ATTENTION, IMAGINATION AND SEXUAL FUNCTION

Pedro Manuel Tomaz de Carvalho Campos

Dissertation submitted in partial fulfilment of the requirements for degree of

Doctor of Philosophy

Specialty: Health Psychology

2025

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Doctor of Philosophy

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2025

Dissertation submitted in partial fulfilment of the requirements for degree of Doctor in Philosophy, specialty in Health Psychology, to ISPA – Instituto Universitário, in 2025, with the supervision of Isabel Maria Pereira Leal, and Rui Miguel Costa.

Acknowledgments

I owe my deepest gratitude to Professor Rui Miguel Costa, my supervisor, whose guidance, scientific rigor, and constant availability were indispensable throughout the development of this thesis. His ability to challenge my ideas while encouraging independent thinking helped me grow both academically and personally. I am also grateful to Professor Isabel Leal, for kindly accepting to act as my supervisor and for her inspiring role as a leading figure in psychology and science in Portugal.

I am especially grateful to my parents, José and Cristina, for their unconditional love, constant support, and the values they passed on to me. Your encouragement and presence have been essential throughout my life and were particularly important during this journey. I am deeply thankful to my partner, Carina, whose love, patience, and unwavering encouragement sustained me through the most demanding stages of this path. Her presence, understanding, and ability to bring balance in moments of difficulty were invaluable. Beyond sharing every challenge, she also celebrated each milestone with me, turning this demanding journey into a meaningful and shared experience. I would also like to thank my brothers, Nuno and Miguel, and my extended family, for their support, always present in meaningful ways along the way.

I am truly grateful to my friends, for their companionship, encouragement, and the many moments of joy and laughter that brought balance to this demanding process.

Finally, I would like to thank ISPA – Instituto Universitário and the William James Center for Research, for providing the academic environment and resources that enabled the realization of this work, and CNS - Campus Neurológico, my professional home, for the support, understanding, and encouragement that allowed me to carry this project through to completion.

Without this playing with fantasy, no creative work has ever yet come to birth. The debt we owe to the play of the imagination is incalculable.

Carl Gustav Jung

Keywords:

Attention; Sexual Fantasy; Sexual Desire; Mental imagery vividness

Palavras-chave:

Atenção; Fantasias Sexuais; Desejo Sexual; Nitidez das imagens mentais

PsycINFO Classification Categories and Codes:

2340 – Cognitive Processes

2346 – Attention

2980 – Sexual Behavior & Sexual Orientation

3365 – Promotion & Maintenance of Health & Wellness

ABSTRACT

Sexual functioning is a complex phenomenon shaped by dynamic interactions between cognitive, attentional, emotional, and relational processes. Attentional mechanisms and erotic mental imagery play key roles in sustaining sexual engagement, but their combined and independent contributions remain insufficiently understood. This thesis aimed to examine: 1) how general inattention, intrusive worries during sexual activity (sexual worries), problematic smartphone use (a common cause of distraction), and the vividness of partner-focused imagery (an index of internally directed attention) independently shape sexual function, pleasure, distress; 2) whether an intervention to stimulate sexual fantasy enhances sexual desire, sexual pleasure, and partner-focused mental imagery vividness, and reduces sexual distress and sexual worries. A multi-phase, quantitative design was employed. Study 1, a cross-sectional survey with 559 heterosexual adults, explored associations between these attentional factors and sexual outcomes. Study 2, a longitudinal study with 134 women, assessed whether these predictors explained changes in sexual functioning, pleasure, and distress over one month. Study 3, a randomized controlled trial with 60 participants, evaluated the effects of a four-week sexual fantasy intervention against a positively valenced nonsexual imagery task. In Study 1, better sexual function was independently by more vivid partner-focused imagination in women and men, and by fewer sexual worries in women only; greater sexual distress was independently predicted by less vivid partner-focused imagination and more sexual worries in women and men, and by problematic smartphone use in women only; 3) greater sexual pleasure was independently predicted by fewer sexual worries in women and by less problematic smartphone use in men. In Study 2, better sexual function was longitudinally predicted by less problematic smartphone use; sexual distress was longitudinally predicted by less vivid partner-focused imagination; and sexual pleasure was longitudinally predicted by both less problematic smartphone use and more vivid partner-focused imagination. All these results in Studies 1 and 2 were obtained independently of age and dysphoric feelings (a composite measure of depression, anxiety, and stress). In Study 1 only, dysphoric feelings additionally predicted poorer sexual function in men and women, and greater sexual distress and lesser sexual pleasure in women. Although general inattention was correlated with poorer sexual function and greater sexual distress for men and women in Study 1, it was never a significant predictor in multiple regressions. Study 3, with its experimental design, showed that guided fantasy practice increased sexual desire and pleasure, reduced intrusive sexual worries, and improved partner-focused imagery vividness over four weeks. These findings offer new insights for cognitive-affective models of sexual response, highlighting attention and imagination as dynamic, modifiable processes central to sexual well-being. Practically, they highlight opportunities for integrating attentional training and guided imagination exercises into clinical and educational contexts, offering innovative, low-cost approaches to enhancing erotic connection, reducing sexual distress, and fostering sexual health.

RESUMO

O funcionamento sexual é um fenómeno complexo moldado por interações dinâmicas entre processos cognitivos, atencionais, emocionais e relacionais. Os mecanismos atencionais e a imagética mental erótica desempenham papéis centrais na manutenção do envolvimento sexual, mas os seus contributos combinados e independentes permanecem insuficientemente compreendidos. Esta tese procurou examinar: 1) de que forma a desatenção geral, as preocupações intrusivas durante a atividade sexual (preocupações sexuais), o uso problemático de smartphone (causa comum de distração) e a nitidez da imagética focada no parceiro (índice de atenção interna) moldam de forma independente o funcionamento sexual, o prazer e o *distress*; 2) se uma intervenção para estimular a fantasia sexual aumenta o desejo, o prazer e a nitidez da imagética focada no parceiro, e reduz o *distress* e as preocupações sexuais. Foi adotado um delineamento quantitativo multifásico. O Estudo 1, um inquérito transversal com 559 adultos heterossexuais, explorou associações entre estes fatores e resultados sexuais. O Estudo 2, longitudinal, com 134 mulheres, avaliou se estes preditores explicavam alterações no funcionamento sexual, no prazer e no *distress* ao longo de um mês. O Estudo 3, um ensaio clínico aleatorizado com 60 participantes, avaliou os efeitos de uma intervenção de fantasia sexual de quatro semanas, comparada com uma tarefa de imagética não sexual com valência positiva. No Estudo 1, melhor funcionamento sexual foi predito por imaginação mais nítida focada no parceiro em homens e mulheres e por menos preocupações sexuais apenas em mulheres. Maior *distress* sexual foi predito por menor nitidez da imagética, mais preocupações sexuais em ambos os sexos e por uso problemático de smartphone apenas em mulheres. Maior prazer sexual foi predito por menos preocupações sexuais em mulheres e por menor uso problemático de smartphone em homens. No Estudo 2, melhor funcionamento sexual foi longitudinalmente predito por menor uso problemático de smartphone; o *distress* por menor nitidez da imagética focada no parceiro; e o prazer por menor uso problemático de smartphone e maior nitidez da imagética. Todos estes resultados nos Estudos 1 e 2 foram independentes da idade e de sentimentos disfóricos (medida composta de depressão, ansiedade e stress). No Estudo 1 apenas, sentimentos disfóricos previram pior funcionamento sexual em ambos os sexos, bem como maior *distress* e menor prazer em mulheres. Embora a desatenção geral se correlacionasse com pior funcionamento sexual e maior *distress* em homens e mulheres, nunca foi preditor significativo nas regressões múltiplas. O Estudo 3 mostrou que a prática de fantasia guiada aumentou desejo e prazer sexuais, reduziu preocupações sexuais intrusivas e melhorou a nitidez da imagética focada no parceiro ao longo de quatro semanas. Estes resultados oferecem novos contributos para os modelos cognitivo-afetivos da resposta sexual, salientando atenção e imaginação como processos dinâmicos e modificáveis, centrais para o bem-estar sexual. Na prática, destacam oportunidades para integrar treino atencional e imaginação guiada em contextos clínicos e educativos, oferecendo abordagens inovadoras e de baixo custo para fortalecer a ligação erótica, reduzir o *distress* e promover a saúde sexual.

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General Introduction

Chapter 1: General Introduction

Cognitive processes have been widely recognized as key determinants of sexual functioning, which is characterized by the absence of difficulties in progressing through the phases of sexual response (sexual desire, arousal, and orgasm), as well as subjective satisfaction with the frequency and outcomes of both individual and partnered sexual behaviour (Fielder, 2013). Among them, attention plays a crucial role in enabling sexual engagement by regulating focus toward erotic stimuli and inhibiting distractions. The role of attention in shaping sexual experiences has gained increasing recognition in recent years, offering a valuable framework for understanding both healthy and disrupted sexual functioning. To understand the role of attention in sexual functioning, it is necessary to first outline how attention operates as a cognitive system. In the following sections, is presented a conceptual overview of attention followed by a review of how attentional processes interact with sexual motivation and sexual function.

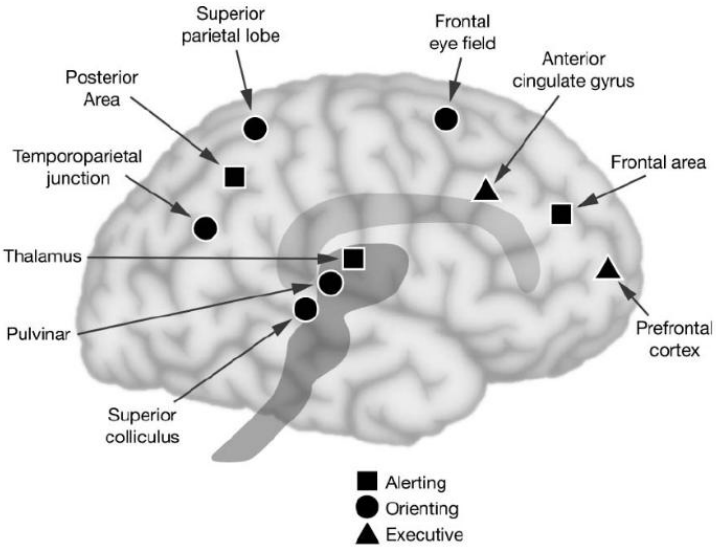
Attention: definition, taxonomy, and attentional systems

At the end of the 19th century, William James (1890) defined attention as "the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought," highlighting both its selective nature. This classical conception remains influential in contemporary literature. Nonetheless, the definition of attention continues to be a subject of theoretical debate. Over the past decades, however, substantial advances have contributed to a more differentiated taxonomy, offering deeper insight into the complexity and diversity of the cognitive operations involved in attentional control.

Attention is now widely recognized as a central cognitive process that enables the nervous system to cope with limited processing capacity. With a long evolutionary history, attention likely developed in response to the need to detect and prioritize stimuli relevant for survival and adaptation (Posner, 2023). At any given moment, both the internal and external environments provide more information than can be processed, requiring mechanisms that select what is most relevant to current goals (Chun et al., 2011). This principle of limited capacity applies not only to perception, but also to memory, decision-making, and behaviour, justifying the adaptive value of attentional mechanisms (Pashler et al., 2001). Attention thus functions as both a filter and an amplifier, directing cognitive resources toward stimuli of higher relevance, whether they involve environmental cues, memories, or other internal representations (Chun et al., 2011). This selective capacity of attention does not operate as a

unified process but rather results from the coordinated activation of specialized subsystems (Posner & Petersen, 1990). In this regard, various models have sought to map the functional components of attention, distinguishing the processes involved in alertness, orienting, and the control of information. According to the influential model proposed by Posner and Petersen (1990), attentional functioning can be decomposed into three interdependent networks: the alerting network, the orienting network, and the executive control network. These networks are specialized in different components of attentional control and rely on distinct neural circuits (Posner & Rothbart, 2007, Figure 1). The alerting network is involved in the ability to achieve and maintain a state of readiness to respond to relevant stimuli. This state of alertness may be tonic (sustained over time, as in prolonged vigilance) or phasic, referring to a transient increase in readiness triggered by cues that signal the imminent appearance of a stimulus. The orienting network is primarily responsible for the selection of relevant sensory information by directing the attentional focus, typically through explicit visual orienting. Finally, the executive control network is involved in high-level cognitive control, monitoring response conflicts, suppressing irrelevant distractions, correcting errors, and planning adaptive behaviour.

Figure 1 - Anatomy of three attentional networks: alerting, orienting, and executive attention. From Posner & Rothbart, 2007

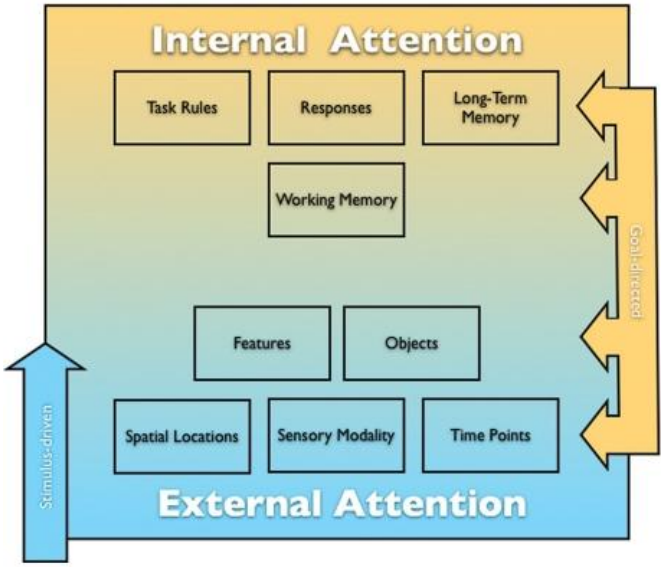


Beyond this functional network decomposition, other contemporary approaches have sought to organize attention according to the type of information it is directed toward. In this context, the model proposed by Chun and colleagues (2011) has gained prominence by

distinguishing between two major attentional domains: external attention and internal attention (Figure 2), offering a complementary framework focused on the content and origin of the stimuli being processed. In this taxonomy, external attention refers to the allocation of cognitive resources to stimuli present in the environment. This system supports the detection and selection of relevant information for action and is essential for navigating and adapting to the sensory world. It encompasses processes such as spatial orienting, object selection, and the modulation of perception in line with goals and contextual demands (Chun et al., 2011). Internal attention, by contrast, refers to the focus directed toward internally generated mental content, such as thoughts, memories, mental images, or intentions (Chun et al., 2011; Morris & Braver, 2023). This form of attention is central to activities such as planning, problem-solving, goal monitoring, and emotional regulation. Although both forms of attention share common control mechanisms, they operate on distinct domains of information, one sensory, the other representational. This distinction offers valuable insight into how attentional focus shifts between the external environment and the internal mental world, and how such shifts influence both behaviour and subjective experience.

A clearer understanding of attentional systems, including their structure and function, offers a valuable framework for exploring how different forms of attention may facilitate or disrupt sexual desire, arousal, and satisfaction. These mechanisms will be further examined in relation to sexual functioning in the following sections.

Figure 2 - Schematic overview of taxonomy of attention. From Chun et al. (2011).



Attention and sexual response: implicit detection

Understanding the role of attention in sexual response requires an integrated perspective on how sexual motivation emerges and unfolds, given that attentional mechanisms are deeply intertwined with the processes that trigger, shape, and regulate both sexual functioning and behaviour (Spiering & Everaerd, 2007; Tavares et al., 2020; Toates, 2009). The literature increasingly highlights the distinct contributions of attention across the various stages of the sexual response, from the implicit detection of erotic cues to the cognitive regulation of behaviour and the overall quality of experience. Within this framework, contemporary information-processing models have progressively moved away from instinct-driven conceptions of sexuality (e.g., Freudian theories of libido), instead emphasizing context-dependent triggers of desire and the cognitive-affective processes that modulate its behavioural expression.

These models suggest that sexual response may be initiated through automatic attentional mechanisms, even before the stimulus reaches the threshold of conscious awareness According to Spiering and Everaerd (2007), sexually relevant cues can trigger rapid physiological responses, including autonomic arousal and activation of subcortical motivational systems, which automatically guide attention toward these stimuli. This early, implicit processing reflects the function of attention as a surveillance system that prioritizes biologically salient information. Building on this perspective, Toates' (2009) hierarchical model of sexual motivation emphasizes that desire emerges from the interaction between external cues and internal states, with attention acting as a filter that detects and assigns incentive value to sexual stimuli, particularly when motivational readiness is high (e.g., due to affective, hormonal, or contextual conditions). While the subjective experience of arousal depends on later stages of conscious evaluation, this early attentional orientation plays a central role in preparing the organism for sexual response.

The capacity to rapidly and efficiently detect sexually salient cues, even before conscious awareness, has been thought to increase reproductive success by promoting behavioural readiness for sexual engagement. This ability has been conceptualised as an automatic attentional bias with evolutionary significance and is described across theoretical approaches as a biologically adaptive mechanism (Spiering & Everaerd, 2007; Stahler et al., 2019). Natural selection may have favoured organisms whose attentional systems were attuned to respond promptly to signals of sexual availability, such as bodily cues, facial expressions, or contextual markers, thereby conferring an adaptive advantage in mating-relevant environments.

Building on this idea, the implicit functioning of sexual attention reflects an evolved sensitivity to reproductive opportunities, with attention acting as an early filter that detects and prioritises relevant sexual cues. Supporting this view, neuroimaging studies using fMRI and PET have consistently demonstrated that exposure to sexual stimuli activates brain regions involved in motivation and reward (Redouté et al., 2000; Stoléru et al., 2012). Notably, even subliminal presentations of erotic content, i.e., below the threshold of conscious awareness, have been shown to activate core reward-related structures, suggesting that sexual desire can be triggered implicitly and without deliberate cognitive engagement (Childress et al., 2008; Gillath & Canterberry, 2011; Oei et al., 2012). These findings underscore the high neurofunctional sensitivity to the salience of sexual stimuli, supporting the notion that sexual processing begins at early, automatic stages of perceptual analysis.

Further evidence from experimental psychology supports this claim by showing that sexually explicit stimuli tend to capture attention involuntarily, even when they are irrelevant to current goals. Studies employing visual attention paradigms have demonstrated that erotic images act as potent emotional distractors, impairing task accuracy and slowing response times (Both et al., 2004; Carvalho et al., 2018). This automatic capture occurs independently of conscious intent, indicating that sexual stimuli engage attentional systems. Rather than relying solely on deliberate focus, such stimuli appear to trigger reflexive shifts in attention due to their high motivational salience.

In line with this, research on implicit cognition has shown that individual differences in automatic responses to sexual stimuli are meaningfully related to sexual functioning. Van Lankveld et al. (2018) found that women with self-reported sexual difficulties displayed weaker implicit associations between erotic images and the concept of “wanting,” as measured by Single-Target Implicit Association Tests (ST-IATs). Across the full sample, stronger implicit “wanting” associations correlated with higher scores on the Female Sexual Function Index (FSFI), suggesting that difficulties in implicit sexual motivation may be linked to poorer sexual functioning.

Attention and sexual response: cognitive control

While sexual stimuli often elicit rapid and automatic attentional responses due to their motivational salience, these early processes do not operate in isolation. Sexual functioning also involves higher-order cognitive mechanisms that allow individuals to selectively direct, maintain, or shift attentional focus in accordance with contextual demands and personal goals.

In this regard, attention plays a dual role, acting both as an early, automatic filter and as a consciously regulated process that can facilitate or hinder sexual engagement.

Aligned with this perspective, Spiering and Everaerd (2007) proposed an information-processing model that, while emphasising the automatic components of sexual response, also recognises the role of cognitive appraisal in the unfolding of sexual experience. According to their framework, sexual responding is initiated through implicit attentional mechanisms that orient cognitive resources toward sexually relevant stimuli, thereby increasing their salience. However, these automatic processes occur within a broader system in which conscious evaluation and integration play a decisive role. Earlier conceptual contributions from Janssen, Everaerd, and Spiering (2000) had already underscored the transition from initial attentional capture to deliberate processing, suggesting that the subjective experience of sexual arousal depends not only on reflexive motivational activation but also on how stimuli are interpreted considering individual beliefs, affective states, and contextual cues. As such, this model bridges automatic and controlled levels of processing, offering a dynamic account of how attention operates across different stages of the sexual response.

In line with this view, the Dual Control Model (Janssen & Bancroft, 2007) posits that sexual response is not an automatic consequence of exposure to sexual stimuli but results from the interplay between excitatory and inhibitory mechanisms, mediated by cognitive and attentional processes. According to this framework, stimuli must be consciously evaluated as meaningful and attractive before they can elicit arousal, and this process is modulated by both excitatory and inhibitory mechanisms.

Building on this integrative perspective, contemporary models of human sexuality have increasingly highlighted the essential contribution of cognition, particularly attention, to sexual functioning (Tavares et al., 2020). Conscious and goal-directed attention serves as a core regulatory mechanism, coordinating the cognitive and emotional processes that sustain sexual desire and arousal. Even when not explicitly framed in attentional terms, many theoretical models emphasise cognitive appraisal and affective regulation as key elements of the sexual response, both of which inherently rely on the intentional allocation of attentional resources (Barlow, 1986; Both et al., 2007; Janssen et al., 2000; Janssen & Bancroft, 2007; Nobre, 2023; Spiering & Everaerd, 2007; Tavares et al., 2020; Toates, 2009). More specifically, cognitive models of sexual response propose that the emergence of sexual desire and arousal depends on how stimuli are appraised considering individual beliefs, schemas, expectations, memories, emotional states, and relational meanings. Within this process, conscious attention functions as

a selection mechanism, regulating focus on both internal (e.g., bodily sensations, thoughts) and external (e.g., partner-related or contextual) cues, thereby directly influencing the intensity of both subjective experiences of arousal and physiological activation.

This theoretical foundation is reflected across several influential models of sexual functioning. Barlow's model (1986), for instance, suggests that in contexts of performance anxiety or fear of negative evaluation, attentional focus tends to shift away from erotic stimuli and toward self-referential, critical cognitions, such as fear of failure or judgment. This shift disrupts the arousal process not because of a reduction in the stimuli's erotic potential, but due to their diminished prioritisation within cognitive processing. Similarly, the Cognitive-Emotional Model of Sexual Response (Nobre, 2023) emphasises the influence of automatic cognitions and sexual schemas activated during sexual encounters. When negative beliefs (e.g., inadequacy, guilt, rejection) dominate attentional focus, individuals are more likely to attend to cues of threat or failure, inhibiting sexual engagement. When persistent, such dysfunctional attentional patterns may consolidate, contributing to the maintenance of sexual difficulties. Concerns such as performance anxiety or pain anticipation orient attention toward threat-related or self-critical cues, thereby disrupting the processing of erotic information (Barlow, 1986; Payne et al., 2005) which frames sexual desire and arousal as the result of an interplay between excitatory and inhibitory processes. These are in turn modulated by cognitive and attentional mechanisms, with conscious attention either amplifying erotic stimuli or facilitating inhibitory responses when stimuli are perceived as threatening, inappropriate, or out of context. In Toates' (2009) hierarchical model, attention is positioned as a key mechanism that mediates the subjective evaluation of sexual incentives. Whether the stimulus originates internally (e.g., fantasy, memory) or externally (e.g., visual cue), it is the attentional system that modulates its incentive value and thus determines the likelihood of activating a motivational and behavioural response.

Empirical research supports these theoretical propositions, showing that attentional focus is not a passive correlate of sexual responding but an active determinant of its unfolding (De Jong, 2009). Studies on voluntary control demonstrate that both men and women can intentionally increase or inhibit arousal by directing attention toward erotic cues (e.g., fantasy) or toward distracting cognitions. Evidence on cognitive biases shows that concerns such as performance anxiety or pain anticipation orient attention toward threat-related or self-critical cues, thereby disrupting the processing of erotic information (Barlow, 1986; Payne et al., 2005). Such biases may be self-reinforcing, maintaining functional or dysfunctional sexual patterns.

Research on directed attention indicates that focusing on bodily and genital sensations can increase concordance between subjective and physiological arousal in women, while instructions to focus on pleasure versus pain can differentially influence both genital responses and affective experience (Brauer et al., 2008; Korff & Geer, 1983).

In sum, cognitive-emotional models converge in viewing sexual response as emerging from the interplay of multiple cognitive operations, with attention occupying a central role in the appraisal and regulation of sexual stimuli. Attention acts as a gating mechanism, facilitating or inhibiting sexual activation depending on the cognitive content, the meanings attributed to the context, and the emotional states present. Despite differences in emphasis, these models share the assumption that sexual activation is not solely determined by the intrinsic properties of stimuli, but by how they are processed, integrated, and sustained within the attentional field.

External attention and sexual functioning

Cognitive processes are widely recognized as key determinants of healthy sexual functioning (Tavares et al., 2020). Among them, attention plays a central role by enabling the selection and direction of focus toward relevant stimuli, a prerequisite for cognitive operations. Failures in attentional orientation toward sexual cues have been associated with poorer physiological (e.g., lubrication, erection) and subjective arousal (Tavares et al., 2020). Such disruptions can arise from external sources (e.g., environmental distractions such as smartphone use) or internal sources (e.g., sexual worries, general inattention, reduced imagery vividness), with similarly detrimental effects on sexual functioning. Across the sexual response cycle, sustained attentional focus fosters erotic engagement and minimizes cognitive interference. When attention is diverted away from sexually relevant stimuli, whether by intrusive thoughts or competing sensory input, individuals may experience diminished desire and arousal, impaired partner connection, lower satisfaction and pleasure, and increased distress (Dove & Wiederman, 2000). Thus, the degree to which attentional resources are withdrawn from erotic content, and redirected toward non-rewarding or evaluative processes, appears more critical than the specific source of distraction. This work will focus on four types of causes of inattention that may disturb sexual well-being: general inattention, inattention due to worries during sexual activity, problematic smartphone use, and lack of fantasy generation and vividness (tied to internally generated attention).

