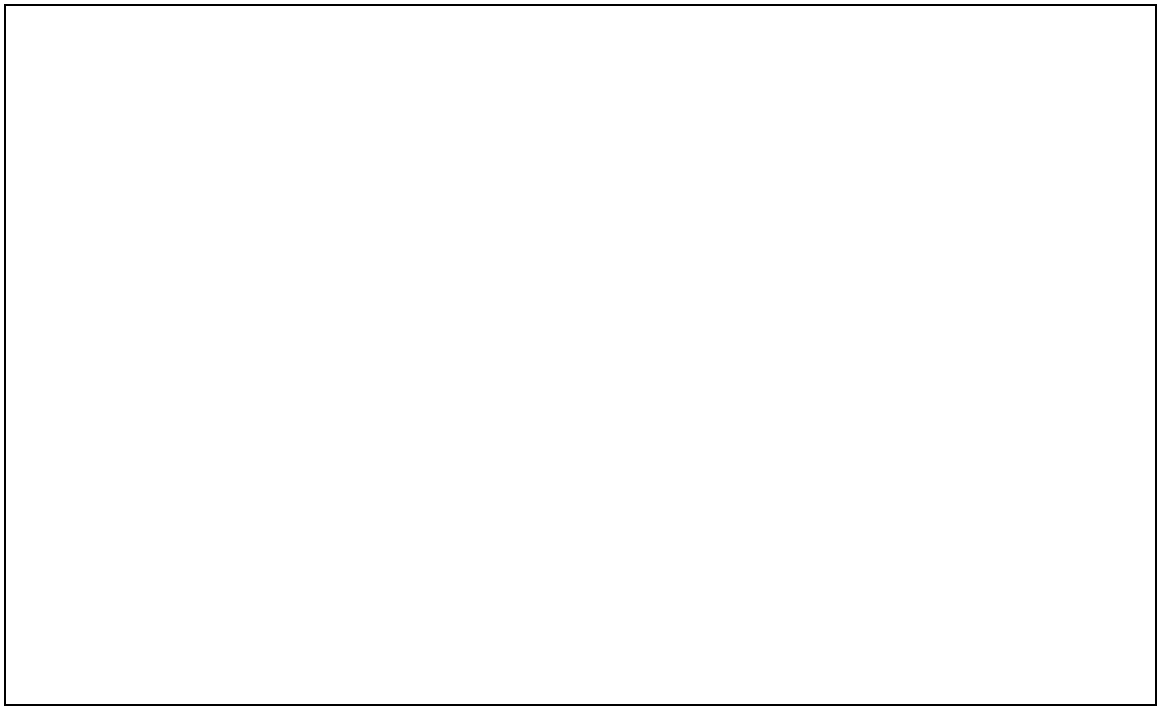
The moderation effect of acting with awareness on the relationship between attachment anxiety and motivations to have sex to affirm the self



Similarly, and also in line with predictions, while attachment anxiety predicted greater motivation to use sex in coping, an interaction with acting with awareness showed that this association was only significant for individuals lower (-1 *SD*; $b = .33$, $SE = .09$, $t = 3.73$, $p < .001$) but not higher (+1 *SD*; $b = -.04$, $SE = .09$, $t = -.44$, $p = .660$) in acting with awareness (see Figure 3.2).

Figure 3.2

The moderation effect of acting with awareness on the relationship between attachment anxiety and motivations to have sex to cope

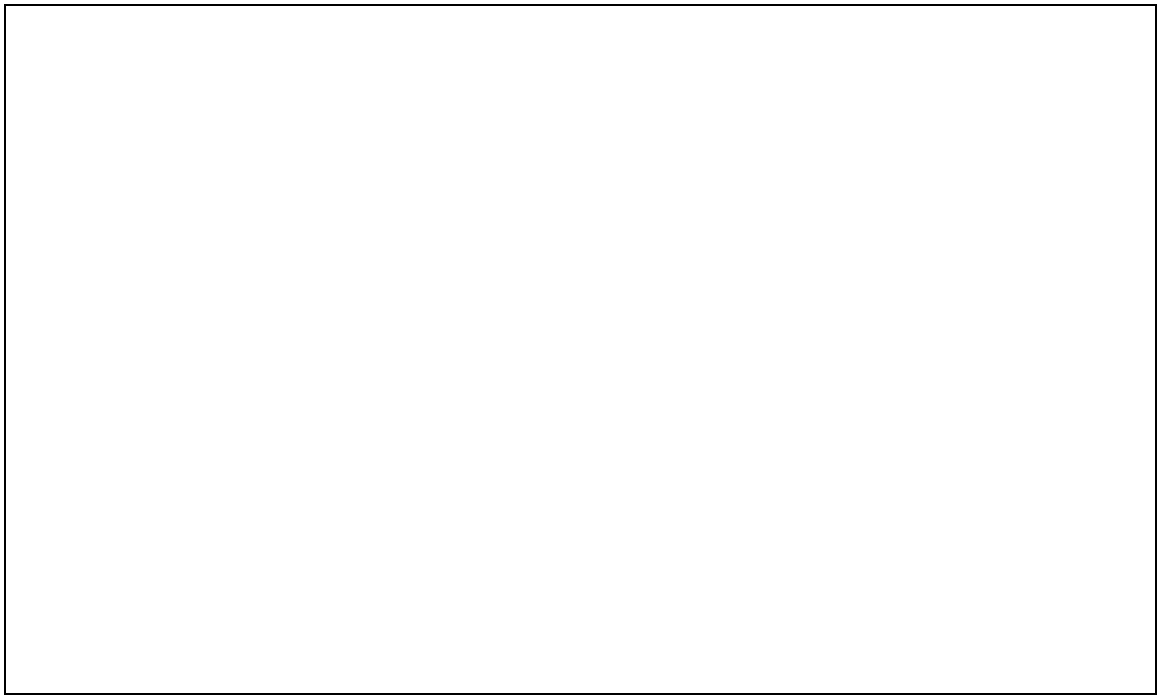


Unexpectedly, an interaction between attachment anxiety and non-judging mindfulness showed that the positive association between attachment anxiety and coping-based sexual motivations was evident only when individuals were higher (+1 *SD*; $b = .36$, $SE = .10$, $t = 3.71$, $p < .001$) but not lower (-1 *SD*; $b = -.07$, $SE = .10$, $t = -.72$, $p = .473$) in non-judging mindfulness (see Figure 3.3). In contrast to this general pattern, however, contrasts of levels of coping motives between those high versus low in non-judging mindfulness were

non-significant at *high* attachment anxiety (+1 SD; b = .11, SE = .11, t = 1.04, p = .301), but were significant at low attachment anxiety (-1 SD; b = -.41, SE = .12, t = -3.45, p = .001), indicating that non-judging mindfulness only impacted levels of coping-based motives when attachment anxiety is low.

Figure 3.3

The moderation effect of non-judging on the relationship between attachment anxiety and motivations to have sex to cope



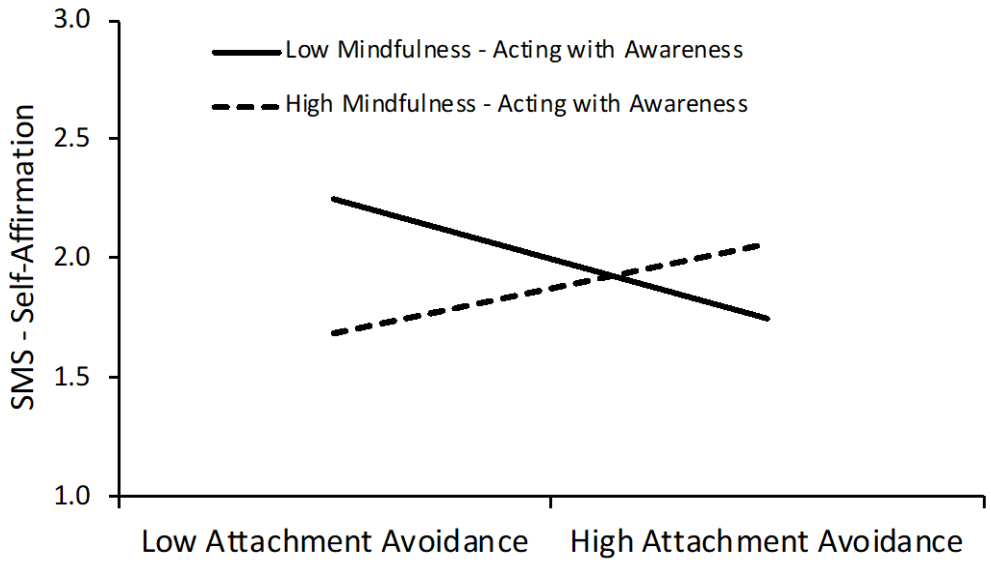
3.5.3 Mindfulness Facets Moderate Attachment Avoidance—Sexual Motivation Links

There were two significant moderation effects on attachment avoidance. First, while attachment avoidance did not predict self-affirmation-based sexual motives as a main effect, attachment avoidance and acting with awareness interacted in predicting this motive. Specifically, simple slopes revealed that self-affirmation-based sexual motives decreased with attachment avoidance when individuals were low in acting with awareness (-1 *SD*; b = -.27, SE = .12, t = -2.25, p = .026). This relationship was not evident when individuals were

high in acting with awareness mindfulness, though high acting with awareness mindfulness tended to increase the extent to which more avoidantly attached individuals engaged in sex for self-affirmation-based reasons (+1 *SD*; $b = .20$, $SE = .13$, $t = 1.57$, $p = .118$; see Figure 3.4).

Figure 3.4

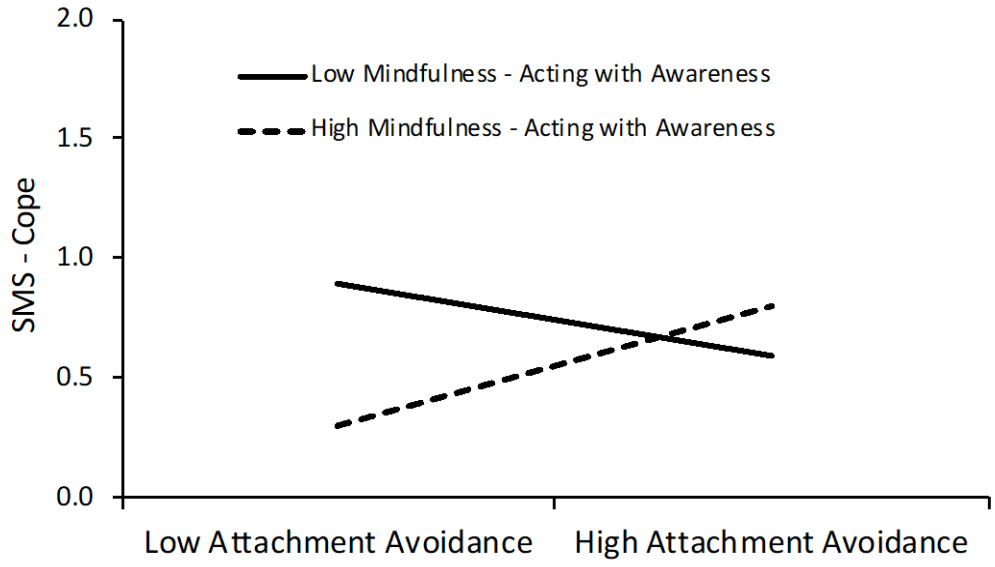
The moderation effect of acting with awareness on the relationship between attachment avoidance and motivations to have sex to affirm the self



Finally, there was a significant interaction between attachment avoidance and acting with awareness in the prediction of coping-based sexual motives. Analysis of the simple slopes revealed that while coping-based sexual motives increased with attachment avoidance when acting with awareness was high (+1 *SD*; $b = .27$, $SE = .11$, $t = 2.45$, $p = .015$), coping-based sexual motives tended to decrease with attachment avoidance when acting with awareness was low (-1 *SD*; $b = -.17$, $SE = .10$, $t = -1.62$, $p = .108$; see Figure 3.5).

Figure 3.5

The moderation effect of acting with awareness on the relationship between attachment avoidance and motivations to have sex to cope



3.6 Discussion

Supporting our primary prediction, results demonstrated that aspects of trait mindfulness buffered the links between attachment anxiety (but not attachment avoidance) and some sexual motivations often associated with maladaptive outcomes. Specifically, we found that acting with awareness mindfulness eliminated the relationship between attachment anxiety and self-affirmation-based and coping-based sexual motives. Unexpectedly, however, non-judging mindfulness *increased* more anxiously attached individuals' tendency to report coping-based sexual motivations, though the difference was only significant at low, not high, attachment anxiety. Associations between attachment avoidance and sexual motivations were more complex. Acting with awareness mindfulness tended to strengthen the link between attachment avoidance and both self-affirmation-based and coping-based sexual motives. In other words, greater levels of trait mindfulness tended to increase more maladaptive sexual motivations among persons reporting greater attachment avoidance. What follows is an

interpretation of these findings with reference to existing theory and evidence regarding mindfulness and attachment security-enhancing processes.

3.6.1 Mindfulness and Attachment Anxiety

Scholars have theorized that mindfulness may be particularly beneficial for persons whose attachment concerns make it more difficult for them to engage constructively in challenging relationship situations, potentially by fostering greater attachment security (Ryan et al., 2007) or supporting them to better manage the way their attachment concerns are expressed (Karremans et al., 2017). However, rather than affecting attachment anxiety and avoidance in the same way, there are reasons to suspect that mindfulness might specifically be of benefit vis-à-vis attachment anxiety. First, there is already an empirical precedent for mindfulness buffering the manifestations of attachment anxiety but not avoidance: Saavedra et al. (2010) showed that trait mindfulness buffered the link between attachment anxiety and relationship break-up.

Second, from a mechanistic point of view, the ingredients of mindfulness are arguably more relevant to the availability/abandonment and self-worth concerns that characterize attachment anxiety. Theory suggests that anxiously attached individuals are likely to become more secure or at least operate in more secure-functioning ways *when* they use strategies or experience situations that (1) strengthen their model of self and/or (2) momentarily calm perceived relationship threats (Arriaga et al., 2018). Given that mindfulness is characterized by greater acceptance of emotional experiences (Bishop et al., 2004), less threat perception, and better emotion regulation when threats *are* perceived (Weinstein et al., 2009), mindfulness might be differentially effective at soothing the attachment concerns of more anxiously attached persons. Rather than being caught in distressing streams of thought about the possibility of rejection or the availability of a partner, mindfulness may offer more anxiously attached individuals a more objective way of looking at their experiences. In the

short term, changes in the way feelings are experienced may enable more anxiously attached individuals to better regulate feelings and operate in ways that are more conducive to their own wellbeing (e.g., less motivation to engage in sex to affirm the self or cope with difficult experiences). In the longer term, characteristic down-regulation of perceived threats may strengthen their model of self (i.e., confidence and a "safe haven"; Karremans et al., 2017), which may result in greater attachment security (cf Stevenson et al., 2021).

Notably, however, these buffering effects were exclusively offered by the acting with awareness facet of mindfulness, perhaps indicating that some aspects of mindfulness are more effective than others in altering the manifestations of attachment anxiety. That it was specifically acting with awareness that buffered may not be entirely surprising. A recent network analysis evaluating the probabilistic dependencies between mindfulness facets showed that acting with awareness mindfulness was the most potent facet, from which other facets were derived (Heeren et al., 2021). Similarly, several longitudinal intervention studies have suggested that acting with awareness mindfulness may be particularly efficacious in improving mental health (Chien et al., 2020; Raphiphatthana et al., 2018; Webb et al., 2019), a pattern that may extend to relationship and attachment functioning. It may be that being aware of moment-to-moment experiences and responding to them with intentionality rather than with automaticity is central to mindfulness in the context of relational functioning, offering new ways of managing attachment distress, which in turn buffers the translation of attachment concerns into maladaptive sexual motivations.

However, while interactions between acting with awareness mindfulness and attachment anxiety were broadly consistent with theory, the third finding regarding anxious attachment (that non-judging mindfulness increased the likelihood that more anxiously attached individuals' reported coping-based sexual motivations) was unexpected. While we cannot know for sure, it is possible that non-judging mindfulness increased acceptance of

difficult experiences, including impulses arising to cope with those experiences. As such, participants may have witnessed desires to have sex to cope and, in the absence of judgments about that motivation, let it manifest in behavior. It is possible, however, that these coping-based sexual motives were not entirely detrimental. While coping-based sexual motives and emotion-focused coping are typically associated with adverse outcomes (Cooper et al., 2011; Penley et al., 2002), research indicates that they may be profitable when nothing else can be done to change the situation (Carver et al., 1989). This may have been the case for some participants. Notably, however, simple slopes only revealed a difference in motives to have sex to cope at low (but not high) attachment anxiety, indicating that non-judging mindfulness has no buffering effect on motivations to cope when attachment anxiety is high.

3.6.2 Mindfulness and Attachment Avoidance

Prior theory suggests that mindfulness may offer more avoidantly attached individuals the opportunity to recalibrate their attachment orientation (and/or the expression of their attachment orientation) by altering their concerns regarding the trustworthiness of others and/or supporting them to better manage the way their attachment concerns are expressed (Karremans et al., 2017; Ryan et al., 2007). Broadly, however, our findings are not consistent with this hypothesis. Rather, mindfulness appeared to increase more maladaptive sexual motivations among persons reporting greater attachment avoidance. This was not entirely surprising: While trait mindfulness is negatively related to attachment avoidance (Stevenson et al., 2017) and one study has shown that attachment avoidance mediates the effect of trait mindfulness on lower stress reactivity during conflict (Hertz et al., 2015), no research has demonstrated that mindfulness *buffers* the attachment avoidance—relational outcomes link. There are two possible reasons for this pattern. First, whereas more anxiously attached individuals may benefit from the increased awareness afforded by mindfulness because it encourages them to better manage experiences that they are *already cognizant of*, more

avoidantly attached individuals may find the increased awareness of previously avoided emotional experiences distressing. More avoidantly attached individuals strategically avoid turning attention towards potentially threatening attachment information (e.g., Edelstein & Gillath, 2008; Fraley et al., 2000) and may become overwhelmed when awareness of threatening thoughts, feelings, and impulses increases. The distress associated with bringing awareness to these experiences may counteract or even overpower the benefits otherwise offered by the accepting and emotion regulatory aspects of mindfulness, leading to greater translation of avoidant attachment concerns into thought, feeling, motivation, and behavior.

Second, mindfulness is arguably less directly or obviously relevant to the relational concerns that characterize attachment avoidance (i.e., doubts about the responsiveness and trustworthiness of others, concerns with threats to autonomy). Instead, mindfulness may make more avoidantly attached individuals more aware of attachment concerns but simultaneously fail to provide resources that alleviate those concerns. This may, in turn, intensify the way in which their fears are expressed in motivation and behavior (e.g., more likelihood of endorsing self-affirmation-based sexual motivations).

Supporting this notion, theory suggests that the effects of attachment avoidance should be ameliorated when individuals experience and internalize relationship situations that contradict their negative views of *others* (Arriaga et al., 2018). While linked to increased feelings of trust towards others (Kuhl & Boyraz, 2017), mindfulness is inherently about one's relationship to the self and one's own experience. As such, it appears less directly relevant to the core concerns characterizing attachment avoidance and thus may be less likely to buffer the way their attachment fears are expressed. Consistent with this interpretation, a recent study showed that while one's *own* daily relationship mindfulness, which is defined as the extent to which one is open and receptive to their partner and the relationship in general, did not buffer the link between attachment avoidance and same-day negative relationship

behaviors (Gazder & Stanton, 2020), a *partner's* relationship mindfulness did. Thus, while an individuals' *own* mindfulness may not buffer the extent to which attachment avoidance manifests in maladaptive personal and relationship outcomes (as in our study), having a more mindful *partner* may enable more avoidantly attached individuals to redefine their working model of others, and thus operate in more secure-functioning ways.

3.6.3 Scholarly and Clinical Implications

In total, these findings suggest that mindfulness—at least at a trait level and in terms of sexual motivations—may not offer the same benefits to persons high in attachment avoidance compared to persons high in attachment anxiety. When making predictions about the interactions between attachment and mindfulness, researchers should be cognizant of the substantial differences between attachment anxiety and avoidance (i.e., differences in cognitions, beliefs, and corresponding affect regulation strategies; Mikulincer et al., 2003) and consider how mindfulness may target and/or interact with these distinct dimensions in more or less beneficial ways. Although findings might change if a domain specific measure of mindfulness was used (e.g., the Sexual Mindfulness Measure; Leavitt et al., 2019), these early data nonetheless suggest that it may be prudent for therapists to operate with caution when offering mindfulness-based strategies to those high in avoidant attachment where the therapeutic targets involve relationship functioning or sexual wellbeing. Indeed, it may be the case that mindfulness *increases* experiential awareness of normatively unconscious and defensively regulated attachment concerns (Fraley et al., 2000) in those with higher attachment avoidance. Encouraging such individuals to become aware of these concerns without targeting the core reason for their attachment distress—the trustworthiness of others—or simultaneously developing the capacity to regulate may lead to distress, dysregulation, and/or lower quality of life (Britton et al., 2021).

3.6.4 Strengths, Caveats, and Future Directions

The current study is the first to explore the effect of mindfulness on the links between attachment insecurities and sexual motivation. Our sample had a wider age range than previous studies on sexuality and attachment, which have tended to use convenience samples of undergraduate students who may have different normative attachments and are less likely to be in established, long-term relationships (e.g., Impett et al., 2008; Snapp et al., 2014). Conversely, the current sample was predominantly female, heterosexual, NZ European, and all were in a relationship. This rather homogenous sample limits the generalizability of our findings. Existing evidence suggests that sexual motivations differ based on relational context and gender (e.g., Cooper et al., 2006, 2011; Hiller, 2005), and some have speculated that they may vary as a function of sexual orientation and culture (Hatfield et al., 2011). However, it is not yet known whether the effects of mindfulness differentially influence sexual motivations based on demographic factors or across different life and relationship stages. Future research should test these possibilities.

Our results and interpretation are constrained by the cross-sectional design. Specifically, our design precludes any causal interpretation regarding the directionality of the associations. In addition, our reliance on self-report measures—particularly on such intimate subjects such as sexual motives—may have been subject to social desirability bias despite anonymous participation. Further, participants' recollections of their sexual motives are likely limited by what was consciously available, which may or may not fully reflect actual motives. Future research could corroborate our results by testing whether mindfulness buffers the links between attachment and *daily* sexual motivations using experience sampling methods to better capture spontaneous, in-the-moment responses that may be less subject to recall biases.

This research was conducted during the COVID-19 pandemic in 2020. While there was no community transmission of COVID-19 and government-mandated restrictions had

ended when this study began, participants may have still been concerned by the possibility of the virus returning, the impact the virus had while in New Zealand, and the effects of the virus elsewhere. These lingering effects of COVID-19 may have impacted reports of sexual motives or attachment.

Given the dyadic nature of sexual interactions between couples, future research could benefit by examining how partners' mindfulness and attachment dynamically influence each other's sexual motivations. For example, researchers could examine the effect of one partner's mindfulness on the link between the other partner's attachment insecurity and sexual motivations. Focusing on only one couple member limits appreciation of the way couples' motivations inevitably influence each other within a relational system (Péloquin et al., 2011). Such research could also include a longitudinal component in order to test whether trait mindfulness buffers against the wellbeing and relational costs of maladaptive sexual motives over time (Impett et al., 2005).

Finally, future research may benefit from using domain-specific, rather than trait, measures of mindfulness when examining possible associations between attachment dimensions and sexual motivations; trait measures may have lower predictive utility than measures of sexual mindfulness when examining sexual outcomes (Adam et al., 2015; Leavitt et al., 2019). More broadly, it could be that specific characteristics of sexual contexts impact attachment insecurities differently, such that mindfulness is reduced, or not, for persons high versus low in attachment anxiety or avoidance.

3.7 Conclusion

Despite the contribution of sexual motivations to personal and relational wellbeing and the likelihood that patterns of attachment are reflected in such motivations, possible moderators of these links have received scant attention. The present study attended to this gap by evaluating the possible buffering role of trait mindfulness on the links between attachment

insecurity and maladaptive sexual motivations. Consistent with prior research, attachment anxiety was associated with more maladaptive sexual motivations. As expected, however, the links between attachment anxiety and self-affirmation- and coping-based sexual motivations were eliminated among individuals reporting higher scores in the acting with awareness facet of trait mindfulness. Testament to the complexity of these associations, however, no such buffering effect was seen for those high in attachment avoidance, although there was some indication that mindfulness may increase more maladaptive sexual motives among more avoidantly attached persons. In total, these findings extend prior work by suggesting that there are ways to reduce the extent to which attachment anxiety manifests in maladaptive sexual motivations. The development of mindfulness may afford more anxiously attached individuals greater internal security and ability to regulate their fears, such that they may operate in ways that are more conducive to wellbeing.

Chapter 4. Will I have sex to please you? Evaluating whether mindfulness buffers links between attachment and sexual motivations in daily life.

4.1. Preface

The previous chapter presented findings from an initial cross-sectional investigation into whether trait mindfulness attenuated the links between attachment dimensions and maladaptive sexual motivations. Broadly, results showed that trait mindfulness reduced the expression of *anxious* attachment concerns in maladaptive sexual motivations, including having sex to affirm the self and cope. However, directly contrasting the notion that mindfulness may be of comparable benefit to attachments characterized by greater anxious versus avoidant characteristics, analyses suggested that facets of trait mindfulness *intensified* the expression of avoidant attachment concerns in typically less-adaptive sexual motives, including increasing reports of sex for self-affirmation and coping based motivations.

As with all correlational designs, however, interpretations are necessarily constrained and the causal links among these constructs remained unclear. Perhaps more concerning for the specific variables under consideration, the reliance on cross-sectional data may not have adequately captured the time courses linking attachment concerns with their expression in sexual motivations. Sexual motives can fluctuate over time in response to changes in felt security and relationship quality (e.g., Davis et al., 2004). Similarly, threatening relationship situations can activate attachment concerns, in turn prompting more maladaptive sexual motives (e.g., Impett & Peplau, 2002). Unfortunately, the static nature of cross-sectional designs means they are unable to capture these fluctuations in sexual motivations across daily life. Further, participants' recall of their general sexual motives may have been biased by difficulties remembering previous sexual motives, by processes in which more recent, more typical, or more salient sexual experiences exert a greater influence over reports, or by a

desire to see and/or present themselves in ways consistent with self and/or other presentational concerns.

Thus, while an important first test of the central questions guiding this thesis, limitations inherent in the initial cross-sectional study indicated the need for a design testing whether mindfulness buffered links between attachment dimensions and spontaneous, naturally occurring day-to-day sexual motives that are less affected by the summation, recall, or presentational biases noted above. Accordingly, the following chapter describes the results of an intensive longitudinal study investigating whether mindfulness moderates the links between attachment dimensions and a range of *daily* sexual motivations, thus providing an important window into how trait mindfulness affects people's everyday expression of attachment insecurities in sexuality.

Citation

Dixon, H. C., Reynolds, L. M., & Consedine, N. S. (2022). Will I have sex to please you? Evaluating whether mindfulness buffers links between attachment and sexual motivations in daily life. *Journal of Sex & Marital Therapy*, *48*(4), 392–414. https://doi.org/10.1080/0092623x.2021.2000534

4.2 Abstract

Insecurely attached individuals are more likely to report more maladaptive sexual motivations that predict worse personal and interpersonal outcomes. Given that mindfulness has been linked with improved relationship and sexual experiences, and that these effects may be moderated by attachment, the current study examined the possible buffering role of trait mindfulness on the links between attachment insecurity and daily sexual motives. Participants from New Zealand (N = 70) took part in a daily diary study that overcame limitations associated with previous cross-sectional research in the area (e.g., recall and aggregation biases). Online measures of trait mindfulness and attachment were completed, before participants reported their sexual motivations on each day they had sex for the next 14 days. Results provided some evidence that trait mindfulness has a therapeutic effect among more anxiously attached persons insofar as it reduced the degree to which attachment concerns manifested in maladaptive daily sexual motivations. In contrast, trait mindfulness did not buffer (and in some cases intensified) the links between attachment avoidance and maladaptive sexual motives. No significant interactions were detected between attachment insecurity and mindfulness in the prediction of adaptive daily sexual motivations. These findings suggest that mindfulness may differentially affect the manifestations of anxious and avoidant attachment. Practical and theoretical implications of the findings are discussed.

4.3 Introduction

Sex is an important part of romantic relationships and can be associated with better personal and relational outcomes (Butzer & Campbell, 2008; Byers, 2005; Meltzer et al., 2017; Muise et al., 2014). Predictably, however, this is not always the case. The motivations behind the decision to engage in sex are an important part of whether sex leads to better personal and interpersonal outcomes (Impett et al., 2005; Muise, Impett, & Desmarais, 2013). Sex undertaken in the service of meeting goals for intimacy or pleasure has been linked to greater sexual and relationship satisfaction while sex to avoid negative relational or personal experiences is associated with lower sexual satisfaction and relationship wellbeing (Cooper et al., 2011; Impett et al., 2005).