Sexual worries (worries during sexual activity)

Sexual worries constitute a salient form of attentional interference, encompassing recurrent concerns related to sexual performance, body image, or other sex-related themes. These cognitive distractions have been consistently identified as significant disruptors of sexual functioning (Carvalheira et al., 2017). Conceptually, worry is defined as a form of repetitive negative thinking, often involving abstract verbal thought and mental imagery focused on the anticipation of potential adverse outcomes (Borkovec, 1994). It typically emerges in contexts of perceived threat and reflects an attempt, often unsuccessful, to anticipate, prevent, or manage undesirable consequences. While mild or situational worry may serve an adaptive preparatory role, chronic or excessive worry is associated with heightened anxiety (Everaert & Joormann, 2020) and impaired cognitive and behavioural performance (Anyan et al., 2020).

Within sexual contexts, worries can be triggered by internal or relational cues, activating dysfunctional cognitive schemas and increasing anxiety during sexual activity (Barlow, 1986; Nobre & Pinto-Gouveia, 2006). Such worries redirect attentional resources away from erotic cues toward self-monitoring, self-evaluation, and vigilance for perceived signs of failure, processes particularly disruptive during the arousal phase (Wiegel et al., 2007). This attentional shift can interrupt the cascade of physiological and psychological processes necessary for sexual response, leading to reduced desire, inhibited arousal, and lower sexual satisfaction. Importantly, beyond their impact on sexual functioning, sexual worries also play a direct role in intensifying sexual distress, both in the moment and over time.

Empirical evidence supports these mechanisms: sex-related worries have been linked to poorer sexual functioning (Carvalheira et al., 2017; Horvath et al., 2020; Woertman & van den Brink, 2012; Yamamiya et al., 2006) and higher sexual distress (Pascoal et al., 2020; Silva et al., 2016). In a transdiagnostic framework, repetitive negative thinking, particularly worry and rumination, was directly associated with greater sexual distress, even in non-clinical samples, and that rumination was also linked to reduced sexual pleasure (Pascoal et al., 2020). Complementing these findings, Bockaj and colleagues (2024) found that both men's and women's worries were also associated with sexual distress. These results underscore that sexual worries operate within a broader interpersonal context, interacting with relationship quality and sexual well-being.

The impact of body image concerns is particularly well documented; for instance, Faith and Schare (1993) found that negative body image fosters an "observer stance" during sexual

activity, wherein individuals monitor and critique their body appearance instead of engaging in pleasurable sensations. Conversely, a positive body image and present-moment bodily awareness have been associated with higher sexual desire, greater ease of arousal, and enhanced sexual satisfaction (Ackard et al., 2001; Campos et al., 2019; Costa et al., 2016).

From a broader theoretical perspective, the transtheoretical model of sexual dysfunction posits that cognitive-affective factors such as sexual worries, negative body image, and performance monitoring frequently co-occur and interact with sexual difficulties (Guerreiro et al., 2024; Pascoal et al., 2020). This recognition has increased the clinical relevance of assessing and addressing sexual worries, given their potential role in initiating, maintaining, or exacerbating both sexual dysfunction and sexual distress. Understanding these processes is crucial for developing targeted interventions aimed at reducing sexual distress and promoting sexual well-being. Although the link between sexual worries and sexual difficulties is well established, there is a lack of research examining the combined effects of sexual worries with other factors that may disrupt attention during sexual activity and earlier phases of sexual motivation (desire, arousal). The present project aims to fill this gap in knowledge.

General inattention

Broader difficulties in sustaining attention, here referred to as general inattention, may be relevant to sexual functioning. While there is still limited empirical evidence directly linking naturally variations in general attention (i.e., outside of clinical contexts) to sexual outcomes, indirect clues emerge from research on Attention-Deficit/Hyperactivity Disorder (ADHD). Individuals with ADHD often experience reduced capacity for sustained focus, heightened distractibility, and difficulty maintaining goal-directed engagement (American Psychiatric Association, 2022). ADHD has been also associated with a higher prevalence of sexual difficulties, including lower satisfaction, reduced desire, and greater sexual distress (Jabalkandi et al., 2020; Soldati et al., 2020). It is therefore plausible that even subclinical levels of inattention could, in some cases, hinder the ability to remain mentally and emotionally immersed in erotic stimuli, thereby compromising aspects of sexual response, but there is lack of evidence in this regard In individuals with ADHD, such associations may be partly attributable to comorbid conditions, including depression, anxiety, or substance use (Paek et al., 2016).

This line of reasoning is consistent with cognitive-emotional models of sexual response (Barlow, 1986; De Jong, 2009; Nobre, 2023; Toates, 2009), which emphasise that sustained

attentional focus on erotic cues is crucial for amplifying incentive value and facilitating the progression from initial desire to orgasm. If attentional control is weakened, erotic cues may be less likely to be prioritised in cognitive processing, increasing susceptibility to competing, non-rewarding thoughts or sensory inputs. Yet, as noted, one question that remains is whether general inattention in nonclinical populations is also associated with sexual difficulties. The present project will address this issue.

Smartphone overuse

Given their ubiquity, smartphones are now part of the daily routines of most individuals, providing constant access to digital content and interpersonal communication. Another prominent and increasingly relevant source of attentional interference is the frequent and compulsive use of these devices. Their widespread presence has made them a common source of distraction (Skowronek et al., 2023). When smartphone use becomes compulsive, interfering with daily routines and interpersonal relationships, it can be classified as problematic. Although the classification of such behaviour as an "addiction" remains debated, it is well established that problematic use is associated with attentional deficits (Marty-Dugas et al., 2018; Panagiotidi & Overton, 2022). This type of usage has also been linked to poorer sexual functioning and greater sexual distress (Fuzeiro et al., 2022). Moreover, problematic social media use, a common reason for using smartphones (Kuss & Griffiths, 2017), has also been linked to poorer sexual functioning and greater sexual distress (Alimoradi et al., 2019; Fekih-Romdhane, 2024; Pawlikowska et al., 2022; Costa et al., 2023). Of note, social media use appears to be one main reason for the attentional absorption caused by smartphones, consequently leading to distraction (Barnes et al., 2018). Some research suggests that problematic smartphone use leads to chronic impairment in attention (Boer et al., 2020; McNamee et al., 2021; Sihoe et al., 2023; Wang et al., 2024), but to what extent a general distraction tendency caused by smartphone overuse impacts sexual function is an open question.

Also, excessive smartphone use may compete with attention directed toward the partner, reducing intimacy and interfering with communication, which could negatively impact sexual function. This is supported by evidence showing associations of lower sexual and relationship satisfaction with attending to one's phone in the presence of a partner (phubbing) or being ignored due to a partner's phone use (being phubbed) (Hipp & Carlson, 2021; Mushquash et al., 2022; Roberts & David, 2016). Thus, Additionally, prolonged smartphone engagement may detract from partner-focused attention and promote dysfunctional relational dynamics,

exacerbating feelings of reduced intimacy and loneliness which may pose a risk for sexual dysfunction (Alimoradi et al., 2019; Fekih-Romdhane et al., 2024).

Additionally, sexual difficulties may be more likely, when extended smartphone usage causes mood disturbances (Hunt et al., 2018; Kross et al., 2013; Lambert et al., 2022; Tromholt, 2016; Turel et al., 2018) or increases exposure to online content that fosters insecurities and conflicts (e.g., jealousy, controlling and being controlled by partner, negative social comparisons; Arikewuyo et al., 2021; Emond et al., 2023; Frampton et al., 2018; Tandon et al., 2021). At any rate, the there is evidence suggesting that problematic smartphone use, by competing with attentional resources and disrupting intimacy, may hinder sexual engagement and contribute to poorer sexual functioning (Hipp & Carlson, 2021; Mushquash et al., 2022). Also, problematic smartphone use may negatively influence sexual functioning and well-being by exerting a broader impact on attentional processes (Boer et al., 2020; McNamee et al., 2021; Sihoe et al., 2023; Wang et al., 2024), although this relationship remains unclear.

In the present context, an open question is whether problematic smartphone use is associated with sexual difficulties after controlling for negative mood, general inattention (a possible effect of smartphone overuse leading to sexual impairment, as discussed above), worries during sexual activity (possibly associated with exposure to insecurity-fostering online contents). The present project will address this topic.

Internal attention (mental imagery) and sexual functioning

Because attention can be oriented toward both external cues and internally generated representations, we therefore also sought to examine sexual fantasies, i.e., sexual imagination or mental imagery relying on sustained internally directed attention (Benedek et al., 2016). These phenomena illustrate how internal attention can evoke, sustain, or modulate sexual experiences independently of immediate sensory input.

Mental imagery, imagination and internal attention

Mental imagery can be defined as the creation of perceptual-like representations (e.g., visual, auditory, olfactory, motor) that are not directly triggered by external sensory stimuli and may or may not be triggered voluntarily (Pearson, 2019). When this process involves the generation of images (without sensory information), it is referred to as visual mental imagery, which consists of accessing perceptual traces stored in memory and reactivating them as simulated sensory experiences, such as “seeing with the mind’s eye” (Kosslyn & Thompson, 2003; Pearson, 2019). Mental images may arise voluntarily or involuntarily. These forms

correspond broadly to top-down and bottom-up processes, respectively. In top-down imagery, initiation occurs in prefrontal regions involved in intention and executive control, proceeds through temporal areas supporting memory retrieval, and culminates in the reactivation of sensory representations in occipital and parietal cortices (Pearson, 2019). Bottom-up imagery, by contrast, often emerges spontaneously during intense emotional states or in conditions of reduced executive regulation. Both voluntary and spontaneous imagery recruit sensory brain areas, particularly the visual cortex, and depend on attentional control and working memory for their maintenance and manipulation (Kosslyn & Thompson, 2003; Pearson, 2019).

One of the defining characteristics of visual mental imagery is the vividness with which mental images are generated. Imagery vividness refers to the clarity, brightness, or intensity of a mental image as subjectively reported (Marks, 1973). Although greater vividness of mental imagery has been studied in relation to psychopathological conditions, a growing body of research has also indicated that it can have various beneficial effects. Higher self-reported vividness has been associated with traits such as optimism, greater mindfulness, and general indicators of psychological well-being (Blackwell et al., 2013; Ji et al., 2017; Kharlas & Frewen, 2016; Odou & Vella-Brodrick, 2013). Visual imagery processes depend strongly on attentional mechanisms, which are essential for generating, maintaining, and manipulating mental images (Andries et al., 2024; Ganis, 2013; Thompson et al., 2011; Gjorgieva et al., 2023).

Also, transient increases in alertness have been linked to improved conscious visual perception, further reinforcing the association between attentional activation and the intensity of imagery experiences (Botta et al., 2014; Kusnir et al., 2011). Consistent with this view, Huang et al. (2023) found that mental imagery vividness correlated with greater activation of the alerting neural network (Posner & Petersen, 1990), suggesting that vividness may serve as a marker of internal processes attention. By reactivating perceptual traces, visual mental imagery not only simulates sensory experience but also seems to modulate and often amplifiy emotional responses, frequently more strongly than verbal representations alone (Holmes & Mathews, 2005; Lawrence et al., 2018; Pearson et al., 2008; Wicken et al., 2021). Building on this framework, recent findings highlight that the adaptive value of vividness of mental imagery can occur due to attentional control mechanisms. In a non-clinical sample, Andries et al. (2024) observed that imagery vividness predicted decreases in negative affect when coupled with higher levels of attentional control, suggesting that vivid internal representations become more effective regulatory tools when individuals can efficiently direct and sustain attention.

Conversely, in the absence of such attentional control, vivid imagery may amplify negative affect, reflecting prior mixed findings on the emotional impact of mental images. These results underscore that attentional control acts as a moderator, transforming vivid imagery from a passive sensory re-experience into an active, adaptive mechanism for emotion regulation. This interplay between visual mental imagery vividness (an index of alerting attention network activation) and attentional control, appears to be a key component for affective amplification both of positive emotional states and the persistence of negative content.

Building on these insights, it is also important to address how mental imagery relates to the broader construct of imagination. While some scholars argue that mental imagery and imagination, though deeply intertwined, constitute distinct cognitive processes (Nanay, 2021), a substantial body of research continues to employ the terms mental visual imagery and imagination interchangeably. This tendency persists despite ongoing conceptual debates that seek to delineate the theoretical boundaries and functional specificities of each construct, reflecting both the complexity of their underlying mechanisms and the challenges inherent in achieving terminological precision. Notwithstanding these distinctions, both processes share core functions, such as generating representations beyond immediate perception, simulating possible scenarios, and supporting creative, predictive, and emotional processes (Liao & Gendler, 2020). Imagination is often conceptualized as operating at two levels: a sensory or imagistic level, grounded in mental imagery, and a propositional level, in which one imagines that a situation holds without necessarily invoking vivid images (Nanay, 2021). Despite these distinctions, imagination is widely understood to be strongly supported by mental imagery, which provides a foundational substrate for the construction of imagined scenarios and experiences. Nevertheless, the precise nature of this relationship remains a matter of ongoing theoretical debate.

Sexual Fantasies, Fantasy-Based Interventions and Sexual Functioning

Building on this foundation, sexual imagination, or sexual fantasies, can be understood as a functional extension of the imaginative process, regulated by internal attentional mechanisms and influenced by affective, relational, and contextual factors. Sexual fantasies are generally described as the mental generation of erotic or sexually explicit imagery, typically accompanied by some degree of arousal (Costa, 2022, 2023; Leitenberg & Henning, 1995). These representations may arise spontaneously or voluntarily, triggered by internal or external stimuli, taking the form of brief, fragmented scenes or more elaborate narrative constructions. Sexual fantasies may reflect desires, curiosities, or aspects of sexual identity that are not

expressed in real-life behaviour, serving both as a symbolic exploration of desire and as a compensatory mechanism for sexual dissatisfaction (Costa, 2022). Their imaginative plasticity allows individuals to transcend physical, moral, or relational constraints, thereby expanding the range of possible sexual experiences on a subjective level. In this way, fantasies function as a complex interface between cognition, motivation, and sexual pleasure, one whose nature and function vary widely across individuals and contexts.

From a motivational perspective, Toates' (2009) hierarchical model, grounded in incentive motivation theory, conceptualises fantasies as internally generated cognitive stimuli with motivational value. Within this framework, fantasies can initiate or modulate sexual desire in the absence of external input, functioning as internally generated incentives that interact with affective and contextual states. In this way, sexual fantasies represent a distinct cognitive route for activating and regulating the sexual response, contributing to the construction and maintenance of erotic experience.

Within this conceptual framework, it becomes pertinent to examine the empirical evidence that links sexual fantasies and sexual fantasy-based interventions to actual sexual functioning, particularly their role in sustaining desire, facilitating arousal, and influencing satisfaction, pleasure, and distress.

A growing body of empirical research has consistently demonstrated an association between the use of sexual fantasies and various indicators of sexual functioning, particularly sexual desire and arousal (Costa, 2022, 2023; Newbury et al., 2012). For example, there is evidence showing significantly lower fantasy frequency among individuals with inhibited sexual desire in both men and women (Nutter & Condron, 1983, 1985). Among women, in particular, more frequent engagement in sexual fantasies has been linked to greater ease in reaching arousal and more consistent orgasmic experiences (Carvalheira et al., 2010). These findings align with research identifying fantasies as a potential protective factor against sexual difficulties, functioning as an internal pathway for sustaining desire and sexual response (Davison et al., 2008; Lo & Kok, 2018; Meana & Nunnink, 2006; Nimbi et al., 2023). During sexual activity, deliberately evoking fantasies can enhance erotic engagement, a strategy especially common during masturbation, where internally generated imagery compensates for the reduced sensory and affective richness of the context (Knafo & Jaffe, 1984; Lunde et al., 1991; Pelletier & Herold, 1988; Talbot et al., 1980)

In some cases, fantasies involving individuals other than one's current partner may contribute to the activation of desire (Newbury et al., 2012; Nutter & Condron, 1983, 1985). Although some women report reaching orgasm through imagination alone (Rosen et al., 1993; Whipple et al., 1992), the association between fantasy frequency and sexual satisfaction remains less consistent (Costa, 2022, 2023). While some studies, in women report positive associations (Alfonso et al., 1992; Arndt et al., 1985; Hulbert et al., 2000; Nimbi et al., 2023; Wilson, 1981; Zimmer, 1983), others have failed to replicate these findings (Carvalheira et al., 2010; Davidson & Hoffman, 1986; Hariton & Singer, 1974; Lunde et al., 1991; Purifoy et al., 1992; Swieczkowski & Walker, 1978). In men, findings of correlations between sexual fantasies and sexual satisfaction are equally mixed (Alfonso et al., 1992; Dubey et al., 2025; Nimbi, et al., 2023; Wilson & Lang, 1981).Moreover, in certain circumstances, the reliance on fantasies to achieve orgasm has been associated with lower sexual satisfaction (Knafo & Jaffe, 1984), and specific contents, such as extradyadic scenarios, may reflect underlying relational dissatisfaction (Hariton & Singer, 1974; Swieczkowski & Walker, 1978; Lehmiller, 2020).

Beyond correlational findings, experimental research has tested whether fantasy induction can directly enhance sexual response. In studies by Goldey and van Anders (2011, 2012), the Imagined Social Situation Exercise (ISSE) significantly increased subjective sexual arousal in both women and men, demonstrating the capacity of erotic cognitive stimulation to activate sexual response even in the absence of physical or interpersonal interaction. Using the ISSE in a sample of women, Costa et al. (2016) reported significant increases in self-reported sexual desire and arousal compared to baseline. Langeslag and Davis (2022) found that partner-focused sexual imagery, mentally evoking an erotic interaction with one's partner, produced significant increases in both desire and infatuation relative to control conditions. Birnbaum et al. (2019) showed that both dyadic (current partner) and extradyadic fantasies were associated with increases in desire, but only dyadic fantasies were consistently linked to pro-relational behaviours, such as affectionate expressions and emotional support. This experimental studies concord with clinical observations that encouraging sexual fantasies has benefits in the treatment of sexual difficulties (Newbury et al., 2012). Collectively, these studies highlight that sexual fantasies represent a psychologically effective means of modulating desire and arousal, with their effects influenced by the specific content of the imagery evoked. In this context, one of the aims of the present project is to test a novel, easy-to-use intervention to stimulate sexual fantasies in nonclinical groups with the objective of improving indices of sexual well-being.

Imagery Vividness of Sexual Fantasies

In the sexual domain, the vividness of erotic imagery, defined as the sensory clarity and intensity of evoked sexual scenes, has been associated with greater subjective and physiological arousal evoked by sexual fantasies (Koukounas & Over, 1997; Tokatlidis & Over, 1995). Also, greater vividness of mental imagery in general correlated with greater sexual arousability across a variety of situations, not only fantasy-induced arousability (Harris et al., 1980; Koukounas & Over, 1997; Meuwissen & Over, 1991; Smith & Over, 1990a). At least in men, training sexual imagery led to increased fantasy-induced sexual arousal and to both general and sexual imagery vividness (Smith & Over, 1990b). The capacity to generate vivid erotic imagery may reflect the efficiency of attentional mechanisms directed toward internal content, facilitating erotic engagement and sexual response. Conversely, lower vividness of sexual fantasies, often linked to cognitive or emotional barriers such as sexual guilt, can hinder internal attention and related arousal processes (Moreault and Follingstad, 1978).

Building on this framework, the observation that imagery vividness reflects activation of the alerting attention network (Huang et al., 2023) and that its emotional impact is moderated by attentional control (Andries et al., 2024) points to a potential mechanism relevant to the sexual domain. The deliberate practice of generating partner-focused sexual fantasies may engage these attentional systems, fostering a shift away from intrusive sexual worries toward pleasurable and rewarding internal representations, reducing inhibitions. This attentional shift could help reallocate cognitive resources from maladaptive, self-focused thoughts (a distraction from erotic cues) to adaptive erotic imagery, thereby supporting sexual well-being and promoting a more balanced emotional experience during sexual interactions (Newbury et al., 2012). It is also possible that fantasizing about the partner in general, not only sexually, has benefits for sexual function (Busch et al., 2025), and the vividness with which this is done plays a relevant role, as positive fantasies in general about partners may have positive impacts of relationships (Barelds & Dijkstra, 2011; Langeslag & Davis, 2022), thereby influencing sexual activity and well-being. However, this is a topic that has received little scientific attention. The present project seeks to fill this gap.

Objectives

Attention plays a central role in sexual functioning, not only in the rapid, automatic detection of sexually relevant cues but also in the deliberate regulation of erotic engagement. Internally generated stimuli, such as sexual fantasies, constitute an important route for initiating

and sustaining desire and arousal, operating independently of immediate sensory input. Individual differences in partner-focused imagery vividness may also rely on capacity to direct and maintain internal attention. This perspective sets the stage for examining how disruptions in attentional processes, whether through inattention or distraction, may impair sexual functioning. Thus, the reviewed literature highlights the potential relevance of attentional mechanisms and mental imagery to sexual functioning. Four factors consistently emerge as noteworthy: (1) general inattention, which may hinder sustained erotic focus; (2) cognitive distractions during sexual activity caused by sexual worries, which can disrupt erotic engagement and contribute to sexual distress; (3) problematic smartphone use, which competes for attentional resources and may impair intimacy; and (4) a lack of self-generated sexual mental imagery (sexual fantasy) and diminished vividness of partner-focused mental imagery vividness, which may indicate reduced attentional engagement with internally generated stimuli that facilitate sexual response. Although some of these variables have been examined individually, and some have received little attention, their combined and independent contributions to sexual functioning, pleasure, and distress, in non-clinical populations remain largely unknown. Furthermore, there is lack of longitudinal and experimental research to deepen the knowledge of their effects. The present project was designed to address these gaps.

To address the research objectives, we conducted a quantitative, multi-phase research project comprising three independent studies (see Figure 3).

Phase 1: study 1 used a cross-sectional design to examine the independent associations of general inattention, worries during sexual activity, problematic smartphone use, and partner-focused mental imagery vividness (independent variables) with sexual functioning, distress, and pleasure.

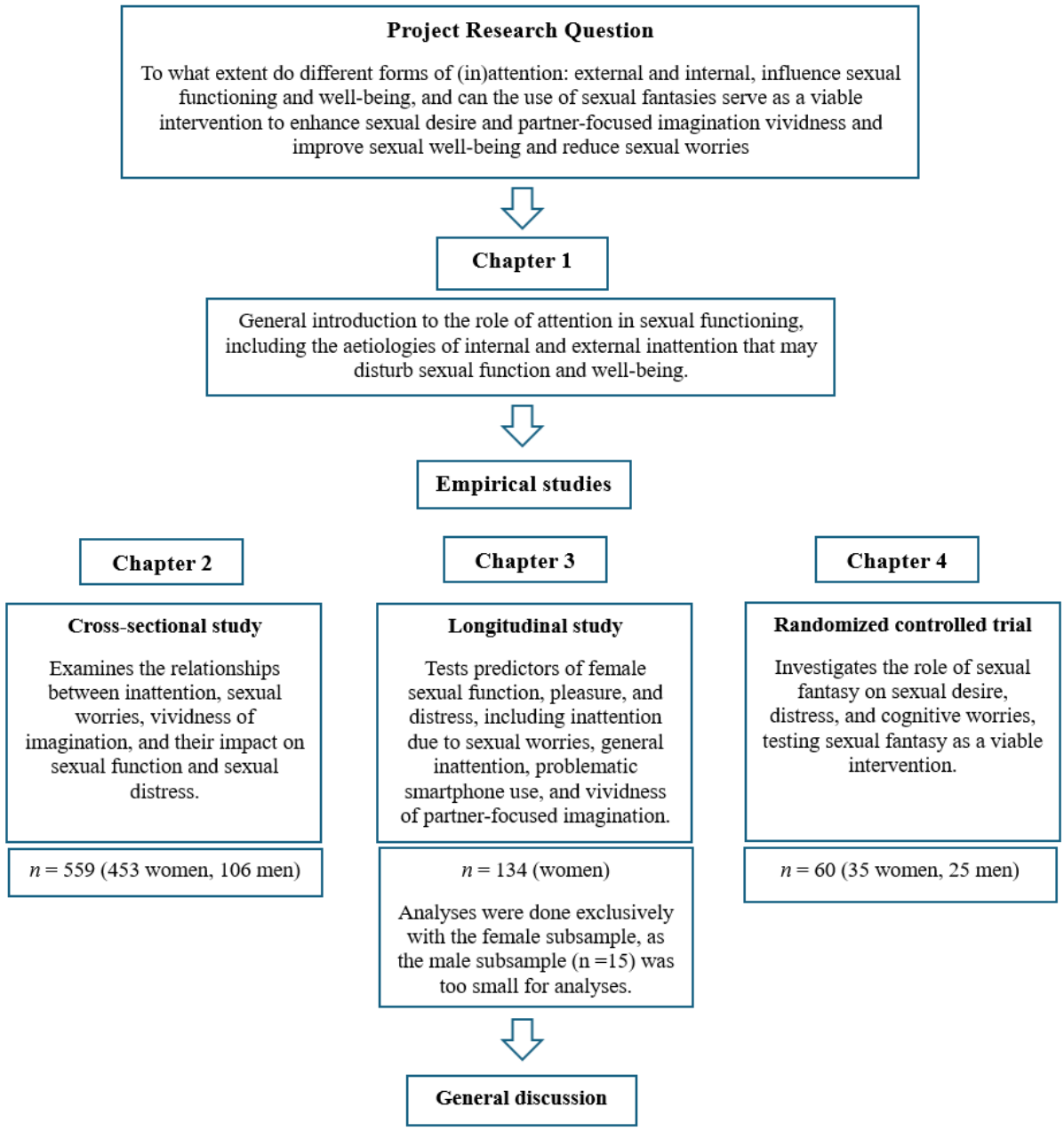
Phase 2: study 2 employed a longitudinal design, with two measurement points separated by one month, to investigate whether general inattention, worries during sexual activity, problematic smartphone use, and partner-focused mental imagery vividness baseline independently predicted changes in sexual function, distress and pleasure over time.

Phase 3: was a randomized controlled trial that evaluated the effects of a four-week intervention designed to stimulate sexual fantasy, compared with a non-sexual, positively valenced, control task, on sexual desire, sexual distress, worries during sexual activity, sexual pleasure, and the vividness of partner-focused mental imagery.

General inclusion criteria

Across all studies, eligibility criteria required participants to be at least 18 years old, heterosexual, and sexually active with a regular opposite-sex partner within the previous four weeks. In all three studies, the sample was restricted to heterosexual participants to ensure greater homogeneity and facilitate generalization to the heterosexual population. This decision was based on the lack of clarity as to whether results obtained with homosexual/sexual minority samples can be generalized to heterosexual individuals, and vice versa. Moreover, the sexual functioning questionnaires used in this research were validated specifically for heterosexual populations, and it remains uncertain to what extent they accurately reflect sexual functioning in homosexual individuals (Meston, et al., 2020). There is also empirical evidence indicating that instruments developed to assess sexual functioning quality in heterosexual populations, such as the Female Sexual Function Index (FSFI) and the International Index of Erectile Function (IIEF), are not fully suitable for application in homosexual and other sexual minority populations (Austria et al., 2021; Clements et al., 2023; Kiss, et al., 2020).

Figure 3 – Diagram of the Project 'Attention, Imagination and Sexual Function'



References

Ackard, D. M., Kearney-Cooke, A., & Peterson, C. B. (2000). Effect of body image and self-image on women's sexual behaviors. *International Journal of Eating Disorders, 28*(4), 422–429.https://doi.org/10.1002/1098-108X(200012)28:4<422::AID-EAT10>3.0.CO;2-1

Alfonso, V. C., Allison, D. B., & Dunn, G. M. (1992). Sexual fantasy and satisfaction: A multidimensional analysis of gender differences. *Journal of Psychology and Human Sexuality, 5*(1), 19–37.

Alimoradi, Z., Lin, C.-Y., Imani, V., Griffiths, M. D., & Pakpour, A. H. (2019). Social media addiction and sexual dysfunction among Iranian women: The mediating role of intimacy and social support. *Journal of Behavioral Addictions, 8*(2), 318–325. https://doi.org/10.1556/2006.8.2019.24

American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.; DSM-5-TR).

Andries, M., Robert, A. J. A., Lyons, A. L., Rawliuk, T. R. D., Li, J., & Greening, S. G. (2024). Attention control mediates the relationship between mental imagery vividness and emotion regulation. *Consciousness and Cognition*, *125*, 103766. https://doi.org/10.1016/j.concog.2024.103766

Anyan, F., Morote, R., & Hjemdal, O. (2020). Temporal and reciprocal relations between worry and rumination among subgroups of metacognitive beliefs. *Frontiers in Psychology, 11,* 551503. https://doi.org/10.3389/fpsyg.2020.551503

Arikewuyo, A. O., Efe-Özad, B., Dambo, T. H., Abdulbaqi, S. S., & Arikewuyo, H. O. (2021). An examination of how multiple use of social media platforms influence romantic relationships. *Journal of Public Affairs, 21*(3), e2240. https://doi.org/10.1002/pa.2240

Arndt, W. B., Foehl, J. C., & Good, F. E. (1985). Specific sexual fantasy themes: A multidimensional study. *Journal of Personality and Social Psychology, 48*(2), 472–480. https://doi.org/10.1037/0022-3514.48.2.472

Austria, M. D., Lynch, K., Le, T., Walters, C. B., Atkinson, T. M., Vickers, A. J., & Carlsson, S. V. (2021). Sexual and gender minority persons' perception of the female sexual function index. *The Journal of Sexual Medicine, 18*(12), 2020–2027. https://doi.org/10.1016/j.jsxm.2021.09.012

Barelds, D. P. H., & Dijkstra, P. (2011). Positive illusions about a partner's personality and relationship quality. *Journal of Research in Personality, 45*(1), 37–43. https://doi.org/10.1016/j.jrp.2010.11.009

Barlow, D. H. (1986). Causes of sexual dysfunction: The role of anxiety and cognitive interference. *Journal of Consulting and Clinical Psychology, 54*(2), 140–148. https://doi.org/10.1037/0022-006X.54.2.140

Barnes, S. J., Pressey, A. D., & Scornavacca, E. (2018). Mobile ubiquity: Understanding the relationship between cognitive absorption, smartphone addiction and social network services. *Computers in Human Behavior, 90*, 246–258. https://doi.org/10.1016/j.chb.2018.09.013

Benedek, M., Jauk, E., Beaty, R. E., Fink, A., Koschutnig, K., & Neubauer, A. C. (2016). Brain mechanisms associated with internally directed attention and self-generated thought. *Scientific Reports, 6,* Article 22959. https://doi.org/10.1038/srep22959

Birnbaum, G. E., Kanat-Maymon, Y., Mizrahi, M., Recanati, M., & Orr, M. (2019). What fantasies can do to your relationship: The effects of sexual fantasies on couple interactions. *Personality and Social Psychology Bulletin, 45*(3), 461–476. https://doi.org/10.1177/0146167218789611

Blackwell, S. E., Rius-Ottenheim, N., Schulte-van Maaren, Y. W. M., Carlier, I. V. E., Middelkoop, V. D., Zitman, F. G., Spinhoven, P., Holmes, E. A., & Giltay, E. J. (2013). Optimism and mental imagery: A possible cognitive marker to promote well-being? *Psychiatry Research, 206*(1), 56–61. https://doi.org/10.1016/j.psychres.2012.09.047

Bockaj, A., Muise, M. D., Belu, C. F., Rosen, N. O., & O'Sullivan, L. F. (2024). Under pressure: Men's and women's sexual performance anxiety in the sexual interactions of adult couples. *Journal of Sex Research.* Advance online publication. https://doi.org/10.1080/00224499.2024.2357587

Boer, M., Stevens, G., Finkenauer, C., & van den Eijnden, R. (2020). Attention deficit hyperactivity disorder-symptoms, social media use intensity, and social media use problems in adolescents: Investigating directionality. *Child Development, 91*(4), e853–e865. https://doi.org/10.1111/cdev.13334

Borkovec, T. D. (1994). The nature, functions, and origins of worry. In G. C. L. Davey & F. Tallis (Eds.), *Worrying: Perspectives on theory, assessment and treatment* (pp. 5–33). John Wiley & Sons.

Both, S., Everaerd, W., & Laan, E. (2007). Desire emerges from excitement: A psychophysiological perspective on sexual motivation. In E. Janssen (Ed.), *The psychophysiology of sex* (pp. 327–339). Indiana University Press.

Both, S., Spiering, M., Everaerd, W., & Laan, E. (2004). Sexual behavior and responsiveness to sexual stimuli following laboratory-induced sexual arousal. *Journal of Sex Research, 41*(3), 242–258. https://doi.org/10.1080/00224490409552232

Botta, F., Lupiáñez, J., & Chica, A. B. (2014). When endogenous spatial attention improves conscious perception: Effects of alerting and bottom-up activation. *Consciousness and Cognition, 23*, 63–73. https://doi.org/10.1016/j.concog.2013.12.003

Brauer, M., ter Kuile, M., & Laan, E. (2008). Effects of appraisal of sexual stimuli on sexual arousal in women with and without superficial dyspareunia. *Archives of Sexual Behavior, 38*(4), 559–570. https://doi.org/10.1007/s10508-008-9371-8

Busch, T. M., Goodwin, G. J., Dempsey, M. R., Conrads, G. S., & Wilson, S. M. (2024). Exploring the impact of fantasizing on romantic relationships and attachment. *Sexuality & Culture, 29*(2), 610–635. https://doi.org/10.1007/s12119-024-10289-x

Campos, P., Wittmann, M., & Costa, R. M. (2021). Sexual function, personality, and body awareness. *Psicologia, Saúde & Doenças*, *22*(2), 411-422. https://doi.org/10.15309/21psd220208

Carvalheira, A. A., Brotto, L. A., & Leal, I. (2010). Women's motivations for sex: Exploring the Diagnostic and Statistical Manual, Fourth Edition, Text Revision criteria for hypoactive sexual desire and female sexual arousal disorders. *The Journal of Sexual Medicine, 7*(4 Pt 1), 1454–1463. https://doi.org/10.1111/j.1743-6109.2009.01693.x

Carvalheira, A., Godinho, L., & Costa, P. (2017). The impact of body dissatisfaction on distressing sexual difficulties among men and women: The mediator role of cognitive distraction. *Journal of Sex Research, 54*(3), 331–340. https://doi.org/10.1080/00224499.2016.1168771

Carvalho, J., Czop, O., Rocha, M., Nobre, P., & Soares, S. (2018). Gender differences in the automatic attention to romantic vs. sexually explicit stimuli. *The Journal of Sexual Medicine, 15*(8), 1083–1092. https://doi.org/10.1016/j.jsxm.2018.06.008

Childress, A. R., Ehrman, R. N., Wang, Z., Li, Y., Sciortino, N., Hakun, J., Jens, W., Suh, J., Listerud, J., Marquez, K., Franklin, T., Langleben, D., Detre, J., & O'Brien, C. P. (2008). Prelude to passion: Limbic activation by "unseen" drug and sexual cues. *PLOS ONE, 3*(1), e1506. https://doi.org/10.1371/journal.pone.0001506

Chun, M. M., Golomb, J. D., & Turk-Browne, N. B. (2011). A taxonomy of external and internal attention. *Annual Review of Psychology, 62,* 73–101. https://doi.org/10.1146/annurev.psych.093008.100427

Clements, M. B., Walters, C. B., Lynch, K. A., Atkinson, T. M., Mulhall, J. P., Starks, T. J., Vickers, A. J., & Carlsson, S. V. (2023). Patient-reported outcome measures for male sexual function do not meet the needs of sexual minority men. *Archives of Sexual Behavior, 52*(8), 3193–3200. https://doi.org/10.1007/s10508-023-02688-2

Costa, R. M. (2022). Sexual fantasies. In T. K. Shackelford (Ed.), *Encyclopedia of sexual psychology and behavior.* Springer. https://doi.org/10.1017/9781108943567.011

Costa, R. M. (2023). Sexual fantasies: and sexual functioning/desire. In: Shackelford, T.K. (eds) *Encyclopedia of Sexual Psychology and Behavior*. Springer, Cham. https://doi.org/10.1007/978-3-031-08956-5_2203-1

Costa, R. M., & Oliveira, T. F. (2016). Poorer subjective sleep quality is related to higher fantasy-induced sexual arousal in women of reproductive age. *Journal of Sex & Marital Therapy, 42*(8), 740–748. https://doi.org/10.1080/0092623X.2015.1113591

Costa, R. M., Pimenta, F., Ferreira-Valente, A., & Patrão, I. (2023). Social media addiction is associated with sexual dissatisfaction: A cross-sectional study with quota sampling in Portugal [Preprint]. *OSF Preprints*. https://doi.org/10.31219/osf.io/eb9c7

Costa, R. M., Pestana, J., Costa, D., & Wittmann, M. (2016). Altered states of consciousness are related to higher sexual responsiveness. *Journal of Sexual Medicine, 13*(7), 1047–1058. https://doi.org/10.1080/0092623X.2015.1113591

Davidson, J. K., & Hoffman, L. E. (1986). Sexual fantasies and sexual satisfaction: An empirical analysis of erotic thought. *Journal of Sex Research, 22*(2), 184–205. https://doi.org/10.1080/00224498609551299

Davison, S. L., Bell, R. J., La China, M., Holden, S. L., & Davis, S. R. (2008). Assessing sexual function in well women: Validity and reliability of the Monash Women's Health Program Female Sexual Satisfaction Questionnaire. *The Journal of Sexual Medicine, 5*(11), 2575–2586. https://doi.org/10.1111/j.1743-6109.2008.00967.x

de Jong, D. C. (2009). The role of attention in sexual arousal: Implications for treatment of sexual dysfunction. *Journal of Sex Research, 46*(2–3), 237–248. https://doi.org/10.1080/00224490902747230

Dove, N. L., & Wiederman, M. W. (2000). Cognitive distraction and women's sexual functioning. *Journal of Sex & Marital Therapy, 26*(1), 67–78. https://doi.org/10.1080/009262300278650

Dubey, A., Ohri, N., Rathi, P., & Vankar, G. K. (2025). Sexual fantasies and their role in sexual satisfaction and quality of life among men with sexual dysfunction. *Journal of Psychosexual Health, 7*(3), 259–267. https://doi.org/10.1177/26318318251323711

Emond M, Vaillancourt-Morel MP, Métellus S, Brassard A, Daspe ME. Social media jealousy and intimate partner violence in young adults' romantic relationships: a longitudinal study. *Telemat Inform 2023;* 79: 101956. https://doi.org/10.1016/j.tele.2023.101956

Everaert, J., & Joormann, J. (2020). Emotion regulation habits related to depression: A longitudinal investigation of stability and change in repetitive negative thinking and positive reappraisal. *Journal of Affective Disorders, 276,* 738–747. https://doi.org/10.1016/j.jad.2020.07.058

Faith, M. S., & Schare, M. L. (1993). The role of body image in sexually avoidant behavior. *Archives of Sexual Behavior, 22*(4), 345–356. https://doi.org/10.1007/BF01542123

Fekih-Romdhane, F., Haddad, P., Roukoz, R., Barakat, M., Gerges, S., Malaeb, D., Obeid, S., & Hallit, S. (2024). Does loneliness mediate the association between social media use disorder and sexual function in Lebanese university students? *International Journal of Environmental Health Research, 34*(3), 1835–1846. https://doi.org/10.1080/09603123.2023.2248005

Fielder, R. (2013). Sexual functioning. In M. D. Gellman & J. R. Turner (Eds.), *Encyclopedia of behavioral medicine* (pp. 1805–1806). Springer. https://doi.org/10.1007/978-1-4419-1005-9_668

Fuzeiro, V., Martins, C., Gonçalves, C., Rolo Santos, A., & Costa, R. M. (2022). Sexual function and problematic use of smartphones and social networking sites. *The Journal of Sexual Medicine, 19*(6), 904–916. https://doi.org/10.1016/j.jsxm.2022.05.004

Frampton, J. R., & Fox, J. (2018). Social media's role in romantic partners' retroactive jealousy: Social comparison, uncertainty, and information seeking. *Social Media + Society, 4*(3). https://doi.org/10.1177/2056305118800317

Ganis, G. (2013). Visual mental imagery. In S. Lacey & R. Lawson (Eds.), *Multisensory imagery* (pp. 3–26). Springer. https://doi.org/10.1007/978-1-4614-5879-1_2

Gillath, O., & Canterberry, M. (2012). Neural correlates of exposure to subliminal and supraliminal sexual cues. *Social Cognitive and Affective Neuroscience, 7*(8), 924–936. https://doi.org/10.1093/scan/nsr065

Gjorgieva, E., Geib, B. R., Cabeza, R., & Woldorff, M. G. (2023). The influence of imagery vividness and internally-directed attention on the neural mechanisms underlying the encoding of visual mental images into episodic memory. *Cerebral Cortex, 33*(6), 3207–3220. https://doi.org/10.1093/cercor/bhac270

Goldey, K. L., & van Anders, S. M. (2011). Sexy thoughts: Effects of sexual cognitions on testosterone, cortisol, and arousal in women. *Hormones and Behavior, 59*(5), 754–764. https://doi.org/10.1016/j.yhbeh.2010.12.005

Goldey, K. L., & van Anders, S. M. (2012). Sexual thoughts: Links to testosterone and cortisol in men. *Archives of Sexual Behavior*, *41*(6), 1461–1470. https://doi.org/10.1007/s10508-011-9858-6

Guerreiro, P. P., Raposo, C. F., Salvador, Á., Manão, A. A., & Pascoal, P. M. (2024). A transdiagnostic approach to sexual distress and pleasure: The role of worry, rumination, and emotional regulation. *Current Psychology, 43*(17), 15385–15396. https://doi.org/10.1007/s12144-023-05320-7

Hariton, B. E., & Singer, J. L. (1974). Women's fantasies during sexual intercourse: Normative and theoretical implications. *Journal of Consulting and Clinical Psychology, 42*(2), 313–322. https://doi.org/10.1037/h0036669

Harris, R., Yulis, S., & LaCoste, D. (1980). Relationships among sexual arousability, imagery ability, and introversion–extraversion. *Journal of Sex Research, 16*(1), 72–86. https://doi.org/10.1080/00224498009551063

Hipp, C. J., & Carlson, R. G. (2021). The dyadic association among technoference and relationship and sexual satisfaction of young adult couples. *Journal of Sex & Marital Therapy, 47*(5), 508–520. https://doi.org/10.1080/0092623X.2021.1922562

Holmes, E. A., & Mathews, A. (2005). Mental imagery and emotion: A special relationship? *Emotion, 5*(4), 489–497. https://doi.org/10.1037/1528-3542.5.4.489

Horvath, Z., Smith, B. H., Sal, D., Hevesi, K., & Rowland, D. L. (2020). Body image, orgasmic response, and sexual relationship satisfaction: Understanding relationships and establishing typologies based on body image satisfaction. *Sexual Medicine, 8*(4), 740–751. https://doi.org/10.1016/j.esxm.2020.06.008

Huang, J.-Y., Xue, X., Wang, Z.-X., Li, Z.-F., et al. (2023). The relationship between attention networks and individual differences in visual mental imagery vividness: An EEG study. *Neuropsychologia, 191*, 108736. https://doi.org/10.1016/j.neuropsychologia.2023.108736

Hulbert, D. F., Apt, C., Hulbert, M. K., & Pierce, A. P. (2000). Sexual compatibility and the sexual desire–motivation relation in females with hypoactive sexual desire disorder. *Behavior Modification, 24*(3), 325–347. https://doi.org/10.1177/0145445500243002

Hunt, M. G., Marx, R., Lipson, C., & Young, J. (2018). No more FOMO: Limiting social media decreases loneliness and depression. *Journal of Social and Clinical Psychology, 37*(10), 751–768. https://doi.org/10.1521/jscp.2018.37.10.751

James, W. (1890). *The principles of psychology* (Vol. 1). New York: Henry Holt.

Janssen, E., & Bancroft, J. (2007). The dual control model: The role of sexual inhibition and excitation in sexual arousal and behavior. In E. Janssen (Ed.), *The psychophysiology of sex* (pp. 197–222). Indiana University Press.

Jabalkandi, A. S., Raisi, F., Shahrivar, Z., Mohammadi, A., Meysamie, A., Firoozikhojastefar, R., & Irani, F. (2020). A study on sexual functioning in adults with attention-deficit/hyperactivity disorder. *Perspectives in Psychiatric Care, 56*(3), 642–648. https://doi.org/10.1111/ppc.12480

Janssen, E., Everaerd, W., Spiering, M., & Janssen, J. (2000). Automatic processes and the appraisal of sexual stimuli: Toward an information processing model of sexual arousal. *Journal of Sex Research, 37*(1), 8–23. https://doi.org/10.1080/00224490009552016

Ji, J. L., Holmes, E. A., & Blackwell, S. E. (2017). Seeing light at the end of the tunnel: Positive prospective mental imagery and optimism in depression. *Psychiatry Research, 247*, 155–162. https://doi.org/10.1016/j.psychres.2016.11.025

Kharlas, D. A., & Frewen, P. (2016). Trait mindfulness correlates with individual differences in multisensory imagery vividness. *Personality and Individual Differences, 92*, 34–40. https://doi.org/10.1016/j.paid.2015.09.027

Kiss, M. J., McDonagh, L. K., Sparks, B., Hamp, T., & Morrison, T. G. (2021). Accurately assessing gay men's erectile functioning: A critique of the International Index of Erectile Function (IIEF) use with gay men. *Journal of Sex Research, 58*(5), 589–598. https://doi.org/10.1080/00224499.2020.1811195

Knafo, D., & Jaffe, Y. (1984). Sexual fantasizing in males and females. *Journal of Research in Personality, 18*(4), 451–462. https://doi.org/10.1016/0092-6566(84)90004-7

Korff, J., & Geer, J. H. (1983). The relationship between sexual arousal experience and genital response. *Psychophysiology, 20*(2), 121–127. https://doi.org/10.1111/j.1469-8986.1983.tb03276.x

Kosslyn, S. M., & Thompson, W. L. (2003). When is early visual cortex activated during visual mental imagery? *Psychological Bulletin, 129*(5), 723–746. https://doi.org/10.1037/0033-2909.129.5.723

Koukounas, E., & Over, R. (1997). Allocation of attentional resources during habituation and dishabituation of male sexual arousal. *Archives of Sexual Behavior, 28*(6), 539–552.

Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., Lin, N., Shablack, H., Jonides, J., & Ybarra, O. (2013). Facebook use predicts declines in subjective well-being in young adults. *PLOS ONE, 8*(8), e69841. https://doi.org/10.1371/journal.pone.0069841

Kusnir, F., Chica, A. B., Mitsumasu, M. A., & Bartolomeo, P. (2011). Phasic auditory alerting improves visual conscious perception. *Consciousness and Cognition, 20*(4), 1201–1210. https://doi.org/10.1016/j.concog.2011.01.012

Kuss, D., & Griffiths, M. (2017). Social networking sites and addiction: Ten lessons learned. *International Journal of Environmental Research and Public Health, 14*(3), 311. https://doi.org/10.3390/ijerph14030311

Lambert, J., Barnstable, G., Minter, E., Cooper, J., & McEwan, D. (2022). Taking a one-week break from social media improves well-being, depression, and anxiety: A randomized

controlled trial. *Cyberpsychology, Behavior and Social Networking, 25*(5), 287–293. https://doi.org/10.1089/cyber.2021.032

Langeslag, S. J. E., & Davis, L. L. (2022). A preliminary study on up-regulation of sexual desire for a long-term partner. *The Journal of Sexual Medicine, 19*(5), 872–878. https://doi.org/10.1016/j.jsxm.2022.02.017

Lawrence, H. R., Haigh, E. A. P., Siegle, G. J., & Schwartz-Mette, R. A. (2018). Visual and verbal depressive cognition: Implications for the rumination–depression relationship. *Cognitive Therapy and Research, 42*(4), 421–435. https://doi.org/10.1007/s10608-018-9890-0

Lehmiller, J. J. (2020). Fantasies about consensual nonmonogamy among persons in monogamous romantic relationships. *Archives of Sexual Behavior, 49*(8), 2799–2812. https://doi.org/10.1007/s10508-020-01788-7

Leitenberg, H., & Henning, K. (1995). Sexual fantasy. *Psychological Bulletin, 117*(3), 469–496. https://doi.org/10.1037/0033-2909.117.3.469

Liao, S., & Gendler, T. (2020). *Imagination*. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Summer 2020 Edition). Metaphysics Research Lab, Stanford University. https://plato.stanford.edu/archives/sum2020/entries/imagination

Lo, S. S., & Kok, W. M. (2018). Prevalence and risk factors for sexual problems and distress in Chinese unmarried young women: An observational study. *The Journal of Sexual Medicine, 15*(11), 1620–1628. https://doi.org/10.1016/j.jsxm.2018.09.010

Lunde, I., Larsen, G. K., Fog, E., & Garde, K. (1991). Sexual desire, orgasm, and sexual fantasies: A study of 625 Danish women born in 1910, 1936, and 1958. *Journal of Sex Education and Therapy, 17*(2), 111–115.

Marks, D. F. (1973). *Vividness of Visual Imagery Questionnaire (VVIQ)* [Database record]. APA PsycTests. https://doi.org/10.1037/t05959-000

Marty-Dugas, J., Ralph, B. C. W., Oakman, J. M., & Smilek, D. (2018). The relation between smartphone use and everyday inattention. *Psychology of Consciousness: Theory, Research, and Practice, 5*(1), 46–62. https://doi.org/10.1037/cns0000131

McNamee, P., Mendolia, S., & Yerokhin, O. (2021). Social media use and emotional and behavioural outcomes in adolescence: Evidence from British longitudinal data. *Economics and Human Biology, 41*, 100992. https://doi.org/10.1016/j.ehb.2021.100992

Meana, M., & Nunnink, S. E. (2006). Gender differences in the content of cognitive distraction during sex. *Journal of Sex Research, 43*(1), 59–67. https://doi.org/10.1080/00224490609552299

Meston, C. M., Freihart, B. K., Handy, A. B., Kilimnik, C. D., & Rosen, R. C. (2020). Scoring and interpretation of the FSFI: What can be learned from 20 years of use? *The Journal of Sexual Medicine, 17*(1), 17–25. https://doi.org/10.1016/j.jsxm.2019.10.007

Meuwissen, I., & Over, R. (1991). Multidimensionality of the content of female sexual fantasy. *Behaviour Research and Therapy, 29*(2), 179–189. https://doi.org/10.1016/0005-7967(91)90046-6

Moreault, D., & Follingstad, D. R. (1978). Sexual fantasies of females as a function of sex guilt and experimental response cues. *Journal of Consulting and Clinical Psychology, 46*(6), 1385–1393. https://doi.org/10.1037/0022-006X.46.6.1385

Morris, A., & Braver, T. S. (2022). What is the nature of "internal content" prior to attentional selection? *Psychological Inquiry, 33*(4), 280–284.

Mushquash, A. R., Charlton, J. K., MacIsaac, A., & Ryan, K. (2022). Romance behind the screens: Exploring the role of technoference on intimacy. *Cyberpsychology, Behavior, and Social Networking, 25*(12), 814–820. https://doi.org/10.1089/cyber.2022.0068

Nanay, B. (2021). *Mental imagery*. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Winter 2021 Edition). Metaphysics Research Lab, Stanford University. https://plato.stanford.edu/archives/fall2021/entries/mental-imagery/>.