Although sexual motivations are influenced by a range of situational, relational, and cultural factors, they also vary as a function of attachment (Cooper et al., 2006; Impett et al., 2008). Whereas securely attached individuals (i.e., persons low in both attachment anxiety and avoidance) tend to approach sex as a way to express intimacy and caring for their partner, less secure individuals report sexual motivations more concerned with mitigating relational or personal distress or with boosting self-image (Davis et al., 2004; Schachner & Shaver, 2004).

However, despite the costs associated with engaging in sex to mitigate negative personal or relationship experiences or to boost self-image, only one cross-sectional study has sought to identify factors that might buffer the extent to which dimensions of insecure attachment manifest in maladaptive sexual motivations (see Dixon et al., 2022a). This study, however, measured and modeled *dispositional* sexual motivations by imposing a static, cross-sectional lens, which may fail to capture the dynamism with which sexual motivations unfold in daily relational life (i.e., the way they shift in response to fluctuations in personal and relational functioning). The present study extends this earlier work by testing whether trait mindfulness—the tendency to bring attention to present experiences in a non-judgmental and

accepting way (Baer et al., 2006; Bishop et al., 2004)—buffers the degree to which attachment insecurities are related to daily maladaptive sexual motivations. In addition to this primary aim, we also tested whether trait mindfulness strengthens or weakens insecurely attached individuals' daily reporting of more adaptive sexual motivations (i.e., motives that reliably predict more beneficial outcomes).

4.3.1 How Sexual Motivations Shape Personal and Relational Outcomes

The experience and expression of sexuality is shaped by what individuals are trying to accomplish via sex (Cooper et al., 2011; Snyder & Cantor, 1998). As such, while two sexual experiences may appear outwardly similar, the experience of sex depends, at least in part, on underlying motivations. Cross-sectional and daily diary research at both individual and dyadic levels shows that engaging in sex for 'approach' motivations (e.g., to seek a positive or pleasurable experience, such as expressing love and care) is typically associated with higher sexual and relationship satisfaction. In contrast, engaging in sex on the basis of 'avoidance' motives (e.g., to avoid a partner's loss of interest) is detrimental to both relationship and sexual satisfaction (Cooper et al., 1998, 2008; Gewirtz-Meydan & Finzi-Dottan, 2018; Impett et al., 2005); the more sex on the basis of avoidance motivations, the more likely couples are to break-up (Impett et al., 2005).

4.3.2 Attachment and Relational Functioning

One framework that has been widely used to explain differences in sexual motivation is attachment theory. Attachment theory was developed to explain infants' need to bond with a primary caregiver for protection and security, particularly in times of distress (Bowlby, 1969, 1973, 1980). Bowlby theorized that the extent to which needs are realized shapes beliefs about one's worth and the likely responsiveness of others (or lack thereof). These mental representations of the self and other (i.e., "internal working models") are thought to

become core features of personality that are carried forward in time to guide individuals' perceptions, motivations, and behaviors within subsequent relationships.

In modern attachment science, adult attachment security is typically assessed around two latent, orthogonal dimensions (Brennan et al., 1998; Simpson et al., 1996) - anxiety and avoidance. Attachment anxiety is characterized by a more negative view of the self, together with concerns about rejection and not being loved by close others (Mikulincer et al., 2003). In contrast, avoidance is characterized by a view of others as unreliable and a discomfort with intimacy and dependence (Mikulincer et al., 2003). Evidence and theory suggest that variation along these dimensions is related to differences in perceptions, motivations, and behaviors in attachment-relevant domains. For instance, greater anxiety predicts a prioritization of closeness and reassurance seeking (Shaver et al., 2005), as well as persistent monitoring for relationship threats, greater reactivity to conflict (Campbell et al., 2005), and more attempts to elicit signs of commitment from partners, presumably as a means of reassurance (Overall et al., 2014). In contrast, those high in avoidance eschew dependence and intimacy in favor of self-sufficiency. They tend to be less attentive to potentially threatening emotional information (Edelstein & Gillath, 2008; Fraley et al., 2000), avoid support-seeking, and exhibit anger and withdrawal in situations that threaten autonomy (Collins & Feeney, 2000; Tan et al., 2012).

4.3.3 How Attachment Shapes Sexual Motivations

Consistent with theory (Bowlby, 1980; Mikulincer & Shaver, 2019), empirical evidence demonstrates that sex can operate in the service of the attachment system (Birnbaum & Reis, 2019; Cooper et al., 2006; Gewirtz-Meydan & Finzi-Dottan, 2018; Kim & Miller, 2019). While securely attached individuals approach sex with confidence and report sexual motivations that typically lead to better outcomes (e.g., sex to build intimacy or express love), individuals high in attachment insecurity are more likely to report using sex to

mitigate personal or relational distress or boost self-image (e.g., Birnbaum, 2010; Davis et al., 2004; Impett et al., 2008; Impett & Peplau, 2002). Consistent with their unmet needs for love and security, greater attachment anxiety predicts greater reports of sex to reaffirm relationships, confirm partner availability, and bolster self-worth (Davis et al., 2004; Impett et al., 2008; Schachner & Shaver, 2004). Anxiety predicts reports of engaging in sex *when* they feel insecure about their partner's feelings for them (Davis et al., 2004) as well as consenting to unwanted sex as a way to hold on to a partner (Impett & Peplau, 2002). The attachment concerns of more avoidant individuals are also associated with more maladaptive sexual motivations. Their desire to avoid closeness leads them to report using sex to pursue autonomy rather than intimacy goals (Davis et al., 2004; Schachner & Shaver, 2004), to affirm themselves and their power (Davis et al., 2004; Schachner & Shaver, 2004), and (akin to more anxious individuals) to avoid negative relational outcomes (Impett et al., 2008).

4.3.4 Could Trait Mindfulness Buffer the Links Between Attachment Insecurity and Daily Maladaptive Sexual Motivations?

We know that maladaptive sexual motivations have costs. However, little attention has been paid to what might attenuate the extent to which attachment characteristics manifest in maladaptive sexual motivations (Dixon et al., 2021a). Research shows that mindfulness—whether measured as a trait, as a fleeting quality of being, or examined as an intervention—predicts better personal wellbeing and health (Brown & Ryan, 2003; Grossman et al., 2004; Murphy et al., 2012). Mindfulness also predicts greater relationship satisfaction and closeness (e.g., Adair et al., 2018; Carson et al., 2004; Jones et al., 2011), improves sexual functioning (Brotto & Goldmeier, 2015; Leavitt, Whiting, et al., 2021; Velten et al., 2020), and attenuates links between distress, negative reactivity, and relationship conflict (Barnes et al., 2007; Dixon & Overall, 2018; Laurent et al., 2016).

Scholars have theorized that mindfulness may be of particular benefit to more insecure individuals (Atkinson, 2013; Karremans et al., 2017; Ryan et al., 2007). It has been suggested that mindfulness may decrease the extent to which attachment insecurities bias individuals' thoughts, feelings, and behaviors (Ryan et al., 2007), allowing them to respond to events in relationally beneficial ways (e.g., less reactivity, more acceptance; Karremans et al., 2017). Empirically, mindfulness is positively associated with attachment security (for a review see Stevenson et al., 2017), a lower likelihood of relationship dissolution among individuals high in anxious attachment (Saavedra et al., 2010), and mediates the relationship between insecurity and negative conflict behaviors (i.e., less compromise, more dominance and submission, and more interactional reactivity; Quickert & Macdonald, 2020). Based on this prior research and theory, we sought to investigate whether trait mindfulness moderated the links between attachment and daily sexual motivations.

Our previous research in this area also partially supports this theorizing. In a cross-sectional analysis we found that trait mindfulness eliminated the links between attachment anxiety and self-affirmation-based and coping-based sexual motives. In contrast, however, trait mindfulness tended to *enhance* the link between attachment avoidance and both coping-based and self-affirmation-based sexual motives among New Zealand individuals (Dixon et al., 2021a). These results refine existing theory regarding *how* mindfulness may buffer the manifestations of insecure attachment dimensions in sexual motivations, implying that mindfulness may be of greater benefit vis-à-vis attachment anxiety rather than avoidance. The Attachment-Security Enhancement Model (ASEM; Arriaga et al., 2018) may help explain these findings. While designed to explain how *relational* situations foster more secure attachment, the ASEM's central tenants may be extrapolated to non-relational settings in order to illuminate how attachment-security-buffering strategies may operate in personal contexts. Specifically, it may be that mindfulness mitigates the effects of attachment anxiety

by strengthening anxious individuals' sense of self-confidence and calm or their ability to tolerate negative feelings. In contrast, however, trait mindfulness may have limited utility in mitigating the effects of attachment avoidance, as it may less directly address core fears regarding vulnerability and intimacy. Paradoxically, trait mindfulness might increase avoidant individuals' awareness of attachment concerns yet fail to soothe them, thereby intensifying the way fears are expressed.

Research in this area, however, remains limited in several ways. First, prior studies are necessarily constrained by cross-sectional analyses that may or may not reflect the time-courses linking sexual motivations with attachment in peoples' daily lives. Second, cross-sectional associations may be subject to pronounced summation and recall-bias and may not reflect variation in sexual motivations within individuals. Cross-sectional measurement requires estimating the general frequency of motivations and may thus obscure variation due to forgetfulness, current affect, re-appraisals of sexual and relationship experiences, and self-concept (Levine et al., 2001). Equally, individuals may overestimate adaptive and underestimate maladaptive sexual motivations – a form of "rose-colored glasses" – a problem that may be more pronounced when rating *global* sexual motivations.

Daily diary methods are useful for studying relationship processes as they permit examination of relational dynamics as and when they occur, within their natural settings (Bolger & Laurenceau, 2013; Laurenceau & Bolger, 2005), and offer a way to get closer to microlevel processes (Laurenceau & Bolger, 2005). This approach is well-suited to the study of sexual motivations, which are known to fluctuate in response to shifts in relationship quality and felt-security (Davis et al., 2004). The reduced time between events and reports of those events reduces the chance of recall and aggregation biases.

The current study addresses these limitations by utilizing daily diary (i.e., intensive longitudinal) methods to test whether facets of trait mindfulness moderate the links between

attachment insecurity and daily sexual motivations. In line with earlier findings, we predicted that trait mindfulness would buffer the association between anxious attachment and daily maladaptive sexual motives (e.g., sex to prevent a partner getting angry; Hypothesis 1). Conversely, we expected that mindfulness would have a null effect or would increase the positive association between attachment avoidance and daily maladaptive sexual motivations (Hypothesis 2). As a secondary aim, we investigated whether mindfulness would moderate the links between attachment insecurity and more adaptive sexual motivations (e.g., sex to build intimacy). As no prior research has yet tested the potential moderating effect of mindfulness on the links between attachment and adaptive relational or sexual outcomes, we made no a priori predictions with respect to the secondary aim.

4.4 Methods

4.5.1. Participants and Recruitment

Following ethical approval from the University of Auckland Human Participants Ethics Committee (Reference Number: 024533), recruitment and data collection processes occurred in two phases between June 2020 and August 2020. First, people fluent in English, over 18 years old, and who were currently or previously in a romantic relationship were invited to participate in a cross-sectional study on "Relationships, Sexuality, and Health" through study posters, flyers, and emails. Two-hundred and fifty-three participants consented to this component of the study. Other than measures of attachment and trait mindfulness, responses to this questionnaire are the subject of a different report and are not presented here.

Of the 253 participants included in the first phase, those who (a) completed the entire questionnaire and (b) indicated they were in a relationship and would see their partner at least 5 times across the next 14 days were invited to participate in a 14-day daily diary study (Phase 2) also about relationships, sexuality, and health (n = 165). One-hundred and eighteen participants (72%) consented to participate in this supplementary component. However, as

reliable completion of daily entries was required for inclusion in analyses, some participants' data were excluded at this point. Specifically, participants were excluded if they completed 5 or fewer entries (n = 37) or if 50% or more of completed entries were completed too retrospectively (defined as ≥1 days after the day they were reporting on; n = 11). This left a final sample of 70. Descriptive characterization of the final sample, including contrasts between the 48 participants that consented to the daily diary study but were excluded from analyses and the 70 that were retained, can be seen in Table 4.1. There were no significant differences in the variables of interest between those that were included versus excluded, with the exception that, if a participant was heterosexual, the odds of them being excluded was 3.2x greater than if they were non-heterosexual (i.e., gay, lesbian, bisexual, other).

In each recruitment phase, participants were informed that participation was voluntary, responses were anonymous, and that they could withdraw from the study at any time. In the cross-sectional component of the study, participants had the opportunity to opt-in to a prize draw to win one of two $100 shopping vouchers; in the second component participants had the opportunity to opt-in to a prize draw to win an iPad or one of three $100 shopping vouchers.

4.5.2 Procedure and Materials

In the first phase of data collection, participants completed a battery of questionnaires assessing demographics, trait mindfulness, and attachment. Measures (detailed below) were scored and averaged so that higher scores reflect greater levels of the construct. Descriptive statistics, reliabilities, and correlations across these measures are shown in Table 4.2.

Trait Mindfulness. Baer and colleagues' (2006) 39-item Five Factor Mindfulness Questionnaire (FFMQ) was used to assess trait mindfulness. The FFMQ is stratified into 5 facets, including observing (being aware of inner and outer stimuli), describing (mentally putting experience into words), acting with awareness (taking considered action as opposed

to acting absent-mindedly (i.e., "reacting")), non-judging (refraining from evaluating or criticizing an experience), and non-reactivity (resisting impulsive reactions). Items were rated on a 5-point scale from 1 (never or very rarely true) to 5 (very often or always true). Cronbach's values for subscales ranged between 0.72 and 0.91, indicating good reliability.

Table 4.1.

Retention Analyses Contrasting Characteristics of Participants Included Versus Excluded

		Included	Excluded	Contrast
Demographic Variables				
Mean Age (SD)		30.44 (9.87)	30.21 (8.41)	-.13$_a$
Mean Rel. Length (SD)		75.07 (68.97)	73.73 (58.61)	-.11$_a$
Gender	% Female	84.3	85.4	.03$_b$
Ethnicity	% NZ European	72.9	79.2	.61$_b$
Rel. Status	% Married or de facto	84.3	77.1	.97$_b$
Sexual Orientation	% Heterosexual	68.6	87.5	5.64$_b$*
Rel. Type	% Monogamous	95.7	89.6	1.69$_b$
Psychological Variables				
ECRR Anxious		3.27 (1.26)	3.11 (.93)	-.78$_a$
ECRR Avoid		2.50 (1.03)	2.27 (.64)	-1.33$_a$
FFMQ Observe		3.39 (.63)	3.42 (.71)	.26$_a$
FFMQ Describe		3.43 (.79)	3.58 (.75)	1.00$_a$
FFMQ Act Aware		3.09 (.68)	3.19 (.60)	.80$_a$
FFMQ Non-Judge.		2.77 (.97)	3.08 (.73)	1.86$_a$
FFMQ Non-React.		2.82 (.67)	2.92 (.58)	.89$_a$

† p <.10 * p <.05 ** p ≤.001. *Note.* $_a$ = independent samples t-test, $_b$ = Chi-Square test, Rel = Relationship, Judge = Judgement, React = Reactivity.

Attachment. Attachment anxiety and avoidance were measured using the widely-used Revised Experiences in Close Relationships Questionnaire (ECR-R; Fraley et al., 2000). This measure has a reliable and replicable two-factor structure and good internal reliability

(Sibley & Liu, 2004), and is among a list of recommended self-report scales tapping generalized adult attachment (Gillath et al., 2016). Of importance, the ECR-R conceptualizes adult attachment along dimensions (rather than categories) and in doing so, generates scores for avoidance and anxiety, which was necessary to test hypotheses. Participants rated two 18-item subscales assessing attachment avoidance (e.g., "I find it difficult to allow myself to depend on romantic partners") and attachment anxiety (e.g., "I'm afraid that I will lose my partner's love"). Items were rated on a 7-point scale from 1 (strongly disagree) to 7 (strongly agree). Each scale had a Cronbach's alpha of 0.94, indicating good internal reliability. Participants reported, on average, low anxiety (M = 3.27, SD = 1.26) and avoidance (M = 2.49, SD = 1.03). As is typical, levels of attachment anxiety and avoidance were positively correlated (r = .51, $p < .001$).

Daily Diary Component.

Participants then completed an online record which included ratings of their sexual motivations on the days they had sex across 14 consecutive days. To bolster compliance, participants could opt to receive daily text reminders and were given more prize draw entries the more entries they completed. Text communication was conducted via the Do It Later app. Text reminders were sent at 8pm each night, with a further reminder sent the next morning if the relevant survey had not been completed. Participants were assured that contact data would not be collected, stored, or linked to their study responses.

Overall, a total of 920 daily surveys were completed. On average, participants completed 13.33 diary entries each (SD = 1.69; median = 14; range = 6 – 15; 90% > 12). However, our dependent variable (sexual motivation) was only reported on days participants engaged in sexual activity, which occurred an average of 2.81 times per participant across the 14-day period. As a result, there were 197 daily diary entries pertaining to daily sexual motivations.

Table 4.2

Descriptive statistics, internal reliabilities, and correlations between all the continuous baseline questionnaire measures

	Mean (SD)	α	1.	2.	3.	4.	5.	6.
1. Att. Anxiety	3.27 (1.26)	.94	-					
2. Att. Avoidance	2.49 (1.03)	.94	.51**	-				
3. TM Observe	3.39 (.63)	.72	.05	-.11	-			
4. TM Describe	3.43 (.79)	.90	-.40**	-.46**	.15	-		
5. TM Act Aware	3.09 (.68)	.85	-.21†	-.32*	.07	.21†	-	
6. TM Non-Judge.	2.77 (.97)	.91	-.61**	-.41**	-.22†	.33*	.48**	-
7. TM Non-React.	2.82 (.67)	.82	-.44**	-.39**	.30*	.35*	.49**	.49**

† $p < .10$ * $p < .05$ ** $p \leq .001$. *Note.* Att. = Attachment, TM = Trait Mindfulness, Judge = Judgement, React = Reactivity.

Sexual motivations. Each day, participants were asked if they engaged in sexual activity with their partner. Sexual activity was defined as penile-vaginal intercourse, anal intercourse, oral sex (receiving and giving), and manual stimulation (touching/massaging of genitals). If participants answered "yes" to this question, they were asked to respond to a 10-item scale assessing sexual goals, adapted from Cooper and colleagues (1998) and used in previous studies (Impett et al., 2005, 2008). Participants rated the importance of each item in motivating their decision to have sex on a 7-point scale from 1 (not at all important) to 7 (extremely important). The items tapped sexual motivations associated with (1) pursuing one's own pleasure, (2) pleasing a partner, (3) feeling good about oneself, (4) building intimacy in the relationship, (5) expressing love for a partner, (6) avoiding relationship conflict, (7) preventing a partner becoming upset (8) preventing a partner becoming angry, (9) preventing a partner losing interest, and (10) because of feelings of sexual obligation.

4.5.3 Data Analysis Plan

Analyses were conducted using hierarchical linear modeling (HLM) techniques and the associated software described by Raudenbush and Bryk (2002) to account for the dependencies in the data arising from repeated daily entries (level 1) nested within individuals (level 2). This approach accounts for differences in the number of entries per participant, such that data from participants who provided more (versus fewer) entries are weighted more heavily in final estimates (Raudenbush & Bryk, 2002).

HLM equations were constructed to examine the potential moderating role of facets of trait mindfulness on associations between daily sexual motivations and attachment. For example, the equation testing whether people higher (versus lower) in observe mindfulness experienced lower (versus higher) motivations to have sex to avoid conflict when high in attachment anxiety was as follows: At Level 1 (see Equation 1), sexual motivations were modeled as a function of an intercept (β_{0j}) representing average levels of daily motives to have sex to avoid conflict on days individuals had sex across the 14-day period, and an error term (r_{ij}).

$$\text{Daily motivations to have sex to avoid conflict} = \beta_{0j} + r_{ij}. \quad (1)$$

To test whether attachment anxiety predicted people's average levels of daily sexual motives to avoid conflict (β_{0j} described above), we entered attachment anxiety at Level 2 (see γ_{01} in Equation 2). We then entered observing mindfulness and the interaction between attachment anxiety and observing mindfulness at Level 2 (see γ_{02} and γ_{03} in Equation 2).

$$\begin{aligned}\beta_{0j} = {} & \gamma_{00} + \gamma_{01}\,(\text{attachment anxiety}) + \gamma_{02}\,(\text{observe mindfulness}) \\ & + \gamma_{03}\,(\text{attachment anxiety X observe mindfulness}) + u_{0j}\end{aligned} \quad (2)$$

As shown in Equation 2, the resulting coefficients provide (1) an intercept (γ_{00}) reflecting average daily motivations to have sex to avoid conflict across participants, γ_{01} testing whether attachment anxiety is associated with daily motivations to have sex to avoid conflict, γ_{02} testing whether observe mindfulness is associated with daily motivations to have

sex to avoid conflict, and γ_{03} modeling the degree to which the link between attachment anxiety and sex motivated by desire to avoid conflict is moderated by observe mindfulness (the two-way interaction that tests our primary prediction). Level 1 intercepts and slopes were modeled as random allowing variation in intercepts (u_{0j}). Analogous models were run replacing (1) daily motivations to have sex to avoid conflict with other sexual motivations, (2) attachment anxiety with attachment avoidance, and (3) the observing facet of trait mindfulness with other mindfulness facets, as relevant.

4.5 Results

The primary goal of this study was to examine whether facets of trait mindfulness moderated the relationships between elements of attachment insecurity and daily sexual motives. In line with this focus, results are organized around 2 sections: (1) analyses involving attachment anxiety, and (2) analyses involving attachment avoidance. Each section has two parts, first testing whether mindfulness moderated the relationship between the attachment dimensions and maladaptive daily sexual motivations before testing the same question regarding adaptive daily sexual motivations. Before conducting these main analyses, however, we calculated the intraclass correlation coefficient (ICC) to determine the percentage of total variance in each outcome due to mean differences within-subjects. All ICCs were significant, indicating that a hierarchical model was needed. The ICC values indicated that within-person differences accounted for 38% of the variance in sexual motivations to avoid conflict, 41% in preventing a partner from losing interest, 33% in preventing a partner from becoming upset, 48% in preventing a partner from becoming angry, 75% in motivations due to obligation, 75% in building intimacy, 61% in feeling good, 57% in expressing-love, 62% in pursuing own pleasure, and 54% in pleasing a partner.
The results of our first set of analyses, which are of relevance to Hypothesis 1, are presented in Table 4.3. There was a significant interaction effect between observing mindfulness and

attachment anxiety on daily motivations to have sex to prevent a partner from losing interest – Figure 4.1 shows the predicted values of daily motivations to have sex to prevent a partner from losing interest at low (-1 SD) versus high (+1 SD) levels of the observing facet of trait mindfulness at low (-1 SD) versus high (+1 SD) levels of attachment anxiety. Simple slope analyses revealed that, while motivations to have sex to prevent a partner from losing interest were greater among more anxious individuals when observing mindfulness was low (-1 *SD*; *b* = .54, *SE* = .16, *t* = 3.46, *p* = .001), this relationship was absent when observing mindfulness was high (+1 *SD*; *b* = .17, *SE* = .15, *t* = 1.10, *p* =.275). No other interactions between attachment anxiety and mindfulness facets predicted other maladaptive sexual motivations.

The results of the second part of our analyses concerning attachment anxiety tested whether mindfulness facets moderated the relationship between attachment anxiety and more adaptive daily sexual motivations. Results of these analyses are presented in Table 4.4. As can be seen, there were two significant interaction effects on daily sexual motivations. First, attachment anxiety and non-judgment interacted in predicting own-pleasure based sexual motivations. Unexpectedly, simple slopes revealed that while attachment anxiety was unrelated to own-pleasure-based sexual motivations when non-judging mindfulness was low (-1 *SD*; *b* = .13, *SE* = .22, *t* = .60, *p* = .551), it tended to be negatively associated when individuals were high in non-judging mindfulness (+1 *SD*; *b* = -.48, *SE* = .24, *t* = -1.97, *p* = .054) (such that the more anxiously attached individuals were, the less likely they were to report sexual motives associated with pursuing their own pleasure, when they were high in non-judging mindfulness; see Figure 4.2).

Table 4.3 *Tests of the Moderating Effect of Trait Mindfulness on the Relationships Between Attachment Anxiety and Maladaptive Daily Sexual Motives*

	SM Avoid Conflict			SM Prev Partner Losing Interest			SM Prev Partner Getting Upset			SM Prev Partner Getting Angry			SM Felt Obligated		
	B	**SE**	**T**	**B**	**SE**	**T**	**B**	**SE**	**T**	**B**	**SE**	**T**	**B**	**SE**	**T**
Att. Anxiety	-.08	.14	-.6	.35	.13	2.8**	.02	.13	.14	.00	.10	.01	.08	.10	.81
Observe	-.29	.18	-1.64	-.55	.16	-3.44**	-.29	.15	-1.88†	-.16	.09	-1.72†	-.15	.15	-1.01
Attanx X Observe	.16	.17	.94	-.29	-.14	-2.03*	-.03	.13	-.20	.04	.09	.46	.05	.18	.29
Att. Anxiety	-.15	.12	-1.23	.26	.11	2.24*	-.09	.11	-.83	-.09	.10	f-.96	.04	.11	.38
Describe	-.19	.21	-.89	-.30	.17	-1.77†	-.37	.20	-1.85†	-.32	.18	-1.76†	-.12	.16	-.75
Attanx X Describe	-.29	.19	-1.52	-.22	.17	-1.30	-.22	.19	-1.15	-.10	.16	-.60	-.10	.12	-.77
Att. Anxiety	-.13	.14	-.90	.30	.14	2.13*	-.01	.14	-.05	-.01	.10	-.12	.04	.10	.42
Act Aware	-.32	.20	-1.62	-.33	.22	-1.50	-.18	.16	-1.11	-.09	.09	-.95	-.28	.10	-2.78**
Attanx X Act Aware	.27	.15	1.76†	-.00	.14	-.01	.13	.11	1.14	.09	.08	1.14	-.19	.11	-1.68†
Att. Anxiety	-.15	.15	-1.03	.30	.15	2.08*	.04	.14	.26	-.06	.10	-.65	.03	.12	.23
Non-Judge	-.14	.16	-.88	-.10	.16	-.60	.05	.17	.28	-.13	.12	-1.16	-.09	.13	-.70
Attanx X Non-Judge	-.08	.14	-.62	-.08	.13	-.63	-.05	.15	-.32	-.09	.11	-.84	-.19	.10	-1.95†
Att. Anxiety	-.10	.17	-.61	.29	.14	2.01*	.03	.14	.19	.00	.11	.00	.06	.12	.51
Non-React	-.04	.21	-.18	-.26	.20	-1.27	.06	.27	.21	.02	.12	.16	-.06	.15	-.43
Attanx X Non-React	-.04	.21	-.20	.01	.19	.06	-.03	.23	-.13	-.03	.14	-.22	-.04	.14	-.30

† p <.10 * p <.05 **p < .01 ***p < .001 *Note*. SM = Sexual Motivation, Prev = Prevent, Att. = Attachment, Attanx = Attachment anxiety.

Table 4.4 *Tests of the Moderating Effect of Trait Mindfulness on the Relationships Between Attachment Anxiety and Adaptive Daily Sexual Motivations*

	SM Intimacy			SM Feel Good			SM Express Love			SM Own Pleasure			SM Please Partner		
	B	**SE**	**T**	**B**	**SE**	**T**	**B**	**SE**	**T**	**B**	**SE**	**T**	**B**	**SE**	**T**
Att. Anxiety	.17	.09	2.00*	.20	.14	1.39	.09	.10	.90	-.02	.14	-.14	.15	.12	1.25
Observe	.56	.15	3.67**	.28	.26	1.07	.55	.18	3.02**	.18	.26	.69	.41	.21	1.98*
Attanx X Observe	-.13	.14	-.93	.25	.24	1.05	-.23	.15	-1.56	.43	.23	1.85†	-.41	.16	-2.61**
Att. Anxiety	.27	.10	2.82**	.14	.16	.90	.17	.10	1.71†	-.00	.16	-.01	.22	.13	1.67†
Describe	.30	.14	2.10*	-.17	.20	-.86	.28	.17	1.65†	.11	.24	.45	.24	.22	1.06
Attanx X Describe	.08	.12	.63	-.15	.15	-1.00	.07	.13	.52	-.24	.15	-1.64	-.04	.15	-.24
Att. Anxiety	.23	.10	2.45*	.20	.16	1.29	.15	.10	1.48	-.02	.15	-.12	.19	.13	1.47
Act Aware	.44	.17	2.52*	.04	.31	.11	.46	.27	1.70†	.05	.28	.16	.27	.25	1.08
Attanx X Act Aware	-.11	.14	-.78	-.20	.28	-.72	-.16	.16	-1.03	-.31	.21	-1.46	-.06	.18	-.32
Att. Anxiety	.15	.14	1.11	.26	.18	1.48	.02	.16	.12	-.17	.19	-.89	.05	.17	.33
Non-Judge	-.03	.19	-.17	.16	.25	.62	-.15	.23	-.62	-.30	.26	-1.14	-.21	.19	-1.12
Attanx X Non-Judge	-.14	.10	-1.32	-.05	.20	-.25	-.14	.12	-1.22	-.31	.13	-2.34*	-.15	.14	-1.08
Att. Anxiety	.26	.12	2.23*	.15	.21	.74	.11	.14	.75	-.00	.18	-.02	.17	.14	1.17
Non-React	.35	.20	1.76†	-.07	.38	-.19	.07	.24	.30	.14	.40	.34	.12	.34	.35
Attanx X Non-React	-.04	.18	-.21	-.23	.35	-.67	.00	.19	.00	-.13	.32	-.42	-.17	.29	-.59

† p <.10 * p <.05 **p < .01 ***p < .001. *Note*. SM = Sexual Motivation, Att. = Attachment, Attanx = Attachment anxiety.