Newbury, R., Hayter, M., Wylie, K. R., & Ridell, J. (2012). Sexual fantasy as clinical intervention. *Sexual and Relationship Therapy, 27*(4), 358–371. https://doi.org/10.1080/14681994.2012.733816

Nimbi, F. M., Galizia, R., Limoncin, E., Levy, T., Jannini, E. A., Simonelli, C., & Tambelli, R. (2023). Sexual Desire and Erotic Fantasies Questionnaire 2: The development and validation of the erotic fantasy use scale (SDEF2) on experience, attitudes, and sharing issues. *Healthcare*, 11(8), 1159. https://doi.org/10.3390/healthcare11081159

Nobre, P. J. (2023). Nobre's cognitive–emotional model of sexual dysfunction. In A. D. Lykins (Ed.), *Encyclopedia of sexuality and gender.* Springer. https://doi.org/10.1007/978-3-319-59531-3_116-1

Nobre, P. J., & Pinto-Gouveia, J. (2006). Dysfunctional sexual beliefs as vulnerability factors for sexual dysfunction. *Journal of Sex Research, 43*(1), 68–75. https://doi.org/10.1080/00224490609552300

Nutter, D. E., & Condron, M. K. (1983). Sexual fantasy and activity patterns of females with inhibited sexual desire versus normal controls. *Journal of Sex & Marital Therapy, 9*(4), 276–282. https://doi.org/10.1080/00926238308410914

Nutter, D. E., & Condron, M. K. (1985). Sexual fantasy and activity patterns of males with inhibited sexual desire and males with erectile dysfunction versus normal controls. *Journal of Sex & Marital Therapy, 11*(2), 91–98. https://doi.org/10.1080/00926238508406074

Odou, N., & Vella-Brodrick, D. A. (2013). The efficacy of positive psychology interventions to increase well-being and the role of mental imagery ability. *Social Indicators Research, 110*(1), 111–129. https://doi.org/10.1007/s11205-011-9919-1

Oei, N. Y. L., Rombouts, S. A. R. B., Soeter, R. P., van Gerven, J. M. A., & Both, S. (2012). Dopamine modulates reward system activity during subconscious processing of sexual stimuli. *Neuropsychopharmacology, 37*(7), 1729–1737. https://doi.org/10.1038/npp.2012.19

Paek, S. H., Abdulla, A. M., & Cramond, B. (2016). A meta-analysis of the relationship between three common psychopathologies—ADHD, anxiety, and depression—and indicators of little-c creativity. *Gifted Child Quarterly, 60*(2), 117–133. https://doi.org/10.1177/0016986216630600

Panagiotidi, M., & Overton, P. G. (2022). Attention deficit hyperactivity symptoms predict problematic mobile phone use. *Current Psychology, 41*(5), 2765–2771. https://doi.org/10.1007/s12144-020-00785-2

Pascoal, P. M., Raposo, C. F., & Roberto, M. S. (2020). A transdiagnostic approach to sexual distress and sexual pleasure: A preliminary mediation study with repetitive negative thinking. *International Journal of Environmental Research and Public Health, 17*(21), 7864. https://doi.org/10.3390/ijerph17217864

Pashler, H., Johnston, J. C., & Ruthruff, E. (2001). Attention and performance. *Annual review of Psychology*, *52*, 629–651. https://doi.org/10.1146/annurev.psych.52.1.629

Payne, K. A., Binik, Y. M., Amsel, R., & Khalifé, S. (2005). When sex hurts, anxiety and fear orient attention towards pain. *European Journal of Pain, 9*(5), 427–436. https://doi.org/10.1016/j.ejpain.2004.10.003

Pawlikowska, A., Szuster, E., Kostrzewska, P., Mandera, A., Biernikiewicz, M., Sobieszczańska, M., Rożek-Piechura, K., Markiewicz, M., Rusiecka, A., & Kałka, D. (2022). Internet addiction and Polish women's sexual functioning: The role of social media, online pornography, and game use during the COVID-19 pandemic—Online surveys based on FSFI and BSMAS questionnaires. *International Journal of Environmental Research and Public Health, 19*(13), 8193. https://doi.org/10.3390/ijerph19138193

Pearson, J. (2019). The human imagination: The cognitive neuroscience of visual mental imagery. *Nature Reviews Neuroscience, 20*(10), 624–634. https://doi.org/10.1038/s41583-019-0202-9

Pearson, J., Clifford, C. W., & Tong, F. (2008). The functional impact of mental imagery on conscious perception. *Current Biology*, *18*(13), 982–986. https://doi.org/10.1016/j.cub.2008.05.048

Pelletier, L. A., & Herold, E. S. (1988). The relationship of age, sex guilt, and sexual experience with female sexual fantasies. *Journal of Sex Research, 24*(2), 250–256. https://doi.org/10.1080/00224498809551420

Posner M. I. (2023). The evolution and future development of attention networks. *Journal of Intelligence*, *11*(6), 98. https://doi.org/10.3390/jintelligence11060098

Posner, M. I., & Petersen, S. E. (1990). The attention system of the human brain. *Annual Review of Neuroscience, 13*(1), 25–42. https://doi.org/10.1146/annurev.ne.13.030190.000325

Posner, M. I., & Rothbart, M. K. (2007). Research on attention networks as a model for the integration of psychological science. *Annual Review of Psychology, 58,* 1–23 https://doi.org/10.1146/annurev.psych.58.110405.085516

Purifoy, F. E., Grodsky, A., & Giambra, L. M. (1992). The relationship of sexual daydreaming to sexual activity, sexual drive, and sexual attitudes for women across the lifespan. *Archives of Sexual Behavior, 21*(4), 369–385. https://doi.org/10.1007/BF01542026

Redouté, J., Stoléru, S., Pugeat, M., Costes, N., Lavenne, F., Le Bars, D., Dechaud, H., Cinotti, L., & Pujol, J. F. (2000). Brain processing of visual sexual stimuli in human males.

Human Brain Mapping, 11(3), 162–177. https://doi.org/10.1002/1097-0193(200011)11:3

Roberts, J. A., & David, M. E. (2016). My life has become a major distraction from my cell phone: Partner phubbing and relationship satisfaction among romantic partners. *Computers in Human Behavior, 54*, 134–141. https://doi.org/10.1016/j.chb.2015.07.058

Rosen, R. C., Taylor, J. F., Leiblum, S. R., & Bachmann, G. A. (1993). Prevalence of sexual dysfunction in women: Results of a survey study of 339 women in an outpatient gynecological clinic. *Journal of Sex & Marital Therapy, 19*(3), 171–188. https://doi.org/10.1080/00926239308404902

Sihoe, C. E., Mueller, U., & Liu, S. (2023). Perceived smartphone addiction predicts ADHD symptomatology in middle school adolescents: A longitudinal study. *Computers in Human Behavior Reports, 12*, 100335. https://doi.org/10.1016/j.chbr.2023.100335

Silva, E., Pascoal, P. M., & Nobre, P. (2016). Beliefs about appearance, cognitive distraction and sexual functioning in men and women: A mediation model based on cognitive theory. *Journal of Sexual Medicine, 13*(9), 1387–1394. https://doi.org/10.1016/j.jsxm.2016.06.005

Skowronek, J., Seifert, A., & Lindberg, S. (2023). The mere presence of a smartphone reduces basal attentional performance. *Scientific Reports, 13*(1), 9363. https://doi.org/10.1038/s41598-023-36256-4

Smith, D., & Over, R. (1990a). Male sexual arousal as a function of the content and the vividness of erotic fantasy. *Psychophysiology, 24*(3), 334-339. https://doi.org/10.1111/j.1469-8986.1987.tb00304.x

Smith, D., & Over, R. (1990b). Enhancement of fantasy-induced sexual arousal in men through training in sexual imagery. *Archives of Sexual Behavior, 19*(5), 477–489. https://doi.org/10.1007/BF02442349

Soldati, L., Bianchi-Demicheli, F., Schockaert, P., Köhl, J., Bolmont, M., Hasler, R., & Perroud, N. (2020). Sexual function, sexual dysfunctions, and ADHD: A systematic literature review. *The Journal of Sexual Medicine, 17*(9), 1653–1664. https://doi.org/10.1016/j.jsxm.2020.03.019

Spiering, M., & Everaerd, W. (2007). The sexual unconscious. *The Journal of Sex Research, 44*(2), 214–230.

Stoléru, S., Fonteille, V., Cornélis, C., Joyal, C., & Moulier, V. (2012). Functional neuroimaging studies of sexual arousal and orgasm in healthy men and women: A review and meta-analysis. *Neuroscience & Biobehavioral Reviews, 36*(6), 1481–1509. https://doi.org/10.1016/j.neubiorev.2012.03.006

Strahler, J., Baranowski, A. M., Walter, B., Huebner, N., & Stark, R. (2019). Attentional bias toward and distractibility by sexual cues: A meta-analytic integration. *Neuroscience & Biobehavioral Reviews, 105,* 276–287. https://doi.org/10.1016/j.neubiorev.2019.07.015

Swieczkowski, J. B., & Walker, E. (1978). Sexual behavior correlates of female orgasm and marital happiness. *Journal of Nervous and Mental Disease, 166*(5), 335–342. https://doi.org/10.1097/00005053-197805000-00004

Talbot, R. M. R., Beech, H. R., & Vaughn, M. (1980). A normative appraisal of erotic fantasies in women. *British Journal of Social and Clinical Psychology, 19*(1), 81–83. https://doi.org/10.1111/j.2044-8260.1980.tb00932.x

Tandon, A., Dhir, A., & Mäntymäki, M. (2021). Jealousy due to social media? A systematic literature review and framework of social media-induced jealousy. *Internet Research, 31*(5), 1541–1582. https://doi.org/10.1108/INTR-02-2020-0103

Tavares, I. M., Moura, C. V., & Nobre, P. J. (2020). The role of cognitive processing factors in sexual function and dysfunction in women and men: A systematic review. *Sexual Medicine Reviews, 8*(4), 512–530. https://doi.org/10.1016/j.sxmr.2020.03.002

Thompson, W. L., Hsiao, Y., & Kosslyn, S. M. (2011). Dissociation between visual attention and visual mental imagery. *Journal of Cognitive Psychology, 23*(3), 256–263. http://dx.doi.org/10.1080/20445911.2011.477810

Toates, F. (2009). An integrative theoretical framework for understanding sexual motivation, arousal, and behavior. *Journal of Sex Research, 46*(2–3), 168–193. https://doi.org/10.1080/00224490902747768

Tokatlidis, O., & Over, R. (1995). Imagery, fantasy, and female sexual arousal. *Australian Journal of Psychology, 47*(2), 81–85. https://doi.org/10.1080/00049539508257504

Tromholt, M. (2016). The facebook experiment: Quitting facebook leads to higher levels of well-being. *Cyberpsychology, Behavior and Social Networking, 19*(11), 661–666. https://doi.org/10.1089/cyber.2016.025

Turel, O., Cavagnaro, D. R., & Meshi, D. (2018). Short abstinence from online social networking sites reduces perceived stress, especially in excessive users. *Psychiatry Research, 270*, 947–953. https://doi.org/10.1016/j.psychres.2018.11.017

van Lankveld, J. J. D. M., Dewitte, M., Verboon, P., van Hooren, S. A. H., & van den Hout, M. A. (2018). Associations between sexual functioning and implicit and explicit sexual appraisals. *Archives of Sexual Behavior, 47*(5), 1325–1338. https://doi.org/10.1111/jsm.12930

Wang, J. L., Yin, X. Q., Wang, H. Z., King, D. L., & Rost, D. H. (2024). The longitudinal associations between internet addiction and ADHD symptoms among adolescents. *Journal of Behavioral Addictions, 13*(1), 191–204. https://doi.org/10.1556/2006.2023.00080

Wicken, M., Keogh, R., & Pearson, J. (2021). The critical role of mental imagery in human emotion: Insights from fear-based imagery and aphantasia. *Proceedings of the Royal Society B: Biological Sciences, 288*(1946), 20210267. https://doi.org/10.1098/rspb.2021.0267

Wiegel, M., Scepkowski, L. A., & Barlow, D. H., (2007). Cognitive-affective processes in sexual arousal and sexual dysfunction. In E. Janssen (Ed.), *The psychophysiology of sex* (pp. 143–165). Indiana University Press.

Whipple, B., Ogden, G., & Komisaruk, B. R. (1992). Physiological correlates of imagery-induced orgasm in women. *Archives of Sexual Behavior, 21*(2), 121–133. https://doi.org/10.1007/BF01542589

Wilson, G. D., & Lang, R. J. (1981). Sex differences in sexual fantasy patterns. *Personality and Individual Differences, 2*(4), 343–346. https://doi.org/10.1016/0191-8869(81)90093-3

Woertman, L., & van den Brink, F. (2012). Body image and female sexual functioning and behavior: A review. *Journal of Sex Research, 49*(2–3), 184–211. https://doi.org/10.1080/00224499.2012.658586

Yamamiya, Y., Cash, T. F., & Thompson, J. K. (2006). Sexual experiences among college women: The differential effects of general versus contextual body images on sexuality. *Sex Roles, 55*(5–6), 421–427. https://doi.org/10.1007/s11199-006-9096-x

Zimmer, D., Borchardt, E., & Fischle, C. (1983). Sexual fantasies of sexually distressed and nondistressed men and women: An empirical comparison. *Journal of Sex & Marital Therapy, 9*(1), 38–50. https://doi.org/10.1080/00926238308405832

2

Chapter 2: General inattention, sexual worries, problematic smartphone and partner-focused imagery vividness: how do they relate to sexual function, pleasure, and distress?

This chapter is based on the paper

Campos, P., Leal, I., & Costa, R. M. (2025). General inattention, sexual worries, problematic smartphone and partner-focused imagery vividness: how do they relate to sexual function, pleasure, and distress? Manuscript submitted for publication

Chapter 2: General inattention, sexual worries, problematic smartphone and partner-focused imagery vividness: how do they relate to sexual function, pleasure, and distress?

Abstract

Sexual functioning depends on the ability to maintain attention on erotic stimuli, whether sensory or internally generated. However, limited research has comprehensively examined the diverse attentional mechanisms that may influence sexual response. This study investigated how four attentional factors: (1) general inattention, (2) sexual worries (about body image and performance during sexual activity), (3) problematic smartphone use, and (4) vividness of partner-focused mental imagery (a feature relying on internal attention), independently predict sexual function, sexual distress, and sexual pleasure in a non-clinical sample. For this purpose, a cross-sectional survey was conducted with 559 Portuguese heterosexual adults (453 women, 106 men). Among women, lower dysphoria, fewer sexual worries, and greater vividness of partner-focused imagery predicted better sexual function; greater dysphoria, fewer sexual worries, less vivid partner-focused imagery, and more problematic smartphone use predicted greater sexual distress; lower dysphoria and fewer sexual worries predicted greater sexual pleasure. Among men, vividness of partner-focused imagery and lower dysphoria predicted better sexual function; more sexual worries and less vivid partner-focused imagery vividness predicted greater sexual distress; less problematic smartphone use predicted greater sexual pleasure. Although, general inattention was generally related to poorer sexual function and well-being in simple correlation, it was never a significant predictor in multiple regressions. Findings underscore the complex role of attentional processes in shaping sexual well-being. This study emphasizes the importance of both reducing attentional distractions and cultivating internal attentional engagement through imagery to promote sexual health.

Keywords:

Attention; sexual function; sexual distress; sexual pleasure; mental imagery; problematic smartphone use; sexual worries

Introduction

Attention and sexual function

Attention is a fundamental cognitive mechanism, responsible for selecting, modulating, and maintaining focus on the most relevant information provided by sensory inputs and perceptions to guide behaviour. Attentional mechanisms have evolved from the need to efficiently allocate limited cognitive resources to the most critical information related to ongoing goals and behaviours. Given the brain's limited capacity to consciously process multiple competing stimuli, attention plays a key role in all cognitive functions (Chun, et al., 2011; Pashler et al., 2001).

Contemporary models suggest that human sexual motivation and desire can be initiated unconsciously, driven by an attentional bias toward sexually relevant cues, and triggered before the individual becomes fully aware of the stimulus (Spiering and Everaerd, 2007). These models suggest that the subjective experience of sexual desire arises as a response to excitatory processes (e.g., bodily, and neural changes) after the automatic processing of a sexual stimulus (Both et al., 2007). In these models, automatic processing of sexual cues, influences attentional mechanisms by redirecting attention focus, which enhances motivation and primes the organism for sexual behaviour. Aligned with this perspective, studies in the field of neuroscience have shown that the onset of sexual response occurs below the threshold of consciousness through the unconscious processing of sexual stimuli (Childress et al., 2008; Gillath & Canterberry, 2011; Oei, et al., 2012), thereby directing attention and shaping sexual behaviour and motivation. The sensitivity to detect sexual stimuli may be interpreted from an evolutionary standpoint, given its significance for survival and reproduction (Spiering & Everaerd, 2007). As sexual reproduction underpins human survival by promoting genetic diversity and adaptation to environmental changes, sexuality plays a vital role in human life, and this centrality heightened sensitivity to sexual cues. Likewise, reinforcing the perspective of an attentional bias toward sexual stimuli, psychological experimental research has demonstrated that explicit sexual stimuli (e.g., visual cues) tend to capture automatic attention more effectively than non-sexual stimuli (Carvalho et al., 2018; Both et al., 2004).

Yet, if attention is not maintained and integrated at a conscious level, it is unlikely that sexual response is fully attained. As such, attention plays not only an important role in initiating sexual response, but also in the quality of sexual function (Barlow, 1986; Cera et al., 2020; De Jong, 2009; Tavares et al., 2020; Velten et al., 2021), which is characterized by the absence of

difficulties in progressing through the phases of sexual response (sexual desire, arousal, and orgasm), as well as subjective satisfaction with the frequency and outcomes of both individual and partnered sexual behaviour (Fielder, 2013). Consequently, sexual function is disrupted, when attention to sexual stimuli is impaired due to an inability to detect them at an implicit level or to an incapacity to consciously and deliberately maintain the attention on them. The aetiologies of lack of attention to sexual stimuli can be varied, but there is lack of research that examines them in a comprehensive manner. In this study, we aim to fill this gap by examining the association of sexual function, distress, and pleasure, with four potential sources of reduced attention to sexual stimuli: 1) inattention during sexual activity due to worries, 2) inattention due to competing interest in the smartphone, as happens with smartphone overuse, 3) general inattention, 4) reduced vividness of partner-focused mental imagery which relies on attention to internally-generated stimuli (Huang et al., 2023).

Worries during sexual activity

Higher-order cognitive processes play a pivotal role in shaping the quality of human sexuality (Tavares et al., 2020). Cognitive processes are central to the perception and interpretation of sexual stimuli, guiding attentional focus and modulating sexual responses through the activation of cognitive schemas and beliefs, which frequently operate at an automatic level. These schemas critically influence the relevance attributed to sexual stimuli, serving to either facilitate or inhibit sexual responses. Empirical evidence highlights the impact of cognitive interference on the attentional processing of sexual stimuli (Barlow, 1986; Nobre & Pinto-Gouveia, 2006). These models have demonstrated that cognitive distraction during sexual activity contribute to sexual difficulties by diverting attention away from erotic sensations. Unrealistic beliefs and negative expectations give rise to specific emotional states marked by heightened anxiety, which is closely linked to self-monitoring of sexual behaviour and responses, particularly during arousal (Wiegel et al., 2007). Due to inattention during sexual activity, individuals can easily lose the necessary focus to feel engaged and derive satisfaction from the interaction with the partner. In contrast, individuals with greater body awareness in sexual relations, i.e., positive attention to bodily sensations (e.g., like touch, breath), anchored to the present moment, tend to report increased levels of sexual desire, arousal, and satisfaction in their sexual experiences (Costa et al., 2016; Campos et al., 2019).

Two common distractors during sexual activity are worries about performance and body image (Carvalheira et al., 2017). These have been associated with impaired sexual function, lesser sexual satisfaction (Carvalheira et al., 2017; Costa et al., 2025; Pascoal et al., 2015;

Woertman & van den Brink, 2012), and greater sexual distress (Afshari et al., 2016; Costa et al., 2025; Horvath, et al., 2020; Woertman & van den Brink, 2012).

General inattention

Sexual disturbances may also result from a generalized inattention, as suggested by individuals with attention deficit hyperactivity disorder (ADHD) being more likely to experience sexual difficulties (Jabalkandi et al., 2020; Soldati et al., 2020). However, comorbidities with dysphoric states may explain this association and there is lack of studies on the topic. Beyond ADHD, there are also individual differences in proneness to distraction at a nonclinical level, and it is plausible that individuals who are generally more susceptible to distraction may experience detrimental effects on sexual functioning, as another domain of life influenced by inattention, although there is a dearth of research in this regard.

Smartphone overuse

Smartphone use has become a ubiquitous and frequent behaviour, constituting one possible specific source of distraction (Skowronek et al., 2023). Problematic smartphone use or smartphone addiction refer to patterns of use of smartphone with characteristics an addiction, including compulsive, uncontrolled use, and interference in social and daily-life activities. Although there is controversy among scholars whether these smartphone use patterns constitute an addiction, the extent to which problematic (or addictive) features occur is associated with inattention (Marty-Dugas et al., 2018; Panagiotidi & Overton, 2020). Problematic use of smartphone has also been associated to poorer sexual function (Fuzeiro et al., 2022). Problematic use of social media, commonly occurring through smartphones, has also been related to sexual difficulties (Alimoradi et al., 2019; Fekih-Romdhane, 2024; Fuzeiro et al., 2022; Pawlikowska et al., 2022), and its use on smartphones seems an important cause of distraction (Barnes et al., 2018). It has been discussed that one mechanism by which smartphones may disturb sexual function is reduced attention to partners (Fuzeiro et al., 2022), which aligns with studies showing that sexual and relationship dissatisfaction were associated with paying attention to the smartphone while being in the presence of the partner (“phubbing”) (Hipp & Carlson, 2021; Mushquash et al., 2022; Roberts & David, 2016). Given that problematic smartphone use on distraction may cause chronic impaired atention, including attention deficit hyperactivity disorder (ADHD) symptoms (Aydin et al., 2024; Boer et al., 2020; McNamee et al., 2021; Sihoe et al., 2023; Wang et al., 2024), it is plausible that

problematic smartphone use may adversely impact sexual function and well-being through a more general effect on attention (see section above), but that is not presently clear.

Imagination vividness and sexual function

Attention operates as a mechanism that encompasses both an external sensory component and an internal component directed toward mental processes in the absence of external stimuli (Chun et al., 2011). Internal attention is crucial in visual mental imagery (Benedek et al., 2016; Huang et al., 2023). Visual mental imagery refers to the capacity to visualize objects that are not currently present in the visual field, creating mental representations of them (Kosslyn et al., 2001). Mental imagery is not solely derived from the retrieval of previously experienced objects or events, but it can also emerge through the integration and reconfiguration of previous perceptual information, allowing for the generation of entirely new contents (Kosslyn et al., 2001).

The importance of mental imagery for sexual function is apparent in studies showing that sexual fantasies are positively associated with improved sexual functioning, particularly in the domains of sexual desire and arousal (Birnbaum et al., 2019; Costa, 2022, 2023; Langeslag & Davis, 2022; Nutter & Condron, 1983, 1985). Notably, experimental studies show that engaging in sexual fantasies about the partner leads to increased sexual desire (Birnbaum et al., 2019; Langeslag and Davis, 2022).

An important aspect of the role of attention to internally generated imagery is the vividness with which these images appear before mind's eye (Huang et al., 2023), that is, their clarity, brightness, or intensity. Some studies suggest that lack of vividness of sex-related or otherwise partner-related mental imagery may interfere with sexual function: subjective and erectile responses to sexual fantasies were found to be greater when the fantasies were more vivid (Koukounas & Over, 1997; Tokatlidis & Over, 1995), and sex guilt was related to lower vividness of sexual fantasies (Moreault and Follingstad, 1978), perhaps as a result sex guilt leading to reduced attention to sexual fantasy. These studies are congruent with another showing that general fantasy vividness was associated with greater sexual arousability not only during sexual fantasies (Koukounas & Over, 1997; Meuwissen & Over, 1991; Smith & Over, 1990a), but also in real life situations (Harris et al., 1980), perhaps because vividness enhances the arousing power of sexual and partner-focused fantasies. In this regard, an under-researched topic is the vividness of partner-focused fantasies in general, not only sexual (Busch et al., 2025), have on sexual function, as it is plausible having the partner in one's mind may promote

desire and intimacy with positive impact on relationship (Barelds & Dijkstra, 2011; Langeslag & Davis, 2022) and consequently on sex and sexual well-being. However, there is lack of research on vividness of partner-related imagery and sexual function, a gap the present study aims to address.

Study aim

The literature highlighted that attention directed toward sexual stimuli, whether sensorial or imagined, plays a crucial role in initiating and shaping the quality of the sexual response. In this study, we tested the independent contributions of general inattention, distractions during sexual activity caused by sexual worries, problematic smartphone use, and vividness of partner-focused mental imagery in predicting sexual function, sexual distress, and sexual pleasure in a non-clinical sample using a cross-sectional design.

Method

Participants and procedure

Five hundred and fifty-nine heterosexual adult Portuguese participated by completing an online survey, 453 women and 106 men after excluding 12 participants who did not fit the inclusion criteria, i.e., heterosexual adults having had sexual intercourse with the opposite sex on the past 4 four weeks. The average age was 27.92 (SD = 7.93; range: 18 – 65). The questionnaire was developed on the *Google Forms* platform and disseminated through paid advertisements on different platforms of the META. Descriptive statistics are presented in Table 1. As calculated by *G*Power* 3.1.9.7, a sample of 453 women has adequate power (.80) to detect an effect of r = .1313 (Cohen's d = .263) in simple correlations and an effect of f = .14636 (Cohen's d = .293) in regressions with six predictors. A sample of 106 men has sufficient power (.80) to detect an effect of r = .269 (Cohen's d = .538) in simple correlations and an effect of f = .3066 (Cohen's d = .613) in regressions with six predictors.

Table 1. Demographic information (*N* = 559)

Women *(n* = 453)	*N* (%) or Mean (SD)
Age (years)	27.53 (7.50)
Marital status	
Single	398 (87.9%)
Married	45 (9.9%)
Divorced	6 (1.3%)
Educational qualifications	
Middle school	1 (0.2%)
High school	101 (22.3%)
Undergraduate Master's	178 (39.3%)
Ph.D.	164 (36.2%)
	6 (1.3%)
Relationship characteristics	
Ongoing relationship	394 (87%)
Cohabiting	164 (36.2%)
Relationship duration (months)	69.30 (67.60)
Men (*n* = 106)	
Age (years)	29.58 (9.40)
Marital status	93 (87.7%)
Single	11 (10.4%)
Married	2 (1.9%)
Divorced	
Educational qualifications	
High school	34 (32.1%)

Undergraduate Master's	35 (%)
Ph.D.	35(%)
	1 (0.9%)
Relationship characteristics	
Ongoing relationship	90 (84.9%)
Cohabiting	50 (47.2%)
Relationship duration (months)	81.94 (103.27)

Table 2. Frequency of sexual behaviours (days in past month; $N = 559$)

Women *(n* = 453)	Mean (SD)
Penile-vaginal intercourse	7.16 (5.97)
Penile-vaginal orgasm with direct clitoral stimulation	4.57 (5.14)
Penile-vaginal orgasm without direct clitoral stimulation	2.38 (6.32)
Noncoital sex	5.10 (5.49)
Noncoital sex orgasm	3.79 (5.10)
Masturbation alone	4.09 (5.38)
Masturbation alone orgasm	3.92 (5.34)
Sexual fantasies	5.94 (7.31)
Men (*n* = 106)	
Penile-vaginal intercourse	7.97 (6.48)
Penile-vaginal intercourse orgasm	7.38 (6.27)
Noncoital sex	6.35 (6.34)
Noncoital sex orgasm	5.18 (6.30)
Masturbation alone	9.09 (7.89)
Masturbation alone orgasm	8.88 (7.91)
Sexual fantasies	12.38 (9.60)

Measures

Measures of sexual functioning, pleasure, and distress

Sexual functioning in women was assessed using the Female Sexual Function Index (FSFI) (Rosen et al., 2000; Pechorro et al., 2009), a self-report questionnaire designed to evaluate six dimensions of female sexual functioning: desire, arousal, lubrication, orgasm, satisfaction, and pain. The FSFI consists of 19 items, each rated on a 5-point Likert scale, with higher scores indicating better sexual functioning. The total score provides an overall measure of female sexual health. For male participants, sexual functioning was measured using the International Index of Erectile Function (IIEF) (Gomes & Nobre, 2012), a validated questionnaire that assesses five key dimensions: erectile function, intercourse satisfaction, overall sexual satisfaction, sexual desire, and orgasm. The Portuguese version of this instrument consists of 14 items, rated on a 5-point Likert scale, with higher scores indicating better sexual performance and satisfaction. The IIEF is commonly used in both clinical and research settings to evaluate erectile dysfunction and general male sexual health.

Symptoms of premature ejaculation were measured using the Premature Ejaculation Diagnostic Tool (Symonds et al., 2007), adapted into Portuguese by Berenguer et al. (2019). This tool consists of 5 items that assess the presence and severity of symptoms of premature ejaculation, with each item rated on a 0 to 4 Likert scale.

Sexual distress was evaluated in both men and women using the Sexual Distress Scale-Revised (SDS-R) – Portuguese Version (Tavares et al., 2022). This scale consists of 13 items that measure negative feelings related to sexual activity, including feelings of frustration, anxiety, guilt, and dissatisfaction. Each item is rated on a 5-point Likert scale, with higher scores reflecting greater levels of sexual distress.

Sexual pleasure was assessed using the Portuguese version of the Sexual Pleasure Scale (SPS) (Pascoal et al., 2016). The SPS is composed of three items that evaluate the level of sexual pleasure experienced across three key aspects of intimate relationships: sexual relationships, sexual activities, and sexual intimacy. While the original response format uses a 7-point scale ranging from 1 (not pleasurable at all) to 7 (very pleasurable), in the present study we applied the validated Portuguese variation, in which responses are rated from −3 (source of displeasure) to +3 (source of pleasure), with 0 as a neutral point. The total score therefore ranges from −9 to +9, with higher scores reflecting greater levels of sexual pleasure.

Additionally, participants reported the number of days in the previous month they engaged in sexual fantasies and various sexual behaviours, providing self-reported data on the frequency of these experiences.

Measures of general inattention, distraction due to sexual worries, problematic smartphone use, and partner-focused mental imagery vividness

General inattention was assessed with the inattention subscale of the Adult ADHD Self-Report Scale - ASRS (Kessler et al., 2005), which was translated and adapted for Portuguese use. The subscale comprises nine items evaluating difficulties such as paying attention to details, maintaining organization, remembering scheduled commitments, and the tendency to make careless mistakes as a result of distractibility. Responses are given on a 5-point Likert scale (0 = never to 4 = very often), and higher scores reflect greater inattentive symptomatology.

Distractions during sexual activity due to body image concerns and performance concerns were assessed with the Portuguese version of the Cognitive Distraction Scale (CDS), originally developed by Dove and Wiederman (2000). The CDS includes two dimensions: distraction based on body appearance and distraction based on sexual performance (Carvalheira et al., 2016). Participants rate their answers on a 6-point Likert scale (1 = Never to 6=Always), in which higher scores indicate greater cognitive distraction.

Problematic smartphone use was measured using the Portuguese adaptation (Água et al., 2017) of the Smartphone Addiction Scale – Short Version (SAS-SV), originally developed by Kwon et al. (2013). This instrument presents a unidimensional structure that captures problematic smartphone engagement across domains such as disruption of daily activities, withdrawal symptoms, preference for online interactions, and compulsive use. The scale comprises 10 items rated on a 6-point Likert scale (1 = “Strongly disagree” to 6 = “Strongly agree”), with higher scores reflecting more severe levels of smartphone-related problems.

The Vividness of Visual Imagery Questionnaire (Pinho et al., 2007) is a self-report measure designed to assess the clarity and vividness of mental images. Participants are asked to visualize specific scenes or objects and rate the vividness of their mental imagery on a 5-point Likert scale, ranging from 1 to 5. An adapted subscale was used for imagining one’s partner (whereas the original scale asks participants to imagine an acquaintance). Higher scores indicate greater vividness of visual imagery.

Dysphoria

Negative mood (dysphoria) was assessed using the Depression, Anxiety, and Stress Scale (DASS-21) – Portuguese version (Ribeiro et al., 2004). The DASS-21 is a self-report questionnaire designed to evaluate three dimensions of negative emotional states: depression, anxiety, and stress. The scale consists of 21 items with participants rating each item on a 4-point Likert scale, ranging from 0 ("Did not apply to me at all") to 3 ("Applied to me very much or most of the time"). Higher scores indicate greater levels of psychological distress in the respective domains. In the present study, we aggregated the three dimensions to create a measure of dysphoria (Osman et al., 2012; Tran et al., 2013).

Statistical Analysis

Pearson correlations and hierarchical multiple linear regressions predicting sexual function, distress, and pleasure, were performed. All the analyses were made separately for women and men. The differences between group analyses were conducted using parametric tests (independent samples t-test). Most variables exhibited an approximately normal distribution, falling within acceptable ranges for parametric testing Specifically, all skewness and kurtosis values were well within the conservative limits of |2| for skewness and |7| for kurtosis suggested by Kline (2011). Even when normality assumptions are not fully met, independent samples t-test remain preferable due to their greater statistical power and robustness when compared to the equivalent non-parametric test (Tsagris et al., 2019). Additionally, according to the Central Limit Theorem (CLT), as sample sizes increase, the sampling distribution of the mean approximates normality regardless of the underlying distribution of the data (Marôco, 2021), further justifying the use of parametric methods. Independent samples t-tests were performed with Welch's correction, when the assumption of homogeneity of variances was violated, ensuring a more reliable comparison between groups.

Hierarchical multiple regressions were performed to predict sexual distress, sexual function, and sexual pleasure from age, dysphoria (sum of depression, anxiety and stress), general inattention (Block 1), problematic smartphone use (entered in Block 2), sexual worries (entered in Block 3), and partner-focused imagination vividness (entered in Block 4). In these analyses, worries about body image and performance were combined into a single variable, justified by their strong intercorrelation (see Table 3) and their shared role as self-focused concerns during sexual activity, reflecting the extent to which individuals experience intrusive thoughts that interfere with sexual experiences.

Results

Table 3 shows correlations between the independent variables. For both men and women, partner-focused imagination vividness showed a negative correlation with body appearance worries. General inattention was positively correlated with body appearance worries, sexual performance worries, problematic smartphone use, and dysphoria, in both men and women. Body appearance worries and sexual performance worries exhibited a strong correlation with each other. Problematic smartphone use was positively associated with body appearance worries, sexual performance worries, and dysphoria in both men and women. Sexual performance worries were positively correlated with dysphoria both in men and women.

Table 3. Correlation matrix between independent variables ($N = 559$).

	1	2	3	4	5	6
	r (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)
				Men (*n* = 106)		
1. Partner-focused imagination vividness		.06	-.19*	-.12	-.13	.01
2. General Inattention	-.09		.19*	.39***	.62***	.56***
3. Body appearance worries	-.23***	.26***		.65***	.45***	.41***
4. Sexual performance worries	-.28***	.31***	.71***		.42***	.51***
5. Problematic smartphone use	-.07	.38***	.20***	.28***		.46***
6. Dysphoria	-.11*	.46***	.36***	.41***	.30***	
				Women (*n* = 453)		

Note: *** $p \leq .001$; ** $p \leq .01$; * $p \leq .0$.

Dysphoria is the sum of depression, anxiety, and stress subscales of the DASS-21.

Table 4 presents independent t-tests comparing men and women across independent variables. Results show that men reported significantly higher levels of general inattention. Women reported significantly higher body appearance worries. Men reported significantly higher sexual performance worries. No significant differences were found between men and women in partner-focused imagination vividness, problematic smartphone use, or dysphoria.

Table 4. Independent samples T-test between men and women.

	Men		Women					
	M	*SD*	*M*	*SD*	*df*	*t*	*p*	*Cohen's d*
Partner-focused imagination vividness[1]	9.29	2.58	9.51	2.26	144.809	-.799	.426	-.09
General Inattention[1]	17.84	7.37	15.65	6.16	141.277	2.840	.005	.34
Body appearance worries	21.08	11.77	24	12.47	557	-2.187	.029	-.24
Sexual performance worries	34.51	11.07	31.51	11.38	557	2.460	.007	.27
Problematic smartphone use	25.20	9.85	25.05	10.22	557	.137	.446	.02
Dysphoria	14.62	12.09	15.59	10.71	557	-.816	.415	-.09

[1]Welch test is reported because Levene's test indicated that the homogeneity of variances assumption was not met for this variable.

As displayed in Table 5, among women, partner-focused imagination vividness was positively correlated with desire, arousal, lubrication, orgasm, satisfaction, sexual pleasure, less pain, and global sexual function. In contrast, it was negatively correlated with sexual distress. General inattention was negatively correlated with arousal, lubrication, orgasm, satisfaction, and less pain, while it was positively correlated with sexual distress and global sexual function. Body appearance and performance worries were negatively correlated with desire, arousal,

lubrication, orgasm, satisfaction, sexual pleasure, less pain, and global sexual function, while they were positively correlated with sexual distress. Problematic smartphone use was negatively correlated with arousal, lubrication, orgasm, satisfaction, less pain, and global sexual function, while it was positively correlated with sexual distress.

As shown in Table 5, among men, partner-focused imagination vividness was positively correlated with desire, erectile function, orgasm, intercourse satisfaction, overall satisfaction, and global sexual function, and negatively correlated with sexual distress. General inattention was negatively correlated with overall satisfaction, while it was positively correlated with sexual distress. Body appearance worries were negatively correlated with desire, erectile function, intercourse satisfaction, overall satisfaction, and global sexual function, while they were positively correlated with sexual distress. Sexual performance worries were negatively correlated with desire, erectile function, intercourse satisfaction, overall satisfaction, and global sexual function, while they were positively correlated with sexual distress. Problematic smartphone use was negatively correlated with desire, erectile function, intercourse satisfaction, overall satisfaction, and global sexual function, while it was positively correlated with sexual distress. Ejaculation (PEDT scores) did not show significant correlations with any variable except for sexual performance worries.

Table 5. Pearson's correlations between male and female sexual function, partner-focused imagination vividness, general inattention, body appearance worries, sexual performance worries and problematic smartphone use.

	Partner-focused imagination vividness *r* (*p*)	General Inattention *r* (*p*)	Body appearance Worries *r* (*p*)	Sexual performance Worries *r* (*p*)	Problematic smartphone use *r* (*p*)
Women (*n*=453)					
Desire	.15**	-.075	-.14**	-.14**	-.05
Arousal	.20***	-.21***	-.28***	-.26***	-.18***
Lubrification	.11*	-.16***	-.12**	-.20***	-.12*
Orgasm	.23***	-.21***	-.25***	-.29***	-.18**
Satisfaction	.29***	-.21***	-.22***	-.28***	-.22***
Less pain	.11*	-.10*	-.18***	-19***	-.11*
Global Sexual function (FSFI total score)	.26***	-.22***	-.28***	.32**	-.20***
Sexual pleasure	.11**	-.06	-.16***	-13**	-.01
Sexual distress	-.21***	.27***	.36***	.48***	.32***
Men (*n*=106)					
Desire	.35***	-.17	-.22*	-.27**	-.33***
Erectile Function	.25**	-.14	-.36***	-.36***	-.20**
Orgasm	.27**	-.24**	-.13	-.33***	-.26**
Intercourse Satisfaction	.29**	-.33***	-.24**	-.36***	-.31**
Overall Satisfaction	.38***	-.02	-.22*	-.28**	-.29**

Global Sexual Function (IIEF total score)	.34***	-.22**	-.30**	-.39***	-.32***
Ejaculation (PEDT)	-.01	.07	.12	.22**	-.02
Sexual Pleasure	.15	-.03	-.05	-.03	-.19*
Sexual Distress	-.27**	.17	.41***	.48***	.35***

Table 6 and Table 7 present hierarchical multiple regressions predicting sexual distress in women and men across four blocks of predictors. For women, in the final block, sexual distress was independently predicted by worries during sexual activity, greater problematic smartphone use, and lower partner-focused imagination vividness. Dysphoria remained a significant predictor across all blocks, consistently contributing to the explained variance in sexual distress. For men, in the final block, sexual distress was independently predicted by more worries during sexual activity and lower vividness of partner-focused imagination. Problematic smartphone use, while a significant predictor in the second block, was no longer a significant predictor in after sexual worries having entered the model.

Table 6. Hierarchical multiple regression predicting women's sexual distress.

Predictors			
Block 1	**β**	***p***	***R^2***
Age	.03	.488	.14
Dysphoria	.31	<.001	
General inattention	.12	.014	
Block 2	**β**	***p***	***R^2***
Age	.05	.287	.18
Dysphoria	.28	<.001	
General inattention	.05	.325	
Problematic smartphone use	.23	<.001	

Block 3	**β**	***p***	***R²***
Age	.05	.217	.20
Dysphoria	.18	<.001	
General inattention	.02	.685	
Problematic smartphone use	.18	<.001	
Sexual worries	.32	<.001	
Block 4	**β**	***p***	***R²***
Age	.05	.258	.27
Dysphoria	.17	<.001	
General inattention	.02	.720	
Problematic smartphone use	.18	<.001	
Sexual worries	.30	<.001	
Partner-focused imagination vividness	-.11	.012	

Dysphoria is the sum of anxiety, depression, and stress; Sexual worries are the sum of body appearance worries and sexual performance worries.

Table 7. Hierarchical multiple regression predicting men's sexual distress.

Predictors			
Block 1	**β**	***p***	***R²***
Age	.11	-261	.07
Dysphoria	.28	.015	
General inattention	.04	.731	
Block 2	**β**	***p***	***R²***
Age	.14	.147	.15
Dysphoria	.22	.049	
General inattention	-.15	.232	
Problematic smartphone use	.38	.002	
Block 3	**β**	***p***	***R²***
Age	.10	.255	.23
Dysphoria	.06	.642	
General inattention	-.07	.541	
Problematic smartphone use	.22	.075	
Sexual worries	.38	<.001	
Block 4	**β**	***p***	***R²***
Age	0.98	.267	.26
Dysphoria	.07	.551	
General inattention	-.04	.738	
Problematic smartphone use	.18	.140	
Sexual worries	.35	.001	
Partner-focused imagination vividness	-.18	.039	

Dysphoria is the sum of anxiety, depression, and stress; Sexual worries are the sum of body appearance worries and sexual performance worries.

Table 8 and Table 9 present hierarchical multiple regressions predicting sexual function in women and men across four blocks of predictors. For women, in the final block, sexual function was independently predicted by lower dysphoria, fewer worries during sexual activity, and greater vividness of partner-focused imagination. Dysphoria, while a consistently significant predictor across blocks, showed a diminished effect by the last block. For men, in the final block, sexual function was independently predicted by greater vividness of partner-focused imagination and lower dysphoria. Problematic smartphone use, while significant predictors in the second block, lost predictive power when sexual worries entered the model.

Table 8. Multiple regression predicting women's global sexual function (total FSFI score).

Predictors			
Block 1	**β**	***p***	***R^2***
Age	-.08	.102	.09
Dysphoria	-.25	<.001	
General inattention	-.11	.032	
Block 2	**β**	***p***	***R^2***
Age	-.08	.069	.10
Dysphoria	-.24	<.001	
General inattention	-.07	.175	
Problematic smartphone use	-.12	.019	
Block 3	**β**	***p***	***R^2***
Age	-.09	.054	.14
Dysphoria	-.16	.002	
General inattention	-.05	.328	
Problematic smartphone use	-.09	.074	
Sexual Worries	-.22	<.001	
Block 4	**β**	***p***	***R^2***
Age	-.08	.075	.17

Dysphoria	-.16	.002
General inattention	-.05	.361
Problematic smartphone use	-.09	.078
Sexual Worries	-.18	<.001
Partner-focused imagination vividness	.19	<.001

Dysphoria is the sum of anxiety, depression, and stress; Sexual worries are the sum of body appearance worries and sexual performance worries.

Table 9. Multiple regression predicting men's global sexual function (total IIEF score)

Predictors			
Block 1	**β**	***p***	***R²***
Age	-.09	.348	.11
Dysphoria	-.36	.002	
General inattention	-.04	.750	
Block 2	**β**	***p***	***R²***
Age	-.11	.230	.15
Dysphoria	-.32	.005	
General inattention	.10	.431	
Problematic smartphone use	-.26	.030	
Block 3	**β**	***p***	***R²***
Age	-.10	.276	.17
Dysphoria	-.23	.063	
General inattention	.07	.576	
Problematic smartphone use	-.18	.157	
Sexual Worries 2**	-.21	.067	
Block 4	**β**	***p***	***R²***
Age	-.11	.223	.25

Dysphoria	-.25	.032
General inattention	.03	.788
Problematic smartphone use	-.12	.320
Sexual Worries	-.18	.100
Partner-focused imagination vividness	.31	< .001

Dysphoria is the sum of anxiety, depression, and stress; Sexual worries are the sum of body appearance worries and sexual performance worries.

Table 10 and 11 presents a hierarchical multiple regression analysis predicting women's and men's sexual pleasure across four blocks of predictors. For women, greater sexual pleasure was predicted by lesser dysphoria and fewer worries during sexual activity. For men, greater sexual pleasure was predicted by less problematic smartphone use and marginally by greater general inattention (p = .056).

Table 10. Multiple regression predicting women's sexual pleasure.

Predictors			
Block 1	**β**	***p***	***R²***
Age	-.08	.106	.02
Dysphoria	-.15	.006	
General inattention	.03	.632	
Block 2	**β**	***p***	***R²***
Age	-.08	.113	.01
Dysphoria	-.15	.006	
General inattention	.02	.730	
Problematic smartphone use	.02	.712	
Block 3	**β**	***p***	***R²***
Age	-.08	.104	.02
Dysphoria	-.11	.049	
General inattention	.03	.582	

Problematic smartphone use	.04	.502	
Sexual Worries	-.12	.022	
Block 4	**β**	***p***	***R²***
Age	-.08	.119	.03
Dysphoria	-.11	.051	
General inattention	.03	.561	
Problematic smartphone use	.04	.489	
Sexual Worries	-.11	.050	
Partner-focused imagination vividness	.08	.120	

Dysphoria is the sum of anxiety, depression, and stress; Sexual worries are the sum of body appearance worries and sexual performance worries.

Table 11. Multiple regression predicting men's sexual pleasure.

Predictors			
Block 1	**β**	***p***	***R²***
Age	-.04	.665	-.02
Dysphoria 1	-.12	.312	
General inattention	.09	.471	
Block 2	**β**	***p***	***R²***
Age	-.07	.492	.05
Dysphoria	-.07	.575	
General inattention	.26	.053	
Problematic smartphone use	-.34	.007	
Block 3	**β**	***p***	***R²***
Age	-.08	.432	.05
Dysphoria	-.12	.370	
General inattention	.28	.039	

Problematic smartphone use	-.39	.004	
Sexual Worries 2	.11	.343	
Block 4	**β**	***p***	***R²***
Age	-.08	.446	.05
Dysphoria	-.12	.338	
General inattention	.27	.056	
Problematic smartphone use	-.37	.008	
Sexual worries	.13	.280	
Partner-focused imagination vividness	.10	.296	

Dysphoria is the sum of anxiety, depression, and stress; Sexual worries are the sum of body appearance worries and sexual performance worries.

Discussion

The findings of this study provide valuable insights into how general inattention, distraction during sex due to sexual worries, problematic smartphone use, and vividness of imagination shape sexual function, sexual distress, and sexual pleasure. Consistent with prior research, these results highlight the intricate interplay between attentional and imaginal processes in sexual health, while also noting potential differences between men and women in these dynamics.

Clinical populations with ADHD tend to experience greater sexual difficulties (Jabalkandi et al., 2020; Soldati et al., 2020) and, in the present study with a nonclinical sample, it was found that, in simple correlations, general inattention correlates with poorer sexual function and greater sexual distress in both men and women. However, in the current non-clinical sample, higher levels of generalized inattention did not predict poorer sexual functioning or increased sexual distress when negative mood and problematic smartphone use were controlled for, something that the previous investigation on the relationships between adult ADHD and sexual functioning did not do. However, it is possible that inattention may not be severe enough to significantly disrupt sexual responses the current non-clinical sample. For men, higher levels of generalized inattention, were even a marginally significant predictor (p = .056) of greater sexual pleasure in the hierarchical regression analysis. This occurred after controlling for problematic smartphone use, which was a significant predictor of lower sexual pleasure and highlights the role that smartphone-driven general attentional disengagement may

have in the ability to fully experience sexual pleasure (a topic which is further discussed below). This also suggests that, when the effects of smartphone-driven general inattention and negative mood are controlled, inattention is not harmful for sexual function, at least in nonclinical samples.

Intriguingly, some traits underlying general inattention may even have benefits to sexual pleasure, especially in men. A possible such trait is the propensity to became fascinated (or attentionally absorbed) by external events and creations of the imagination, which may come at the cost in inattention to one's surroundings (Biederman et al., 2019; Soukup et al., 2010; Tellegen & Atkinson, 1979). The plausibility of this mechanism is supported by a study showing that self-forgetfulness, an index of propensity for attentional absorption, was positively related to men's desire and frequency of partnered sexual activity (Costa et al., 2018), while women's self-forgetfulness was associated with higher sexual desire but was unrelated to partnered sex frequency (Costa et al., 2016, 2018). The fact that, after controlling for partner-focused visual imagery vividness, general inattention lost some of its predictive effect on male sexual pleasure supports this possibility, since greater visual imagery vividness is a common characteristic of individuals with a higher tendency for states of attentional absorption and, as confirmed in the present study, may favour sexual function (Costa et al., 2018, 2024; Peleka et al., 1985). This is a topic that has received little attention, and this proposed explanation must be considered rather speculative until more research is done.

Results are consistent with the notion that distraction due to sexual concerns, particularly concerns with body image and performance anxiety, plays a critical role in sexual function, distress, and pleasure, perhaps with distinct effects in men and women. These findings reaffirm the disruptive nature of attentional interference on sexual well-being, where cognitive distractions during sexual activity impair the ability to remain engaged in erotic sensations and increase sexual distress. For women, lower levels of sexual worries during sexual activity were associated with better sexual function, higher sexual pleasure and lower sexual distress, in both simple correlations and multiple regressions. These results align with prior evidence highlighting the pivotal role of attentional focus in sustaining arousal and satisfaction (Barlow, 1986; Tavares et al., 2020). In simple correlations, men's sexual worries were significantly associated with greater sexual distress and better sexual function, but not with sexual pleasure. In hierarchical multiple regression models, sexual worries predicted greater sexual distress, but not sexual function, after other predictors having entered the model, including negative mood and problematic smartphone use. This raises attention to the possibility that dysphoric mood

and many internet contents are causing concerns related to body image and sexual performance that impact negatively on sexual functioning, and that might be more deleterious to men's sexual functioning. It is possible that men's sexual worries would be a significant predictor of sexual function with a larger male sample size, but it is worth noting that previous cross-country research in Europe found that body image concerns were not a significant predictor of reduced sexual desire in men (Carvalheira et al., 2015).

In simple correlations, problematic smartphone use was associated with poorer sexual function and greater sexual distress in men and women, and with lesser sexual pleasure in men, which is consistent with previous research showing associations between poorer sexual function and greater sexual distress with problematic smartphone use (Fuzeiro et a., 2022) and problematic social media use (Alimoradi et al., 2019; Costa et al., 2023; Fekih-Romdhane et al., 2024; Fuzeiro et al., 2022; Pawlikowska et al., 2022). By the last block of the hierarchical multiple regressions, problematic smartphone use emerged as a significant predictor of sexual distress in women, and of lesser sexual pleasure in men.