Figure 4.1

The moderation effect of observe on the link between attachment anxiety and daily motivations to have sex to prevent a partner from losing interest

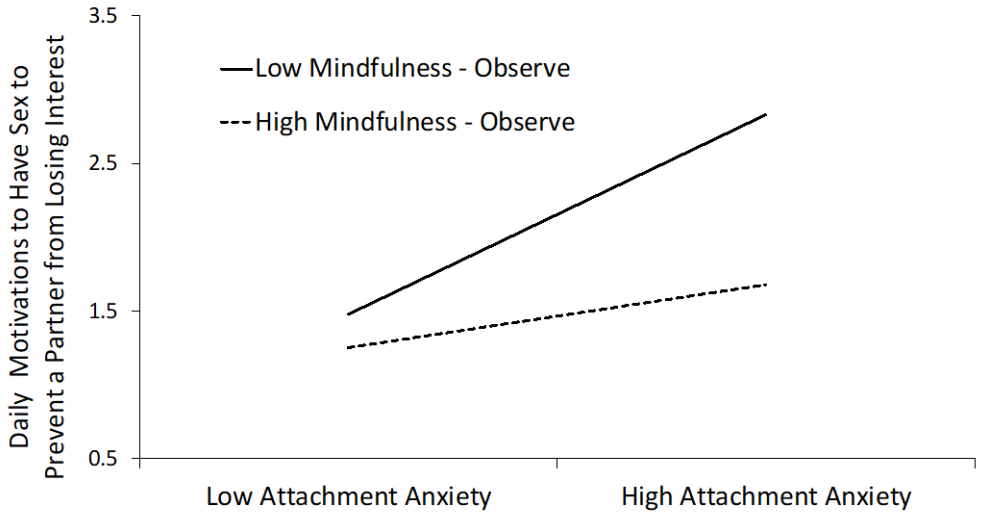
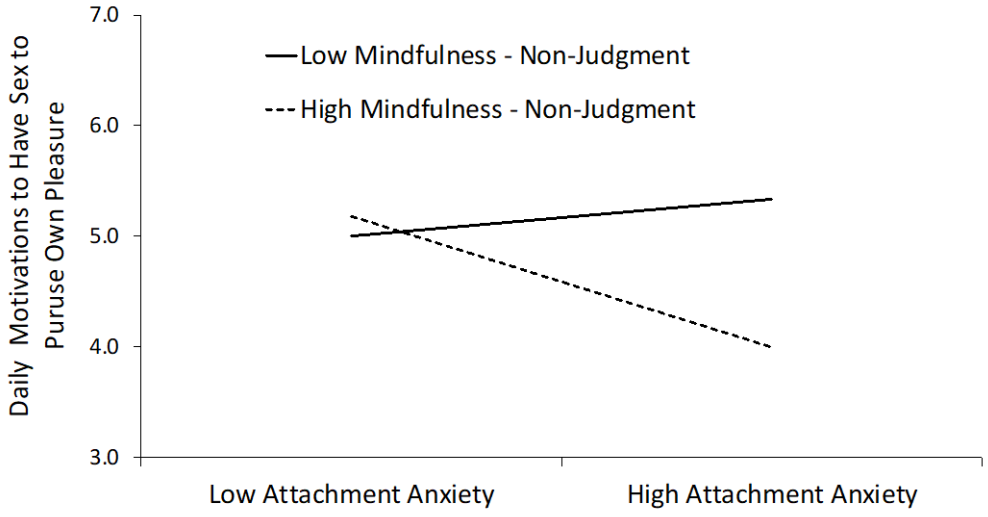


Figure 4.2

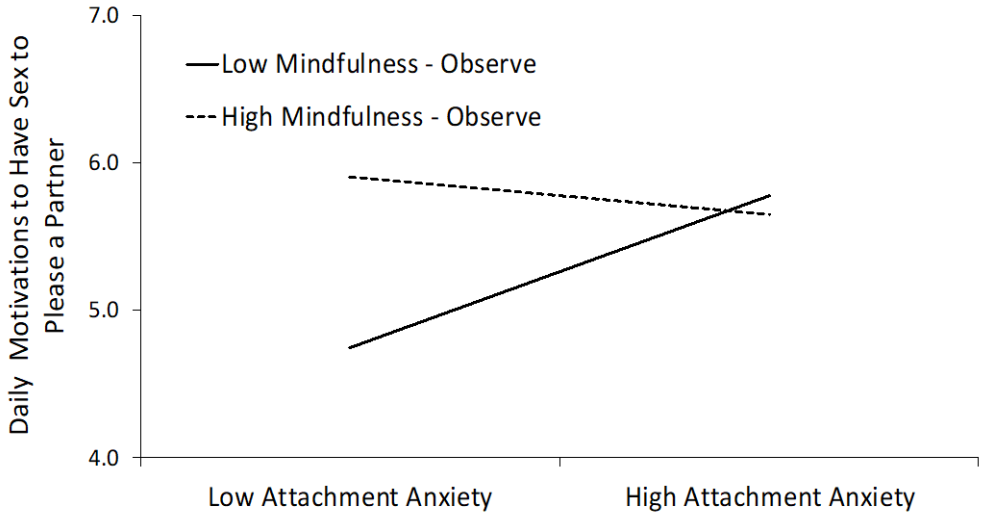
The moderation effect of non-judgment on the link between attachment anxiety and daily motivations to have sex to pursue one's own pleasure



Results of this second set of analyses also indicated that, attachment anxiety interacted with observing mindfulness in predicting daily sexual motivations to please a partner. Simple slopes revealed that attachment anxiety was positively associated with daily motivations to have sex to please a partner when observing mindfulness was low (-1 *SD*; b = .41, *SE* = .15, t = 2.69, p = .009), but was unrelated to daily motivations to have sex to please a partner when observing mindfulness was high (+1 *SD*; b = -.10, *SE* = .16, t = -.64, p = .526) (in other words, the more anxiously attached an individual was, the more likely they were to report sexual motives associated with pleasing a partner, but only when observing mindfulness was low; see Figure 4.3).

Figure 4.3

The moderation effect of observe on the link between attachment anxiety and daily motivations to have sex please a partner



Turning to the second section of our results (i.e., analyses relevant to Hypothesis 2), we tested whether mindfulness facets moderated the relationship between attachment avoidance and daily sexual motivations, first looking at maladaptive daily sexual motivations.

The results of these analyses are presented in Table 4.5. As can be seen, there were two significant interaction effects on daily sexual motivations. First, attachment avoidance and acting with awareness mindfulness interacted in predicting the maladaptive daily sexual motivation: sex to prevent a partner getting angry. However, despite the significant interaction effect, simple slopes revealed that attachment avoidance was unrelated to daily motivations to have sex to prevent a partner from getting angry at both low (-1 *SD*; b = -.10, SE = .17, t = -.61, p = .546) and high (+1 *SD*; b = .21, SE = .15, t = 1.35, p = .182) levels of acting with awareness mindfulness (see Figure 4.4).

Results of these analyses also indicated that attachment avoidance and observing mindfulness interacted to predict daily motivations to have sex due to feelings of obligation. Although neither slope was significant in isolation, simple slopes suggested that while attachment avoidance was unrelated to daily motivations to have sex out of obligation when observing mindfulness was low (-1 *SD*; b = -.13, SE = .10, t = -1.28, p = .205), avoidance tended to be positively related to greater daily motivations to have sex due to obligation when observing mindfulness was high (+1 *SD*; b = .31, SE = .18, t = 1.74, p = .088) (see Figure 4.5).

Table 4.5 *Tests of the Moderating Effect of Trait Mindfulness on the Relationships Between Attachment Avoidance and Maladaptive Daily Sexual Motives*

	SM Avoid Conflict			SM Prev Partner Losing Interest			SM Prev Partner Getting Upset			SM Prev Partner Getting Angry			SM Felt Obligated		
	B	**SE**	**T**	**B**	**SE**	**T**	**B**	**SE**	**T**	**B**	**SE**	**T**	**B**	**SE**	**T**
Att. Avoidance	.02	.20	.13	.31	.20	1.53	.05	.20	.24	.07	.13	.52	.09	.13	.76
Observe	-.29	.18	-1.66†	-.47	.19	-2.42*	-.28	.15	-1.85†	-.15	.09	-1.63	-.12	.12	-.97
Attavd X Observe	.15	.15	.99	.21	.25	.83	.09	.13	.66	.07	.09	.76	.35	.12	2.97**
Att. Avoidance	-.12	.20	-.63	.09	.17	.55	-.19	.14	-1.33	-.10	.08	-1.21	-.07	.13	-.54
Describe	-.13	.20	-.62	-.44	.19	-2.27*	-.37	.17	-2.15*	-.28	.14	-2.09*	-.18	.15	-1.26
Attavd X Describe	-.38	.25	-1.53	-.06	.28	-.20	-.37	.22	-1.67†	-.21	.15	-1.43	-.08	.15	-.52
Att. Avoidance	-.05	.20	-.24	.21	.21	1.01	.01	.21	.06	.05	.14	.36	-.02	.12	-.15
Act Aware	-.31	.21	-1.47	-.38	.22	-1.73	-.16	.15	-1.06	-.06	.10	-.57	-.28	.10	-2.71**
Attavd X Act Aware	.19	.29	.66	.08	.24	.34	.30	.17	1.78†	.23	.12	1.96*	-.08	.13	-.62
Att. Avoidance	-.04	.19	-.19	.12	.16	.78	.03	.16	.19	.03	.12	.21	-.08	.10	-.77
Non-Judge	-.05	.15	-.30	-.31	.15	-2.04*	.02	.17	.11	-.07	.14	-.47	-.15	.12	-1.28
Attavd X Non-Judge	-.17	.22	-.77	-.24	.22	-1.11	-.12	.26	-.49	-.06	.18	-.32	-.26	.13	-1.96†
Att. Avoidance	-.01	.22	-.03	.17	.19	.91	.07	.20	.38	.11	.14	.78	.01	.13	.09
Non-React	.02	.23	.08	-.44	.23	-1.92†	.08	.21	.40	.11	.18	.61	-.10	.16	-.64
Attavd X Non-React	-.20	.34	-.58	-.03	.32	-.09	.07	.32	.21	.15	.24	.62	.06	.22	.28

† p <.10 * p <.05 **p < .01 ***p < .001. *Note*. SM = Sexual Motivation, Prev = Prevent, Att. = Attachment, Attavd = Attachment avoidance.

Figure 4.4

The moderation effect of acting with awareness on the link between attachment avoidance and daily motivations to have sex to prevent a partner from getting angry

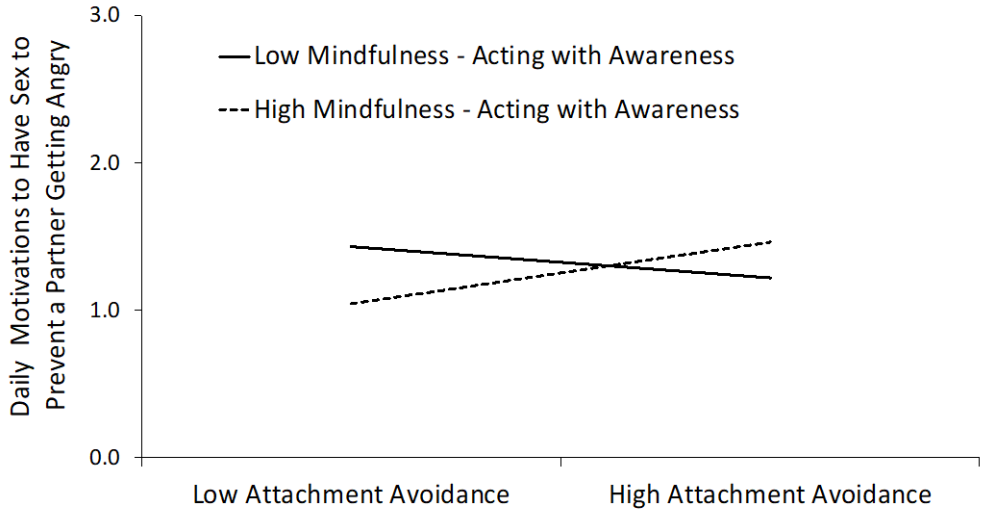
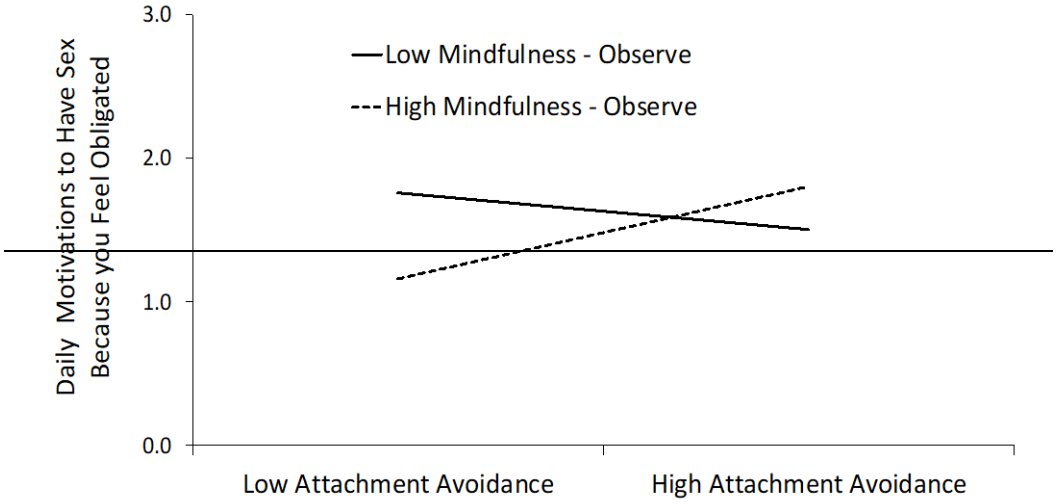


Figure 4.5

The moderation effect of observe on the link between attachment avoidance and daily motivations because you feel obligated



Finally, we tested whether mindfulness moderated the relationship between attachment avoidance and adaptive daily sexual motivations. As can be seen in Table 4.6, there were no significant interactions between attachment avoidance and mindfulness facets in the prediction of adaptive daily sexual motivations.

Table 4.6 *Tests of the Moderating Effect of Trait Mindfulness on the Relationships Between Attachment Avoidance and Adaptive Daily Sexual Motives*

	SM Intimacy			SM Feel Good			SM Express Love			SM Own Pleasure			SM Please Partner		
	B	**SE**	**T**	**B**	**SE**	**T**	**B**	**SE**	**T**	**B**	**SE**	**T**	**B**	**SE**	**T**
Att. Avoidance	.15	.13	1.15	.19	.21	.92	-.04	.16	-.27	.01	.19	.07	-.17	.15	-1.14
Observe	.60	.18	3.42***	.30	.25	1.20	.57	.20	2.82**	.11	.25	.42	.43	.24	1.79†
Attavd X Observe	.07	.14	.51	.33	.25	1.32	.10	.18	.57	-.45	.25	-1.82†	-.13	.16	-.83
Att. Avoidance	.25	13	2.00*	.01	.20	.05	.03	.16	.21	.08	.21	.37	-.17	.19	-.88
Describe	.21	.15	1.41	-.32	.22	-1.50	.13	.16	.82	.19	.26	.73	-.02	.24	-.09
Attavd X Describe	.25	.18	1.40	.12	.23	.52	.29	.21	1.39	-.38	.20	-1.90†	.05	.14	.34
Att. Avoidance	.17	.14	1.18	.13	.20	.63	-.02	.19	-.10	.12	.21	.56	-.14	.15	-.92
Act Aware	.40	.16	2.43*	.08	.28	.29	.38	.25	1.54	.12	.31	.38	.16	.26	.62
Attavd X Act Aware	-.14	.21	-.69	.44	.35	1.27	-.28	.30	-.95	-.22	.37	-.61	.08	.28	.29
Att. Avoidance	.07	.16	.42	.15	.20	.79	-.16	.21	-.78	.01	.23	.02	-.33	.16	-2.06*
Non-Judge	-.09	.16	-.58	.04	.23	.20	-.19	.19	-1.00	-.14	.22	-.63	-.37	.14	-2.71**
Attavd X Non-Judge	.02	.16	.14	.12	.26	.48	.03	.19	.13	-.20	.22	-.92	-.09	.16	-.58
Att. Avoidance	.21	.16	1.31	.15	.22	.67	-.08	.22	-.34	.08	.21	.40	-.23	.17	-1.32
Non-React	.27	.20	1.34	-.06	.35	-.18	-.04	.25	-.17	.13	.36	.35	-.18	.33	-.53
Attavd X Non-React	.26	.26	1.02	.40	.43	.93	.19	.33	.58	-.34	.39	-.89	-.09	.34	-.26

† p <.10 * p <.05 **p < .01 ***p < .001 *Note*. SM = Sexual Motivation, Att. = Attachment, Attavd = Attachment avoidance.

4.6 Discussion

The present study drew on the attachment-buffering (Arriaga et al., 2018) and mindfulness literatures (Karremans et al., 2017), to inform a daily diary study of whether trait mindfulness moderated the degree to which attachment insecurities manifested in maladaptive sexual motives on days individuals had sex. In line with predictions, the observing facet of mindfulness eliminated the relationship between attachment anxiety and having sex to prevent a partner from losing interest. Observing mindfulness also reduced the degree to which persons high in attachment anxiety had sex to please a partner. Unexpectedly, non-judging mindfulness reduced the likelihood that more anxiously attached individuals would report engaging in sex to pursue their own pleasure. As predicted, there were fewer and less robust associations between attachment avoidance and sexual motivations: Acting with awareness mindfulness moderated the link between attachment avoidance and sexual motivations to prevent a partner from getting angry (though both individual slopes were non-significant), and observing mindfulness marginally increased the tendency for more avoidant individuals to report having sex to due to feelings of obligation. There were no interactions between attachment avoidance and mindfulness predicting adaptive daily sexual motivations.

4.7.1 Mindfulness and Attachment Anxiety

That observing mindfulness reduced more anxiously attached individuals' tendency to have sex to prevent a partner from losing interest when reporting higher observe mindfulness is broadly consistent with prior research and theory. Two prior studies have shown that trait mindfulness can buffer links between attachment anxiety and negative relational outcomes (Dixon et al., 2021a; Saavedra et al., 2010). In one study, mindfulness eliminated the link between anxious attachment and having sex for self-affirmation-based and coping-based goals (Dixon et al., 2021a). The current study corroborates and extends this effect, providing

evidence using a different methodology that the buffering effect of mindfulness may persist when examining daily sexual motives.

A buffering effect of observing mindfulness on the link between anxious attachment and motivations to prevent a partner from losing interest is also consistent with theory regarding how attachment anxiety is likely to be attenuated (Arriaga et al., 2018). More anxious individuals are theorized to become more secure (or at least operate in more secure-functioning ways) when they experience situations that strengthen self-worth and/or when strategies offer moments of calm in response to relational threats (Arriaga et al., 2018). Because mindfulness, in general, is associated with greater and more robust self-esteem (Heppner & Kernis, 2007; Pepping, O'Donovan, et al., 2013; Randal et al., 2015), a greater ability to distinguish between threatening and neutral stimuli (Im et al., 2021), and better emotion regulation when threats *are* perceived (e.g., Britton et al., 2012; Teper et al., 2013; Weinstein et al., 2009), mindfulness may reduce the activation of attachment concerns among more anxiously attached individuals or give them skills to cope when attachment concerns do arise. More specifically, mindfulness may alleviate immediate distress, and—over time—build inner resources that lessen the degree to which their insecurities flow through into motivations and behaviors that are not conducive to personal and relationship wellbeing.

However, that observing mindfulness but no other facets of mindfulness had these effects is also noteworthy. It is possible that observing mindfulness, which indexes the tendency to attend to thoughts, sensations, and feelings (Baer et al., 2006) may be particularly relevant to persons higher in attachment anxiety. Such individuals are likely to be quite familiar with the contents of their consciousness, including being aware of the manifestations of attachment insecurities. Observing mindfulness may allow such individuals to attend to their experiences in a more objective way, being aware of their transient nature. This

particular kind of observing experience may buffer the degree to which attachment concerns manifest in sexual motives to prevent a partner from losing interest.

However, while this finding is broadly consistent with theory, our second finding regarding anxious attachment (that non-judging mindfulness *decreased* the likelihood that more anxiously attached individuals engaged in sex to pursue their own pleasure) was unexpected. At an overt level, anxious individuals are thought to prioritize their partner's needs in ways that are self-neglecting in nature (Fritz & Helgeson, 1998). Given the empirical and theoretical links between non-judging mindfulness (in particular) and "de-automaticity" (e.g., Kang et al., 2013; Reynolds et al., 2014), it is possible this self-denying effect arose because non-judging mindfulness decoupled underlying relational anxiety from its manifestations in sexual motivations. For example, it might be that when mindfulness is low, more anxious persons use sex as a tool for distraction or reassurance seeking but that this tendency is reduced when mindfulness is greater; the person is more aware of the origins of their feelings and better able to remain present with them (rather than let them flow into other processes). Instead of feelings being treated as phenomena to be acted upon, feelings may simply be observed without translation into motivation (and eventually behavior). That said, this interpretation does not explain why non-judging mindfulness and attachment anxiety interacted in predicting lower *self-pleasure* (but not other) motivations. Although we cannot know for sure, one possibility is that the links between self-pleasure motivations and attachment anxiety are more easily altered as self-pleasure motives do not obviously operate in the service of the attachment system. In other words, while sexual motivations concerned with reaffirming a relationship or preventing relational distress may be harder to decouple from underlying relational anxieties because they serve important attachment regulatory functions, self-pleasure motivations may be easier to change because they do not obviously reflect the purposes of the attachment system.

Our third finding regarding anxious attachment (the interaction between observing mindfulness and attachment anxiety predicting motivations to have sex to please a partner) is more difficult to interpret. Sexual motivations to please a partner can come from a place of wanting to care for and be responsive to a partner's wants/needs ("sexual communal motivation"), and thus be beneficial to an individual and/or their relationship (Day et al., 2015; Impett et al., 2019). Conversely, such motivations can also be self-neglecting (i.e., "unmitigated communal motivation"; Fritz & Helgeson, 1998) and associated with poorer outcomes (Impett et al., 2019). Unfortunately, as the item indexing this motivation did not clarify whether this other-focused motivation was prompted by fears of rejection or relationship-promotive reasons, we cannot be sure whether observing mindfulness is operating in a beneficial manner. That said, as rejection concerns are more characteristic of anxiously attached individuals, one could speculate that this interaction indicates that greater attachment anxiety predicts more *maladaptive* sexual motives to please a partner. Importantly, however, this association only occurred *when* individuals concurrently reported a lower ability to attend to their thoughts, sensations, and feelings (i.e., were low in observing mindfulness). Akin to the description of how observing mindfulness buffers the manifestations of attachment anxiety outlined above, it may be the case that a lower ability to observe experiences in a detached manner allows attachment concerns to flow freely into motivations to please a partner in an unmitigated/maladaptive way; such a process may be less likely when observing mindfulness is high. This possibility may be usefully tested in future research. Notably, however, as simple slopes only revealed a difference in motives to have sex to please a partner at *low* (but not high) attachment anxiety, it appears that observing mindfulness has no buffering effect on motivations to please a partner when attachment anxiety is high.

4.7.2 Mindfulness and Attachment Avoidance

Broadly in line with our suspicion that mindfulness would be more relevant to the links between anxious attachment and sexual motivations, findings regarding attachment avoidance were either marginal or had non-significant slopes when plotted. Our one marginal interaction showed that higher observing mindfulness tended to increase the association between avoidance and the tendency to have sex to due to feelings of obligation. This pattern is consistent with prior work suggesting that trait mindfulness may either *not* provide the same benefits to more avoidant individuals as it does for more anxious individuals or that it may be a double edged sword for them (e.g., Dixon et al., 2021a). Previous research linking mindfulness and attachment has speculated that mindfulness may support anxious *and* avoidant individuals in a similar manner (e.g., by enabling them to better manage emotional reactivity, disengage from biases that cloud their interpretation of ambiguous events, and foster more secure attachment; Brown et al., 2007; Karremans et al., 2017; Quickert & Macdonald, 2020). The current findings, however, imply that a more nuanced approach to understanding the interactions between attachment insecurity and mindfulness is needed, at least in the context of sexual motivations.

The Attachment-Security Enhancement Model (ASEM) is useful in this regard (Arriaga et al., 2018). This model suggests that attachment anxiety and avoidance are likely to be reduced under different circumstances. Specifically, more avoidantly attached individuals are likely to become more secure when they experience and internalize situations that contradict their negative views of others (Arriaga et al., 2018). As mindfulness is fundamentally about the relationship to the self, it may be that it has less relevance to the core attachment concerns of those high in attachment avoidance. Instead, mindfulness (at least at a trait level) may simply increase the experiential accessibility of attachment-related concerns (and the corollary distress these concerns create), while simultaneously failing to provide

resources that alleviate those concerns, ultimately increasing the likelihood they are expressed in motivations or behavior.

However, the fact that trait mindfulness does not appear to be of particular benefit regarding the association between sexual motivations and attachment avoidance does not mean that mindfulness has no benefit whatsoever for more avoidant individuals. Instead, it may be the case that mindfulness could be used in tandem with interventions that *more directly* attend to more avoidant individuals' attachment concerns, with mindfulness allowing them to more readily integrate information that contradicts their negative views of others. Alternatively, having a more mindful *partner* may assist more avoidant individuals to become more secure because mindfulness may enable their partner to be more responsive and less reactive (Adair et al., 2018; Harvey et al., 2019; Quaglia et al., 2015), thus challenging their negative expectations about others' trustworthiness. Consistent with this possibility, recent research found that a *partner's* relationship mindfulness buffered the link between attachment avoidance and same-day negative relationship behaviors (Gazder & Stanton, 2020).

Alternatively (or as well as), when mindfulness is being taught or practiced as an intervention, it could be that more avoidant individuals need a higher 'dose' of mindfulness before the links between avoidance and adverse relationship outcomes are buffered. More avoidant individuals are dispositionally less attentive to potentially threatening emotional information (Edelstein & Gillath, 2008; Fraley et al., 2000). As such, more mindfulness training (relative to that needed by more anxious individuals) may be required to progress through the process of (1) attending to inner and outer experiences, and (2) learning to disengage from and manage this information. In sum, mindfulness may be more usefully offered to more avoidant individuals when it is paired with other attachment interventions,

offered alongside their partner (e.g., Carson et al., 2004), or at a high enough 'dose' to ensure individuals have the skills to cope with newly accessible emotional information.

4.7.3 Strengths, Caveats, and Future Directions

Our daily diary method allowed a way of testing sexual motivations in spontaneous, naturally occurring day-to-day contexts and so offered a methodologically robust examination of how trait mindfulness might relate to attachment and sexual motivations. Nonetheless, the correlational nature of our data prevents causal conclusions. Experimentally testing whether a mindfulness intervention (e.g., Carson et al., 2004; Kappen et al., 2019) leads to lower endorsement of maladaptive sexual motives and more endorsement of adaptive motives (and for which attachment dimensions) would allow us to establish such links. Doing so would also test our ideas regarding how mindfulness interventions (rather that trait mindfulness) integrate with the predictions of the ASEM (Arriaga et al., 2018).

The daily diary methods used in this study mitigate against validity concerns stemming from difficulties recalling sexual motives or aggregating them in a way that reduces heterogeneity. However, validity concerns may be raised when considering the reliance on self-report measures of sexual motives (Catania et al., 1990). While alternatives are unclear, participants may be reluctant to accurately and/or fully report sexual motives because of embarrassment and/or a desire for privacy, despite assurances of anonymity. Our self-report measures of attachment and trait mindfulness may have also been limited by participants' reliance on consciously available information. What participants were able to consciously recall about their dispositional tendencies may (or may not) fully reflect their actual attachment (in)security and trait mindfulness.