Several studies strongly suggest that heavy use of social media apps, commonly used in smartphones (Hunt et al., 2018; Lambert et al., 2018; Tromholt, 2016; Turel et al., 2018), may lead to dysphoric mood and thereby negatively impact sexuality (Fuzeiro et al., 2022). However, in multiple regressions, we found that problematic smartphone use was a significant predictor of poorer sexual outcomes, independently of negative mood suggesting that that smartphone-driven dysphoria is does not wholly explain possible untoward effects of smartphones sexual well-being. Although in simple correlations, it was possible to confirm that problematic smartphone is related to general inattention, problematic smartphone use predicted greater sexual distress and lesser sexual pleasure, in independently of general inattention, which, as discussed above, was never a significant predictor of greater distress or lower pleasure. It is possible that excessive engagement with smartphones can contribute to the disruption of attentional focus on specific aspects of reality and ultimately, interfere with the ability to fully engage in and derive pleasure from sexual experiences; this may include to less attention to partners by means of phubbing (Hipp & Carlson, 2021; Mushquash et al., 2022) and even less attention to internal bodily sensations reducing interoceptive awareness (Wallman-Jones et al., 2023), which is important for sexual function and well-being (Berenguer et al., 2019). Also, dysfunctional relationship dynamics may also arise from particular patterns of social media use that foster jealousy, partner monitoring, and partner violence (Arikewuyo et al., 2021; Emond et al., 2023; Frampton & Fox, 2018; Tandon et al., 2021), not forgetting

that monitoring a partner location is also possible by the geolocation applications on smartphones.

Notably, problematic smartphone use did not predict male and female sexual function and male sexual distress, but only after sexual worries (and dysphoria) having entered the model. As noted above, prolonged use of smartphones might expose users to many internet contents that increase insecurities related to body image and sexual performance (Costa et al., 2023), which on their turn impact sexual function adversely (Carvalheira et al., 2017; Woertman & van den Brink, 2012). Men who frequently see online pornography often might be more likely to have lower sexual desire for partnered sex (Carvalheira et al., 2015), although aetiology here is unclear. This is an important matter for future research.

Vividness of imagination focused on the sexual partner emerged as a key predictor of sexual outcomes for both men and women. This highlights the importance of mental imagery vividness in facilitating sexual arousal (Harris et al., 1980; Koukounas & Over, 1997; Meuwissen & Over, 1991; Smith and Over, 1990a,b; Tokatlidis & Over, 1995). Given that sexual fantasies may increase sexual desire for partner (Birnbaum et al., 2019; Langeslag & Davis, 2022), it is plausible that the vividness with which the mental images are formed is a relevant factor here. For men, vividness of imagination was the most robust predictor of sexual function, underscoring its critical role in enhancing sexual arousal and satisfaction. This supports prior research emphasizing the role of mental imagery and fantasy in men's sexual response. A key contribution of this study is the identification of vividness of imagination as a central variable positively associated with sexual function and negatively associated with sexual distress. This finding is consistent with less vivid sexual fantasies being associated with higher sexual guilt (Moreault & Follingstad, 1978) and builds on existing literature by emphasizing the quality and vividness of mental imagery, rather than merely its frequency, as a crucial component in enhancing sexual experiences and reducing distress (Costa, 2022, 2023). Training sexual imagery was shown to increase both vividness and erectile responses to fantasy in men (Smith & Over, 1990b). Future studies should seek to expand these by testing if partner-focused mental imagery training, not necessarily sexual fantasies, leads to better sexual outcomes in men and women, and whether this is mediated partner-focused mental imagery vividness

The study had a correlational design, which precludes causal inferences. Other limitations include the reliance on self-reported data and convenience character of the sample, which design should be addressed in future research. Longitudinal and experimental designs

could provide more nuanced insights into the causal relationships between these mechanisms and sexual outcomes.

Conclusion

This study highlights the critical roles of worries about body image and performance during sex, problematic smartphone use and vividness of partner-focused imagination in influencing sexual function, distress, and pleasure. By identifying these factors, the findings pave the way for targeted interventions that prioritize attentional focus during sexual activity, avoidance of smartphone overuse and partner-focused imagination vividness, offering a more comprehensive approach to enhancing sexual health and well-being.

References

Afshari, P., Houshyar, Z., Javadifar, N., Pourmotahari, F., & Jorfi, M. (2016). The relationship between body image and sexual function in middle-aged women. *Electronic Physician, 8*(11), 3302–3308. https://doi.org/10.19082/3302

Água, J., Patrão, I., & Leal, I. (2017). SAS-SV: Estudo da validação da escala de dependência do smartphone numa amostra da população portuguesa [Study of validation of the smartphone addiction scale in a sample of the Portuguese population]. In Atas do II Congresso Ibérico de Psicologia Clínica e da Saúde (pp. 102–114). Lisboa, Portugal: ISPA – Instituto Universitário.

Alimoradi, Z., Lin, C. Y., Imani, V., Griffiths, M. D., & Pakpour, A. H. (2019). Social media addiction and sexual dysfunction among Iranian women: The mediating role of intimacy and social support. *Journal of Behavioral Addictions, 8*(2), 318–325. https://doi.org/10.1556/2006.8.2019.24

Arikewuyo, A. O., Efe-Özad, B., Dambo, T. H., Abdulbaqi, S. S., & Arikewuyo, H. O. (2021). An examination of how multiple use of social media platforms influence romantic relationships. *Journal of Public Affairs, 21*(3), e2240. https://doi.org/10.1002/pa.2240

Aydin, T., Parris, B. A., Arabaci, G., & Demirci, I. (2024). Trait-level non-clinical ADHD symptoms in a community sample and their association with technology addictions. *Current Psychology, 43*(15), 10682–10692. https://doi.org/10.1007/s12144-023-05203-x

Barelds, D. P. H., & Dijkstra, P. (2011). Positive illusions about a partner's personality and relationship quality. *Journal of Research in Personality, 45*(1), 37–43. https://doi.org/10.1016/j.jrp.2010.11.009

Barnes, S. J., Pressey, A. D., & Scornavacca, E. (2018). Mobile ubiquity: Understanding the relationship between cognitive absorption, smartphone addiction and social network services. *Computers in Human Behavior, 90*, 246–258. https://doi.org/10.1016/j.chb.2018.09.013

Barlow, D. H. (1986). Causes of sexual dysfunction: The role of anxiety and cognitive interference. *Journal of Consulting and Clinical Psychology, 54*(2), 140–148. https://doi.org/10.1037/0022-006X.54.2.140

Berenguer, C. Rebôlo, C, & Costa, R. M. (2019). Interoceptive awareness, alexithymia, and sexual function. *Journal of Sex & Marital Therapy, 45*, 729-738. https://doi.org/10.1080/0092623X.2019.1610128

Benedek, M., Jauk, E., Beaty, R. E., Fink, A., Koschutnig, K., & Neubauer, A. C. (2016). Brain mechanisms associated with internally directed attention and self-generated thought. *Scientific Reports, 6*, Article 22959. https://doi.org/10.1038/srep22959

Biederman, J., Lanier, J., DiSalvo, M., Noyes, E., Fried, R., Woodworth, K. Y., Biederman, I., & Faraone, S. v. (2019). Clinical correlates of mind wandering in adults with ADHD. *Journal of Psychiatric Research, 117*, 15–23. https://doi.org/10.1016/j.jpsychires.2019.06.012

Birnbaum, G. E., Kanat-Maymon, Y., Mizrahi, M., Recanati, M., & Orr, M. (2019). What fantasies can do to your relationship: The effects of sexual fantasies on couple interactions. *Personality & Social Psychology Bulletin, 45*, 461-476. https://doi.org/10.1177/0146167218789611

Boer, M., Stevens, G., Finkenauer, C., & van den Eijnden, R. (2020). Attention deficit hyperactivity disorder-symptoms, social media use intensity, and social media use problems in adolescents: Investigating directionality. *Child Development, 91*(4), e853–e865. https://doi.org/10.1111/cdev.13334

Both, S., Everaerd, W., & Laan, E. (2007). Desire emerges from excitement: A psychophysiological perspective on sexual motivation. In E. Janssen (Ed.), *The Psychophysiology of Sex* (pp. 327–339). Indiana University Press.

Both, S., Spiering, M., Everaerd, W., & Laan, E. (2004). Sexual behavior and responsiveness to sexual stimuli following laboratory-induced sexual arousal. *Journal of Sex Research, 41*(3), 242–258. https://doi.org/10.1080/00224490409552232

Busch, T. M., Goodwin, G. J., Dempsey, M. R., & Wright, J. (2025). Exploring the impact of fantasizing on romantic relationships and attachment. *Sexuality & Culture, 29*(2), 610–635. https://doi.org/10.1007/s12119-024-10289-x

Campos, P., Wittmann, M., & Costa, R. M. (2021). Sexual function, personality, and body awareness. *Psicologia, Saúde & Doenças, 22*(2), 411–422. https://doi.org/10.15309/21psd220208

Carvalheira, A., Godinho, L., & Costa, P. (2017). The impact of body dissatisfaction on distressing sexual difficulties among men and women: The mediator role of cognitive distraction. *Journal of Sex Research*. https://doi.org/10.1080/00224499.2016.1168771

Carvalheira, A., Træen, B., & Štulhofer, A. (2014). Correlates of men's sexual interest: A cross-cultural study. *Journal of Sexual Medicine, 11*, 154–164. https://doi.org/10.1111/jsm.12345

Carvalheira, A., Træen, B., & Stulhofer, A. (2015). Masturbation and pornography use among coupled heterosexual men with decreased sexual desire: How many roles of masturbation? *Journal of Sex & Marital Therapy, 41*(6), 626–635. https://doi.org/10.1080/0092623X.2014.958790

Carvalho, J., Czop, O., Rocha, M., Nobre, P., & Soares, S. (2018). Gender differences in the automatic attention to romantic vs. sexually explicit stimuli. *The Journal of Sexual Medicine, 15*(8), 1083–1092. https://doi.org/10.1016/j.jsxm.2018.06.008

Cera, N., Castelhano, J., Oliveira, C., Carvalho, J., Quinta Gomes, A. L., Peixoto, M. M., Pereira, R., Janssen, E., Castelo-Branco, M., & Nobre, P. (2020). The role of anterior and posterior insula in male genital response and in visual attention: An exploratory multimodal fMRI study. *Scientific Reports, 10*(1), 18463. https://doi.org/10.1038/s41598-020-74681-x

Childress, A. R., Ehrman, R. N., Wang, Z., Li, Y., Sciortino, N., Hakun, J., Jens, W., Suh, J., Listerud, J., Marquez, K., Franklin, T., Langleben, D., Detre, J., & O'Brien, C. P. (2008). Prelude to passion: Limbic activation by "unseen" drug and sexual cues. *PLOS One, 3*(1), e1506. https://doi.org/10.1371/journal.pone.0001506

Chun, M. M., Golomb, J. D., & Turk-Browne, N. B. (2011). A taxonomy of external and internal attention. *Annual Review of Psychology, 62*, 73–101. https://doi.org/10.1371/journal.pone.0001506

Costa, I.B.; Rosa, P.J.; Pascoal, P.M. (2025). Exploring the roles of body dissatisfaction, cognitive distraction, and age in sexual distress related to sexual function and sexual satisfaction in men: an extended understanding using a moderated mediation model. *Healthcare, 13*, 843. https://doi.org/10.3390/healthcare13070843

Costa, R. M. (2022). Sexual fantasies. In T. K. Shackelford (Ed.), The Cambridge handbook of evolutionary perspectives on sexual psychology (Vol. 3, Female sexual adaptations, pp. 209–240). *Cambridge University Press*. https://doi.org/10.1017/9781108943567.011

Costa, R. M. (2023). Sexual fantasies: and sexual functioning/desire. In: Shackelford, T.K. (eds) *Encyclopedia of Sexual Psychology and Behavior*. Springer, Cham. https://doi.org/10.1007/978-3-031-08956-5_2203-1

Costa, R.M. (2024). Sexual Fantasies: Spirituality and Mysticism. In: Shackelford, T.K. (eds) *Encyclopedia of Sexual Psychology and Behavior*. Springer, Cham. https://doi.org/10.1007/978-3-031-08956-5_2210-1

Costa, R. M., Pestana, J., & Costa, D. (2018). Self-transcendence, sexual desire, and sexual frequency. *Journal of Sex & Marital Therapy, 44*(1), 56-60. https://doi.org/10.1080/0092623X.2017.1314397

Costa, R. M., Pestana, J., Costa, D., & Wittmann, M. (2016). Altered states of consciousness are related to higher sexual responsiveness. *Journal of Sexual Medicine, 13*(7), 1047–1058. https://doi.org/10.1080/0092623X.2015.1113591

Costa, R. M., Oliveira, T. F., Pestana, J., & Costa, D. (2016). Self-transcendence is related to higher female sexual desire. *Personality and Individual Differences, 96*, 191-197. https://doi.org/10.1016/j.paid.2016.02.078

Costa, R. M., Pimenta, F., Ferreira-Valente, A., & Patrão, I. (2023). Social media addiction is associated with sexual dissatisfaction: A cross-sectional study with quota sampling in Portugal [Preprint]. *OSF Preprints*. https://doi.org/10.31219/osf.io/eb9c7

De Jong, D. C. (2009). The role of attention in sexual arousal: Implications for treatment of sexual dysfunction. *Journal of Sex Research, 46*(2–3), 237–248. https://doi.org/10.1080/00224490902747230

Dove, N. L., & Wiederman, M. W. (2000). Cognitive distraction and women's sexual functioning. *Journal of Sex & Marital Therapy, 26*(1), 67–78. https://doi.org/10.1080/009262300278650

Emond M, Vaillancourt-Morel MP, Métellus S, Brassard A, Daspe ME. Social media jealousy and intimate partner violence in young adults' romantic relationships: a longitudinal study. *Telemat Inform 2023*; 79: 101956. https://doi.org/10.1016/j.tele.2023.101956

Fekih-Romdhane, F., Haddad, P., Roukoz, R., Barakat, M., Gerges, S., Malaeb, D., Obeid, S., & Hallit, S. (2024). Does loneliness mediate the association between social media use disorder and sexual function in Lebanese university students? *International Journal of Environmental Health Research, 34*(3), 1835–1846. https://doi.org/10.1080/09603123.2023.2248005

Fielder, R. (2013). Sexual functioning. In M. D. Gellman & J. R. Turner (Eds.), *Encyclopedia of Behavioral Medicine*. Springer. https://doi.org/10.1007/978-1-4419-1005-9_668

Frampton, J. R., & Fox, J. (2018). Social media's role in romantic partners' retroactive jealousy: Social comparison, uncertainty, and information seeking. *Social Media + Society, 4*(3). https://doi.org/10.1177/2056305118800317

Fuzeiro, V., Martins, C., Gonçalves, C., Rolo Santos, A., & Costa, R. M. (2022). Sexual function and problematic use of smartphones and social networking sites. *Journal of Sexual Medicine*. https://doi.org/10.1016/j.jsxm.2022.05.004

Gillath, O., & Canterberry, M. (2012). Neural correlates of exposure to subliminal and supraliminal sexual cues. *Social Cognitive and Affective Neuroscience, 7*(8), 924–936. https://doi.org/10.1093/scan/nsr065

Gomes, A. L. Q., & Nobre, P. (2012). The International Index of Erectile Function (IIEF-15): Psychometric properties of the Portuguese version. *Journal of Sexual Medicine, 9*(1), 180–187. https://doi.org/10.1111/j.1743-6109.2011.02467.x

Harris, R., Yulis, S., & LaCoste, D. (1980). Relationships among sexual arousability imagery, and introversion-extroversion. *Journal of Sex Research, 16*,72–86. https://doi.org/10.1080/00224498009551063

Hipp, C. J., & Carlson, R. G. (2021). The dyadic association among technoference and relationship and sexual satisfaction of young adult couples. *Journal of Sex & Marital Therapy, 47*(5), 508–520. https://doi.org/10.1080/0092623X.2021.1922562

Horvath, Z., Smith, B. H., Sal, D., Hevesi, K., & Rowland, D. L. (2020). Body image, orgasmic response, and sexual relationship satisfaction: Understanding relationships and establishing typologies based on body image satisfaction. *Sexual Medicine, 8*(4), 740–751. https://doi.org/10.1016/j.esxm.2020.06.008

Huang, J. Y., Xue, X. J., Wang, Z. X., Li, Z. F., Rui-Su, Wang, N. N., Huang, X. Y., Li, H., Ma, H. L., Liu, M., & Zhang, D. L. (2023). The relationship between attention networks and

individual differences in visual mental imagery vividness: An EEG study. *Neuropsychologia, 191*, 108736. https://doi.org/10.1016/j.neuropsychologia.2023.108736

Hunt, M. G., Marx, R., Lipson, C., & Young, J. (2018). No more FOMO: Limiting social media decreases loneliness and depression. *Journal of Social and Clinical Psychology, 37*(10), 751- 768. https://doi.org/10.1521/jscp.2018.37.10.751

Jabalkandi, S. A., Raisi, F., Shahrivar, Z., Mohammadi, A., Meysamie, A., Firoozikhojastefar, R., & Irani, F. (2020). A study on sexual functioning in adults with attention-deficit/hyperactivity disorder. *Perspectives in Psychiatric Care, 56*(3), 642–648. https://doi.org/10.1111/ppc.12480

Kessler, R. C., Adler, L., Ames, M., Demler, O., Faraone, S., et al. (2005). The World Health Organization Adult ADHD Self-Report Scale (ASRS): A short screening scale for use in the general population. *Psychological Medicine, 35*(2), 245–256. https://doi.org/10.1017/S0033291704002892

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). The Guilford Press.

Kosslyn, S. M., Ganis, G., & Thompson, W. L. (2001). Neural foundations of imagery. *Nature Reviews Neuroscience, 2*(9), 635–642. https://doi.org/10.1038/35090055

Koukounas, E., & Over, R. (1997). Allocation of attentional resources during habituation and dishabituation of male sexual arousal. *Archives of Sexual Behavior, 28*(6), 539–552. https://doi.org/10.1023/A:1018769200845

Kwon, M., Kim, D. J., Cho, H., & Yang, S. (2013). The smartphone addiction scale: Development and validation of a short version for adolescents. *PLOS ONE, 8*(12), e83558. https://doi.org/10.1371/journal.pone.0083558

Lambert, J., Barnstable, G., Minter, E., Cooper, J., & McEwan, D. (2022). Taking a one-week break from social media improves well-being, depression, and anxiety: A randomized controlled trial. *Cyberpsychology, Behavior and Social Networking, 25*(5), 287–293. https://doi.org/10.1089/cyber.2021.032

Langeslag, S., & Davis, L. L. (2022). A preliminary study on up-regulation of sexual desire for a long-term partner. *The Journal of Sexual Medicine, 19*(5), 872–878. https://doi.org/10.1016/j.jsxm.2022.02.017

Marôco, J. (2021). Análise estatística com o SPSS Statistics: Versões 18 a 27 (8ª ed.). *ReportNumber.*

Marty-Dugas, J., Ralph, B. C. W., Oakman, J. M., & Smilek, D. (2018). The relation between smartphone use and everyday inattention. *Psychology of Consciousness: Theory, Research, and Practice, 5*(1), 46–62. https://doi.org/10.1037/cns0000131

McNamee, P., Mendolia, S., & Yerokhin, O. (2021). Social media use and emotional and behavioural outcomes in adolescence: Evidence from British longitudinal data. *Economics and Human Biology, 41*, 100992. https://doi.org/10.1016/j.ehb.2021.100992

Meuwissen, I., & Over, R. (1991). Multidimensionality of the content of female sexual fantasy. *Behaviour Research and Therapy, 29*(2), 179–189. https://doi.org/10.1016/0005-7967(91)90046-6

Moreault, D., & Follingstad, D. R. (1978). Sexual fantasies of females as a function of sex guilt and experimental response cues. *Journal of Consulting and Clinical Psychology, 46*, 1385-1393. 1385–1393. https://doi.org/10.1037/0022-006X.46.6.1385

Mushquash, A. R., Charlton, J. K., MacIsaac, A., & Ryan, K. (2022). Romance behind the screens: Exploring the role of technoference on intimacy. *Cyberpsychology, Behavior and Social Networking, 25*(12), 814–820. https://doi.org/10.1089/cyber.2022.0068

Nobre, P. J., & Pinto-Gouveia, J. (2006). Dysfunctional sexual beliefs as vulnerability factors for sexual dysfunction. *Journal of Sex Research, 43*(1), 68–75. https://doi.org/10.1080/00224490609552300

Nutter, D. E., & Condron, M. K. (1983). Sexual fantasy and activity patterns of females with inhibited sexual desire versus normal controls. *Journal of Sex & Marital Therapy*, *9*(4), 276–282. https://doi.org/10.1080/00926238308410914

Nutter, D. E., & Condron, M. K. (1985). Sexual fantasy and activity patterns of males with inhibited sexual desire and males with erectile dysfunction versus normal controls. *Journal of Sex & Marital Therapy, 11*(2), 91–98. https://doi.org/10.1080/00926238508406074

Oei, N. Y., Rombouts, S. A., Soeter, R. P., van Gerven, J. M., & Both, S. (2012). Dopamine modulates reward system activity during subconscious processing of sexual stimuli. *Neuropsychopharmacology, 37*(7), 1729–1737. https://doi.org/10.1038/npp.2012.19

Osman, A., Wong, J. L., Bagge, C. L., Freedenthal, S., Gutierrez, P. M., & Lozano, G. (2012). The Depression Anxiety Stress Scales—21 (DASS-21): Further examination of dimensions, scale reliability, and correlates. *Journal of Clinical Psychology, 68*(12), 1322–1338. https://doi.org/10.1002/jclp.21908

Panagiotidi, M., & Overton, P. (2022). Attention deficit hyperactivity symptoms predict problematic mobile phone use. *Current Psychology, 41*(5), 2765–2771. https://doi.org/10.1007/s12144-020-00785-2

Pascoal, P. M., Raposo, C. F., & Oliveira, L. B. (2015). Predictors of body appearance cognitive distraction during sexual activity in a sample of men with ED. *International Journal of Impotence Research, 27*, 103–107. https://doi.org/10.3390/ijerph17217864

Pascoal, P. M., Sanchez, D. T., Raposo, C. F., & Pechorro, P. (2016). Initial validation of the Sexual Pleasure Scale in clinical and non-clinical samples of partnered heterosexual people. *Journal of Sexual Medicine, 13*(9), 1408–1413. https://doi.org/10.1016/j.jsxm.2016.06.010

Pashler, H., Johnston, J. C., & Ruthruff, E. (2001). Attention and performance. *Annual Review of Psychology, 52*, 629–651. https://doi.org/10.1146/annurev.psych.52.1.629

Pawlikowska, A., Szuster, E., Kostrzewska, P., Mandera, A., Biernikiewicz, M., Sobieszczańska, M., Rożek-Piechura, K., Markiewicz, M., Rusiecka, A., & Kałka, D. (2022). Internet addiction and Polish women's sexual functioning: The role of social media, online pornography, and game use during the COVID-19 pandemic - Online surveys based on FSFI and BSMAS questionnaires. *International Journal of Environmental Research and Public Health, 19*(13), 8193. https://doi.org/10.3390/ijerph19138193

Pechorro, P., Diniz, A., Almeida, S., & Vieira, R. (2009). Validação portuguesa do Índice de Funcionamento Sexual Feminino (FSFI). *Laboratório de Psicologia, 7*, 33–44. https://doi.org/10.14417/lp.684

Pekala, R. J., Wenger, C. F., & Levine, R. L. (1985). Individual differences in phenomenological experience: States of consciousness as a function of absorption. *Journal of Personality and Social Psychology, 48*(1), 125–132. https://doi.org/10.1037/0022-3514.48.1.125

Pinho, M. S., Simões, M. R., Beato, M. S., & Díez, E. (2007). Questionário de vivacidade de imagens visuais - Versão revista (VVIQ-RV). In M. R. Simões, C. Machado, M.

Gonçalves, & L. Almeida (Eds.), *Avaliação psicológica: Instrumentos validados para a população portuguesa* (Vol. 3, pp. 187–201). Quarteto.

Ribeiro, J. L. P., Honrado, A. A. J. D., & Leal, I. P. (2004). Contribuição para o estudo da adaptação portuguesa das Escalas de Ansiedade, Depressão e Stress (EADS) de 21 itens de Lovibond e Lovibond. *Psicologia, Saúde & Doenças, 5*(2), 229–239.

Roberts, J. A., & David, M. E. (2016). My life has become a major distraction from my cell phone: Partner phubbing and relationship satisfaction among romantic partners. *Computers in Human Behavior, 54*, 134–141. https://doi.org/10.1016/j.chb.2015.07.058

Sihoe, C. E., Mueller, U., & Liu, S. (2023). Perceived smartphone addiction predicts ADHD symptomatology in middle school adolescents: A longitudinal study. *Computers in Human Behavior Reports, 12*, 100335. https://doi.org/10.1016/j.chbr.2023.100335

Skowronek, J., Seifert, A., & Lindberg, S. (2023). The mere presence of a smartphone reduces basal attentional performance. *Scientific Reports, 13*(1), 9363. https://doi.org/10.1038/s41598-023-36256-4

Smith, D., & Over, R. (1990a). Male sexual arousal as a function of the content and the vividness of erotic fantasy. *Psychophysiology, 24*(3), 334–339. https://doi.org/10.1111/j.1469-8986.1987.tb00304.x

Smith, D., & Over, R. (1990b). Enhancement of fantasy-induced sexual arousal in men through training in sexual imagery. *Archives of Sexual Behavior, 19*(5), 477–489. https://doi.org/10.1007/BF02442349

Soldati, L., Bianchi-Demicheli, F., Schockaert, P., Köhl, J., Bolmont, M., Hasler, R., & Perroud, N. (2020). Sexual function, sexual dysfunctions, and ADHD: A systematic literature review. *The Journal of Sexual Medicine, 17*(9), 1653–1664. https://doi.org/10.1016/j.jsxm.2020.03.019

Soukup, J., Papežová, H., Kuběna, A. A., & Mikolajová, V. (2010). Dissociation in non-clinical and clinical sample of Czech adolescents. Reliability and validity of the Czech version of the Adolescent Dissociative Experiences Scale. *European Psychiatry, 25*(7), 390–395. https://doi.org/10.1016/j.eurpsy.2010.03.011

Spiering, M., & Everaerd, W. (2007). The sexual unconscious. In E. Janssen (Ed.), *The psychophysiology of sex* (pp. 166–184). Indiana University Press.