Our measurement of daily sexual motivations was necessarily brief, so as to prevent participant fatigue and reduce attrition in a repeated-measures design. A trade-off, however, was that this measure only asked participants to report their level of agreement with ten

sexual motives. While this measure broadly captures the main motivations that underlie sexual behavior, it does not fully capture the range of reasons people engage in sex, which are reported to be above 200 (Meston & Buss, 2007). Perhaps more importantly in terms of our findings, the item measuring sexual motives to please a partner did not distinguish whether this other-focused motivation came from a place of care and responsiveness (Impett et al., 2015; Muise & Impett, 2016) or a sense of obligation (Fritz & Helgeson, 1998; Impett et al., 2019). Future studies could investigate whether mindfulness strengthens links between attachment and sexual communal motivation and decreases unmitigated sexual communal motivation among individuals whose attachment needs make it more likely that they will negate their own sexual needs.

Our study required participants to be in a romantic relationship and see their partner at least 5 times over the two weeks of the study. These inclusion criteria may have inadvertently excluded participants high in attachment avoidance. Attachment avoidance is associated with lower initiation and maintenance of social connections (Gillath et al., 2017). While the mean level of attachment avoidance in our sample was similar to other studies (e.g., Overall et al., 2009; Shaver et al., 2005; Tran & Simpson, 2009), only 8.4% of our sample had mean attachment avoidance scores above the mid-point of the scale (in contrast to the 29.4% that had mean attachment *anxiety* scores above the mid-point of the scale). As such, by virtue of their relationship status, those higher in attachment avoidance may have been ineligible to participate. This constrained variance may have had the unfortunate effect of limiting our ability to detect interactions between attachment avoidance and facets of mindfulness in the prediction of sexual motivations.

Finally, future research should consider looking at the interplay between attachment, sexual motivations, and mindfulness using a dyadic lens. For instance, researchers could test whether one partner's mindfulness shapes the degree to which the other partner's attachment

insecurity is related to their daily maladaptive sexual motives. Couples' constantly and dynamically influence each other within a relational system (Péloquin et al., 2011). Thus, modelling these processes dyadically may provide a more nuanced picture of the way in which attachment, mindfulness, and sexual motivations are associated in everyday life.

4.7.4 Clinical Implications

Trait mindfulness can increase with practice (Shapiro et al., 2011). As such, these findings may be used to inform the practical application of mindfulness in relationship and sex therapy contexts. While the nascent body of work exploring the relational and sexual effects of mindfulness interventions has largely shown it to be of benefit (e.g., Karremans et al., 2020; May et al., 2020; Velten et al., 2020), findings from the present study suggest that these benefits may not be equally evident with respect to the correlates of all attachment characteristics or may even magnify associations between attachment avoidance and negative outcomes. The reporting of adverse effects following mindfulness-based interventions is not unheard of (Baer et al., 2021; Britton et al., 2021; Reynolds et al., 2017) although the fact that these outcomes include sexual motivations is intriguing. While more research is needed to "unpack" this finding, it may be prudent for clinicians to operate with caution when offering mindfulness-based practices to improve relationship or sexual wellbeing among more avoidant individuals. It is possible that mindfulness training heightens experiential awareness of attachment distress by bringing it into relief—a process that will have been defensively regulated against for a long time (Fraley et al., 2000). The introduction of new experiential negativity into awareness may, in turn, lead to dysregulated arousal and/or lower quality of life requiring additional or counter treatment approaches (Britton et al., 2021).

4.7 Conclusion

The reasons people engage in sex are linked with significant personal and relational outcomes. Sex in the service of goals for intimacy or pleasure leads to profoundly different

outcomes than sex undertaken to avoid negative relational or personal experiences, which more insecurely attached individuals are more likely to report (Cooper et al., 2011; Impett et al., 2005). The current study evaluated the possible buffering role of trait mindfulness on the links between attachment insecurity (particularly anxiety) and daily sexual motivations. Results suggested that some facets of trait mindfulness attenuate the relationship between attachment anxiety and daily maladaptive sexual motivations. Interestingly, however, facets of trait mindfulness did not buffer (and in some cases appeared to intensify), the relationship between attachment avoidance and more maladaptive sexual motivations. No significant interactions were detected between attachment insecurity (anxiety or avoidance) and mindfulness in the prediction of adaptive daily sexual motivations. Thus, while some facets of trait mindfulness appear of potential benefit vis-à-vis attachment anxiety, it is unclear whether greater mindfulness is of benefit regarding the way avoidant attachment dynamics play out in human sexual behavior. Greater understanding of the nuanced way mindfulness interacts with attachment insecurities in the production of sexual motives may help therapists tailor their approach to better suit the needs of couples in distress.

Chapter 5. Do attachment anxiety and avoidance moderate the effects of mindfulness on relational functioning? A randomized controlled trial.

5.1. Preface

Replicating and extending the results of the initial cross-sectional study presented in this thesis, the previous chapter reported findings of an intensive longitudinal study again suggesting that mindfulness may be of greater relevance or utility regarding the concerns characterizing anxious attachment. Facets of trait mindfulness eliminated the relationship between attachment anxiety and having sex to prevent a partner from losing interest and reduced the degree to which persons high in attachment anxiety reported having sex to please a partner. Although one finding regarding attachment anxiety was unexpected (that non-judging mindfulness reduced the likelihood that more anxiously attached individuals reported engaging in sex to pursue their own pleasure), findings regarding attachment avoidance were consistent with the emergent picture suggesting that mindfulness may be of lower relevance/less utility regarding the concerns characterizing attachment avoidance. Specifically, mindfulness marginally increased more avoidant persons reporting of daily motives to have sex due to feelings of obligation. No other effects regarding attachment avoidance emerged.

Although this study usefully extends a small body of research (including the cross-sectional study presented earlier) exploring mindfulness' attachment-buffering potential and likely mitigated some of the limitations of the first study, the data remain fundamentally correlational. Indeed, it is not possible to know whether the observed effects of the previous studies were, in fact, due to trait mindfulness *per se* or due to another unmeasured psychological construct that systematically covaries with mindfulness (i.e., positive affect and emotion regulation difficulties; McLaughlin et al., 2019). Further, there are notable

limitations with self-report measures of trait mindfulness. In addition to the inherent paradox involved in assessing a self-reflective construct via self-report (reflection) and the accompanying validity concerns, there has also been some suggestion that the validity of mindfulness reports may vary as a function of prior experience. Van Dam et al. (2018), for example, have argued that persons with greater mindfulness meditation experience may understand and respond to questionnaires assessing trait mindfulness differently than persons with no experience. Relatedly, people may conflate a *desire* to be mindful with being mindful (a form of presentational bias). In addition, it is not yet known whether the way *trait* mindfulness and attachment dimensions interact reflects how mindfulness, *as taught in an intervention,* interacts with attachment to shape sexual outcomes.

Thus, to determine whether (a) the effects of mindfulness *training* on interpersonal outcomes depend on levels of attachment anxiety and avoidance and (b) whether mindfulness is effective beyond an active control, the following study capitalized on an existing dataset that took an experimental approach. By standardizing study methods and randomizing participants to either a mindfulness or relaxation condition, data collected in this large study of couples in the Netherlands (see Kappen et al., 2019; Karremans et al., 2020 for the studies for which this data was initially collected) permitted causal interpretations about whether mindfulness' role in interpersonal contexts depended on attachment characteristics and whether these effects were unique to mindfulness. While not focused on buffering typically less-adaptive sexual experiences, as in the previous two studies, the manuscript on the following pages presents a crucial first test of whether a mindfulness *intervention* is of disproportionate benefit (or disadvantage) to the interpersonal experiences of more anxiously and more avoidantly attached individuals.

Citation

Dixon, H. C., Karremans, J. C., Kappen, G., Reynolds, L. M., & Consedine, N. S. (2022). *Do attachment anxiety and avoidance moderate the effects of mindfulness on relational functioning? A randomized controlled trial* [Manuscript in preparation]. Department of Health Psychology, University of Auckland.

5.2 Abstract

Research on mindfulness' effects in relationships has proliferated recently, yet little is known about whether individual differences moderate its effects. The current study examined whether attachment insecurity moderated the effects of a two-week mindfulness (versus relaxation) intervention on relationship outcomes. Romantically involved participants from The Netherlands (N=553) were randomized to listen to a daily mindfulness or relaxation audio-recording for two weeks. Participants completed measures of attachment pre-intervention, and measures of connection, partner acceptance, rejection fears, destructive behavior, and relationship conflict pre- and post-intervention, and at 1-month follow-up. Findings suggested that mindfulness had a disproportionately beneficial effect in more anxious individuals. Results regarding attachment avoidance were more nuanced, suggesting that mindfulness may *sometimes* offer slightly greater benefits vis-à-vis relationship outcomes among the more avoidant, though these effects were not always maintained. However, this same pattern of results was evident across the relaxation condition as well, making it difficult to ascertain whether these effects are specific to mindfulness interventions. Findings are discussed in light of theory regarding how mindfulness may differentially affect the manifestations of anxious and avoidant attachment, and the similarities between mindfulness and relaxation as they relate to attachment-relevant functioning.

5.3 Introduction

After many years of documenting the benefits of mindfulness for intra-individual outcomes such as general wellbeing and self-regulation (e.g., Weinstein et al., 2009), research is increasingly implicating more mindful functioning in better relational outcomes. (e.g., Dixon & Overall, 2018; Kappen et al., 2019). Specifically, early evidence suggests trait mindfulness predicts greater relationship quality and satisfaction (Kappen et al., 2018; Quinn-Nilas, 2020), perceived partner responsiveness (Adair et al., 2018), attachment security (Stevenson et al., 2017), and more constructive responses during conflict (Barnes et al., 2007). A few interventional studies corroborate some of these findings. Teaching individuals or couples to be more mindful leads to greater relationship satisfaction, wellbeing, closeness, partner acceptance and reduces relationship distress (Carson et al., 2004; Kappen et al., 2019; Karremans et al., 2020).

5.2.1 Attachment as a Potential Moderator of Mindfulness' Effects in Relationships

Less clear is whether mindfulness is equally suited to different types of relational challenges. Rather than offering the same benefits to all, it is possible that mindfulness disproportionately helps (or hinders) some individuals over others. What might shape potential differences in the relational benefits of mindfulness is unknown at this time. After an initial flurry of mindfulness studies, research has begun to more systematically consider questions of moderation; for whom does mindfulness "work" and when is it less useful? Studies have shown that neuroticism (de Vibe et al., 2015; Norris et al., 2018; Nyklíček & Irrmischer, 2017) and post-traumatic stress (Kuhl & Boyraz, 2017) may moderate the effects of mindfulness on personal health and wellbeing outcomes.

In considering the potential factors that might moderate the direction and magnitude of mindfulness' effects on *relationship* outcomes, it is worth recalling that attachment is widely considered a central component of personality that exerts a powerful influence on our

experience in relationships (Bowlby, 1973; Collins & Allard, 2001; Mikulincer & Shaver, 2003). Greater attachment anxiety is consistently associated with lower self-worth, greater worries about the availability of close others, and a "hyperactivation" of attachment concerns and strategies in an attempt to gain comfort and security (Simpson & Rholes, 2012). In contrast, attachment avoidance is characterized by concerns about the trustworthiness of others, a discomfort with intimacy and dependence, and a deactivation (i.e., suppression) of attachment systems in favor of independence and personal control (Mikulincer et al., 2003).

Although both anxiety and avoidance are functional responses to patterns of early life interactions, they have the potential to "play out" in unhelpful ways in subsequent relationships (Collins & Allard, 2001). For example, anxious individuals report a strong, almost excessive, desire for connection (Collins et al., 2004)—wanting *more* closeness with their partner than is expressed by their secure or avoidant counterparts (Feeney, 1999). More anxious individuals are more likely to expect, fear, and be hypervigilant for rejection cues (Vorauer et al., 2003). They tend to perceive greater relationship conflict than is warranted (Collins, 1996) or reported by their partner (Campbell et al., 2005; cf. Pietromonaco & Barrett, 1997), and respond to such conflicts with more destructive behaviors (Campbell et al., 2005). Attachment anxiety also predicts more negative-direct attempts to change or regulate partners (Jayamaha et al., 2016), less favorable partner evaluations (Collins, 1996), and less support provision (Jayamaha et al., 2017), the sum of which may indicate that more anxious persons are less accepting of their partner.

Although the dynamics are distinct, greater attachment avoidance can also pose challenges in relationships. First, more avoidant individuals report lower expectations of, and desires for, connection (Mikulincer et al., 2003; Spielmann et al., 2013), which may result in less *felt* connection with partners. Second, while there is no evidence suggesting that rejection fears are characteristic of more avoidant individuals, more avoidant persons tend to

*over*estimate partners' negative emotions and engage in more hostile and defensive relationship behaviors as a result (Overall et al., 2015). They also report lower support-provision (Simpson et al., 1992) and sometimes appraise their partner's behavior as indicative of an unchanging negative attitude or motivation (Collins, 1996), both of which may lower partner acceptance.

5.2.2 Possible Buffering Effects of Mindfulness on Attachment Insecurity

Revisited in the context of mindfulness research, these characterizations suggest that anxious and avoidant attachment may change how mindfulness' shapes relational outcomes (Karremans et al., 2017). First, since persons with high anxiety and/or avoidance tend to show more stress and destructive behaviors during conflict (e.g., Ben-Naim et al., 2013; Campbell et al., 2005), mindfulness-linked enhancement of the ability to manage relational challenges may be particularly useful to them. Equally, mindfulness may alter attachment-related cognitions, changing the way more insecure individuals view themselves, their partner, their relationship, or relationships in general (Karremans et al., 2017). Such changes may increase the ability to manage attachment-related distress and/or reduce the extent to which more insecure individuals' think, feel and act in ways that are personally and relationally costly (Karremans et al., 2017). If this is the case, mindfulness may be of greater benefit to more insecure persons.

To this point, however, whether and how mindfulness may be differentially relevant to attachment anxiety versus avoidance is less clear. Some research indicates that trait mindfulness may be of particular benefit to more anxious persons. Saavedra et al. (2010), for example, found the link between attachment anxiety (but not avoidance) and relationship dissolution a year later was reduced among individuals with greater trait mindfulness. More recently, Dixon et al. (2022a, 2022b) found that some facets of trait mindfulness attenuated the links between attachment anxiety and maladaptive sexual motivations but they did not

buffer (and in some cases intensified) links between attachment avoidance and more maladaptive sexual motivations. Taken together, these early studies suggest that the size of mindfulness' effects on relational functioning may be greater among more anxious persons whereas effects may not vary systematically as a function of attachment avoidance.

Given the distinct concerns characterizing anxiety and avoidance and the different strategies used to manage them (Mikulincer et al., 2003), different effects for mindfulness on these two characteristics may not be entirely surprising. Theory suggests that anxiety and avoidance are reduced (or at least buffered) under different circumstances (Arriaga et al., 2018). While anxiety is thought to decline when individuals use strategies that increase their self-worth and/or facilitate calm in relational threatening situations, avoidance is thought to reduce when individuals' views of others are strengthened and autonomy concerns reduced (Arriaga et al., 2018). Arguably, mindfulness is primarily about one's relationship to the self and one's own experiences. Mindfulness is also associated with improvements in self-concept and emotion regulation (Britton et al., 2012; Randal et al., 2015; Teper et al., 2013). As such, mindfulness may be particularly relevant to the concerns characterizing anxious attachment. The increased accepting awareness afforded by mindfulness may offer more anxious persons a more objective way to relate to (emotional) experiences that already occupy consciousness, leading to enhanced regulatory capacities that reduce attachment distress and improve coping and relationship functioning (Karremans et al., 2017).

It is less clear how useful mindfulness is for more avoidant persons. Insofar as mindfulness fails to impact the specific processes characterizing avoidant attachment (i.e., changing views of others, reducing autonomy concerns; Arriaga et al., 2018) it may be less advantageous. It is possible, however, that mindfulness may offer both costs and benefits to more avoidant persons. Given they are strongly motivated to avoid threatening attachment information (Edelstein & Gillath, 2008; Fraley et al., 2000), the greater awareness

necessitated by mindfulness may be more difficult to train and/or implement among more avoidant persons. Mindfulness may bring attachment concerns into relief or intensify their expression, undermining the effectiveness of a mindfulness intervention. Alternatively, however, given that flexible emotion regulatory skills—which comprise a key part of mindfulness training—are in sharp contrast to more avoidant persons' habitual emotion regulation strategies (e.g., suppression; Fraley & Shaver, 1998), more avoidant individuals may have more to "gain" from a mindfulness intervention. The lack of research testing these alternate theoretical possibilities, however, means it is unclear whether mindfulness is of benefit to the attachment concerns characterizing avoidant attachment and if it alters their manifestations in relationship outcomes.

5.2.3 The Current Study

To recap, despite growing appreciation of the potential relevance of mindfulness to relationship functioning, empirical studies in this area remain limited. While we know that trait mindfulness and attachment security are positively correlated (Stevenson et al., 2017) and mindfulness mediates and moderates links between attachment and poorer relationship outcomes (Dixon et al., 2022a, 2022b; Quickert & Macdonald, 2020; Saavedra et al., 2010), no studies have explored whether the effects of mindfulness *interventions* on relationship functioning vary as a function of attachment anxiety and avoidance. To the best of our knowledge, prior studies exploring possible interactions between attachment and mindfulness have relied on measures of *trait* mindfulness (Dixon et al., 2022a, 2022b; Saavedra et al., 2010). Such reports have clear limitations (Grossman, 2008; Van Dam et al., 2018), including variation in the subjective meaning of mindfulness (Van Dam et al., 2018) and response biases (Grossman, 2008). Perhaps most importantly, prior research is limited by correlational data that cannot test causal hypotheses. Firmer conclusions regarding whether (and which) attachment dimensions interact with mindfulness to predict relationship functioning would be

enhanced using experimental designs with an active control. For the current report, we leverage an existing dataset to conduct a first test of whether attachment anxiety and avoidance moderate the effects of a two-week mindfulness (versus relaxation) intervention on relationship outcomes (i.e., rejection fears, destructive behavior, conflict, partner acceptance, and felt connection).

5.4 Methods

5.4.1 Participants

Initial ethical approval was provided by The Radboud University Faculty of Social Sciences Ethics Committee (ID: EC2015- 0903-304). Ethical approval for secondary data analysis was provided by The University of Auckland Human Participants Ethics Committee (ID: 22678). The initial study was preregistered on OSF, while analytic plans and hypotheses for secondary data analysis were preregistered on AsPredicted. Prospective participants were recruited via an independent Dutch research agency (www.flycatcher.eu) that had a nation-wide participant panel at their disposal. Prospective participants were required to complete an initial questionnaire assessing eligibility. Those who indicated they were over 18-years-old, involved in a current romantic relationship with a minimum duration of one-year and living together with their partner were invited to participate. Participants were informed that participation was voluntary, and they could withdraw from the study at any time. As the initial study required an individual *and* their partner to contribute, participation was remunerated based on involvement from both couple members. Couples were initially remunerated with €22.50. To incentivize participation, couples with complete data were included in a prize draw to win one of ten €25 vouchers.

A total of 1291 prospective participants filled in the eligibility questionnaire, of whom 1233 qualified. If partners of participants did not also agree to participate however, participants were excluded (n=244). Participants were then randomized and proceeded

through the interventions and measurement stages. As we were interested in changes over time, participants who failed to complete questionnaire measures over the three time points were excluded from analyses. This left a final sample of 553. Of these, 301 were in the mindfulness group and 252 were in the relaxation group (for a CONSORT diagram, see Figure 5.1). Descriptive characterization of the final sample, including contrasts of those who were included versus excluded, can be seen in Table 5.1. As can be seen, relative to excluded participants, included participants were likely to be in a longer relationship and reported lower anxious and avoidant attachment. As might be expected, they were also more likely to report greater feelings of connectedness and partner acceptance, and lower rejection fears.

5.4.2 Procedure

Following initial ethical approval, data were collected between March 2018 and May 2018. Participants in both conditions proceeded through four phases. Participants first completed questionnaires assessing demographics, attachment, and baseline measures of relationship feelings and behaviors. Next, participants listened to mindfulness or relaxation audio-recordings (according to randomization) each working day for two-weeks. Post-intervention assessment of relationship feelings and behaviors was completed directly after the intervention ended and again at one-month follow-up.

Participants randomized to the mindfulness condition were instructed to listen to daily 10-minute guided mindfulness exercises, which were recorded by a certified mindfulness teacher and developed with reference to the core components of mindfulness (Bishop et al., 2004). Exercises proceeded through four phases. First, participants were given instructions regarding posture. They were then invited to pay attention to posture and breathing to ground them in the present moment. Participants were then invited to direct attention toward experiences arising in the present moment (e.g., bodily sensations, thoughts, emotions), and were encouraged to cultivate a "decentered" attitude towards these experiences. That is, to

appreciate the transient nature of events and limit over-identification with experience. Metaphors were adopted to help participants understand this instruction (e.g., awareness was described as the sky and experiences that arise within consciousness were likened to clouds passing through). Finally, participants were invited to carry this quality of attention into their interactions with their romantic partner. Three different versions of this exercise were offered over the two weeks, differing slightly in wording and metaphors used, but not in overall intent and content.

Participants randomized to the relaxation condition were also asked to listen to daily 10-minute audio-guided exercises. These exercises were recorded by the same person that recorded the mindfulness exercises. Participants proceeded through three phases: (1) guidance around posture, (2) instruction to sequentially tense and release muscles, and (3) an invitation to carry any resulting relaxation into interactions with their romantic partner. Three different versions of this exercise were offered, differing slightly in wording and order of instructions. Transcripts of the audio files for both conditions can be found in OSF.

5.4.3 Measures

All questionnaire measures were scored and averaged so that higher scores reflect greater levels of the construct. Means and standard deviations of continuous variables can be found in Table 5.1, and correlations in Table 5.2. All items were presented to participants in Dutch. Translations were completed using Google Translate and validated by a Dutch-as-a-second-language speaker.

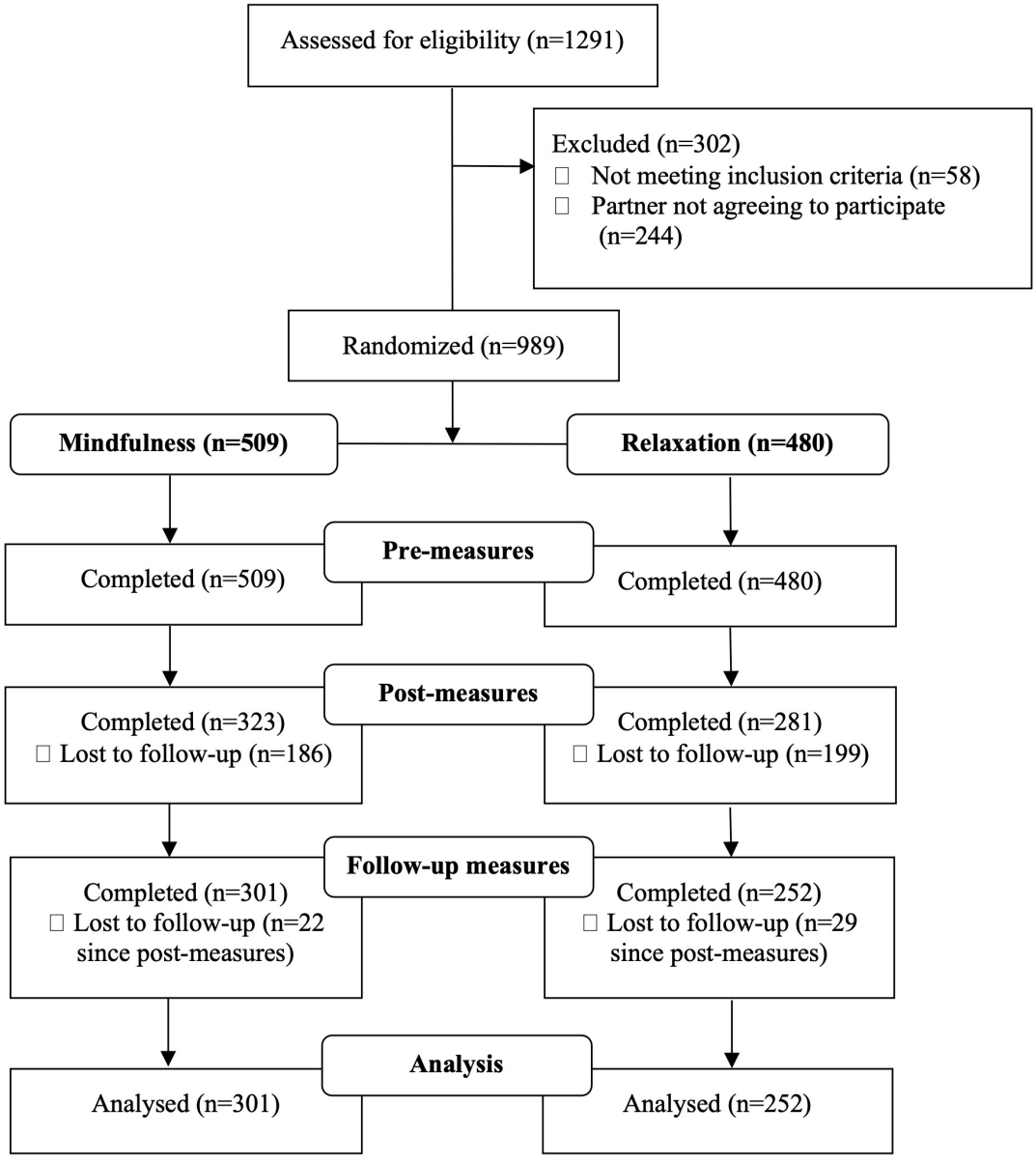
Baseline Measures.

Attachment Insecurity. Attachment anxiety and avoidance were measured using the Experiences in Close Relationships–Relationship Structures Questionnaire (ECR-RS; Fraley et al., 2011). Three-items assessed attachment anxiety (e.g., “I often worry that my partner doesn’t really care about me”) and six-items assessed attachment avoidance (e.g., “I find it

uncomfortable to open up to my partner"). Items were responded to on a 7-point scale from 1 (completely disagree) to 7 (completely agree). Each dimension demonstrated good internal reliability (anxiety α = .88, avoidance α = .87).

Figure 5.1

CONSORT Diagram



Note. Participant numbers differ from the initial study's pre-registration on OSF. See Karremans et al. (2020) for information regarding this change.

Table 5.1

Retention Analyses Contrasting Characteristics of Participants Included Versus Excluded

	Included	Excluded	Contrast
Demographics			
Mean Age (SD)	49.69(15.17)	48.27(14.24)	-1.74$^{\dagger}{}_{a}$
Mean Relationship Length (SD)	23.13(14.89)	21.05(14.59)	-2.45*$_{a}$
% Female	62.00%	59.30%	.93$_{b}$
% Heterosexual	96.20%	95.61%	.51$_{b}$
% Married	74.32%	70.20%	2.55$_{b}$
% Have Children	71.97%	73.98%	.62$_{b}$
% Cohabitating	93.67%	91.53%	1.99$_{b}$
Attachment and relationship variables			
Anxious Attachment	2.00(1.22)	2.22(1.29)	3.05*$_{a}$
Avoidant Attachment	2.20(1.05)	2.47(1.18)	4.25**$_{a}$
Rejection Fears	1.73(1.17)	1.95(1.35)	3.03*$_{a}$
Destructive Behavior	2.96(1.72)	3.04(1.71)	.82$_{a}$
Relationship Conflict	2.59(1.42)	2.82(1.48)	2.74*$_{a}$
Connection	5.77(1.06)	5.54(1.16)	-3.64**$_{a}$
Partner Acceptance	5.03(1.06)	4.86(1.04)	-2.95*$_{a}$

$^{\dagger}p$<.10 *p<.05 **p< .001. *Note:* All variables are measured at Time 1, $_{a}$ = independent samples t-test, $_{b}$ = Chi-Square test.

Pre-, Post- and Follow-up Intervention Measures.

Rejection Fears. One-item was used to assess rejection fears: "During the past 2 weeks I was afraid of being rejected by my partner" using a 7-point scale from 1 (completely disagree) to 7 (completely agree). This item was modelled off a similar item used in previous research (Dixon & Overall, 2018). Given the large positive skew (skew = 2.53, *SE* = .06) and leptokurtic distribution (kurtosis = 6.76, *SE* = .12), rejection fears was windsorized.

Destructive Behavior. Participants responded to 1-item assessing destructive behavior that was based on a previously used measure of self-protective responses to

relationship difficulties (Dixon & Overall, 2018): "During the past 2 weeks I have been critical/dismissive/offensive to my partner or have behaved in a way that could have been unpleasant for my partner". This item was responded to on a 7-point scale from 1 (completely disagree) to 7 (completely agree).

Relationship Conflict. Amount of relationship conflict was assessed with 1-item: "During the past two weeks, how many problems, stress or conflict have you experienced in your relationship?" that was answered on a 7-point scale from 1 (none at all) to 7 (a lot).

Partner Acceptance. The 5-item Partner Acceptance Scale (Kappen et al., 2018) assessed the extent to which participants accepted their partner (e.g., "I was able to accept my partner's less pleasant qualities"). Items were responded to on a 7-point scale from 1 (completely disagree) to 7 (completely agree). The scale demonstrated good internal reliability (T1 $\alpha = .72$, T2 $\alpha = .72$, T3 $\alpha = .73$).

Connection. Perceived connectedness to a romantic partner was measured with 3-items (e.g., "During the past two-weeks, when I was in contact with my partner, I felt really connected to my partner"). Items were responded to on a 7-point scale from 1 (completely disagree) to 7 (completely agree) and demonstrated good internal reliability at all timepoints (T1 $\alpha = .91$, T2 $\alpha = .95$, T3 $\alpha = .94$).

5.4.4 Statistical Analysis

Data were analyzed using IBM SPSS Version 26. Five generalized linear mixed models were run to test the prediction that any beneficial effect of the intervention would be stronger among more anxiously attached individuals. In each analysis one of the five relationship outcomes was regressed onto the following fixed effects: intervention condition (mindfulness versus relaxation), time (pre, post, follow-up), attachment anxiety, the two- and three- way interactions among these variables, and attachment avoidance (as a covariate). Subsequently, five analogous models were run replacing attachment anxiety with attachment

avoidance to examine whether the magnitude and direction of any effects of the mindfulness intervention (as compared to the relaxation intervention) on relationship outcomes across the three time points varied as a function of attachment avoidance.

This analytic approach varies slightly from what was proposed in the pre-registration (see #71184 on aspredicted.org). Initially, we planned to use repeated measures (RM) ANCOVAs and subsequent post-hoc tests to examine our predictions. This approach, however, required that the continuous attachment measures be dichotomized—an approach that unnecessarily reduces variability within the data. As such, we have opted to present the linear mixed models described above. However, because (1) running our models using a RM ANCOVA offered, with one exception, an identical pattern of results to the results of the linear mixed models and (2) the results of the RM ANCOVAs and post-hoc tests are easier to interpret, the post-hoc tests presented here were conducted following RM ANCOVAs and used the categorical measure of attachment dimensions.

Table 5.2

Correlations Between Attachment Dimensions and Relationship Outcomes at Baseline

	1.	2.	3.	4.	5.	6.
1. Attachment Anxiety	-					
2. Attachment Avoidance	.37**	-				
3. Rejection Fears	.53**	.27**	-			
4. Destructive Behavior	.29**	.27**	.40**	-		
5. Relationship Conflict	.39**	.37**	.45**	.56**	-	
6. Partner Acceptance	-.32**	-.35**	-.30**	-.37**	-.39**	-
7. Connection	-.41**	-.65**	-.36**	-.42**	-.52**	.41**

**$p \leq .001$

5.5 Results

5.5.1 Analyses Testing Moderation by Attachment Anxiety

Table 5.3 presents the results of the mixed models testing the potential moderation effects of attachment anxiety on the links between interventions and outcomes over time. As can be seen, none of the group by time interactions were significant—which appears inconsistent with expectation. Equally, none of the three-way interactions with attachment anxiety were significant for any of the dependent variables. Together, these findings indicate that mindfulness versus relaxation interventions did not differentially effect the outcome variables, even when attachment anxiety was taken into account.

Interestingly, however, analyses did reveal significant interactions between time and attachment anxiety in the prediction of rejection fears, destructive behavior, relationship conflict, and felt connection. Post-hoc tests further probing these interactions were generally consistent with predictions (see comparisons in Table 5.5). Specifically, while rejection fears decreased between Time 1 and 2 for both those low (Wilk's $\lambda = .97$, $F(1, 305) = 9.64$, $p = .002$, $\eta^2 = .03$) and high (Wilk's $\lambda = .87$, $F(1, 246) = 38.16$, $p < .001$, $\eta^2 = .13$) in attachment anxiety, the magnitude of the decrease was greater for those high in attachment anxiety. Similarly, while the reduction in rejection fears were maintained for those high in attachment anxiety between Time 2 and 3 (Wilk's $\lambda = 1.00$, $F(1, 246) = .18$, $p = .675$, $\eta^2 < .01$), they increased between Times 2 and 3 among those low in attachment anxiety (Wilk's $\lambda = .98$, $F(1, 305) = 6.34$, $p = .012$, $\eta^2 = .02$).

Table 5.3. Main and Interaction Effects of Attachment Anxiety, Intervention Group, and Time in the Prediction of Outcome Variables

	Rejection Fears		**Destructive Behavior**		**Conflict**		**Partner Acceptance**		**Felt Connection**	
	F	*p*-value	*F*	*p*-value	*F*	*p*-value	*F*	*p*-value	*F*	*p*-value
Main Effects										
Time	2.19	.113	13.65	**< .001**	.28	.758	14.12	**< .001**	.22	.886
Group	.16	.693	.00	.949	.58	.448	.86	.354	.01	.910
Attanx	181.55	**< .001**	32.59	**< .001**	49.81	**< .001**	27.43	**< .001**	26.27	**< .001**
Attavd (included as control)	3.73	**.054**	24.47	**< .001**	69.01	**< .001**	63.64	**< .001**	337.33	**< .001**
2-way Interactions										
Time X Group	.33	.722	.13	.878	.78	.460	.74	.477	.12	.886
Time X AttAnx	17.11	**< .001**	4.67	**.010**	5.47	**.004**	1.51	.221	3.87	**.021**
Group X AttAnx	.28	.595	.01	.913	1.01	.315	1.72	.191	.05	.829
3-way Interactions										
Time X AttAnx X Group	.19	.827	.09	.911	2.09	.124	.15	.863	.69	.504

Note. AttAnx = attachment anxiety, Attavd = attachment avoidance.

Regarding destructive behaviors, contrary to predictions, post hoc tests revealed that persons high (Wilk's $\lambda = .71$, $F(1, 246) = 98.86$, $p < .001$, $\eta^2 = .29$) and low (Wilk's $\lambda = .81$, $F(1, 305) = 73.09$, $p < .001$, $\eta^2 = .19$) in attachment anxiety reported similar reductions in destructive behaviors between Time 1 and 2. No significant effect of time was apparent for those high (Wilk's $\lambda = 1.00$, $F(1, 246) = .83$, $p = .362$, $\eta^2 < .01$) or low (Wilk's $\lambda = 1.00$, $F(1, 305) = .16$, $p = .686$, $\eta^2 < .01$) in attachment anxiety between Time 2 and 3.

Finally, analyses predicting conflict and felt connection revealed a similar pattern of results to the analysis predicting rejection fears. Specifically, whereas those low in attachment anxiety reported no significant change in rates of conflict (Wilk's $\lambda = 1.00$, $F(1, 305) = 1.63$, $p = .203$, $\eta^2 = .01$) and felt connection (Wilk's $\lambda = .99$, $F(1, 305) = 2.84$, $p = .093$, $\eta^2 = .01$) across Time 1 to 2, persons high in attachment anxiety reported significant decreases in rates of conflict (Wilk's $\lambda = .96$, $F(1, 246) = 11.61$, $p = .001$, $\eta^2 = .05$) and significant increases in felt connection (Wilk's $\lambda = .89$, $F(1, 246) = 30.45$, $p < .001$, $\eta^2 = .11$). Thus, with the exception of equivalent decreases in destructive behavior among persons both high and low in attachment anxiety, these results tend to collectively suggest that more anxious individuals derived greater benefit from the interventions over time.

5.5.2 Analyses Testing Moderation by Attachment Avoidance

Turning to the second set of findings, Table 5.4 presents results of all mixed models testing the moderation effects of attachment avoidance on links between the interventions and outcomes over time. Akin to the models with attachment anxiety, no two- or three- way interactions with group were significant, indicating that mindfulness versus relaxation interventions did not differ in the way they effected outcome variables, even when attachment avoidance was accounted for.

Table 5.4. Main and Interaction Effects of Attachment Avoidance, Intervention Group, and Time in the Prediction of Outcome Variables

	Rejection Fears		**Destructive Behavior**		**Conflict**		**Partner Acceptance**		**Felt Connection**	
	F	*p*-value	*F*	*p*-value	*F*	*p*-value	*F*	*p*-value	*F*	*p*-value
Main Effects										
Time	4.02	**.018**	10.28	**< .001**	.45	.639	17.16	**< .001**	2.13	.120
Group	.69	.405	2.48	.116	.03	.871	.55	.46	1.37	.243
Attavd	2.89	.090	27.25	**< .001**	67.68	**< .001**	64.56	**< .001**	314.03	**< .001**
Attanx (included as control)	179.21	**< .001**	26.01	**< .001**	45.76	**< .001**	26.56	**< .001**	29.37	**< .001**
2-way Interactions										
Time X Group	.02	.98	.00	.997	.27	.763	1.46	.233	.22	.799
Time X AttAvd	10.37	**< .001**	4.61	**.010**	2.45	.088	1.52	.221	5.47	**.004**
Group X AttAvd	.75	.386	2.71	.100	.01	.930	.99	.321	1.51	.220
3-way Interactions										
Time X AttAvd X Group	.01	.986	.02	.977	.86	.425	2.46	.087	.77	.462

Note. Attavd = attachment avoidance, AttAnx = attachment anxiety.

Analyses did reveal, however, some significant interactions between attachment avoidance and time in the prediction of rejection fears, destructive behavior, and felt connection. Post-hoc tests further probing these interactions revealed less straight-forward associations than those found regarding attachment anxiety (see comparisons in Table 5.5). Between Time 1 and 2, equally significant decreases in rejection fears were seen for both those high (Wilk's $\lambda = .90$, $F(1, 249) = 26.78$, $p < .001$, $\eta^2 = .10$) and low (Wilk's $\lambda = .94$, $F(1,302) = 19.99$, $p < .001$, $\eta^2 = .06$) in attachment avoidance. Differences emerged between Time 2 and 3 however, as rejection fears plateaued for those high in attachment avoidance (Wilk's $\lambda = 1.00$, $F(1, 249) = .02$, $p = .896$, $\eta^2 = .00$) but *increased* among persons low in attachment avoidance (Wilk's $\lambda = .97$, $F(1,302) = 8.19$, $p = .005$, $\eta^2 = .03$; see Table 5.5). This suggests that intervention-inspired reductions in rejection fears were sustained for at least one-month among those reporting high avoidance, whereas rejection fears reverted towards pre-intervention levels for those reporting low avoidance.

Similarly, significant reductions in destructive behavior were evident among both those high (Wilk's $\lambda = .69$, $F(1, 249) = 113.66$, $p < .001$, $\eta^2 = .31$) and low (Wilk's $\lambda = .83$, $F(1, 302) = 62.54$, $p < .001$, $\eta^2 = .17$) in attachment avoidance between Time 1 and 2, though the size of the effect was slightly larger among the more avoidant. In contrast, between post-intervention and follow-up persons *low* in attachment avoidance continued to report significant decreases in destructive behavior (Wilk's $\lambda = .98$, $F(1,302) = 5.97$, $p = .015$, $\eta^2 = .02$), whereas persons *high* in attachment avoidance tended to report an increase in destructive behavior (Wilk's $\lambda = 1.00$, $F(1, 249) = 3.14$, $p = .078$, $\eta^2 = .01$; see Table 5.5).

Table 5.5. Means, Standard Deviations, and Pairwise Comparisons of the Outcome Variables at Each Time Point for Persons High Versus Low in Attachment Anxiety (Top) and Avoidance (Bottom)

		T1	T2	T3	Difference Between T1 & T2		Difference Between T2 & T3	
		M(SD)	*M(SD)*	*M(SD)*	*Mean difference (SE)*	*p*	*Mean difference (SE)*	*p*
Attachment Anxiety								
Rejection Fears	High	2.31(1.34)	1.79(1.17)	1.82(1.21)	.52(.08)	< .001	-.03(.07)	.675
	Low	1.27(.74)	1.14(.54)	1.23(.81)	.12(.04)	.002	-.09(.04)	.012
Destructive Behavior	High	3.44(1.64)	2.47(1.36)	2.40(1.35)	.96(.10)	< .001	.07(.08)	.362
	Low	2.57(1.69)	1.88(1.27)	1.91(1.31)	.70(.81)	< .001	-.03(.07)	.686
Relationship Conflict	High	3.07(1.41)	2.79(1.28)	2.68(1.28)	.29(.08)	. 001	.11(.07)	.140
	Low	2.19(1.31)	2.11(1.08)	2.11(1.17)	.09(.07)	.203	.00(.06)	1.00
Partner Acceptance	High	4.70(.96)	5.14(.97)	5.15(.98)	-.44(.05)	< .001	-.01(.04)	.808
	Low	5.31(1.05)	5.67(.98)	5.71(.92)	-.36(.05)	< .001	-.04(.04)	.323
Felt Connection	High	5.30(1.04)	5.57(.95)	5.55(1.07)	-.27(.05)	< .001	.02(.05)	.718
	Low	6.14(.90)	6.21(.95)	6.16(.95)	-.07(.04)	.093	.05(.04)	.194
Attachment Avoidance								
Rejection Fears	High	2.06(1.35)	1.64(1.13)	1.64(1.18)	.41(.08)	< .001	-.12(.04)	.005
	Low	1.47(.92)	1.26(.70)	1.38(.92)	.21(.05)	< .001	.01(.06)	.90
Destructive Behavior	High	3.37(1.67)	2.34(1.39)	2.50(1.47)	1.03(1.00)	< .001	-.16(.09)	.078
	Low	2.62(1.69)	1.98(1.29)	1.82(1.17)	.64(.08)	< .001	.16(.07)	.015
Relationship Conflict	High	3.04(1.52)	2.82(1.35)	2.72(1.31)	.22(.09)	.015	.10(.08)	.208
	Low	2.21(1.22)	2.07(.98)	2.07(1.13)	.14(.06)	.026	.00(.05)	.952
Partner Acceptance	High	4.69(.96)	5.10(1.00)	5.11(.96)	-.41(.05)	< .001	-.02(.04)	.656
	Low	5.32(1.05)	5.71(.93)	5.74(.92)	-.39(.05)	< .001	-.03(.04)	.419
Felt Connection	High	5.24(1.13)	5.45(1.14)	5.45(1.15)	-.22(.06)	< .001	.01(.05)	.880
	Low	6.20(.74)	6.32(.65)	6.26(.79)	-.11(.04)	.002	.06(.04)	.118

Finally, post-hoc tests did not clarify the significant attachment avoidance by time effect. Both those high (Wilk's $\lambda = .94$, $F(1, 249) = 15.53$, $p < .001$, $\eta^2 = .06$) and low (Wilk's $\lambda = .97$, $F(1, 302) = 9.69$, $p = .002$, $\eta^2 = .03$) in attachment avoidance reported increases in felt connection between Time 1 and 2, but there was no significant change in felt connection between Time 2 and 3 for either persons high (Wilk's $\lambda = 1.00$, $F(1, 249) = .02$, $p = .880$, $\eta^2 < .01$) or low (Wilk's $\lambda = .99$, $F(1, 302) = 2.46$, $p = .118$, $\eta^2 < .01$) in attachment avoidance.

5.6 Discussion

Given the centrality of attachment to relationship functioning, this report tested whether attachment dimensions moderated the effects of a 2-week mindfulness (versus relaxation) intervention on relationship outcomes. In line with predictions, persons reporting greater attachment anxiety tended to derive greater benefit from the mindfulness intervention as indexed by greater reductions in rejection fears and conflict and greater increases in connection. Effects of attachment avoidance were more complex. On the one hand, mindfulness training offered slightly greater benefits on relationship outcomes (reduced destructive behavior, maintenance of lowered rejection fears) among more (versus less) avoidant individuals. Conversely, other findings suggested mindfulness did not provide greater benefit among more avoidant persons, or intervention-based benefits were not maintained. Importantly, however, an equivalent pattern of findings was evident among persons randomized to the relaxation intervention. Thus, while these results suggest brief mindfulness interventions may have greater positive effects on relationship outcomes among the more anxiously attached and may benefit the more avoidant in some ways, regular *relaxation* may offer comparable benefits.

5.6.1 Attachment Anxiety Moderates the Effects of a Mindfulness Intervention

Notwithstanding mindfulness and relaxation's equivalent effects (discussed in more detail below), our results regarding attachment anxiety are broadly consistent with existing work suggesting that mindfulness may particularly benefit more anxious persons (Dixon et al., 2022a, 2022b; Saavedra et al., 2010). The elements of mindfulness theorized to give rise to its salutary effects in relationships (i.e., awareness, emotion regulation, executive control; Karremans et al., 2017) may be of greater relevance to more anxious persons who typically struggle to regulate felt relational distress (e.g., Ben-Naim et al., 2013; Campbell et al., 2005). While learning to observe experience with a non-evaluative lens may provide all individuals with greater impartiality when relating to experiences, this objectivity may be *especially* useful for more anxious persons whose biased interpretations of relational situations and resulting thoughts, feelings, and behaviors often result in detrimental relationship outcomes (Collins, 1996; Overall et al., 2015). With mindfulness, more anxious persons may have a greater capacity to notice and hold attachment concerns in awareness *without* having to identify with, judge, or react to them. This "decentered" perspective, coupled with a realization that feelings ebb and flow, may augment their ability to manage distress, resulting in fewer destructive behaviors, less conflict, and greater connection.

Mindfulness may also 'work' especially well for more anxious persons because it specifically impacts their core attachment-related concerns. Theory suggests that anxious attachment is likely to be buffered when individuals employ strategies that facilitate calm in relationally threatening situations and/or strengthen their model of self (Arriaga et al., 2018). Arguably, both mindfulness and relaxation interventions facilitate the capacity to remain calm during stressful situations (e.g., Britton et al., 2012; Weinstein et al., 2009). Mindfulness may also offer improvements to self-concept (Randal et al., 2015). Together, these elements of more mindful functioning may decrease the intensity of attachment

concerns, thereby minimizing their expression in feeling (i.e., connection), thought (i.e., rejection fears), and behavior (i.e., conflict, destructive behavior).

5.6.2 Attachment Avoidance Moderates the Effects of a Mindfulness Intervention

Findings regarding attachment avoidance were also broadly consistent with existing research insofar as they suggested that mindfulness (and relaxation) may be less clearly relevant to the relational functioning of more avoidant individuals (Dixon et al., 2022a, 2022b; Saavedra, 2010). However, findings suggested that mindfulness may *sometimes* benefit more avoidant persons, though benefits may be harder to sustain. There are a few possibilities for these findings. First, mindfulness is potentially less overtly relevant to the concerns characterizing attachment avoidance. Mindfulness is primarily about one's relationship to one's own experience while relaxation similarly addresses own felt tension. As such, such interventions may have less ability to buffer the manifestations of more avoidant persons' other-focused attachment concerns. Theory suggests that the unhelpful manifestations of attachment avoidance are reduced when individuals experience and internalize relationship situations that contradict their pessimistic views about close others' responsiveness (Arriaga et al., 2018). While mindfulness may help to facilitate this change by increasing the likelihood that individuals detect and assimilate relationship experiences that contradict these negative views, mindfulness itself may do little to alleviate them directly.

That said, while mindfulness is arguably less directly relevant to the core concerns characterizing avoidant attachment, other elements of mindfulness may interact with avoidance in ways that produce both relational costs and benefits. Specifically, the emotion-regulatory skills inherent to mindfulness training may be particularly useful for more avoidant persons insofar as they may reduce the tendency more avoidant persons have to rely on regulatory strategies like suppression and withdrawal, which are associated with poorer relational outcomes (e.g., Fraley & Shaver, 1998). Instead, interventions such as mindfulness

(or relaxation) may help more avoidant persons to tolerate and manage distressing relationship experiences in more adaptive ways, potentially by encouraging them to view difficult situations with more objectivity or by building their capacity to inhibit the translation of distress into behavior. Prima facie, such interpretations may help explain why persons reporting higher avoidance experienced greater declines in destructive behavior across the intervention.

However, testament to the possibility that avoidance may interact with mindfulness in a less straightforward manner than anxiety, the downward trajectory of destructive behaviors reversed and tended to increase in the month following the intervention among the more avoidant—the effect was not maintained. It is possible that this "regression" to pre-intervention levels of destructive behavior may simply be a consequence of removing the mindfulness intervention. However, consistent with earlier theorizing (see Dixon et al., 2022a, 2022b), it may also reflect that mindfulness or relaxation type trainings heighten the awareness of attachment concerns that might otherwise be defensively kept from awareness (Edelstein & Gillath, 2008; Fraley et al., 2000). Bringing attachment-related emotions to the surface in persons who habitually avoid them may increase distress or intensify their expression. While such effects do not mean that interventions of this kind are contraindicated among more avoidant individuals, they might suggest that longer interventions that offer higher "doses" and greater opportunities to embed new emotion regulatory skills are needed.

5.6.3 Interpreting the Equivalent Outcomes Produced by Mindfulness and Relaxation

Though the current findings generally fit with extant research in the area and our research questions, the current study adds complexity, suggesting that brief relaxation and mindfulness interventions interact with attachment characteristics in substantively similar ways. However, while this research was based in theory regarding the ways in which attachment characteristics might specifically moderate how *mindfulness* impacts relationship

outcomes, the fact that the effects of the two interventions were similar may suggest that the mechanisms at play are not unique to mindfulness. Perhaps most relevant in the context of attachment, is the fact that both mindfulness and relaxation interventions indirectly reduce negative affect (Luberto et al., 2020). Given that negative affect drives much of our relational behavior (Mikulincer et al., 2003) and is typically greater among more anxiously attached persons, reductions in negative affect may help explain the greater benefits mindfulness and relaxation interventions offered to more anxious individuals. In contrast, because more avoidant persons tend to distance themselves from negative affect (Mikulincer et al., 2003), mindfulness and relaxation may have been less able to target the affective manifestations of their attachment insecurity.

5.6.4 Strengths, Caveats, and Future Directions

To the best of our knowledge, this report is the first to test whether attachment dimensions moderate the effects of a mindfulness *intervention* on relationship outcomes using an experimental design. As such, it makes an important contribution to research on mindfulness in relationships. Several limitations should be noted, however. First, validity concerns may be raised when considering the reliance on self-report measures of attachment and relationship experiences. Participants may have forgotten experiences, not been able to consciously recall experiences, or been reluctant to disclose more adverse relationship experiences for fear of judgement. Conceivably then, what participants reported about their experiences may not have fully reflected their actual attachment (in)security and relationship experiences. Future research could use more objective measures to overcome these issues. Second, the length of the interventions was relatively brief. Longer interventions may lead to greater relationship benefits or costs among more insecure persons, possibly above and beyond the effects of relaxation. Finally, it is possible that measurement floor effects restricted full identification of mindfulness' effects for those low in attachment insecurity.

For example, that rates of relationship conflict among those low in anxiety did not change across the study does not necessarily mean that mindfulness is of no benefit. Instead, it may simply indicate that persons reporting low levels of conflict at baseline have little room to report downwards further.

5.6.5 Clinical Implications

Our results corroborate existing evidence suggesting that clinicians seeking to improve relationship outcomes among more anxiously attached persons may find mindfulness useful. However, less certain conclusions can be formed regarding the use of mindfulness training among avoidantly attached persons experiencing relationship difficulties. While mindfulness may be less relevant to the concerns of more avoidant persons and/or may increase the experiential accessibility of distressing attachment-related content, it is possible that longer interventions may buffer the negative manifestations of avoidance in relationship-related thoughts, feelings, and behaviors. Until more research tests this possibility, however, therapists may do well to operate with caution when offering brief mindfulness-based practices to more avoidant individuals to improve relationship outcomes.

5.7 Conclusion

The present study was the first to test whether attachment anxiety and avoidance moderate the effects of mindfulness training on relational functioning. Findings regarding anxiety presented a straight-forward picture: mindfulness appeared to be of greater relational benefit to more (versus less) anxious individuals. In contrast, results regarding attachment avoidance were more nuanced, suggesting that mindfulness may *sometimes* offer slightly greater benefits vis-à-vis some relationship outcomes among more avoidant persons, but at other times may offer no particular benefit or the benefits are not maintained. That relaxation produced equivalent relationship outcomes among insecure persons, however, limits our ability to draw causal conclusions regarding mindfulness' *specific* effects on relationship

outcomes among more insecure persons. Future research should explore whether higher doses of mindfulness lead to greater relationship benefits (or costs) among more insecure persons, possibly above and beyond the effects of relaxation.

Chapter 6. Mindfulness between the sheets: Does a mindfulness intervention improve community-dwelling adults' sexual experiences, and are effects moderated by attachment insecurity?

6.1. Preface

In extending this investigation to an experimental design, the previous chapter examined whether attachment dimensions moderated the effects of mindfulness training on relationship functioning. Providing a test of the causal effect of mindfulness (and relaxation) on relational outcomes, this study also considered whether attachment anxiety and avoidance moderated any effects and whether it did so distinctly from an active control (relaxation). In the context of this overall thesis and indeed in the context of the literature in this field, the study presented an important extension to earlier studies relying on evaluating whether *trait* mindfulness might buffer the effects of attachment insecurity on relational functioning. While results from this experimental study were more nuanced and complex than in the first two studies presented in this thesis, they tended to reinforce the notion that mindfulness is somehow more relevant to the characteristics associated with attachment anxiety than with those of avoidance (with one important caveat). At least as indexed by greater reductions in rejection fears and conflict (and greater increases in connection), analyses in this study suggested that while anxiously attached persons appeared to experience greater benefit from the mindfulness intervention, they received comparable benefits from the relaxation intervention; the two interventions appeared to offer *some* slightly greater benefits among more avoidant persons, but these benefits were not maintained. As was argued in this paper, this pattern might be taken as indicating that rather than mindfulness being specifically beneficial among those with greater anxious attachment, any intervention that provides tools for the management of experiential distress are useful.

Thus, the preceding study presents a useful qualification to existing research linking mindfulness *interventions* with better relationship outcomes in at least two ways. First, it provides evidence for the suggestion that mindfulness might "work" among those with greater attachment anxiety because it provides tools for managing felt distress (as does relaxation). Second, however, it continues to imply that the effectiveness of such interventions may vary as a function of attachment characteristics. However, further research is needed to corroborate and extend these results by testing whether they are also evident within sexuality—an important domain that most people derive pleasure from and that shapes relationship quality and satisfaction (Impett et al., 2014). As has been noted earlier, sexual experiences can be constrained by the attachment concerns individuals bring with them into sexual situations (e.g., Birnbaum et al., 2006; Butzer & Campbell, 2008). For example, more anxious and avoidant individuals report lower sexual satisfaction (Butzer & Campbell, 2008), more ambivalent or aversive feelings about a sexual experience (Birnbaum et al., 2006), and, as highlighted in prior chapters, more maladaptive reasons for engaging in sex (e.g., Birnbaum, 2010; Davis et al., 2004; Impett et al., 2008; Impett & Peplau, 2002). Thus, it seems important for research to also explore how to improve the sexual experiences of more insecure persons, so they may be more likely to reap the benefits that gratifying sex has to offer.

Accordingly, building on the (a) results outlined in Chapters 3 and 4 suggesting that *trait* mindfulness moderates links between anxious attachment and general and daily sexual motivations, and (b) results of the third study (Chapter 5) suggesting the effects of a mindfulness *intervention* on relationship outcomes also depend on attachment characteristics, the final study presented in the next chapter examined whether the differential benefits (and costs) of mindfulness training extended to sexual experiences. Currently undergoing review at the *Journal of Sex Research,* this study presents the first empirical test of whether an

individually-administered, online mindfulness intervention has greater benefits for the sexual experiences of more insecure persons, particularly more anxiously attached persons. Given relatively consistent evidence that mindfulness appeared to be more useful with respect to attachment anxiety presented in this thesis so far, greater benefits were expected among more anxiously attached persons, while lesser or no benefits (and possibly some costs) were expected among those high in attachment avoidance.

Citation

Dixon, H. C., Reynolds, L. M., & Consedine, N. S. (2022). Mindfulness between the sheets: Does a mindfulness intervention improve community-dwelling adults' sexual experiences, and are effects moderated by attachment insecurity? [Manuscript submitted for publication]. Department of Health Psychology, University of Auckland.

6.2 Abstract

Research is increasingly linking mindfulness with better relationship outcomes. Less clear is whether these benefits extend to the sexual domain or whether the benefits of mindfulness are moderated by individual characteristics. Accordingly, the current report tested whether a brief online mindfulness intervention improved the cognitive, affective, and behavioral aspects of sexual experiences and whether effects varied by attachment anxiety and avoidance. Participants (N = 90) first completed a measure of attachment before reporting their sexual experiences each day for 7-days. Participants then listened to a mindfulness recording every day for 4-weeks. Finally, sexual experiences were reported on every day for 7-days again. Consistent with previous studies, no benefits of the mindfulness intervention were detected for more avoidant persons. Less consistent with expectation, however, the mindfulness intervention did not improve sexual outcomes in general, nor did it buffer other-focused avoidance-based sexual motivations or sexual communal strength among more anxiously attached persons. However, the intervention did increase reports of positive sexuality among more anxious persons. Results are discussed in terms of the differential utility and limits of mindfulness for interventions looking to enhance sexual functioning in different populations and the potential mechanisms behind the presence and absence of effects.