Symonds, T., Perelman, M. A., Althof, S., Giuliano, F., Martin, M., May, K., & Morris, M. (2007). Development and validation of a premature ejaculation diagnostic tool. *European Urology, 52*(3), 565–573. https://doi.org/10.1016/j.eururo.2007.01.028

Tandon, A., Dhir, A., & Mäntymäki, M. (2021). Jealousy due to social media? A systematic literature review and framework of social media-induced jealousy. *Internet Research, 31*(5), 1541–1582. https://doi.org/10.1108/INTR-02-2020-0103

Tavares, I. M., Moura, C. V., & Nobre, P. J. (2020). The role of cognitive processing factors in sexual function and dysfunction in women and men: A systematic review. *Sexual Medicine Reviews, 8*(4), 512–530. https://doi.org/10.1016/j.sxmr.2020.03.002

Tavares, I. M., Santos-Iglesias, P., & Nobre, P. J. (2022). Psychometric validation of the Sexual Distress Scale in male and female Portuguese samples. *The Journal of Sexual Medicine, 19*(5), 834–845.

Tellegen, A., & Atkinson, G. (1974). Openness to absorbing and self-altering experiences ("absorption"), a trait related to hypnotic susceptibility. *Journal of Abnormal Psychology, 83*(3), 268–277. https://doi.org/10.1037/h0036681

Tokatlidis, O., & Over, R. (1995). Imagery, fantasy, and female sexual arousal. *Australian Journal of Psychology*, *47*(2), 81–85. https://doi.org/10.1080/00049539508257504

Tran, T. D., Tran, T., & Fisher, J. (2013). Validation of the Depression Anxiety Stress Scales (DASS-21) as a screening instrument for depression and anxiety in a rural community-based cohort of northern Vietnamese women. *BMC Psychiatry, 13*, 24. https://doi.org/10.1186/1471-244X-13-24

Tromholt, M. (2016). The facebook experiment: Quitting facebook leads to higher levels of well-being. *Cyberpsychology, Behavior and Social Networking, 19*(11), 661–666. https://doi.org/10.1089/cyber.2016.025

Tsagris, M., Alenazi, A., Verrou, K.-M., & Pandis, N. (2019). Hypothesis testing for two population means: Parametric or non-parametric test? *Journal of Applied Statistics, 46*(15), 2821–2838. https://doi.org/10.48550/arXiv.1812.11361

Turel, O., Cavagnaro, D. R., & Meshi, D. (2018). Short abstinence from online social networking sites reduces perceived stress, especially in excessive users. *Psychiatry Research, 270*, 947–953. https://doi.org/10.1016/j.psychres.2018.11.017

Velten, J., Milani, S., Margraf, J., & Brotto, L. A. (2021). Visual attention and sexual arousal in women with and without sexual dysfunction. *Behaviour Research and Therapy, 144*, Article 103915. https://doi.org/10.1016/j.brat.2021.103915

Wallman-Jones, A., Nigg, C., Benzing, V., Schimdt, M. (2023). Leave the screen: the influence of everyday behaviors on self-reported interoception. *Biological Psychology, 181*, 108600. https://doi.org/10.1016/j.biopsycho.2023.108600

Wang, J. L., Yin, X. Q., Wang, H. Z., King, D. L., & Rost, D. H. (2024). The longitudinal associations between internet addiction and ADHD symptoms among adolescents. *Journal of Behavioral Addictions, 13*(1), 191–204. https://doi.org/10.1556/2006.2023.00080

Wiegel, M., Scepkowski, L. A., & Barlow, D. H. (2007). Cognitive-affective processes in sexual arousal and sexual dysfunction. In E. Janssen (Ed.), *The Psychophysiology of Sex* (pp. 143–165). Indiana University Press.

Woertman, L., & van den Brink, F. (2012). Body image and female sexual functioning and behavior: A review. *Journal of Sex Research, 49*(2–3), 184–211. https://doi.org/10.1080/00224499.2012.658586

3

Chapter 3: A test of longitudinal predictors of female sexual function, pleasure, and distress: Inattention due to sexual worries, general inattention, problematic smartphone use and partner-focused imagery vividness

This chapter is based on the paper

Campos, P., Leal, I., & Costa, R. M. (2025). A test of longitudinal predictors of female sexual function, pleasure, and distress: Inattention due to sexual worries, general inattention, problematic smartphone use and partner-focused imagery vividness. Manuscript submitted for publication.

Chapter 3: A test of longitudinal predictors of female sexual function, pleasure, and distress: Inattention due to sexual worries, general inattention, problematic smartphone use and partner-focused imagery vividness

Abstract

Sexual functioning depends on the capacity to maintain attention on erotic stimuli, whether external or internally generated. However, few studies have longitudinally explored how specific forms of inattention influence sexual outcomes. This study investigated whether sexual worries (with performance and body image during sexual activity), problematic smartphone use (a common source of distraction process), general inattention, and partner-focused mental imagery vividness (a feature strongly dependent on internally generated attention), predict changes in sexual functioning, sexual distress, and sexual pleasure over a one-month period. A longitudinal study was conducted with 134 heterosexual Portuguese women who completed online surveys at two time points (T1 and T2), separated by one month. Hierarchical multiple regression models were used to predict sexual function, distress, and pleasure at T2. Independent variables assessed at T1 included age, dysphoria, general inattention, sexual worries, problematic smartphone use, partner-focused imagination vividness, and in separate regressions, sexual function, distress, or pleasure at T1. Problematic smartphone use at T1 predicted poorer sexual function and lower sexual pleasure at T2. Partner-focused imagination vividness at T1 predicted greater sexual pleasure and lesser sexual distress at T2. General inattention and sexual worries did not emerge as longitudinal predictors. Across all outcomes, baseline levels of sexual function, distress and pleasure were the strongest predictors, reflecting their temporal stability. While problematic smartphone use appears to undermine sexual functioning and pleasure, partner-focused imagination vividness may buffer against distress and enhance sexual function. These mechanisms represent promising targets for future interventions and research aimed at promoting sexual health.

Keywords:

Attention; sexual functioning; sexual distress; sexual pleasure; imagination vividness; problematic smartphone use; sexual worries longitudinal study

Introduction

Sexual function and attention: from automatic attention to conscious control

Sexual response is the result of a complex and intricate network of evolutionary, neurophysiological, cognitive, behavioural, and environmental mechanisms (Calabrò et al., 2019). Although typically triggered by external stimuli, such as sexual cues, it can also be initiated by internal stimuli, such as thoughts, mental images, or fantasies (Costa, 2022). Thus, the ability to attend (voluntarily or involuntarily) to sexual stimuli, whether perceptual or imagined, plays a significant role in human sexual functioning (Costa, 2022; Tavares et al., 2020). Attention is responsible for selecting, modulating, and maintaining focus on the most relevant information provided by sensory inputs and perceptions to guide behaviour. Taxonomically, can be divided into external and internal (Chun et al., 2011). External attention typically operates as a bottom-up, stimulus-driven process, while internal attention is generally a top-down process involving cognitive control over representations in working memory and long-term memory (Chun et al., 2011).

Contemporary models propose that sexual motivation can be initiated unconsciously, through automatic attentional biases toward sexual cues, which prime the organism for sexual behaviour even before conscious awareness (Both et al., 2007; Childress et al., 2008; Gillath & Canterberry, 2011; Oei et al., 2012; Spiering & Everaerd, 2007). However, conscious attention is essential to sustain desire and integrate cognitive and emotional processes that shape sexual experience (Janssen & Bancroft, 2007; Nobre & Pinto-Gouveia, 2008). Across models, sexual desire emerges from the dynamic interplay between automatic reactivity and conscious appraisal, guided by cognitive interpretations, beliefs, and emotional states (Barlow, 1986; Basson, 2000; Janssen & Bancroft, 2007; Toates, 2009). These attentional mechanisms are fundamental not only to the initiation of desire and arousal but also to the overall quality of sexual functioning and satisfaction (Barlow, 1986; De Jong, 2009; Tavares et al., 2020; Velten et al., 2021).

Independent of its aetiologies, lack of attention to sexual stimuli has been linked to a diminished quality of sexual functioning (Tavares et al., 2020). When attentional engagement with sexual stimuli is disrupted, whether due to difficulties in implicitly detecting these cues or to an inability to consciously and deliberately sustain attention, sexual functioning may be compromised. Although the underlying causes of attentional deficits in sexual contexts are multifactorial, comprehensive empirical research exploring these mechanisms remains scarce.

The present study specifically examined three potential sources of attentional disruption: (1) distraction during sexual activity stemming from sexual worries related to body image and performance; (2) problematic smartphone use, a common source of inattention; (3) generalized inattention, and (4) reduced partner-focused mental imagery vividness, a feature highly dependent on internal attention (Huang et al., 2023).

Sexual Worries

One cognitive mechanism that exemplifies attentional disruption during sexual activity is worry, particularly in relation to body image and sexual performance, which emerges as a particularly salient contributor. Worry is defined as a pattern of abstract thinking involving a cascade of thoughts and images speculating on uncertain future outcomes (Borkovec, 1994). Worries related to body appearance and sexual performance have been consistently linked to heightened cognitive distraction during sexual activity, increased sexual distress, and reduced sexual function quality (Carvalheira et al., 2017; Woertman & van den Brink, 2012; Yamamiya et al., 2006). Faith and Schare (1993) observed that negative body image fosters self-spectatoring during sex – where an individual's attentional focus shifts inward, centring on self-critique rather than the erotic experience itself. Conversely, evidence suggests that women with a more positive body image report better sexual function (Ackard et al., 2001), and individuals who report greater bodily awareness during sexual activity, presumably less affected by the cognitive interference of worries, are more likely to report higher levels of sexual desire, arousal, and satisfaction (Costa et al., 2016; Campos et al., 2019).

General inattention

Broad attentional impairments, such as generalized inattention, have likewise been associated to disruptions on sexual functioning. Research shows that individuals with higher levels of inattentiveness, such as those with attention deficit hyperactivity disorder (ADHD), are more likely to experience sexual difficulties (Jabalkandi et al., 2020; Soldati et al., 2020), though this relationship may often be influenced by comorbid conditions. Outside of ADHD cases, there are individual differences in the proneness to distraction, and it is possible that individuals more susceptible to distraction in general, even if at a nonclinical level, may experience negative impacts on sexual functioning, as another aspect of life that is affected by inattention. Excessive inattention would hinder ability to maintain the focus required to feel engaged in, and derive satisfaction from, sexual activity. As a result, feelings of disconnection from partners would ensue, leading to frustration. When attention is compromised, sustaining

sexual desire and arousal or achieving orgasm becomes increasingly challenging. Furthermore, inattention during sexual interactions can adversely affect the partner, potentially damaging intimacy and elevating the likelihood of sexual response dysfunctions (Soldati et al., 2020). However, there is little research on associations between general inattention and sexual difficulties and well-being in the nonclinical population, something the present study seeks to address.

Smartphone overuse

Another prominent and increasingly relevant source of attentional interference is the frequent and compulsive use of smartphones. Their widespread presence has made them a common source of distraction (Skowronek et al., 2023). When smartphone use becomes compulsive, interfering with daily routines and interpersonal relationships, it can be classified as problematic. Although the classification of such behaviour as an "addiction" remains debated, it is well-established that problematic use is associated with attentional deficits (Marty-Dugas et al., 2018; Panagiotidi & Overton, 2020). This type of usage has also been linked to poorer sexual functioning and greater sexual distress (Fuzeiro et al., 2022). Moreover, problematic social media use, a common reason for using smartphones (Kuss & Griffiths, 2017) and an important source of distraction when using them (Barnes et al., 2018) has also been linked to poorer sexual functioning, greater sexual dissatisfaction, and greater sexual distress (Alimoradi et al., 2019; Fekih-Romdhane, 2024; Pawlikowska et al., 2022; Costa et al., 2023). A potential explanation is that excessive smartphone use competes with attention directed toward the partner, reducing intimacy and interfering with communication, which could negatively impact sexual function. This is supported by evidence showing associations of lesser sexual and relationship satisfaction with attending to one's phone in the presence of a partner (phubbing the partner) or having the partner doing the same (being phubbed by the partner (Hipp & Carlson, 2021; Mushquash et al., 2022; Roberts & David, 2016). Moreover, considering the potential effects of problematic smartphone use on attentional difficulties in general, including ADHD symptoms (Aydin et al., 2024; Boer et al., 2020; McNamee et al., 2021; Sihoe et al., 2023; Wang et al., 2024), it is also plausible that excessive smartphone use could negatively affect sexual function and well-being via its broader impact on attention (see section above); however, this relationship remains uncertain.

Imagination vividness and internal attention

Attention functions as a mechanism that integrates both an external sensory aspect, focusing on stimuli from the environment, and an internal aspect, which involves mental processes in the absence of external input (Chun et al., 2011), such as imagination. Mental imagery is the ability to mentally visualize objects that are not present in the immediate visual field, forming sensory-like mental representations of them. This cognitive skill is critical to various mental processes (Kosslyn et al., 2001), and research indicates that individuals with more vivid imaginations tend to perform better across a range of cognitive tasks (Keogh & Pearson, 2014). Interestingly, some studies suggest that enhanced sexual fantasy vividness is beneficial for sexual function and well-being.

Importantly, beyond the frequency of sexual fantasies, the vividness of these mental images appears to play a potentially significant role in shaping their effectiveness in eliciting desire, arousal and enhancing sexual experience. Vividness refers to the clarity, brightness, and perceptual intensity with which mental images are experienced, essentially, how distinctly they appear in the mind's eye (Huang et al., 2023). This dimension of mental imagery has been identified as a crucial indicator of attentional engagement with internally generated content (Huang et al., 2023). Evidence suggests that diminished vividness of sex-related imagery may negatively impact sexual functioning. For instance, erectile and subjective sexual responses have been found to be stronger when sexual fantasies are more vivid (Koukounas & Over, 1997; Tokatlidis & Over, 1995), and individuals reporting higher levels of sexual guilt tend to experience lower vividness in sexual fantasies, potentially due to a reduced willingness to attend to such imagery (Moreault & Follingstad, 1978). Similarly, greater general vividness of mental imagery has been linked to increased sexual arousability (Harris et al., 1980; Koukounas & Over, 1997; Meuwissen & Over, 1991; Smith & Over, 1990a), possibly because more vivid fantasies amplify the affective and physiological response to erotic content. It is also possible that fantasizing about the partner in general, not only sexually, has benefits for sexual life (Busch et al., 2025), and the vividness with which this is done may play an important role, since positive partner-focused fantasies could enhance relationship quality (Barelds & Dijkstra, 2011; Langeslag & Davis, 2022), which in turn may influence sexual activity and well-being. However, this is not presently clear.

Study Aim

Attention plays a critical role in the quality of sexual functioning, as it facilitates the perception and processing of sexual stimuli, supports arousal, and sustains engagement in sexual experiences. Individuals who can sustain focus on multimodal sexual or erotic stimuli (i.e., stimuli engaging multiple senses) during sexual interactions tend to exhibit better sexual functioning. Research has consistently shown that attentional focus toward erotic cues enhances both subjective and physiological aspects of sexual arousal, while attentional distractions can significantly impair sexual response (Barlow, 1986; Nobre & Pinto-Gouveia, 2006; Tavares et al., 2020).

Although non-experimental longitudinal designs cannot provide strong evidence of causal effects, they can at least demonstrate temporal precedence, a characteristic of causal pathways. Thus, this prospective study aimed to investigate, within a non-clinical sample of women, whether distractions due to sexual worries, problematic smartphone use, general inattention, and partner focused vividness of imagination, a feature of mental imagery highly dependent on attention to internally-generated stimuli (Huang et al., 2023), predict changes in sexual functioning, sexual distress, and sexual pleasure over a one-month period.

Method

Participants

One hundred and thirty-four heterosexual Portuguese women participated in a longitudinal design study by completing an online survey in two different moments, separated by a one-month interval. This is a subsample on which Study 1 was based, comprised by respondents who accepted to complete again the questionnaire one month later.

Descriptive statistics are presented In Tables 12 and 13. The questionnaire was developed on the *Google Forms* platform and disseminated through paid advertisements on different platforms of the META group. A sample size of 134 has adequate power (.80) to detect an effect of $r = .2392$ (Cohen's $d = .493$) in simple correlations and an effect of $f = .338$ (Cohen's $d = .676$) in regressions with seven predictors (calculated by *G*Power.3.1.9.7* software), which are included in the statistical approach of the present study. The final sample was obtained after excluding eight participants who didn't fit the inclusion criteria, i.e., had sexual intercourse on the past four weeks. Additionally, 15 male participants were excluded from the dataset. This decision was based on both methodological and statistical considerations: the small number of

male participants did not provide sufficient statistical power for conducting separate regression analyses (see Appendix E for supplementary analyses).

Table 12. Descriptive statistics (N =134)

	N (%) or Mean (SD)
Age (years)	5.45 7.44)
Marital status	
Single	118 (88.1%)
Married	15 (11.2%)
Divorced	0 (0%)
Educational qualifications	
High school	22 (16.4%)
Undergraduate	57 (42.5%)
Master's	52 (38.8%)
Ph.D.	2 (1.5%)
Relationship characteristics	
Ongoing relationship	116 (86.6%)
Cohabiting	51 (38.1%)
Relationship duration (months)	68.72 (68.30)

Table 13. Descriptive statistics of sexual response (days in past month; *N* =134)

T1	Mean (SD)
Penile-vaginal intercourse	6.96 (5.66)
Penile-vaginal orgasm with direct clitoral stimulation	4.01 (4.24)
Penile-vaginal orgasm without direct clitoral stimulation	2.68 (9.69)
Noncoital sex	4.75 (4.88)
Noncoital sex orgasm	3.84 (5.07)
Masturbation alone	3.87 (4.73)
Masturbation alone orgasm	4.57 (5.89)
Sexual fantasies	5.41 (7.28)
T2	
Penile-vaginal intercourse	6.50 (5.99)
Penile-vaginal orgasm with direct clitoral stimulation	4.15 (4.86)
Penile-vaginal orgasm without direct clitoral stimulation	1.62 (3.29)
Noncoital sex	4.18 (5.09)
Noncoital sex orgasm	3.59 (5.04)
Masturbation alone	3.89 (4.68)
Masturbation alone orgasm	4.63 (5.94)
Sexual fantasies	5.45 (6.94)

Measures

Measures of sexual functioning, pleasure, and distress

Sexual functioning in women was assessed using the Female Sexual Function Index (FSFI) (Rosen et al., 2000; Pechorro et al., 2009), a self-report questionnaire designed to assess six dimensions of female sexual functioning: desire, arousal, lubrication, orgasm, satisfaction, and pain. The FSFI consists of 19 items, each rated on a 5-point Likert scale, with higher scores indicating better sexual functioning. The total score provides an overall measure of female sexual health.

Sexual distress was evaluated using the Sexual Distress Scale-Revised (SDS-R) – Portuguese Version (Tavares et al., 2022). This scale consists of 13 items that measure distress

related to sexual activity, including feelings of frustration, anxiety, guilt, and dissatisfaction. Each item is rated on a 5-point Likert scale, with higher scores reflecting greater levels of sexual distress.

Sexual pleasure was assessed using the Portuguese version of the Sexual Pleasure Scale (SPS) (Pascoal et al., 2016). The SPS is composed of three items that evaluate the level of sexual pleasure experienced across three key aspects of intimate relationships: sexual relationships, sexual activities, and sexual intimacy. In its original version, the SPS employs a 7-point response format ranging from 1 (*not pleasurable at all*) to 7 (*very pleasurable*). In the current study, we used the validated Portuguese adaptation, where responses are scored from −3 (*source of displeasure*) to +3 (*source of pleasure*), with 0 as a neutral midpoint. Consequently, total scores vary from −9 to +9, with higher values indicating greater sexual pleasure.

Additionally, participants reported the number of days in the previous month they engaged in sexual fantasies and various sexual behaviours, providing self-reported data on the frequency of these experiences.

The male subsample completed the International Index of Erectile Function (Gomes & Nobre, 2012) and the Premature Ejaculation Diagnostic Tool (Symonds et al., 2007) instead of the FSFI, but this is not pertinent for the present study.

Measures of general inattention, distraction due to sexual worries, problematic smartphone use, and partner-focused mental imagery vividness

General inattention was measured using the inattention subscale of the Adult ADHD Self-Report Scale (Kessler et al., 2005), translated and adapted into Portuguese. It consists of 9 items that assess an adult's difficulty in focusing on details, staying organized, remembering appointments, as well as the tendency to make careless mistakes due to inattentiveness or distraction. Each item is rated on a 5-point Likert scale, ranging from 0 (never) to 4 (very often), with higher scores indicating greater levels of inattention.

Distractions during sexual activity due to body image concerns and performance concerns were assessed with the Portuguese version of the Cognitive Distraction Scale (CDS) (Carvalheira et al., 2017), originally developed by Dove and Wiederman (2000). The CDS includes two dimensions: distraction based on body appearance and distraction based on sexual performance. Participants rate their answers on a 6-point Likert scale (1 = Never to 6=Always), in which higher scores indicate greater cognitive distraction.

Problematic smartphone use was assessed with the Portuguese version (Água et al., 2017) of Smartphone Addiction Scale – Short Version (SAS-SV), originally developed by Kwon et al. (2013). The SAS-SV has a unidimensional structure assessing problematic smartphone usage through symptoms such as daily-life disturbance, withdrawal, cyberspace-oriented relationships, and compulsive use. Participants respond to 10 items using a 6-point Likert-type scale ranging from 1 ("Strongly disagree") to 6 ("Strongly agree"), in which higher scores indicate greater severity of smartphone addiction.

The Vividness of Visual Imagery Questionnaire (Pinho et al., 2007) is a self-report measure designed to assess the clarity and vividness of mental images. Participants are asked to visualize specific scenes or objects and rate the vividness of their mental imagery on a 5-point Likert scale, ranging from 1 to 5. An adapted subscale was used for imagining one's partner (whereas the original scale asks participants to imagine an acquaintance). Higher scores indicate greater vividness of visual imagery.

Dysphoria

Dysphoria was assessed using the Depression, Anxiety, and Stress Scale (DASS-21) – Portuguese version (Ribeiro et al., 2004). The DASS-21 is a self-report questionnaire designed to evaluate three dimensions of negative emotional states: depression, anxiety, and stress. The scale consists of 21 items (DASS-21), with participants rating each item on a 4-point Likert scale, ranging from 0 ("Did not apply to me at all") to 3 ("Applied to me very much or most of the time"). Higher scores indicate greater levels of psychological distress in the respective domains. In the present study, we combined the three dimensions to create a single measure of dysphoria (Osman et al., 2012; Tran et al., 2013).

Statistical Analysis

Data was analysed using IBM SPSS Statistics (version 30.0). Pearson correlations were conducted to explore associations between variables. The study employed a longitudinal design, in which participants completed self-report measures at two distinct time points, T1 and T2, separated by an interval of one month. This design allowed for the investigation of temporal associations between the attentional predictors and later sexual outcomes. A series of hierarchical multiple linear regression analyses were conducted. The goal was to determine whether variables measured at T1 could significantly predict outcomes assessed at T2, thus providing stronger support for potential causal pathways than cross-sectional data would allow. The dependent variables, measured at T2, were sexual function, sexual distress, and sexual

pleasure. The independent variables, all measured at T1, included: age, dysphoria (the composite of anxiety, depression and stress), general inattention, sexual worries (composite of body image and performance concerns due to strong covariance), problematic smartphone use, partner-focused vividness of imagination, and, when applicable, sexual function, distress or pleasure at T1 for controlling for their temporal stability. These predictors were entered into the regression models in successive blocks to examine their incremental contribution to the explained variance in each outcome.

Results

Table 14 displays the correlation matrix for all study variables assessed at T1 and T2.

At both T1 and T2, poorer sexual function and greater sexual distress correlated with more worries during sexual activity, more problematic smartphone use, and lesser partner-focused imagination vividness. Correlations sexual pleasure and sexual variables were more inconsistent; sexual pleasure correlated with greater partner-focused imagination vividness, more worries with body appearance, and more problematic smartphone use at T2. General inattention was mostly uncorrelated with sexual function, pleasure, and distress, only correlating with poorer sexual function at T2. Almost all variables demonstrated strong temporal stability (that is strong correlations between T1 and T2 assessments). Only pleasure at T1 correlated moderately with pleasure at T2.

Table 14. Correlation matrix between study variables in T1 and T2 (N =134).