6.3 Introduction

While the benefits mindfulness has for outcomes such as stress, depression, and anxiety have historically been more focal in research, interest is increasingly being paid to how mindfulness may promote *inter*personal wellbeing. With some exceptions (Dixon et al., 2022a, 2022b), the sum of this research suggests that mindfulness may improve relationship functioning (e.g., Dixon & Overall, 2018; Kappen et al., 2019; Quickert & Macdonald, 2020). For example, research suggests that trait mindfulness—the tendency to attend to present moment experiences in a non-judgmental and accepting way (Baer et al., 2006; Bishop et al., 2004)—is positively associated with relationship satisfaction (Quinn-Nilas, 2020; Stanton et al., 2021), attachment security (Stevenson et al., 2017), and relationship growth beliefs (Don, 2020). Higher trait mindfulness has also been shown to increase the likelihood that individuals respond to relationship conflicts in constructive ways (Barnes et al., 2007), and buffer the degree to which the inevitable dips in relationship satisfaction lead to declines in personal wellbeing (Don & Algoe, 2020).

Although these are useful developments in a field that has historically focused on *intra*personal outcomes, there are areas of weakness. First, sexuality, which is a major component in the initiation and maintenance of adult romantic relationships (Impett et al., 2014), is poorly studied here. We know from cross-sectional studies that trait mindfulness and/or *sexual* mindfulness—that is, someone's tendency to be mindful during partnered sexual activities (Adam et al., 2015)—is positively associated with sexual satisfaction (Khaddouma et al., 2015; Pepping et al., 2018), orgasm consistency (Leavitt et al., 2021), and some adaptive sexual motives (Dixon et al., 2022a, 2022b), but negatively related to hyper- and de- activation of the sexual system (Pepping et al., 2018).

However, these studies are limited by their reliance on correlational data, which cannot test causal hypotheses, and on *trait* measures of mindfulness, which may be subject to

response biases (Grossman, 2008) and variation in the subjective meaning of mindfulness (Van Dam et al., 2018). A few *intervention* studies overcome these limitations, showing that mindfulness may improve sexual functioning via increases in interoceptive awareness (Silverstein et al., 2011) and greater concordance between genital and subjective sexual arousal (Velten et al., 2018, 2020) in community-dwelling adult populations, and may benefit persons seeking support for sexual functioning disorders (e.g., Bossio et al., 2018; Brotto et al., 2020, 2021; Gunst et al., 2019). However, what is still missing from this nascent body of work is a focus on whether mindfulness interventions affect the cognitive, affective, and behavioral aspects of community-dwelling adults' sexual experiences. Specifically, it is not yet known whether mindfulness affects how positively individuals rate their sexual experiences, the reasons why they have sex, and how responsive they are to their partner's sexual needs (i.e., sexual communal strength)—variables that are thought to have a significant influence on whether sexual behaviors lead to better or worse personal and interpersonal outcomes (Impett et al., 2005; Muise, Impett, & Desmarais, 2013; Muise, Impett, Kogan, et al., 2013).

A second area of weakness in the nascent mindfulness literature looking at outcomes related to human sexuality regards the possibility of moderation. That is, examining *who* mindfulness interventions most and least benefit. Although popular media has implied that mindfulness is a universal panacea (Gibbs, 2016; Gunderson, 2016; Huffington, 2013), evidence suggests otherwise (see Britton, 2019; Farias & Wikholm, 2016). Studies show that the effects of mindfulness are not equal across people and may even lead to adverse outcomes in some instances (e.g., Farias et al., 2020; Reynolds et al., 2017). Moderation by neuroticism has been demonstrated, with studies showing persons high (versus low) in neuroticism experience disproportionate benefits to wellbeing from mindfulness interventions (e.g., de Vibe et al., 2015; Norris et al., 2018). Higher trait mindfulness has also been linked with

greater trust and perceived social support, but only among those with low, not high, PTSD symptomatology, indicating that mindfulness may have limited utility in some populations (Kuhl & Boyraz, 2017). Taken together, it seems plausible that a mindfulness intervention in the context of human sexual functioning might not be of equal benefit across all persons.

6.3.1 Attachment Dimensions as Potential Moderators of Mindfulness' Effects on Sexuality

While there are many factors that might moderate the effect of a mindfulness intervention on sexual outcomes, attachment characteristics are likely candidates. Attachment—a dispositional "style" of relating to important others—is a central component of personality that exerts a powerful influence on individuals' thoughts, feelings, motivations, and behaviors in attachment-relevant contexts (Bowlby, 1973; Collins & Allard, 2001; Mikulincer & Shaver, 2003), of which sex is one (Birnbaum, 2015). Higher attachment anxiety is characterized by a preoccupation with the emotional availability of close others, worries of rejection, low self-worth, and a "hyperactivation" of attachment concerns and strategies in an attempt to elicit reassurance from and connection with others (Simpson & Rholes, 2012). Attachment avoidance, on the other hand, is associated with a discomfort with intimacy, doubts about others' trustworthiness, and a deactivation of attachment concerns and normative strategies in favor of self-reliance (Mikulincer et al., 2003).

While the characteristics of those high in attachment anxiety or avoidance are adaptive responses to a repeated inability to realize attachment security early in life, they have the potential to negatively affect relationship experiences throughout the lifespan (Collins & Allard, 2001). This includes affecting individuals' sexual experiences. For example, consistent with their pronounced desire for closeness and reassurance, more anxiously attached persons report engaging in sex to reassure themselves of their value, establish intense intimacy, avoid negative relationship outcomes, and reduce feelings of

insecurity (Davis et al., 2004; Impett et al., 2008; Schachner & Shaver, 2004). The experiences of sexual behavior characterizing anxious attachment also differ, with studies suggesting persons with these characteristics inhibit their own sexual needs in an attempt to hold on to or please a partner (Davis et al., 2006; Impett & Peplau, 2002). Such reports may index a tendency to respond to a partners' sexual needs at the expense of their own (i.e., unmitigated sexual communal strength). Unsurprisingly then, they also report lower sexual satisfaction (Butzer & Campbell, 2008; Gewirtz-Meydan & Finzi-Dottan, 2018; Tracy et al., 2003), and greater disappointment, negative feelings, and interfering thoughts during sex (Birnbaum, 2007; Birnbaum et al., 2006). Perhaps as a consequence, more anxiously attached persons experience lower sexual arousal and less orgasmic responsivity (Birnbaum et al., 2006; Gewirtz-Meydan & Finzi-Dottan, 2018), the sum total of which indicate sub-optimal sexual experiences.

The attachment concerns of more avoidant individuals are also associated with systematic differences in sexual experience (e.g., Birnbaum et al., 2008; Cooper et al., 2006). Descriptively, attachment avoidance is associated with less sexual satisfaction, intimacy, enjoyment, and orgasmic responsivity (Birnbaum, 2007; Butzer & Campbell, 2008; Gewirtz-Meydan & Finzi-Dottan, 2018; Tracy et al., 2003). In terms of process, their discomfort with intimacy means sex is less likely to be used for the purpose of expressing love or facilitating closeness (Davis et al., 2004; Impett et al., 2008). Instead, motives for sex among the more avoidantly attached tend to be more concerned with facilitating autonomy, affirming themselves or their power, coping with negative emotion, and avoiding aversive relational experiences (e.g., conflict; Davis et al., 2004; Impett et al., 2008; Schachner & Shaver, 2004). While no evidence exists that speaks to their sexual communal strength (whether unmitigated or not), it is possible that their desire to remain independent means they are dispositionally lower in sexual communal strength.

6.3.2 A Rationale for Why Attachment Should Shape Mindfulness' Effects on Sexuality

Given the complex ways in which attachment concerns are reflected in human sexuality, it is possible that attachment anxiety and avoidance alter how/whether mindfulness benefits sexual experience. Three existing lines of reasoning offer some guidance as to how this might occur. First, it has been suggested that the greater awareness afforded by mindfulness promotes access to feelings, thoughts, motivations, and behavioral tendencies that may otherwise remain below conscious awareness (Brown & Ryan, 2003). Increased awareness of these internal processes coupled with an acknowledgment that these experiences are transient should, in turn, promote greater emotion- and self- regulatory capacities (Britton et al., 2012; Teper et al., 2013). Together, such competencies may increase more insecure persons' ability to identify attachment-related concerns as they become active and better manage how those concerns are expressed, including whether they go on to shape the motives for, feelings about, and behaviors during sex.

Second, rather than only buffering the *translation* or manifestation of attachment concerns into feeling, thought, motivation, and behavior, mindfulness may alter the attachment concerns that underlie them (Karremans et al., 2017). Specifically, mindfulness may prompt a revision of the views more insecure individuals hold about themselves, their partner, their relationship, or relationships in general (Karremans et al., 2017). Such revisions may, in turn, reduce attachment-related distress and the extent to which attachment concerns negatively affect sexual experiences.

Third, given mindfulness helps individuals to maintain body awareness (Hölzel et al., 2011) and attention to physiological sensations (Ortner et al., 2007), mindfulness may be particularly useful to more insecurely attached persons who typically report more attention-demanding (and negative) cognitive and affective experiences during sex (Birnbaum, 2007). Increased ability to regulate attention towards physiological pleasure during sex may mean

persons high in attachment anxiety and/or avoidance are less "pulled" into the contents of their attachment concerns, allowing them to more readily notice and respond to their and their partner's sexual needs, and ultimately enjoy a more fulfilling sexual experience.

In addition to there being general reasons to expect that attachment might moderate the effects of mindfulness on sexual outcomes, there are theoretical and empirical reasons to suspect that effects of mindfulness on sexuality may not be equivalent among more anxious versus more avoidant persons. Theory suggests that different processes should be responsible for reducing, or at least altering, the manifestations of attachment anxiety and avoidance, respectively (Arriaga et al., 2018). Specifically, whereas attachment anxiety is reduced when individuals repeatedly experience improvements to their working model of self or experience calm in relationally threatening situations, attachment avoidance is thought to decrease when individuals' trust in others increases and their autonomy concerns are reduced (Arriaga et al., 2018). Given that mindfulness is arguably about one's relationship to one's *own* experience and is associated with improved emotion regulation and self-esteem (Britton et al., 2012; Randal et al., 2015; Teper et al., 2013), it seems more overtly relevant to processes involved in buffering attachment anxiety. In contrast, mindfulness seems less pertinent to the processes involved in altering attachment avoidance and thus it may not be of comparable benefit in buffering these characteristics. Further, and as we have argued elsewhere (Dixon et al., 2022a, 2022b), it is even possible that greater mindfulness might lead to worse outcomes among the more avoidant insofar as the development of mindfulness encompasses an increased awareness of attachment concerns that are typically defensively regulated (e.g., threatening feelings), while failing to provide the necessary coping strategies relevant to their internal working model.

While scanty, existing research provides some empirical support for this possibility. Saavedra (2010) found that trait mindfulness buffered the link between attachment anxiety

(but not avoidance) and relationship dissolution across a year. Cross-sectional and longitudinal research also suggests that trait mindfulness reduces the link between attachment anxiety and some maladaptive sexual motives, but either has no effect or an intensifying effect on the links between attachment avoidance and maladaptive sexual motives (Dixon et al., 2022a, 2022b). Finally, in the first and only study to test whether attachment dimensions moderate the relational effects of a mindfulness *intervention*, more (versus less) anxious persons derived greater benefit from the intervention as indexed by greater decreases in rejection fears and conflict, and greater increases in felt connection (Dixon et al., 2022c). In contrast, persons high in attachment avoidance tended not to report greater benefit from the mindfulness intervention and there was even some evidence that it may have increased reports of destructive behavior (Dixon et al., 2022c). More research is needed to corroborate these early findings and extend tests of mindfulness moderation by attachment into the sexual domain.

6.3.3 The Current Study

In summary, while researchers are beginning to explore whether mindfulness is of benefit to sexual expression and functioning, research in this area remains limited. Studies exploring the effects of mindfulness interventions on sexual cognition, affect, motivation, and behavior among community-dwelling adult populations are scarce, and to the best of our knowledge no studies have explored whether mindfulness' effects on sexuality depend on individual differences in attachment—an aspect of personality that invariably shapes sexual experience (Birnbaum & Reis, 2019). Of the studies that have examined interactions between mindfulness and attachment in the prediction of sexual experiences, only trait measures of mindfulness have been used (i.e., Dixon et al., 2022a, 2022b). These measures may be subject to response biases (Grossman, 2008; Van Dam et al., 2018). Moreover, the way *trait* mindfulness and attachment dimensions interact may not reflect how mindfulness *as taught*

in an intervention interacts with attachment to shape sexual outcomes. As such, in the present study, we test whether attachment anxiety and avoidance moderate the effects of a four-week mindfulness intervention on a range of positive and negative sexual outcomes, including the positivity of sexual experience, self-focused approach-based sexual motives, other-focused avoidance-based sexual motives, other-focused avoidance-based sexual motives, and mitigated and unmitigated sexual communal strength.

6.4 Methods

6.4.1 Recruitment and participants

Ethics approval was granted by The University of Auckland Human Participants Ethics Committee (Reference: UAHPEC22749). The study was preregistered on the Australian New Zealand Clinical Trials Registry (ANZCTR; ID: ACTRN12621000942853). Prospective participants were invited to opt-in to a study on "Interventions to boost relationship wellbeing in daily life", which was advertised via paid-advertisements on Facebook and to a faculty-wide email list. Interested persons clicked through to a secure REDcap hosted webpage to check eligibility and read more about the study. Only persons 18 years or older, fluent in English, in a relationship of more than one year, and living with their romantic partner in New Zealand could participate. Prospective participants were excluded if they were currently undergoing relationship counselling. Before consenting, eligible participants were informed that participation was voluntary, they could withdraw at any time, and that participation would be remunerated in a way that was commensurate with their participation. Specifically, participants were told that if they completed at least 60% of the entries within each daily diary period, they would get one entry into a prize draw to win one of three iPads, and an additional entry/entries would be given for every 7 days of the intervention completed.

Given the absence of prior research permitting an effect size estimate for the intended statistical models, we thus aimed to recruit enough participants to power our model to detect a small to medium sized effect (f = .20). G*Power indicated that the minimum required sample size to detect such effects using a mixed analysis of variance (ANOVA) including within-subject (2 time points) and between-subject (2 groups) effects with 80% power and at a 2-sided 5% significance level was 200 participants[1]. Of a total of 635 individuals assessed for eligibility (of whom 593 qualified), an initial sample of 200 individuals consented and were recruited. However, for inclusion in analyses, participants needed to have completed at least one (of 7) daily diary entry pre- *and* post-intervention and to have listened to at least 3 (of 28) daily mindfulness recordings. This left a final sample of 90 participants. Descriptive characterization of the final sample, including information regarding the degree of engagement in the intervention and contrasts of those who were included versus excluded, can be seen in Table 6.1. There were no significant differences between excluded and included participants in demographic, attachment, or sexual characteristics. However, as would be expected, included participants reported more frequent use of the audio-recordings and completed more daily diary entries than excluded participants.

6.4.2 Procedure

Following ethical approval, data were collected between July 2021 and October 2021. Participants proceeded through four phases. First, participants completed questionaries assessing demographics and attachment. Second, participants completed daily questionnaires for 7-days asking them to report on their sexual experiences and motivations that day (participants were also required to report on general relationship experiences but these are not

[1] During the examination of this thesis, it became apparent that this power analysis incorrectly included *between-subjects* effects. Its inclusion was because early plans for this study included a relaxation control group. However, practical considerations meant that including a control group was not feasible, thus, it was removed. Crucially, however, a new power analysis *without* between-subject effects was not conducted, and Study 4 relied on the power analysis included in this section of the thesis.

germane to the present report). Third, participants listened to 10-minute mindfulness audio-recordings each day for four-weeks. After each audio-recording, participants were asked to indicate whether they listened to all, none, or part of the audio-recording in order to assess compliance. Missing responses to this daily question were interpreted as a lack of listening to the audio-recording that day. Finally, participants completed a second set of daily questionnaires measuring post-intervention sexual experiences and motivations each day for 7-days. Links to complete the pre- and post- intervention daily questionnaires and listen to the audio-recordings were sent daily via text messages. Text messages were sent using Twilio, an automated communications platform, that integrated with our data collection software, REDcap, which "told" Twilio when to send text messages. Texts requesting completion of the daily questionnaires (during phases two and four) were sent at 8pm, with an automatic reminder sent at 7:30am the next morning if a response to the relevant daily questionnaire had not been completed. Texts providing a link to the relevant daily mindfulness audio-recording (phase three) were sent at 6am each day, and a reminder text was sent at 8pm the same day if the mindfulness audio recording had not yet been accessed.

The daily 10-minute guided mindfulness exercises were modelled off recordings used in Karremans et al.'s (2020) RCT study and developed with reference to mindfulness' core components (Bishop et al., 2004) and mindfulness teaching guidelines (McCown et al., 2010). Recordings were completed by the first author who was part-way through Mindfulness-Based Stress Reduction (MBSR) teacher training at the time of recording. Exercises proceeded through four phases. Participants were given instructions regarding posture and then invited to pay attention to the body and breathing. They were invited to direct attention toward present moment experiences (i.e., emotions, thoughts, bodily sensations), and were encouraged to acknowledge the transient nature of these experiences. Metaphors were used to help participants understand this instruction (e.g., experiences that

arise within consciousness were likened to the waterfall, which participants could simply watch from a vantage point). Participants were then invited to bring this quality of attention into their interactions with their partner. Four different versions of this exercise were offered over the four weeks that differed slightly in wording and metaphors used but not in overall intent and content.

Table 6.1

Retention Analyses Contrasting Characteristics of Included Versus Excluded Participants

	Included	Excluded	Contrast
Demographics			
Mean Age (SD)	33.23 (7.71)	32.64 (9.46)	$.49_a$
Mean Relationship Length (months) (SD)	106.81 (79.49)	99.20 (91.03)	$.62_a$
% Female	93.33%	91.82%	$.86_b$
% Heterosexual	78.89%	84.55%	2.49_b
% Monogamous	95.56%	96.36%	1.43_b
% New Zealand European	72.22%	63.64%	1.66_b
% Currently or Previously Sexually Active	100.00%	100.00%	n/a
% With No or Minimal Meditation Experience	77.78%	85.00%	1.45_b
Adherence information			
Mean Days Listened to Audio-Recording (SD)	18.29 (7.39)	1.08 (2.54)	21.10_a*
Mean Days Completed Pre-Int. Diary (SD)	6.84 (.63)	3.15 (3.00)	12.58_a*
Mean Days Completed Post-Int. Diary (SD)	5.88 (1.65)	0.11 (0.75)	30.73_a*
Attachment and sexual variables			
Anxious Attachment	3.12 (1.00)	3.28 (1.06)	-1.02_a
Avoidant Attachment	2.53 (.82)	2.76 (1.05)	-1.66_a
Positive Sexual Experience	5.58 (1.29)	5.49 (1.23)	$.35_a$
Self-Focused Approach-Based Sexual Mot	4.74 (1.38)	4.60 (1.27)	$.59_a$
Other Focused Approach-Based Sexual Mot	5.64 (.90)	5.69 (1.06)	$-.26_a$
Other Focused Avoidance-Based Sexual Mot	1.96 (1.38)	2.11 (1.27)	$-.64_a$
Sexual Communal Strength	4.91 (1.08)	4.69 (1.41)	$.94_a$
Unmitigated Sexual Communal Strength	3.09 (1.28)	2.95 (1.26)	$.53_a$

Note: Int = Intervention. All demographic and attachment variables were measured at baseline. The sexual variables were measured each day (when relevant) for 7-days prior to the mindfulness intervention and then aggregated to represent a pre-intervention average of those scores. $_a$ = independent samples t-test, $_b$ = Chi-Square test. Mot = Motives.

6.4.3 Measures

All questionnaire measures were scored and averaged so that higher scores reflect greater levels of the construct. Means and standard deviations of continuous variables can be found in Table 6.1, and correlations in Table 6.2.

Table 6.2

Correlations Between Attachment Dimensions and Relationship Outcomes at Baseline

	1.	2.	3.	4.	5.	6.	7.
1. Attachment Anxiety	-						
2. Attachment Avoidance	.54***	-					
3. Positive Sexual Exp.	-.06	-.09	-				
4. SF Approach-Based SM	.10	-.04	.51***	-			
5. OF Approach-Based SM	-.20	-.22	.35**	.22*	-		
6. OF Avoidance-Based SM	.19	.22	-.51***	-.43***	-.09	-	
7. SCS	.00	-.02	.13	.05	.52***	-.01	-
8. Unmitigated SCS	.05	-.00	-.49***	-.32*	.09	.40**	.39**

*$p \leq .05$ **$p \leq .01$ ***$p \leq .001$. *Note,* SF.= Self-Focused, OF = Other-Focused, SM = Sexual Motives, SCS = Sexual Communal Strength, Exp = Experience.

Baseline Measures.

Attachment Insecurity. Attachment anxiety and avoidance were measured using the Experiences in Close Relationships–Revised Questionnaire (ECR-R; Fraley et al., 2000), which has a reliable and replicable two-factor structure and good internal consistency (Sibley & Liu, 2004). Eighteen items assessed attachment anxiety (e.g., "I'm afraid that I will lose my partner's love") and 18 assessed attachment avoidance (e.g., "I find it difficult to allow

myself to depend on romantic partners"). Items were responded to on a 7-point scale from 1 (completely disagree) to 7 (completely agree). Each dimension demonstrated good internal reliability (anxiety $\alpha = .89$, avoidance $\alpha = .90$). For analyses, each dimension was recoded into a binary categorical variable split around the median.

Pre- and Post- Intervention Measures.

Each day during the pre- and post- intervention diary periods, participants answered the following question: "Have you and your partner engaged in sexual activity since the last time you completed a daily survey (i.e., penile-vaginal intercourse, anal intercourse, oral sex (receiving and giving), manual stimulation (touching/massaging of genitals))?" If they answered "yes", then all measures outlined below were presented to participants for answering. If "no", they were asked: "Even though you and your partner didn't engage in partnered sex since the last time you completed a daily survey, have you been motivated to engage in sexual activity?" If "yes", participants were prompted to answer items that make up the sexual motivation variables outlined below only. If "no", participants were not prompted to answer any questions about sexual experiences that day.

Positive Sexual Experience. Eight-items items previously used in a daily diary study of sexual experience (Birnbaum et al., 2006) or created for the purpose of this study assessed positive sexual experiences: "When the sexual activity was first initiated, I felt physically aroused", "During the sexual activity, I felt physically aroused", "During or after the sexual activity, I felt some frustration and disappointment" (reverse-coded), "During the sexual activity, I didn't feel a great deal of sexual desire" (reverse-coded), "During the sexual activity, I felt bored and apathetic" (reverse-coded), "During the sexual activity, I reached a satisfying orgasm", "During the sexual activity, I felt passionately attracted to my partner", and "During the sexual activity, I experienced a lot of pleasure". Items were responded to on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Repeated responses to these

eight pre-intervention and eight post-intervention items were then aggregated to create average scores of *each* item for both diary periods. A component analysis with these 8 items assessing pre-intervention sexual experiences and 10 items assessing pre-intervention sexual motivations (outlined below) showed that the 8 items assessing sexual experiences loaded onto a single factor. On this basis, we aggregated the eight pre-intervention sexual experience items to form an average score indexing pre-intervention positive sexual experiences. The same was done to create an average score indexing post-intervention positive sexual experiences. This measure demonstrated good internal reliability at both time points (pre-intervention $\alpha = .91$, post-intervention $\alpha = .91$).

Sexual Motives. Participants rated 10 items assessing sexual motivations that were adapted from Cooper and colleagues (1998) and used in previous daily diary studies (Impett et al., 2005, 2008). Each item was rated in terms of how much they motivated participants' decision to have sex on a 7-point scale from 1 (*not at all important*) to 7 (*extremely important*): (1) Pursuing one's own pleasure, (2) feeling good about oneself, (3) pleasing a partner, (4) building intimacy in the relationship, (5) expressing love for a partner, (6) avoiding relationship conflict, (7) preventing a partner becoming upset (8) preventing a partner becoming angry, (9) preventing a partner losing interest, and (10) because of feelings of sexual obligation. Akin to the operationalization process outlined for the positive sexual experiences variable above, repeated scores of these motivations across both diary periods were aggregated to form average scores for each motivation in each diary period. The results of the aforementioned component analysis demonstrated that these 10 items loaded onto three sexual motivations factors consistent with Cooper's model (1998). Accordingly, items were categorized into three sexual motivation types: self-focused approach-based (items 1-2), other-focused approach-based (items 3-5), and other-focused avoidance-based sexual motives (items 6-10). Each type of motivation demonstrated good internal reliability (self-focused

approach-based sexual motives: pre-intervention α = .77, post-intervention α = .80; other-focused approach-based sexual motives: pre-intervention α = .73, post-intervention α = .72; other-focused avoidance-based sexual motives: pre-intervention α = .95, post-intervention α = .88).

Sexual Communal Strength. Participants used a 1 (*Strongly disagree*) to 7 (*Strongly agree*) scale to respond to three items previously used to assess daily sexual communal strength (Impett et al., 2019). These items were adapted from a previously validated 6-item measure of sexual communal strength (Muise et al., 2013). We chose the 3-item measure to prevent attrition due to demands of lengthy questionaries. Items were as follows: "During the sexual activity, I was focused on meeting my partner's needs", "Meeting my partner's needs was a high priority for me during sex", and "During the sexual activity, I did things to meet my partners needs without expecting him or her to directly reciprocate". Repeated responses to all these items were then aggregated to create the overall variable indexing sexual communal strength for each diary period. The measure demonstrated sufficient internal reliability at both time points (pre-intervention α = .61, post-intervention α = .79).

Unmitigated Sexual Communal Strength. Participants responded to three items previously used to assess daily unmitigated sexual communal strength (Impett et al., 2019), which were taken from a validated measure of unmitigated communion (Helgeson, 1993) and adapted to focus on sexual encounters in particular. Items were as follows: "During the sexual activity, I was only focused on meeting my partner's needs", "During the sexual activity, I put my partners needs ahead of my own needs", and "During the sexual activity, it was impossible for me to satisfy my own needs if they conflicted with my partner's needs". Items were rated on a 7-point scale from 1 (*Strongly disagree*) to 7 (*Strongly agree*). Repeated responses to all these items were then aggregated to form the overall variable indexing unmitigated sexual communal strength for each diary period. The measure

demonstrated sufficient to low internal reliability at both time points (pre-intervention α = .75, post-intervention α = .57).

6.4.4 Statistical Analysis

Data were analyzed using IBM SPSS Version 28. To test the prediction that any beneficial effect of the mindfulness intervention on sexual outcomes would be comparably evidenced at high versus low attachment anxiety (which was dichotomized and split around the median), we conducted repeated measures (RM) ANCOVAs with main factors of time (pre-intervention versus post-intervention) and attachment anxiety (high versus low) and their interaction. Attachment avoidance (which was also dichotomized and split around the median) and two variables indexing the number of times an individual had, or was motivated to have, sex at both pre- and post-intervention were included as covariates given the likely role they play in reports of sexual experiences and motivations. Adherence to the intervention was also included as a covariate. To follow, six analogous models in which attachment avoidance was modelled as the main effect (and anxiety as a covariate) were used to examine whether the magnitude and direction of any effects of the mindfulness intervention on sexual outcomes depended on level of attachment avoidance. Post-hoc *t*-tests were used to deconstruct significant two-way interactions between attachment anxiety and time.

6.5 Results

Though the present report was designed and instantiated in the pre-registration as a test of moderation, Table 6.3 presents the results of RM ANOVAs testing whether trait mindfulness changed over the course of the intervention. As can be seen, observe mindfulness increased over time, and non-judging mindfulness marginally increased, while change in other dimensions (and the FFMQ total score) were not significant. More relevant to our primary research questions, Table 6.4 presents the results of all RM ANCOVAs that tested whether attachment anxiety (top) and avoidance (bottom) would moderate any effects

of the mindfulness intervention on sexual outcomes over time. As can be seen, none of the main effects of time or attachment anxiety were significant. There were, however, main effects of attachment avoidance and the variable indexing the number of times an individual had or was motivated to have sex during the pre-intervention period, in the prediction of other-focused avoidance-based sexual motives. Of greater relevance to the key questions of this report, there were two significant interactions between time and attachment anxiety in the prediction of self-focused approach-based sexual motives and sexual communal strength.

Table 6.3

Results of Repeated Measures ANOVAs Examining Pre- to Post-Intervention Change in Mindfulness Facets and Overall Mindfulness

	Pre		Post		$F(1,70)$	p	η^2
	M	*SD*	*M*	*SD*			
FFMQ Observe	3.26	.70	3.38	.80	4.59	**.036**	.06
FFMQ Describe	3.54	.81	3.58	.83	.59	.447	.01
FFMQ Acting with Awareness	3.07	.69	3.03	.75	.47	.496	.01
FFMQ Non-Judgement	3.21	.89	3.34	.97	3.06	.084	.04
FFMQ Non-Reactivity	3.17	.55	3.07	.58	2.66	.108	.04
FFMQ total score	3.25	.50	3.29	.54	.85	.360	.01

Note. Sample is only with 71 participants rather than the full 90 that were included as 19 people did not complete the final FFMQ scale.

Post-hoc tests probing the first significant interaction effect revealed that while self-focused approach-based sexual motivations were stable between Time 1 and 2 for those low in attachment anxiety (Wilk's $\lambda = .96$, $F(1, 30) = 1.17$, $p = .288$, $\eta^2 = .04$), there was an increase in self-focused approach-based sexual motivations among those high in attachment anxiety (Wilk's $\lambda = .84$, $F(1, 34) = 6.49$, $p = .016$, $\eta^2 = .16$; see Figure 6.1 and Table 6.5). Further confirming our assumption that changes in sexual experiences over the course of

the intervention would depend on level of attachment anxiety, post-hoc t-tests revealed no difference in self-focused approach-based sexual motivations between those high versus low in attachment anxiety at Time 1 ($t(75) =$, $p = .629$), whereas there was a significant difference in this motivation between those high versus low in attachment anxiety at Time 2 ($t(72) =$, $p = .003$).

Post-hoc comparisons probing the second interaction indicated that those high in attachment anxiety tended to report a non-significant decrease in sexual communal strength (Wilk's $\lambda = .93$, $F(1, 25) = 1.93$, $p = .177$, $\eta^2 = .07$), whereas those low in attachment anxiety tended to report an increase (Wilk's $\lambda = .82$, $F(1, 18) = 4.01$, $p = .061$, $\eta^2 = .18$; see Figure 6.2 and Table 6.5). Independently, both slopes were non-significant however. Post-hoc t-tests contrasting levels of sexual communal strength between those high versus low in attachment anxiety revealed no significant differences at Time 1 ($t(57) = -.05$, $p = .956$) or Time 2 ($t(57) = 1.40$, $p = .161$).

Figure 6.1

Rates of self-focused approach based sexual motivations among those high versus low in attachment anxiety across the two time points

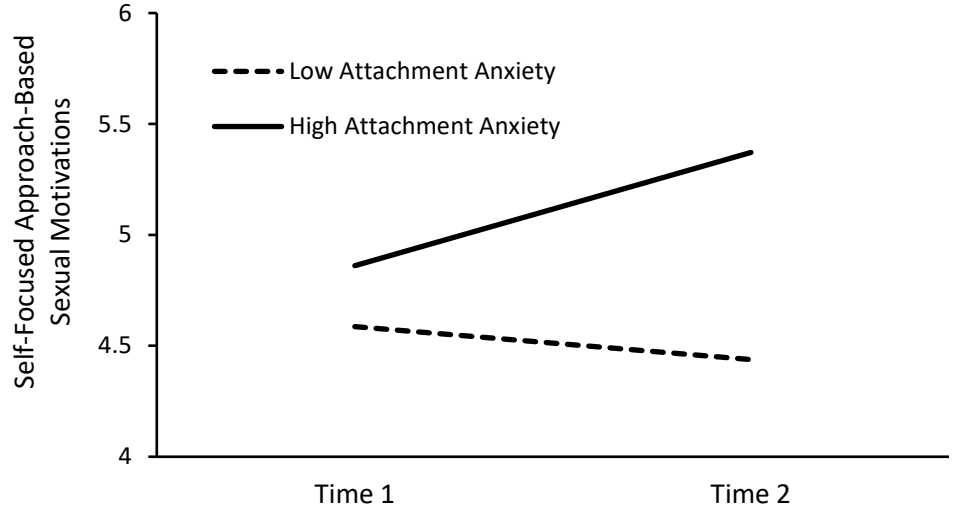


Table 6.4. The Effects of the Covariates, Time, Attachment Anxiety, and the Interaction Between Time and Attachment Anxiety (Top) and the Effect of the Covariates, Time, Attachment Avoidance, and the Interaction Between Time and Attachment Avoidance (Bottom) in the Prediction of the Outcome Variables

	Positive Sexual Experience			**Self-Focused Approach-Based Sexual Motives**			**Other Focused Approach-Based Sexual Motives**			**Other Focused Avoidance-Based Sexual Motives**			**Sexual Communal Strength**			**Unmitigated Sexual Communal Strength**		
	F	*p*	η^2	*F*	*p*	η^2	*F*	*p*	η^2	*F*	*p*	η^2	*F*	*p*	η^2	*F*	*p*	η^2
Attachment Anxiety																		
IntAdhere	.87	.356	.02	.02	.900	.00	.50	.481	.01	.03	.863	.00	2.50	.122	.06	2.31	.137	.06
PreCountSexOrMot	1.35	.253	.03	1.19	.280	.02	1.70	.198	.03	4.34	**.042**	.07	.11	.746	.00	.09	.770	.00
PostCountSexOrMot	1.54	.222	.04	3.18	.079	.05	.65	.424	.01	2.20	.143	.04	2.14	.151	.05	.017	.687	.00
AttAvd	1.24	.272	.03	.26	.610	.00	.02	.896	.00	5.52	**.022**	.08	.02	.883	.00	.94	.339	.02
Time	.93	.341	.02	2.20	.143	.04	.93	.339	.02	.02	.895	.00	.00	.965	.00	1.58	.216	.04
AttAnx	.27	.606	.01	3.24	.077	.05	.76	.388	.01	.96	.331	.02	1.30	.261	.03	.11	.745	.00
Time*AttAnx	1.34	.255	.03	7.17	**.010**	.11	.20	.656	.00	1.48	.228	.02	5.64	**.023**	.13	.57	.454	.01
Attachment Avoidance																		
IntAdhere	.87	.356	.02	.02	.900	.00	.50	.481	.01	.03	.863	.00	2.50	.122	.06	2.31	.137	.06
PreCountSexOrMot	1.35	.253	.03	1.19	.280	.02	1.70	.198	.03	4.34	**.042**	.07	.11	.746	.00	.09	.770	.00
PostCountSexOrMot	1.54	.222	.04	3.18	.079	.05	.65	.424	.01	2.20	.143	.04	2.14	.151	.05	.17	.687	.00
AttAnx	.27	.606	.01	3.24	.077	.05	.76	.388	.01	.96	.331	.02	1.30	.261	.03	.11	.745	.01
Time	.22	.642	.01	.58	.450	.01	1.23	.272	.02	.01	.908	.00	.20	.660	.01	1.05	.311	.03
AttAvd	1.24	.272	.03	.26	.610	.00	.02	.896	.00	5.52	**.022**	.08	.02	.883	.00	.94	.339	.02
Time*AttAvd	.53	.471	.01	.04	.837	.00	1.00	.321	.02	.13	.722	.00	.24	.627	.01	.02	.904	.00

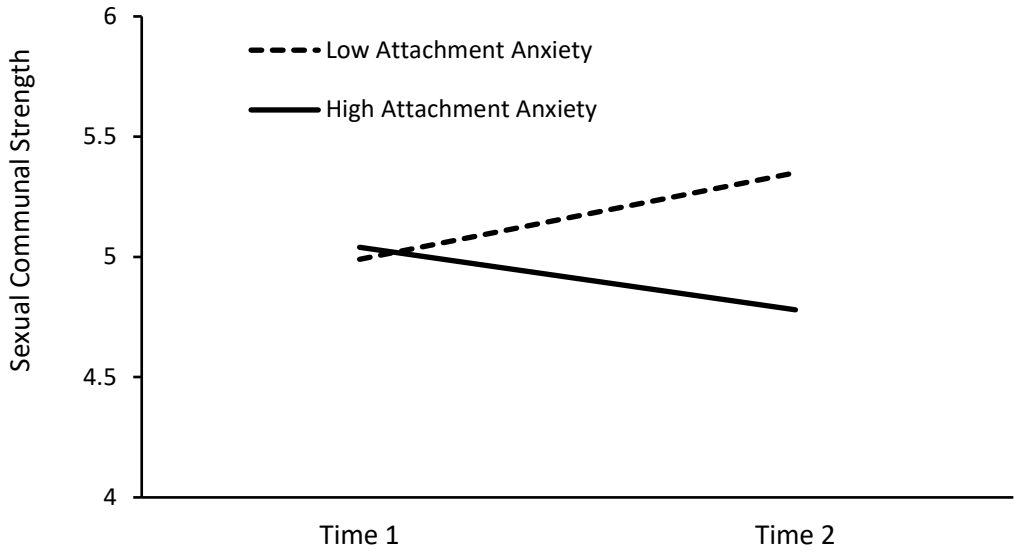
Note. IntAdhere = Interventional Adherence; PreCountSexOrMot = The number of times an individual had, or was motivated to have, sex during the pre-intervention period; PostCountSexOrMot = The number of times an individual had, or was motivated to have, sex during the post-intervention period; AttAnx = Attachment Anxiety; AttAvd = Attachment Avoidance.

Table 6.5. Means, Standard Deviations, and Pairwise Comparisons of the Outcome Variables at Each Time Point for Persons High Versus Low in Attachment Anxiety (Top) and Avoidance (Bottom)

		T1	T2	Difference Between T1 & T2	
		M(SD)	*M(SD)*	*Mean difference (SE)*	*p*
Attachment Anxiety					
Positive Sexual Experience	High	5.69 (1.35)	5.77 (1.02)	-.08 (.20)	.681
	Low	5.66 (1.11)	5.51 (1.38)	.15 (.13)	.260
Self-Focused Approach-Based Sexual Motives	High	4.86 (1.34)	5.37 (1.35)	-.51 (.20)	**.016**
	Low	4.59 (1.28)	4.44 (1.43)	.15 (.14)	.288
Other-Focused Approach-Based Sexual Motives	High	5.68 (.89)	5.84 (.92)	-.16 (.11)	.160
	Low	5.86 (.91)	5.88 (.83)	-.01 (.15)	.934
Other-Focused Avoidance-Based Sexual Motives	High	2.14 (1.46)	1.72 (.85)	.41 (.15)	**.012**
	Low	1.68 (2.14)	1.46 (.82)	.21 (.10)	**.033**
Sexual Communal Strength	High	5.04 (1.03)	4.78 (1.40)	.26 (.19)	.177
	Low	4.99 (.94)	5.35 (1.08)	-.36 (.18)	.061
Unmitigated Sexual Communal Strength	High	3.20 (1.31)	3.03 (1.05)	.17 (.16)	.31
	Low	3.09 (1.04)	3.06 (1.23)	.03 (.23)	.890
Attachment Avoidance					
Positive Sexual Experience	High	5.42 (1.31)	5.40 (1.24)	.02 (.17)	.886
	Low	5.90 (1.16)	5.89 (1.09)	.01 (.19)	.976
Other Focused Avoidance-Based Sexual Motives	High	2.30 (1.61)	1.91 (.91)	.39 (.18)	.040
	Low	1.60 (1.04)	1.34 (.69)	.26 (.08)	**.003**
Other Focused Approach-Based Sexual Motives	High	5.61 (.93)	5.87 (.77)	-.26 (.16)	.114
	Low	5.90 (.86)	5.85 (.96)	.05 (.10)	.622
Self-Focused Approach-Based Sexual Motives	High	4.58 (1.17)	4.94 (1.39)	-.36 (.20)	**.084**
	Low	4.86 (1.42)	4.93 (1.52)	-.07 (.17)	.695
Sexual Communal Strength	High	5.01 (.94)	4.77 (1.34)	.24 (.21)	.266
	Low	5.04 (1.04)	5.25 (1.23)	-.21 (.18)	.241
Unmitigated Sexual Communal Strength	High	3.35 (1.13)	3.19 (1.12)	.16 (.23)	.486

Figure 6.2

Rates of sexual communal strength among those high versus low in attachment anxiety across the two time points



6.6 Discussion

The current study was designed to examine the effects of a brief online mindfulness intervention on aspects of sexual functioning and to test whether interventional effects were moderated by attachment anxiety or avoidance. Inconsistent with expectation, there was no specific benefit of the mindfulness intervention and moderation analyses also failed to show the expected effects in which mindfulness buffered the effects of attachment anxiety on reports of other-focused avoidance-based sexual motivations and unmitigated sexual communal strength (i.e., negative sexual experiences). Somewhat more consistent with expectation, interactions between anxiety and time showed that more (versus less) anxiously attached participants reported increased self-focused approach-based sexual motives but decreased sexual communal strength. Similarly, consistent with expectation was the absence of interactions between time and avoidant attachment. Taken together, these findings seem to

suggest that while the mindfulness intervention did not improve sexual outcomes overall, it appeared to encourage more anxiously attached persons to reprioritize sexual motives related to their own pleasure. Below, we discuss these results more fully. First, we consider the absence of overall effects and effects on negative sexual experiences (i.e., other-focused avoidance-based sexual motivations and unmitigated sexual communal strength) among more anxiously or avoidantly attached persons. Second, we consider why mindfulness training differentially enhanced self-focused approach-based sexual motives among those higher in attachment anxiety. We then discuss study limitations and end by offering future directions for mindfulness research in the area of relational and sexual functioning.

6.6.1 Why Was Mindfulness Not of General or Specific Benefit? Unpacking the Absence of Effects

Given prior studies (Dixon et al., 2022a; Pepping et al., 2018; Saavedra et al., 2010; Silverstein et al., 2011; Velten et al., 2018), the absence of any overall benefit of mindfulness on sexual functioning *or* any buffering effect of mindfulness on more anxiously attached persons' reporting of negative sexual experiences is somewhat surprising. Previous research has linked both trait mindfulness and mindfulness interventions with better sexual functioning (Silverstein et al., 2011; Velten et al., 2018, 2020) and trait mindfulness has previously been shown to weaken associations between attachment anxiety and more maladaptive sexual motives (Dixon et al., 2022a, 2022b).

In interpreting the absence of comparable main and interaction effects in the present study, several possibilities are evident. One initial possibility is that the methods and/or sample employed here differed in meaningful ways from those in prior studies. Most prior work in the area has been non-interventional and has relied on measures of trait mindfulness, which may fail to accurately measure the intended construct (i.e., construct validity issues; Goldberg et al., 2019) or may not predict sexual outcomes in the same ways that mindfulness

interventions do (Van Dam et al., 2018). In the few interventional studies, researchers have tended to focus on physiological sexual outcomes (rather than cognitive, affective, or behavioral outcomes; Velten et al., 2020), used samples experiencing sexual distress (Brotto et al., 2021; Gunst et al., 2019), delivered interventions in-person (Brotto et al., 2020, 2021; Gunst et al., 2019; Silverstein et al., 2011; Velten et al., 2020), and/or utilized longer interventions (i.e., 12-weeks; Silverstein et al., 2011). Such methodological differences may have resulted in different patterns of outcomes than seen in the present study.

One obvious possibility for the relative absence of effects could be that the "dose" of mindfulness used in this study was relatively small, perhaps too small for mindfulness to affect sexual experiences. Indeed, that only observing mindfulness changed significantly over the course of the intervention may be why few effects of the intervention were detected. It is also possible that issues with power restricted our ability to detect intervention-based changes in sexual experiences. Indeed, while we *recruited* enough participants to find small- to medium-sized effects (see the preregistration), more than half of participants dropped out, reducing power. Relatedly, many participants did not adhere to the protocol as prescribed, potentially leading to reduced intervention effectiveness and thus less likelihood that the expected changes eventuated.

A potentially more fruitful possibility is that the elements of more mindful functioning that impact sexual outcomes in established relationships may take longer than 4-weeks to develop. Mindfulness is not a unitary construct. Indeed, self-report measures of mindfulness list awareness, attention-regulation, acceptance/non-judgment, and non-reactivity as core features (e.g., Baer et al., 2006; Brown & Ryan, 2003; Lau et al., 2006). Potentially, different mechanisms facilitate the development of different components, and components may emerge in a different sequence or at different rates. For example, awareness may be relatively easy and quick to develop compared to non-judgment, non-reactivity, and

acting with awareness, which may require greater effort, depend on the prior development of other mindfulness elements (e.g., awareness; Brown & Ryan, 2003), and thus emerge more gradually (Van Dam et al., 2018). This is supported in the present study, in which observing mindfulness was the only facet to significantly change over the intervention period. Whether the more complex elements (e.g., non-reactivity, non-judgement) are needed to generate positive change in sexual experiences is unknown but prior work suggests they are more closely associated with beneficial *intra*personal outcomes (Medvedev et al., 2021; Roca et al., 2019). Thus, if particular elements of mindfulness are important to sexual functioning but these elements were unable to change in the time/dose of the intervention (or in the context of an established relationship), this might help explain why participants reported no change in sexual outcomes.

However, while the absence of general effects and interaction effects between mindfulness and attachment anxiety was inconsistent with expectation, the absence of effects among more avoidantly attached persons was not surprising. As noted, while theory has suggested that mindfulness should offer similar benefits to both anxious and avoidant persons (Atkinson, 2013; Brown et al., 2007; Karremans et al., 2017), empirical studies suggest specific benefits for more anxious versus more avoidant persons are to be expected (Dixon et al., 2022a, 2022b, 2022c). Some have even suggested that mindfulness may be a double-edged sword for more avoidant persons (Dixon et al., 2022b). To this extent, the present study is consistent with prior cross-sectional data suggesting few benefits for more avoidant persons. In interpreting why this might be, the Attachment Security Enhancement Model (ASEM; Arriaga et al., 2018) is helpful. The ASEM suggests that attachment avoidance is reduced when persons confront experiences that contradict their negative views of others and their confidence in others' responsiveness increases (Arriaga et al., 2018). Given mindfulness training is arguably less about how others are viewed and more about one's relationship to

oneself and one's own experience, mindfulness may be less relevant to the key other-focused concerns characterizing attachment avoidance.

6.6.2 Why Attachment Anxiety Moderated Mindfulness' Effects on Positive Sexual Experiences

As noted, prior research has shown that trait mindfulness buffers the links between attachment anxiety and more maladaptive sexual motives (Dixon et al., 2022a, 2022b), though data regarding how mindfulness affects pleasure-based motivations has been missing. One prior (albeit marginal) finding from a cross-sectional study has suggested that the effect of attachment anxiety on reporting having sex to pursue one's own pleasure was reduced among those reporting greater non-judging mindfulness (i.e., potentially a form of self-denying; Dixon et al., 2022b). In the current interventional study, however, an effect to the contrary was found; self-focused approach-based sexual motives *increased* among more (but not less) anxiously attached participants across the intervention.

Two initial interpretative possibilities may help explain this effect. First, repeatedly reporting on sexual experiences may differentially increase the awareness of having sex for personal pleasure among the more anxiously attached (i.e., a "mere measurement" effect; Conner et al., 2011; Godin et al., 2010). Certain personalities appear predisposed to respond to the non-treatment-related aspects of interventions (e.g., measurement; Darragh et al., 2015); attachment anxiety may fall into this category. We know that anxiously attached persons closely monitor relationships for signs of threat (Mikulincer & Shaver, 2003). Such vigilance may operate more broadly, inclining them toward greater monitoring of (and responsiveness to) outside inputs than their less anxious counterparts. This dispositional tendency may, in turn, make more anxiously attached persons more susceptible to change due to the "mere" act of specifically attending to and reporting on sexual functioning.

This “mere measurement” interpretation, however, does not explain why this effect only emerged for *own pleasure-based sexual motives* (rather than more broadly). While we cannot know for sure, two possibilities may explain this finding. First, that reports of pleasure-based *motives* but not sexual experiences changed may suggest that motivations are easier to change than sexual experiences that have a complex individual and relationship history and involve another person. Second, own pleasure-based motives may be easier to change than other-focused sexual motives among more anxiously attached persons because motives regarding one’s own pleasure are less intertwined with the functions of the attachment system than motives focused on another person. Other-focused sexual motives and responsiveness to a partner’s sexual desires may be harder to alter because they are more closely tied to the workings of the attachment system and may serve important interpersonal regulatory functions for more anxious persons.

A second possibility for why self-focused approach-based sexual motives increased among the more anxiously attached could be that, rather than "mere measurement", mindfulness itself was responsible for these changes. Specifically, the precise elements of mindfulness that impact self-focused approach-based sexual motivations (e.g., awareness) may have had sufficient time to develop across the intervention. Developing awareness via mindfulness training may have helped more anxious individuals to enhance bodily awareness (Hölzel et al., 2011) and attention to physiological sensations (Ortner et al., 2007), such that they were more able to enjoy the more positive and pleasurable aspects of sex. Experiencing physical pleasure may, in turn, have led to a stronger sense of being motivated by self-focused approach-based sexual motives.

However, why self-focused approach-based motives increased solely among more anxiously attached persons is less clear. As argued, it could be that more anxiously attached persons are dispositionally more responsive to outside inputs and thus are more susceptible to

change from any intervention. However, it is also possible that the elements of mindfulness responsible for prompting increases in motives of this kind are particularly beneficial to more anxiously attached persons, who typically report more maladaptive and avoidance-based sexual motives (Cooper et al., 2006). Specifically, by increasing their ability to accept themselves without judgment, mindfulness may have improved more anxiously attached persons' working model of self (Randal et al., 2015), a pathway thought to be involved in buffering attachment anxiety (Arriaga et al., 2018). This, in turn, may have prompted a "healthier" sexual motivation profile, whereby positive and pleasurable experiences (specifically for the self) were given greater importance.

6.6.3 Limitations and future directions

While the current study offers a useful extension to prior cross-sectional work, it is not without limitations. First, participant attrition was unexpectedly high. Although no differences in demographic, psychological, or sexual variables were detected between included and excluded participants, the high attrition rate may have introduced external bias, which limits extrapolation of findings (Marcellus, 2004). It is possible this high attrition rate occurred as a result of the high study demands. In particular, capturing reports of sexual experiences for 7-days pre- and 7-days post-intervention may have contributed to drop-out levels. This sampling method reduced the likelihood of reporting bias via aggregation and was further justified by the variability inherent to human sexual behavior over time (Bodenmann et al., 2010). However, future research could consider using less demanding measurement to minimize attrition, especially if the intervention itself is also time intensive. Attrition may have been exacerbated because the intervention was insufficiently engaging, potentially due to a lack of facilitator or group contact or due to technology-meditated communication and delivery issues. Although online interventions provide benefits in terms of cost-effectiveness, accessibility, and flexibility, future research could pay greater attention

to how to maintain engagement during online-delivered mindfulness programs. Finally, the study took place when many participants were living through a government-mandated COVID lockdown, which may have placed additional burdens on participants and increased the likelihood of dropping-out. Relatedly, reports of sexual experiences among those who *did* participate sufficiently may still have been affected by COVID. Accordingly, future research could replicate this study when the population of interest is not experiencing pandemic-related restrictions, so as to reduce attrition and increase generalizability of results.

Second, it is possible that training participants in *general* mindfulness may not have been as effective in altering participants' sexual experiences as if we had trained them in *sexual* mindfulness (although there are likely some practical challenges to such research). Indeed, research indicates that trait and sexual mindfulness are distinct constructs (Adam et al., 2015a; 2015b) and that sexual mindfulness predicts sexual outcomes over and above general mindfulness, at least in cross-sectional designs (Adam et al., 2015; Leavitt et al., 2019). In theory, interventions that teach individuals to bring a quality of mindful attention and acceptance specifically into the *sexual* domain, rather than more generally across everyday life, might have been better able to target and buffer the sexual manifestations of attachment insecurity. Future research should test this possibility.

Third, the absence of a control means we cannot conclude that effects were due to mindfulness per se. Indeed, outcomes may have been due to a relaxation-type effect associated with the intervention (Dixon et al., 2022c), expectancy effects, the effects of time, and/or "mere measurement" effects (Godin et al., 2010). Fourth, while alternatives are unclear, our reliance on self-report measures of sexual experiences may have been biased by social-desirability effects or participants' inability to accurately recall their sexual experiences fully. Fifth, the vast majority of our sample was female, potentially reducing the generalizability of these results to other genders. Sixth, the interpretive framework we used

may constrain understanding of why people have sex. Future research could consider utilizing an intrinsic versus extrinsic lens via which to understand sexual motives (Gravel et al., 2016; Green-Demers et al., 2002). Seventh, the mindfulness intervention was designed to be brief and accessed independently and remotely by participants. While some studies suggest that smaller doses of mindfulness are as effective as larger doses when predicting depression, anxiety, and stress (Strohmaier, 2020), sexual experiences or processes that occur between people may require a larger interventional dose to change. Eighth, the lack of follow-up measurement prevents us from testing whether treatment effects persisted in the longer-term. Future research could address these limitations by using longer mindfulness-based programs with active controls, measurement paradigms that minimize participant burden, and longitudinal measurement of effects.

6.7 Conclusion

Despite research increasingly implicating mindfulness in better relationship functioning, few pre-registered studies have explored how mindfulness interventions affect the sexual experiences of community-dwelling adults or whether such effects are moderated by intraindividual characteristics. The present study addressed these gaps by testing whether a mindfulness intervention affected the cognitive, affective, and behavioral aspects of sexual experiences and whether effects varied by attachment anxiety and avoidance. Inconsistent with expectation, mindfulness did not enhance sexual outcomes in general nor did it buffer more negative sexual experiences among the more anxiously attached. However, the mindfulness intervention did increase reports of positive sexuality among more anxious persons. Findings may reflect variation in the speed by which the different elements of mindfulness develop, greater psychological malleability among more anxious persons, and/or the fact that mindfulness training impacts processes more relevant to the buffering of attachment anxiety. Future research should replicate and extend this research so that more

definitive conclusions regarding mindfulness's role in relationships and sexuality, particularly among the more insecurely attached, can be found.

Chapter 7. General Discussion

7.1 Overview

The notion that attachment insecurity shapes interpersonal functioning is not new. It is well established in both clinical and basic research contexts that the concerns of persons high in attachment anxiety and avoidance have the potential to interfere with the development and maintenance of healthy romantic relationships, including inclining them toward poorer interpersonal communication and conflict resolution, greater difficulties managing emotions, and less satisfying relationships and sex lives than more secure persons (for reviews, see Birnbaum & Reis, 2019; Gillath et al., 2016; Mikulincer & Shaver, 2016). Less well-considered is what might reduce the manifestations of attachment insecurities in interpersonal functioning, notably in adult sexuality. Given the significant implications of attachment insecurities for the health of romantic relationships, the relative lack of research into what might mitigate how attachment concerns manifest in relational functioning is striking.

Responding to this relative dearth of literature, the broadest aim of this thesis was to examine whether mindfulness might help individuals manage the manifestations of their attachment concerns such that these concerns were less likely to "bleed out" into relational and sexual experiences. Empirically, work in this thesis began by investigating whether *trait* mindfulness buffered the manifestations of attachment anxiety and avoidance in sexual motivations using cross-sectional (Chapter 3) and intensive longitudinal (Chapter 4) study designs. Building on these studies, a randomized controlled trial was then used to experimentally investigate whether a brief online mindfulness (versus a relaxation) *intervention* differentially improved relationship functioning among more anxious and avoidant persons (Chapter 5). Returning to the initial focus on sexuality, a final empirical piece examined the potential effects of a self-administered mindfulness intervention on sexual experiences and motivations (Chapter 6). In this final chapter, the contributions of

each study are presented and integrated within the wider attachment and mindfulness literatures, before greater attention is given to potential explanations for the emerging pattern of findings thus far. The thesis concludes with a discussion of the limitations of this work, identifies some opportunities for future research, and shares some words of consideration and caution.

7.2 Summary of Key Findings

Noting the adverse outcomes associated with attachment insecurities (see Birnbaum & Reis, 2019; Gillath et al., 2016) and theoretical and empirical investigations suggesting mindfulness may be of benefit in interpersonal functioning in general and to more insecure persons specifically (e.g., Hertz et al., 2015; Jones et al., 2011; Karremans et al., 2017; Leigh & Anderson, 2013; Melen et al., 2017; Pepping et al., 2013; Ryan et al., 2007), this thesis sought to answer the question of whether the interpersonal effects of mindfulness were moderated by attachment anxiety and avoidance. In beginning to test this question, a cross-sectional investigation of whether trait mindfulness attenuated the links between attachment dimensions and maladaptive sexual motivations was conducted (Study 1; Chapter 3). Following from a single earlier study (Saavedra et al., 2010), this study represents the second empirical test of whether mindfulness buffers the interpersonal manifestations of attachment insecurities as well as the first test of whether trait mindfulness buffers the *sexual* manifestations of attachment concerns. Results were generally consistent with the available literature (i.e., Saavedra et al., 2010) and corroborating theoretical reasoning (e.g., Karremans et al., 2017) insofar as they indicated that the acting with awareness facet of trait mindfulness may reduce the expression of more *anxiously* attached person's attachment concerns in maladaptive sexual motivations (i.e., having sex to affirm the self and cope). However, calling into question the notion that mindfulness may be of equal benefit to insecure attachments characterized by greater anxious or avoidant characteristics, this study suggested

that acting with awareness mindfulness *intensified* the link between avoidant attachment concerns and typically less-adaptive sexual motives, including increasing reports of sex to affirm the self and cope.

As a cross-sectional study, however, the causal pathways linking these constructs remained unclear. Perhaps more concerning for the variables under consideration, the reliance on cross-sectional data may not have adequately captured the fluid temporal relationships between attachment concerns and sexual motivations, and reports of sexual motives may have been affected by summation and recall biases. More specifically, difficulties remembering previous sexual motives may have meant that more recent, more typical, or more salient sexual experiences were given greater weight in self-reports. In addition, reports may have been biased by participants' desires to see and/or present themselves in ways consistent with self and/or other presentational concerns. Thus, while an important first test of the central questions guiding this thesis, these considerations paved the way for a study that permitted examination of relational and sexual dynamics *as and when* they occurred.

To replicate and extend the first study's results, an intensive longitudinal study testing whether trait mindfulness mitigated the expression of attachment anxiety and avoidance in *daily* maladaptive sexual motivations was conducted. Findings were generally consistent with the results of the initial cross-sectional study insofar as mindfulness was again of greater relevance to the concerns characterizing anxious attachment. Specifically, greater scores on the observing facet of mindfulness eliminated the relationship between attachment anxiety and having sex to prevent a partner from losing interest and reduced the degree to which persons high in attachment anxiety reported having sex to please a partner. Although this study does not clarify whether motives to please a partner necessarily occur at the expense of the self, this was encouraging. Somewhat in contrast to expectation, however, non-judging

mindfulness reduced the likelihood that more anxiously attached individuals reported engaging in sex to pursue their own pleasure. Nonetheless, in line with the emerging picture of mindfulness as being more useful or relevant regarding anxiety-focused attachment concerns, there were fewer and less robust associations between attachment avoidance and sexual motivations, with only observing mindfulness marginally increasing more avoidant person's tendency to report having sex due to feelings of obligation.

The penultimate contribution of this thesis shifted to a more causal design, considering whether the effects of mindfulness *training* on relationship, rather than sexual, functioning were moderated by attachment dimensions. Providing a test of the causal relationship between constructs, this study also considered whether any moderation effects of mindfulness were distinct from an active control (relaxation). Perhaps unsurprisingly, given the presence of an active control, findings were more nuanced and complex than in the first two studies presented in this thesis, though they still tended to reinforce the notion that mindfulness is more relevant to attachment *anxiety* than avoidance. Specifically, findings suggested that more (versus less) anxious individuals derived greater benefit from the mindfulness intervention over time, as indexed by greater reductions in rejection fears and conflict, and greater increases in connection. Regarding attachment avoidance, findings showed that mindfulness offered *some* slightly greater benefits to more (versus less) avoidant persons, though, replicating earlier patterns, these benefits were not as significant or as sustained in time as the benefits experienced by more anxiously attached persons. Importantly, however, persons in the relaxation (control) condition reported equivalent benefits, indicating that mindfulness, at least delivered via a brief online intervention, may not be *uniquely* advantageous to the relationship functioning of more anxious (and sometimes more avoidant) individuals.

Finally, circling back to the initial focus on sexual functioning, Study 4 (Chapter 6) tested whether the effects of mindfulness training extended to the sexual domain. Consistent with the pattern of effects exhibited in the three prior studies, mindfulness was not particularly beneficial to more avoidantly attached persons. However, in contrast to earlier cross-sectional findings, mindfulness did not appear to disproportionately benefit (i.e., buffer) the effects of greater (versus lesser) anxious attachment on negative sexual experiences. Conversely (and more consistent with expectation), the intervention did appear to encourage more anxiously attached persons to reprioritize sexual motives related to their own pleasure. In the following section, these studies are integrated within the broader attachment and mindfulness literatures, including considering how they fit with recent theoretical and empirical developments in our understanding of attachment buffering, and how mindfulness may intersect with or contribute to such processes.

7.3 Integration into the Broader Literature

Relative to the decades of research exploring the personal and interpersonal costs of attachment insecurity, consideration of what might mitigate the translation of attachment concerns into relational and sexual experiences has only recently been of interest to researchers. Previously, researchers have considered whether psychotherapy might reduce attachment anxiety and avoidance (e.g., Fonagy et al., 1995; Kinley & Reyno, 2013; Kirchmann et al., 2012; Levy et al., 2006; Maxwell et al., 2014; Muller & Rosenkranz, 2009; Tasca et al., 2007), though it is less clear whether these reductions buffer the expression of attachment insecurities in relationship and sexual functioning. More recently, attention has also considered how a partner's behavior or the quality of a relationship may attenuate the degree to which the concerns characterizing attachment anxiety and avoidance are reflected in feelings, thoughts, and behaviors (see Arriaga et al., 2018; Overall et al., 2016; Righetti et al., 2020; Simpson & Overall, 2014). While both lines of research have shown promise (e.g.,

Girme et al., 2019; Kim et al., 2018; Little et al., 2010; Maxwell et al., 2014; Muller & Rosenkranz, 2009), these interventions have clear limitations. For instance, psychotherapy's time and financial costs may preclude many from accessing such services (Ollerton, 1995), while its requirement to disclose vulnerable aspects of the self and trust in another's responsiveness may be threatening or deterring for persons with greater attachment avoidance. "Partner-buffering" techniques, while overcoming some of these limitations, are constrained by their reliance on individuals being in a romantic relationship *and* having a partner that is willing and able to regulate their responses in the service of mitigating a partner's insecurities—a process that may come with significant personal costs (Overall et al., 2014).

Individuals' working models of attachment are thought to develop within the context of significant early life relationships (Bowlby, 1969, 1973). Given this hypothesized origin, it makes sense to focus on assessing how characteristics of relationships with others (either a therapist or partner) can beneficially influence outcomes associated with attachment insecurities. However, given the limitations of attachment-buffering methods reliant on others, identifying individual characteristics or inexpensive, self-administered interventions that may also mitigate the expression of attachment concerns seems valuable. Despite the potential merits of such an investigation, little consideration has been given to these possibilities (cf Saavedra et al., 2010). Thus, at a macro level, a key contribution of this thesis rests in it empirically testing a previously underexplored question: Can attachment insecurities be buffered by the actions or characteristics of an individual alone? More specifically, can an inherent or taught individual resource—mindfulness—buffer the manifestations of attachment insecurities? The results of this thesis suggest that it can. However, adding an element of complexity, the collective interpretation of the studies presented here suggests that mindfulness is of *disproportionate* relevance to the concerns

characterizing attachment anxiety rather than avoidance. Indeed, whereas both trait and interventionally-increased mindfulness were regularly of benefit to more anxious persons, it less commonly attenuated the manifestations of attachment avoidance—sometimes being of slight benefit (Study 3; Chapter 5), sometimes exacerbating the expression of avoidant concerns (Study 1, Chapter 3; Study 2; Chapter 4), but most often failing to interact with mindfulness in the prediction of sexual and relational functioning (Study 2, Chapter 4; Study 4, Chapter 6).

Preliminary explanations for the disparate relevance of mindfulness to attachment anxiety versus avoidance have been presented throughout Chapters Three to Six but are usefully revisited here since these findings and the associated theoretical development reflect the contribution of the thesis as a whole. As has been made clear, the differential pattern of mindfulness' benefits vis-à-vis attachment anxiety is broadly consistent with work available prior to this thesis' conception. In particular, one study had shown that the link between attachment anxiety (but not avoidance) and relationship break-up was reduced when individuals were high (but not low) in trait mindfulness (Saavedra et al., 2010). Similarly, the pattern of results presented here is also consistent with subsequent empirical studies that became available *during* the time this program of doctoral study was conducted. Of particular note, a study testing whether attachment dimensions moderated the effects of a 6-week mindfulness versus loving-kindness intervention on emotional profiles found that persons with moderate to high attachment anxiety were particularly likely to benefit from the mindfulness intervention (West et al., 2022). Specifically, growth-curve analyses indicated that persons with moderate to high (but not low) attachment anxiety experienced significant increases in positive emotion and significant decreases in negative affect throughout the mindfulness (but not loving-kindness) intervention. In contrast, there was little evidence that mindfulness was of disproportionate benefit to the emotional profiles of more avoidantly

attached persons. Replication of the pattern of effects seen throughout this thesis in another study (i.e., West et al., 2022) using a different sample, interventional approach, and measures, and a finer-grained analytical approach is promising, offering greater confidence that the results seen in this thesis are not spurious or idiosyncratic to these designs or samples but are more likely indexing processes that are occurring in actuality.

7.3.1 Why Mindfulness is of Disparate Relevance to Attachment Anxiety Versus Avoidance

Of course, the key question that cannot be fully answered at this time regards why. Why is mindfulness of greater benefit regarding attachment anxiety but less beneficial regarding attachment avoidance? Two overlapping ideas may shed light on why this occurs. However, before addressing these possibilities fully, it is worth initially recalling (a) the presence of greater distress among more anxious persons and (b) their typical style of managing distress, particularly in relationships. Evidence suggests that anxiously attached persons' threshold for perceiving threats (and relationship threats in particular) is calibrated to their history of unpredictable and/or insufficiently supportive relationship experiences (Simpson & Rholes, 1994). Accordingly, persons with anxious characteristics are hypervigilant to, and perceive a greater number and intensity of, threats than is typically warranted (Campbell et al., 2005; Dančík et al., 2021), with perceived rejection or abandonment experienced as particularly threatening (Campbell et al., 2005). Because detection of these threats "activates" felt insecurity, they respond to these perceived relationship threats with a significant degree of distress (Campbell et al., 2005; Mikulincer et al., 2002), which they struggle to regulate effectively (Evraire & Dozois, 2014; Kratz et al., 2012; Lanciano et al., 2012; Mikulincer & Orbach, 1995). The centrality of their attachment concerns and the degree of distress they experience when relationship threats are detected increase their likelihood of reporting relationship and sexual feelings, cognitions,

motivations, and behaviors that undermine relationship quality (e.g., Birnbaum et al., 2006; Campbell et al., 2005; Collins et al., 2006; Davis et al., 2004; Impett & Peplau, 2002).

Given the lens through which more anxious persons interpret, experience, and respond to relationship events, it is perhaps unsurprising that mindfulness differentially buffers the manifestations of attachment anxiety. Mindfulness is thought to enable a greater ability to see experiences objectively (Bernstein et al., 2015). That is, without unwarranted interference from past experiences and the mental representations that maintain them. This "decentered" state is thought to enable better emotion regulation (Dixon & Overall, 2016; Feldman et al., 2010; Pepping et al., 2014; Weinstein et al., 2009), which is potentially why mindfulness reduces experiential distress when personal (Arch & Craske, 2006; Bullis et al., 2014; Evans et al., 2011) and interpersonal (Barnes et al., 2007; Kimmes et al., 2018; Laurent et al., 2013) stressors *are* detected. Drawing these threads together, mindfulness seems particularly well suited to reducing the manifestations of attachment anxiety. Indeed, the very things more anxiously attached persons tend to struggle with (i.e., over-detection of stressors and high levels of distress and dysregulation, as fueled by biased perceptions) appear to be the very things mindfulness is best suited to alleviate. Plausibly then, a key reason mindfulness mitigates the expression of attachment anxiety in relationship and sexual experience is because it (1) dampens the detection of stressors, and/or (2) improves more anxiously attached persons' ability to contain their hyperactivated responses to perceived interpersonal stressors. Both processes should, in turn, reduce the degree to which attachment concerns bleed out into negative relationship and sexual experiences, as was seen in the studies comprising this thesis.

However, while there appears to be a strong conceptual congruence between the active mechanisms of mindfulness and the challenges experienced by more anxiously attached persons, mindfulness appears less overtly suited to the processes characterizing

avoidant attachment. Indeed, whereas more anxiously attached persons are overly attentive and reactive to potential sources of threat or distress, more avoidant individuals cognitively and behaviorally distance themselves from threatening experiences (Shaver & Mikulincer, 2002), dismissing or downregulating the feelings associated with vulnerability (Cassidy, 1994). In other words, they tend to deny experiential distress and emotionality (Collins & Read, 1994; Fraley & Shaver, 1997; Pietromonaco & Barrett, 1997). As such, arguably, the key benefit of mindfulness—its ability to change the way people relate to experiential distress—may be largely irrelevant to the psychological processes of more avoidant persons, thus failing to mitigate the expression of their insecurities in sexual and relational behavior.

This general observation noted, it remains possible that some elements of mindfulness may be of some benefit to more avoidant individuals. For example, the greater reductions in destructive behavior among more (versus less) avoidant persons seen in Chapter 5 may indicate that *some* elements of mindfulness are nonetheless helpful. Exactly why this would be the case is unclear. However, it is worth recalling that the emotion-regulatory skills thought to characterize greater mindfulness are in clear contrast to the suppression and withdrawal strategies that characterize attachment avoidance (Fraley et al., 2000; Fraley & Shaver, 1998; Simpson et al., 1992) and are associated with poorer relational outcomes (e.g., Fraley & Shaver, 1998). As such, it is possible that mindfulness may have some benefits for more avoidant persons because it reduces these tendencies. For example, the encouragement to turn towards experiences with openness and non-judgment may help more avoidant persons to tolerate and manage distressing interpersonal experiences in more adaptive ways, potentially by encouraging them to view challenging situations with more objectivity or by building their capacity to inhibit the translation of distress into behavior. However, whether these benefits outweigh any potential costs of turning toward experiences that might

otherwise be experientially avoided (as seen in Chapters 3 and, marginally, in Chapter 4) is as yet unknown.

More than just being of disproportionate relevance to the *distress regulation strategies* of more anxious versus more avoidant persons, however, mindfulness may also be more relevant to the *core concerns* underlying attachment anxiety than avoidance. As noted throughout the early chapters of this thesis, existing theory suggests that processes that buffer the manifestations of attachment insecurities should be tied to and differ based on the distinct concerns at the heart of each attachment dimension (Arriaga et al., 2018). Given that the core concerns of more anxiously attached persons center on their perceived lack of worth and the availability of close others (Shaver & Mikulincer, 2002), buffering should occur when more anxious persons encounter opportunities to strengthen their model of self and experience moments of calm in otherwise distressing situations (Arriaga et al., 2018; Arriaga & Kumashiro, 2021). In contrast, more avoidant persons' concerns are less centered on concerns regarding the self and rest more in their distrust of others. Thus, situations that strengthen their model of *others* should buffer the expression of avoidant attachment (Arriaga & Kumashiro, 2021). As has been argued above (Chapters 3, 4, and 5), mindfulness is arguably more about one's relationship to the self and one's own experience than it is to how we see others; mindfulness may thus more effectively relate to the core concerns of more anxious (versus more avoidant) persons. For example, the reduced perceptions of and responses to threats, as facilitated by mindfulness, may increase more anxiously attached persons' confidence in their ability to cope with challenging relationship situations. Alongside this, mindfulness may increase individuals' ability to accept themselves without judgment, thereby bolstering their self-image (Randal et al., 2015). Taken together, such processes may alter more anxiously attached persons' experience of themselves, reducing the

power of their attachment concerns and limiting their expression in typically less-adaptive thought, feeling, motivation, and behavior.

In total, such processes may prompt a "healthier" sexual and relationship profile, in which more anxious persons do not feel the need to engage in sex to affirm their worth, cope (Study 1; Chapter 3), or prevent a partner from losing interest (Study 2; Chapter 4), perceive less conflict, do not fear rejection or engage in as much destructive behavior as they usually would (Study 3; Chapter 5), and take greater pleasure in sexual experiences (Study 4; Chapter 6). In contrast, mindfulness' encouragement to focus on one's own experience may fail to challenge more avoidantly attached persons' other-focused concerns, which may be why mindfulness was largely ineffectual in mitigating the expression of avoidant attachment in sexual and relational functioning.

7.4 Broader Research Considerations Relating to Mindfulness, Sexuality, and Attachment

The above theorizing was necessarily general given that explanations for mindfulness' disparate relevance to interpersonal functioning rely on broader theories about attachment buffering processes. However, while sexual functioning is often treated as an index of individual and relational functioning, it is also an important element of human functioning in its own right that is influenced by various factors. Thus, it seems prudent to revisit some considerations regarding the applications of mindfulness to sexuality more broadly. In beginning, it is worth noting that throughout this program of research, an increasing number of empirical studies came out exploring the effects of "sexual mindfulness", a domain-specific measure of the ability to be mindful during sexual experiences (Adam et al., 2015; Lafortune et al., 2022; Leavitt et al., 2019; 2021a; 2021b). Cross-sectional research has indicated that sexual mindfulness is linked with greater sexual satisfaction, relational flourishing, sexual harmony, and orgasm consistency (Leavitt et al.,

2019; 2021a). Qualitative evidence, though only using a sample of 5 participants, also suggests that *training* individuals to be more sexually mindful increases sexual satisfaction insofar as it improves intimacy and connection (Leavitt et al., 2021b). However, while this domain-specific mindfulness appears to be of benefit—at least in these early, mostly cross-sectional studies—there are reasons to remain cautious of encouraging people to be mindful specifically *during* sexual experiences.

At face value, being fully alive and present during sex and relinquishing attempts to force a sexual experience to be anything other than what it is seems beneficial. In fact, the former is thought to be a component of optimal sex (Kleinplatz et al., 2009) and may increase awareness of sexual arousal, leading to greater sexual desire (Basson, 2015). However, the non-reactivity and "one-step-removed"-type objectivity that mindfulness encourages might also "put the handbrake on" the spontaneity that some individuals believe is integral to "good sex" (e.g., Sims & Meana, 2010; Swindle et al., 2004). Potentially, controlled dissociation of this kind could take them away from capitalizing on the flow of in-the-moment desire and arousal.

However, rather than being either useful *or* detrimental, the benefits and potential costs of mindfulness *during* sex may depend on personal characteristics, much like the moderation effects seen in the studies comprising this thesis. Potentially, persons struggling with sexual dysfunctions (Brotto, 2013) or greater sexual or attachment anxiety may benefit to a greater degree from sexual mindfulness, with it permitting them greater freedom to express sexual desires or behaviors (Pepping et al., 2018) and greater freedom from cognitive interference and the impact of insecurities (Newcombe & Weaver, 2016). In contrast, individuals who believe spontaneity is necessary for "good" sex may experience less satisfying sexual experiences when encouraged to be sexually mindful because the non-reactivity and objectivity mindfulness invites may remove a crucial part of what makes sex

enjoyable for them. Given that there are sex differences in sexual response cycles (Basson, 2000), the effect of mindfulness during sex may also depend on whether one is male or female. Researchers should consider these possible costs of mindfulness during sex as research in this area continues.

While the results of this research program indicated that mindfulness is of benefit to the sexual motivations of more anxiously attached persons, it is worth reflecting on whether trying to change sexual functioning is advisable independent of corollary changes to relationship functioning. Some have argued that sexual dysfunction is a bellwether that signals relationship dysfunction upstream (e.g., Johnson, 2008). This view implies that relationship disharmony, disconnection, or distress *causes* sexual difficulties. Research has also indicated that the reverse relationship is possible too (i.e., that sexual experiences shape relationship wellbeing; Birnbaum et al., 2006; Maxwell & McNulty, 2019; Meltzer et al., 2017). Though, to the extent that relationship problems shape dissatisfying sex, it may be more beneficial to have interventions target these primary issues rather than their symptoms in sexual outcomes.

Finally, it seems prudent to consider more deeply the differential impact of mindfulness facets in buffering the expression of attachment concerns in relationship and sexual functioning (Studies 1 and 2; Chapters 3 and 4). Recall that in Study 1 (Chapter 3) the attenuation of maladaptive sexual motives was exclusively offered by the acting with awareness facet of mindfulness. In contrast, the results of Study 2 (Chapter 4) suggested that *observing* mindfulness played a key role in buffering the manifestations of attachment anxiety. What might be deduced from this? First, that acting with awareness was a key buffer of the manifestations of anxious attachment is not entirely surprising. As addressed earlier in this thesis (i.e., Chapter 2), while research examining the effects of a multi-dimensional measure of mindfulness on romantic relationship health is severely lacking, collective

interpretation of the studies that *do* exist suggest that the acting with awareness facet of mindfulness is of particular utility, at least with respect to relationship and sexual satisfaction, stability, and forgiveness of a partner's transgressions (Adair et al., 2018; Johns et al., 2015; Khaddouma et al., 2015; Khaddouma & Gordon, 2018; McGill et al., 2020). Studies in the intrapersonal domain have also attested to the power of acting with awareness, indicating that it is the most potent facet of mindfulness, from which other facets derive (Heeren et al., 2021). Moreover, acting with awareness has been found to be particularly efficacious in improving mental health in mindfulness interventions (Chien et al., 2020; Raphiphatthana et al., 2018; Webb et al., 2019). Plausibly then, acting with conscious intention may be a central pathway through which mindfulness confers interpersonal benefits, particularly for those with greater attachment anxiety.

Given the apparent importance of acting with awareness mindfulness in the *intra*personal domain and some indication that this is reflected in the *inter*personal domain, it was somewhat surprising that acting with awareness was not of particular utility in buffering the adverse sexual manifestations of attachment anxiety in daily life (Study 2). That it was observing mindfulness that buffered the manifestations of attachment anxiety was also somewhat surprising. Previous research has indicated that observing mindfulness is linked with adverse psychological symptoms (Baer et al., 2006) and attachment anxiety (an effect that may reflect the ruminating, worrying, and hypervigilance typical of those higher in attachment anxiety; Pepping 2014). Thus, there is reason to suspect that observing mindfulness may not always be helpful or protective. However, other research has indicated that observing mindfulness is linked to beneficial social outcomes, including greater relationship satisfaction and stability (Adair et al., 2018; Khaddouma et al., 2015; Khaddouma & Gordon, 2018). Given the mixed results regarding observing mindfulness' role in interpersonal functioning more broadly and buffering the manifestations of attachment

anxiety more specifically, future research should continue to examine the differential relevance of mindfulness facets as they pertain to buffering attachment anxiety in relational and sexual functioning.

7.5 Limitations and Future Directions

The studies outlined in this thesis have contributed to the extant mindfulness and attachment literatures with cross-sectional, intensive longitudinal, and experimental works highlighting that (1) mindfulness benefits more anxiously attached persons, buffering some sexual and relational manifestations of their insecurities, but (2) appears ill-suited to buffering the manifestations of attachment avoidance. These contributions noted, this work is not without limitations, many of which have already been noted in the previous pages and discussion sections of each study. Further limitations are briefly discussed below, and recommendations are made for future research questions and considerations.

That participants in the four studies comprising this thesis were self-selected and mostly women may limit the generalizability of results. First, studies did not hide that they were focused on relationships or sexuality. Thus, it is possible that participants agreed to participate explicitly *because* they were interested in improving these aspects of their lives. If their participation was indeed motivated by these personal interests, it is plausible the generalizability of results is limited to persons with similar interests. Second, given women and men differ in attachment (Bartholomew & Horowitz, 1991) and mindfulness (Bränström et al., 2011; Gilbert & Waltz, 2010; Josefsson et al., 2011) characteristics, it is also possible that the overrepresentation of women in the studies comprising this thesis may also limit the generalizability of results. Future studies should strive to obtain more representative samples.

Broader considerations relating to gender should also be considered in future research. Specifically, it is worth noting that women typically score higher on the observing facet of mindfulness (Bränström et al., 2011; Gilbert & Waltz, 2010; Josefsson et al., 2011),

which has been suggested as a central element of mindfulness (e.g., Brown & Ryan, 2003). If it is the case, it is plausible that women have a "head start" in developing mindfulness skills, with their predisposition towards observing enabling quicker development of the (arguably) more complex attitudinal elements of mindfulness (Rojiani et al., 2017). Mindfulness training may thus be of disproportionate benefit to women, at least earlier in mindfulness training, whereas men may require greater "doses" of mindfulness before benefits are detected. Future research should consider these ideas around the differential development of mindfulness skills.

Whereas Study 3 in this paper suggested 2-weeks of mindfulness training was enough to reduce reports of conflict, rejection fears, and destructive behavior (Chapter 5), Study 4's (Chapter 5) 2-week mindfulness intervention was insufficient to buffer maladaptive sexual motivations and experiences. It was surmised that the absence of expected buffering effects in Study 4 may have been due to an insufficient "dose" of mindfulness. However, it remains unknown whether this was the case. Future research should consider the length and intensity of mindfulness interventions required to buffer different manifestations of attachment anxiety. These tests of what "dose" is necessary should also consider the sustainability of buffering effects. While a two-week intervention may be sufficient to produce change immediately and one month after a mindfulness intervention (at least in some relationship behaviors), more prolonged or intense interventions may be required to produce meaningful long-term change (i.e., across a year). Attention to these unanswered questions seems an important next step.

In addition to limitations associated with the generalizability of effects and issues of dose, the fact that we did not examine whether these buffering effects were evident in situations rated as particularly threatening for more insecure persons is also a significant limitation. Insecure individuals are most likely to report feelings, thoughts, motivations, and

behaviors consistent with their working models of attachment (i.e., hyperactivating or deactivating attachment strategies) *when* actual or perceived stressors are detected (Fraley & Shaver, 1998; Impett & Peplau, 2002; Mikulincer et al., 2000; Overall et al., 2015; Simpson & Rholes, 2017). Accordingly, it would appear essential to test whether mindfulness buffers the manifestations of attachment anxiety in stressful situations where the influence of someone's internal working model is most potent. Experimental conflict or support discussion paradigms could be usefully employed to test such questions (e.g., Creasey, 2002; Gottman, 1979; Simpson et al., 1996). Given the intrapsychic power internal working models can hold, it may be more difficult for mindfulness to buffer the manifestations of attachment anxiety in such situations. However, it may be that "dose" matters in more threatening situations, with greater (versus lesser) doses of mindfulness required to attenuate more anxiously attached persons' typical responses to threatening relationship situations. These overlapping contextual and dose issues deserve attention in future research.

Another important consideration this research highlighted was the ongoing need for research in this area to use experimental paradigms with active controls. Study 3 (Chapter 5) indicated that mindfulness was no better than relaxation at buffering the manifestations of attachment anxiety (and sometimes avoidance) in relationship experiences. While at face value the equivalency of these effects challenges the notion that mindfulness has unique benefits in relationships, it has been argued that there are some differences in the *manner* by which mindfulness and relaxation affect personal and interpersonal outcomes (Luberto et al., 2020). Indeed, unpublished research has indicated mindfulness- and relaxation- driven benefits on relationship wellbeing are both driven by increases in positive emotion, but mindfulness-driven benefits are also facilitated by increases in self-control (Karremans, 2021). It is plausible that these mechanistic differences would lead to different outcomes as the length of mindfulness training increases. As such, mindfulness may provide benefits

above and beyond the effect of relaxation *when* training is sufficiently long enough for the unique mechanisms of mindfulness to come into force.

Finally, researchers could consider whether there are different times during a relationship or one's life when mindfulness would be of greatest benefit to more anxiously attached persons. It has been suggested that attachment orientations, and presumably their manifestations, are less malleable as one ages, though they may also differ in malleability as a function of relationship development (Fraley & Roisman, 2019). While not yet empirically tested, this view implies that (a) mindfulness may be more able to buffer the manifestations of attachment anxiety among younger versus older individuals and/or that (b) mindfulness may have more or less potent effects depending on the stage of a relationship. Previous research indicates that moderately stressful life transitions, such as the initiation or dissolution of a romantic relationship or transition to parenthood, can facilitate changes in individuals' attachment working models (Kirkpatrick & Hazan, 1994; Simpson et al., 2003); thus, these periods may be particularly well suited to intervene with mindfulness.

7.6 Concluding Comments

This research program was motivated by an awareness of the suffering experienced by those high in attachment anxiety and avoidance and a desire to explore a novel and previously underexplored strategy that may be of benefit to them. Despite decades of research into the consequences of attachment insecurities, comparatively less empirical research has considered how to improve the relational and sexual lives of more insecurely attached populations. In contributing to this gap, the body of work presented in the preceding pages represents some of the earliest steps in investigating whether mindfulness buffers the degree to which attachment insecurities adversely impact individuals' sexual and relational functioning. While the collective interpretation of the studies suggests that the capacity to be mindful is a disproportionately valuable inner resource for more anxiously attached persons

to cultivate, the same cannot be said for more avoidantly attached persons. As discussed above, studies that can elucidate the "dose" of mindfulness required for beneficial change in interpersonal outcomes to occur, especially in relationally threatening situations, would provide critical guidance as the research unfolds. In addition, experimental studies comparing mindfulness to active controls continues to be necessary to determine whether, and what it is about, mindfulness that is uniquely beneficial to anxiously attached individuals. Overall, this thesis indicates that the ability to turn attention toward moment-to-moment experiences and relate to them with openness, curiosity, and non-reactivity can contain the manifestation of attachment anxiety in relational and sexual contexts, thereby improving their personal and interpersonal wellbeing.

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