	Vividness of partner-focused Imagination T1	General Inattention T1	Body Appearance Worries T1	Performance Worries T1	Problematic smartphone use T1	Sexual Function T1	Sexual Distress T1	Sexual Pleasure T1	Vividness of partner-focused Imagination T2	General Inattention T2	Body Appearance Worries T2	Performance Worries T2	Problematic smartphone use T2	Sexual Function T2	Sexual Distress T2	Sexual Pleasure T2
	r (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)
Vividness of partner-focused Imagination T1	-	.10	-.28***	-.19*	-.01	.26**	-.22**	.07	.76***	.06	-.29***	-.16*	-.13	.27**	-.28***	.27***
General Inattention T1		-	.18`*	.27***	.30***	-.12	.12	-.03	.06	.78***	.14	.20**	.28***	-.10	.11	-.07
Body Appearance Worries T1			-	.66***	.16*	-.20*	.21**	-.06	-.22**	.18*	.85***	.55***	.17*	-.16	.18*	-.18*
Performance Worries T1				-	.29***	-.27**	.43***	-.05	-.24**	.21**	.51***	.69***	.25**	-.26**	.34***	-.18*
Problematic smartphone use T1					-	-.19*	.31***	.01	-.01	.29***	.10	.24**	.77***	-.25**	.31***	-.14
Sexual Function T1						-	-74***	.35***	.27**	-.13	-.26**	.23**	-.19*	.85***	-.72***	.61***
Sexual Distress T1							-	-.21**	-.29***	.14	.18*	.27***	.26***	-.68***	.84***	-.47***
Sexual Pleasure T1								-	.01	.02	-.17*	-.07	.01	.33***	-.24**	.34***

Vividness of partner-focused Imagination T2	-	.02	-.21**	-.13	-.07	.32***	-.32***	.26**
General Inattention T2		-	.15	.20**	.40***	-.19*	.16	-.12
Body Appearance Worries T2			-	.66***	.15	-.28***	.26***	-.22**
Performance Worries T2				-	.28***	-.24**	.35***	-.14
Problematic smartphone ruse T2					-	-.20*	.34***	-.16*
Sexual Function T2						-	-.74***	.62***
Sexual Distress T2							-	-.51***
Sexual Pleasure T2								-

Table 14 displays the results of the hierarchical multiple regression analysis conducted to predict women's sexual function at T2.

In Block 1, sexual function at T1 was entered along with age and dysphoria. Sexual function at T1 significantly predicted sexual function at T2, whereas age and dysphoria were not significant predictors. In Block 2, general inattention at T1 was added to the predictors. The inclusion of this variable did not significantly alter the predictive model, and general inattention was not a significant predictor. In Block 3, problematic smartphone use at T1 was entered in the model and became significantly and negatively associated with sexual function at T2. In Block 4, worries during sexual activity at T1 were added to the model. Sexual function at T1 and problematic smartphone use continued to be the only significant predictors, with worries not contributing significantly to the model. Finally, in Block 5, partner-focused imagination vividness at T1 was included among the potential predictors, but problematic smartphone use remained the only significant predictors.

Table 15. Hierarchical multiple regression predicting sexual function T2 (all potential predictors were measured at T1).

Predictors			
Block 1	***β***	***p***	***R^2***
Sexual Function	.86	<.001	.72
Age	.04	.374	
Dysphoria	.02	.678	
Block 2	***β***	***p***	***R^2***
Sexual Function	.86	<.001	.72
Age	.04	.374	
Dysphoria	.01	.803	
General inattention	.02	.785	
Block 3	***β***	***p***	***R2***
Sexual Function	.85	<.001	.73
Age	.04	.442	
Dysphoria	.04	.486	

General inattention	.03	.571	
Problematic smartphone use	-.11	.024	
Block 4	***β***	***p***	***R2***
Sexual Function	.84	<.001	.73
Age	.04	.444	
Dysphoria	.05	.436	
General inattention	.03	.578	
Problematic smartphone use	-.11	.027	
Sexual Worries	-.02	.713	
Block 5	***β***	***p***	***R2***
Sexual Function	.83	<.001	.73
Age	.04	.464	
Dysphoria	.05	.428	
General inattention	.02	.663	
Problematic smartphone use	-.12	.021	
Sexual Worries	-.01	.926	
Partner-focused imagination vividness	.06	.208	

T1 = initial assessment moment; T2 = assessment moment one month later.

Dysphoria is the sum of anxiety, depression, and stress; Sexual worries are the sum of body appearance worries and sexual performance worries.

Table 16 presents the results of the hierarchical multiple regression analysis predicting women's sexual distress at T2. In Block 1, sexual distress at T1 was entered alongside age and dysphoria. Sexual distress at T1 significantly predicted sexual distress at T2, whereas age and dysphoria were not significant predictors. In Block 2, general inattention at T1 was added to the model. The inclusion of this variable did not result in significant changes to the model; general inattention was not a significant predictor. In Block 3, problematic smartphone use at T1 was introduced. Sexual distress at T1 remained the only significant predictor, with problematic smartphone use not significantly contributing to the prediction of sexual distress at T2. In Block 4, worries during sexual activity were included but did not significantly predict sexual distress at T2. Finally, in Block 5, partner-focused imagination vividness at T1 was added

to the model. Both sexual distress and partner-focused imagination vividness at T1 emerged as significant predictors of sexual distress at T2. Partner-focused imagination vividness at T1 was negatively associated with sexual distress at T2.

Table 16. Hierarchical multiple regression predicting sexual distress at T2 (all potential predictors were measured at T1).

Predictors			
Block 1	***β***	***p***	***R^2***
Sexual Distress	.85	<.001	.72
Age	-.04	.368	
Dysphoria	-.02	.712	
Block 2	***β***	***p***	***R^2***
Sexual Distress	.85	<.001	.72
Age	-.04	.372	
Dysphoria	-.02	.673	
General inattention	.01	.834	
Block 3	***β***	***p***	***R2***
Sexual Distress	.84	<.001	.72
Age	-.04	.398	
Dysphoria	-.03	.597	
General inattention	.01	.940	
Problematic smartphone use	.05	.382	
Block 4	***β***	***p***	***R2***
Sexual Distress	.85	<.001	.72
Age	-.04	.404	
Dysphoria	-.02	.799	
General inattention	.01	.953	
Problematic smartphone use	.05	.370	
Sexual Worries	-.04	.470	
Block 5	***β***	***p***	***R2***
Sexual Distress	.83	<.001	.74

Age	.04	.388
Dysphoria	-.02	.766
General inattention	.02	.732
Problematic smartphone use	.06	.234
Sexual Worries	-.08	.153
Partner-focused imagination vividness	-.15	.001

T1 = initial assessment moment; T2 = assessment moment one month later.

Dysphoria is the sum of anxiety, depression, and stress; Sexual worries are the sum of body appearance worries and sexual performance worries.

Table 17 presents the results of the hierarchical multiple regression analysis predicting women's sexual pleasure at T2. In Block 1, age, sexual pleasure, and dysphoria at T1 were entered as predictors. Sexual pleasure at T1 was a significant predictor of sexual pleasure at T2, whereas age and dysphoria were not. In Block 2, general inattention at T1 was added to the model. The inclusion of this variable did not significantly alter the model; general inattention was not a significant predictor of sexual pleasure at T2. In Block 3, problematic smartphone use at T1 was entered and became significantly and negatively associated with sexual pleasure at T2. Sexual pleasure at T1 remained a significant positive predictor. In Block 4, sexual worries at T1 were added to the model. Sexual pleasure and problematic smartphone use at T1 continued to be significant predictors, while sexual worries did not show a significant association with sexual pleasure at T2. In Block 5, partner-focused imagination vividness at T1 was introduced, and became significantly and positively associated with sexual pleasure at T2 with sexual pleasure and problematic smartphone use remaining significant predictors.

Table 17. Hierarchical multiple regression predicting sexual pleasure at T2 (all potential predictors were measured at T1).

Predictors			
Block 1	***β***	***p***	***R^2***
Sexual pleasure	.30	<.001	.09
Age	-.13	.130	
Dysphoria	-.16	.075	
Block 2	***β***	***p***	***R^2***
Sexual pleasure	.30	<.001	.08
Age	-.13	.130	
Dysphoria	-.15	.142	
General inattention	-.02	.805	
Block 3	***β***	***p***	***R2***
Sexual pleasure	.31	<.001	.11
Age	-.15	.089	
Dysphoria	-.10	.312	
General inattention	.004	.970	
Problematic smartphone use	-.20	.025	
Block 4	***β***	***p***	***R2***
Sexual pleasure	.30	<.001	.12
Age	-.15	.088	
Dysphoria	-.04	.717	
General inattention	-.002	.983	
Problematic smartphone use	-.19	.036	
Sexual Worries	-.14	.127	
Block 5	***β***	***p***	***R2***
Sexual pleasure	.30	<.001	.16
Age	-.15	.079	
Dysphoria	-.03	.767	
General inattention	-.03	.785	

Problematic smartphone use	-.20	.023
Sexual Worries	-.08	.383
Partner-focused imagination vividness	.23	.008

T1 = initial assessment moment; T2 = assessment moment one month later.

Dysphoria is the sum of anxiety, depression, and stress; Sexual worries are the sum of body appearance worries and sexual performance worries.

Discussion

This study provides important insights into the dynamic relationships between cognitive factors such as sexual worries, general inattention, problematic smartphone use, and partner-focused imagination vividness and their influence on sexual functioning, distress and pleasure over time. The findings of this study emphasize the protective role of vividness of imagination in mitigating sexual distress, suggesting that fostering mental imagery particularly when directed toward one's sexual partner, could serve as a valuable strategy to enhance sexual well-being. These results extend prior research suggesting the important role of imagination as a potential target for clinical interventions aimed at reducing sexual distress and increasing desire and arousal (Birnbaum et al., 2019; Langeslag & Davis, 2022; Newbury et al., 2012;). Building on these findings, the results further revealed that partner-focused imagination vividness was a predictor (positively associated) with sexual pleasure after a month period, suggesting a potential role for the clarity of imaginative processes in sustaining or enhancing sexual pleasure over time, which was already suggested by previous studies (Harris et al., 1990; Koukounas & Over, 1997; Meuwissen & Over, 1991; Smith & Over, 1990a,b; Tokatlidis & Over, 1995). These results underscore the potential clinical relevance of cultivating vivid, partner-oriented mental imagery as a strategy to promote sexual pleasure and overall sexual well-being, i.e., reducing distress with sexual experiences and increasing sexual pleasure. There are possible interventions to increase mental imagery vividness. Training sexual imagery vividness was shown to increase erectile responsiveness and subjective sexual arousal in men during fantasy, when alone in a laboratory setting (Smith & Over, 1990b). It remains to be examined whether such exercises also apply to women and to sexual interactions, whether they may lead to better sexual outcomes.

Problematic smartphone use was identified as a significant longitudinal predictor of diminished sexual function and reduced sexual pleasure, although it did not significantly predict sexual distress. Prolonged smartphone engagement may detract from partner-focused attention and promote dysfunctional relational dynamics, further exacerbating the risk of sexual dysfunction (Hipp & Carlson, 2021; Mushquash et al., 2022; Roberts & David, 2016). Problematic smartphone use may also lead to general attentional deficits (Aydin et al., 2024; Boer et al., 2020; McNamee et al., 2021; Sihoe et al., 2023; Wang et al., 2024), which raises the possibility of negative effects of sexual function and well-being being due to an effect on general proneness to distraction; however, we did not find longitudinal associations between general inattention and sexual outcomes. Also, extended smartphone usage may increase negative mood (Hunt et al., 2018; Kross et al., 2013; Lambert et al., 2022; Tromholt, 2016; Turel et al., 2018), as well as exposure to online content that fosters insecurities (Arikewuyo et al., 2021; Emond et al., 2023; Frampton et al., 2018; Tandon et al., 2021), which in turn can negatively affect female sexual functioning.

Given the overlap between problematic use of smartphones and social media (Kuss & Griffiths, 2017), thehese results are consistent with previous longitudinal research showing that problematic social media use (social media addiction) predicted poorer sexual function (and greater sexual distress) six months later, after controlling for initial levels of anxiety and depression, and initial levels of sexual functioning and distress (Alimoradi et al., 2019). These results were partially explained by lower intimacy and lower perceived social support, variables that we did not control, but that could plausibly be influenced by phubbing partners and being phubbed by them (Hipp & Carlson, 2021; Mushquash et al., 2022; Roberts & David, 2016). Our findings are also consistent with previous cross-sectional studies showing links between sexual difficulties and problematic use of social media and smartphones (Costa et al., 2023; Fekih-Romdhane, 2024; Fuzeiro et al., 2022; Pawlikowska et al., 2022).

Unlike experimental designs, a simple longitudinal design cannot fully establish causality; however, the finding that sexual function, distress, and pleasure are associated with and temporally preceded by problematic smartphone use and/or partner-focused imagination vividness is consistent with a potential causal role for problematic smartphone use and partner-focused mental imagery vividness, which could be clarified through future experimental investigation.

Although sexual worries with body image and performance anxiety were significantly associated with poorer sexual functioning and greater distress in cross-sectional Pearson’s

correlations, their predictive role in regression models was not significant. Similarly, general inattention did not significantly predict sexual outcomes, highlighting its limited direct impact and the potential need for further exploration of its indirect contributions. While clinical populations with ADHD are known to experience heightened sexual difficulties (Jabalkandi et al., 2020; Soldati et al., 2020), the current study, which focused on a non-clinical sample, did not find generalized inattention to be a significant predictor of poorer sexual outcomes when controlling for other variables. These findings may be partially explained by the non-clinical nature of the sample (the presence of comorbidities in individuals with ADHD may directly impair sexual functioning) and the sample size, which could have constrained the statistical power to detect more nuanced relationships.

Despite its contributions, this study is not without limitations. The sample size and the use of self-reported measures may introduce response biases, as participants might underreport or overreport certain behaviors and experiences due to social desirability or recall errors. Future research should address these limitations by incorporating greater sample size, using multi-method approaches (e.g., experimental studies) to complement self-reports, and exploring additional variables that might contribute to sexual health.

Conclusion

Taken together, these findings reinforce the relevance of attentional and imaginal processes in sexual functioning and suggest promising avenues for interventions aimed at enhancing sexual well-being.

References

Ackard, D. M., Kearney-Cooke, A., & Peterson, C. B. (2000). Effect of body image and self-image on women's sexual behaviors. *International Journal of Eating Disorders, 28*(4), 422–429. https://doi.org/10.1002/1098-108X(200012)28:4<422::AID-EAT10>3.0.CO;2-1

Água, J., Patrão, I., & Leal, I. (2017). SAS-SV: Estudo da validação da escala de dependência do smartphone numa amostra da população portuguesa [Study of validation of the smartphone addiction scale in a sample of the Portuguese population]. In Atas do II Congresso Ibérico de Psicologia Clínica e da Saúde (pp. 102–114). Lisboa, Portugal: ISPA – Instituto Universitário.

Alimoradi, Z., Lin, C. Y., Imani, V., Griffiths, M. D., & Pakpour, A. H. (2019). Social media addiction and sexual dysfunction among Iranian women: The mediating role of intimacy and social support. *Journal of Behavioral Addictions, 8*(2), 318–325. https://doi.org/10.1556/2006.8.2019.24

Arikewuyo, A. O., Efe-Özad, B., Dambo, T. H., Abdulbaqi, S. S., & Arikewuyo, H. O. (2021). An examination of how multiple use of social media platforms influence romantic relationships. *Journal of Public Affairs, 21*(3), e2240. https://doi.org/10.1002/pa.2240

Aydin, T., Parris, B. A., Arabaci, G., & Demirci, I. (2024). Trait-level non-clinical ADHD symptoms in a community sample and their association with technology addictions. *Current Psychology, 43*(15), 10682–10692. https://doi.org/10.1007/s12144-023-05203-x

Barelds, D. P. H., & Dijkstra, P. (2011). Positive illusions about a partner's personality and relationship quality. *Journal of Research in Personality, 45*(1), 37–43. https://doi.org/10.1016/j.jrp.2010.11.009

Barnes, S. J., Pressey, A. D., & Scornavacca, E. (2018). Mobile ubiquity: Understanding the relationship between cognitive absorption, smartphone addiction and social network services. *Computers in Human Behavior, 90*, 246–258. https://doi.org/10.1016/j.chb.2018.09.013

Barlow, D. H. (1986). Causes of sexual dysfunction: The role of anxiety and cognitive interference. *Journal of Consulting and Clinical Psychology, 54*(2), 140–148. https://doi.org/10.1037/0022-006X.54.2.140

Basson, R. (2000). The female sexual response: A different model. *Journal of Sex & Marital Therapy, 26*(1), 51–65. https://doi.org/10.1080/009262300278641

Birnbaum, G. E., Kanat-Maymon, Y., Mizrahi, M., Recanati, M., & Orr, M. (2019). What fantasies can do to your relationship: The effects of sexual fantasies on couple interactions. *Personality and Social Psychology Bulletin, 45*(3), 461–476. https://doi.org/10.1177/0146167218789611

Both, S., Everaerd, W., & Laan, E. (2007). Desire emerges from excitement: A psychophysiological perspective on sexual motivation. In E. Janssen (Ed.), *The Psychophysiology of Sex* (pp. 327–339). Indiana University Press.

Boer, M., Stevens, G., Finkenauer, C., & van den Eijnden, R. (2020). Attention deficit hyperactivity disorder-symptoms, social media use intensity, and social media use problems in adolescents: Investigating directionality. *Child Development, 91*(4), e853–e865. https://doi.org/10.1111/cdev.13334

Borkovec, T. D. (1994). The nature, functions, and origins of worry. In G. C. L. Davey & F. Tallis (Eds.), *Worrying: Perspectives on theory, assessment and treatment* (pp. 5–33). John Wiley & Sons.

Busch, T. M., Goodwin, G. J., Dempsey, M. R., Conrads, G. S., & Wilson, S. M. (2024). Exploring the impact of fantasizing on romantic relationships and attachment. *Sexuality & Culture*, *29*(2), 610–635. https://doi.org/10.1007/s12119-024-10289-x

Calabrò, R. S., Cacciola, A., Bruschetta, D., Milardi, D., Quattrini, F., Sciarrone, F., la Rosa, G., Bramanti, P., & Anastasi, G. (2019). Neuroanatomy and function of human sexual behavior: A neglected or unknown issue? *Brain and Behavior*, *9*(12). https://doi.org/10.1002/brb3.1389

Campos, P., Wittmann, M., & Costa, R. M. (2021). Sexual function, personality, and body awareness. *Psicologia, Saúde & Doenças, 22*(2), 411–422. https://doi.org/10.15309/21psd220208

Carvalheira, A., Godinho, L., & Costa, P. (2017). The impact of body dissatisfaction on distressing sexual difficulties among men and women: The mediator role of cognitive distraction. *Journal of Sex Research*. https://doi.org/10.1080/00224499.2016.1168771

Childress, A. R., Ehrman, R. N., Wang, Z., Li, Y., Sciortino, N., Hakun, J., Jens, W., Suh, J., Listerud, J., Marquez, K., Franklin, T., Langleben, D., Detre, J., & O'Brien, C. P. (2008).

Prelude to passion: Limbic activation by "unseen" drug and sexual cues. *PLOS One, 3*(1), e1506. https://doi.org/10.1371/journal.pone.0001506

Chun, M. M., Golomb, J. D., & Turk-Browne, N. B. (2011). A taxonomy of external and internal attention. *Annual Review of Psychology, 62*, 73–101. https://doi.org/10.1146/annurev.psych.093008.10042 7

Costa, R. M. (2022). Sexual fantasies. In T. K. Shackelford (Ed.), *The Cambridge handbook of evolutionary perspectives on sexual psychology* (Vol. 3, *Female sexual adaptations*, pp. 209–240). Cambridge University Press. https://doi.org/10.1017/9781108943567.01

Costa, R. M., Pestana, J., Costa, D., & Wittmann, M. (2016). Altered states of consciousness are related to higher sexual responsiveness. *Journal of Sexual Medicine*, 13(7), 1047–1058. https://doi.org/10.1080/0092623X.2015.1113591

Costa, R. M., Pimenta, F., Ferreira-Valente, A., & Patrão, I. (2023). Social media addiction is associated with sexual dissatisfaction: A cross-sectional study with quota sampling in Portugal [Preprint]. *OSF Preprints*. https://doi.org/10.31219/osf.io/eb9c7

de Jong, D. C. (2009). The role of attention in sexual arousal: Implications for treatment of sexual dysfunction. *Journal of Sex Research, 46*(2–3), 237–248. https://doi.org/10.1080/00224490902747230

Dove, N. L., & Wiederman, M. W. (2000). Cognitive distraction and women's sexual functioning. *Journal of Sex & Marital Therapy, 26*(1), 67–78. https://doi.org/10.1080/009262300278650

Emond, M., Vaillancourt-Morel, M. P., Métellus, S., Brassard, A., & Daspe, M. E. (2023). Social media jealousy and intimate partner violence in young adults' romantic relationships: A longitudinal study. *Telematics and Informatics, 79*, 101956. https://doi.org/10.1016/j.tele.2023.101956

Faith, M. S., & Schare, M. L. (1993). The role of body image in sexually avoidant behavior. *Archives of Sexual Behavior, 22*(4), 345–356. https://doi.org/10.1007/BF01542123

Fekih-Romdhane, F., Haddad, P., Roukoz, R., Barakat, M., Gerges, S., Malaeb, D., Obeid, S., & Hallit, S. (2024). Does loneliness mediate the association between social media use disorder and sexual function in Lebanese university students? *International Journal of Environmental Health Research, 34*(3), 1835–1846. https://doi.org/10.1080/09603123.2023.2248005

Frampton, J. R., & Fox, J. (2018). Social media's role in romantic partners' retroactive jealousy: Social comparison, uncertainty, and information seeking. *Social Media + Society, 4*(3), 2056305118800317. https://doi.org/10.1177/2056305118800317

Fuzeiro, V., Martins, C., Gonçalves, C., Rolo Santos, A., & Costa, R. M. (2022). Sexual function and problematic use of smartphones and social networking sites. *Journal of Sexual Medicine.* https://doi.org/10.1016/j.jsxm.2022.05.004

Gillath, O., & Canterberry, M. (2012). Neural correlates of exposure to subliminal and supraliminal sexual cues. *Social Cognitive and Affective Neuroscience, 7*(8), 924–936. https://doi.org/10.1093/scan/nsr065

Harris, R., Yulis, S., & LaCoste, D. (1980). Relationships among sexual arousability imagery, and introversion-extroversion. *Journal of Sex Research, 16*,72–86. https://doi.org/10.1080/00224498009551063

Hipp, C. J., & Carlson, R. G. (2021). The dyadic association among technoference and relationship and sexual satisfaction of young adult couples. *Journal of Sex & Marital Therapy, 47*(5), 508–520. https://doi.org/10.1080/0092623X.2021.1922562

Huang, J. Y., Xue, X. J., Wang, Z. X., Li, Z. F., Rui-Su, Wang, N. N., Huang, X. Y., Li, H., Ma, H. L., Liu, M., & Zhang, D. L. (2023). The relationship between attention networks and individual differences in visual mental imagery vividness: An EEG study. *Neuropsychologia, 191*, 108736. https://doi.org/10.1016/j.neuropsychologia.2023.108736

Hunt, M. G., Marx, R., Lipson, C., & Young, J. (2018). No more FOMO: Limiting social media decreases loneliness and depression. *Journal of Social and Clinical Psychology, 37*(10), 751–768. https://doi.org/10.1521/jscp.2018.37.10.751

Jabalkandi, S. A., Raisi, F., Shahrivar, Z., Mohammadi, A., Meysamie, A., Firoozikhojastefar, R., & Irani, F. (2020). A study on sexual functioning in adults with attention-deficit/hyperactivity disorder. *Perspectives in Psychiatric Care, 56*(3), 642–648. https://doi.org/10.1111/ppc.12480

Janssen, E., & Bancroft, J. (2007). The dual control model: The role of sexual inhibition and excitation in sexual arousal and behavior. In E. Janssen (Ed.), *The psychophysiology of sex* (pp. 197–222). Indiana University Press.

Janssen, E., Everaerd, W., Spiering, M., & Janssen, J. (2000). Automatic processes and the appraisal of sexual stimuli: Toward an information processing model of sexual arousal. *Journal of Sex Research*, *37*(1), 8–23.

Keogh, R., & Pearson, J. (2014). The sensory strength of voluntary visual imagery predicts visual working memory capacity. *Journal of Vision, 14*(12), 7. https://doi.org/10.1167/14.12.7

Kessler, R. C., Adler, L., Ames, M., Demler, O., Faraone, S., et al. (2005). The World Health Organization Adult ADHD Self-Report Scale (ASRS): A short screening scale for use in the general population. *Psychological Medicine, 35*(2), 245–256. https://doi.org/10.1017/S0033291704002892

Koukounas, E., & Over, R. (1997). Allocation of attentional resources during habituation and dishabituation of male sexual arousal. *Archives of Sexual Behavior, 28*(6), 539–552. https://doi.org/10.1023/A:1018769200845

Kosslyn, S. M., Ganis, G., & Thompson, W. L. (2001). Neural foundations of imagery. *Nature Reviews Neuroscience, 2*(9), 635–642. https://doi.org/10.1038/35090055

Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., Lin, N., Shablack, H., Jonides, J., & Ybarra, O. (2013). Facebook use predicts declines in subjective well-being in young adults. *PLOS ONE, 8*(8), e69841. https://doi.org/10.1371/journal.pone.0069841

Kuss, D., & Griffiths, M. (2017). Social networking sites and addiction: Ten lessons learned. *International Journal of Environmental Research and Public Health*, *14*(3), 311. https://doi.org/10.3390/ijerph14030311

Kwon, M., Kim, D. J., Cho, H., & Yang, S. (2013). The smartphone addiction scale: Development and validation of a short version for adolescents. *PLOS ONE, 8*(12), e83558. https://doi.org/10.1371/journal.pone.0083558

Lambert, J., Barnstable, G., Minter, E., Cooper, J., & McEwan, D. (2022). Taking a one-week break from social media improves well-being, depression, and anxiety: A randomized controlled trial. *Cyberpsychology, Behavior, and Social Networking, 25*(5), 287–293. https://doi.org/10.1089/cyber.2021.0324

Langeslag, S., & Davis, L. L. (2022). A preliminary study on up-regulation of sexual desire for a long-term partner. *The Journal of Sexual Medicine, 19*(5), 872–878. https://doi.org/10.1016/j.jsxm.2022.02.017

Marty-Dugas, J., Ralph, B. C. W., Oakman, J. M., & Smilek, D. (2018). The relation between smartphone use and everyday inattention. *Psychology of Consciousness: Theory, Research, and Practice, 5*(1), 46–62. https://doi.org/10.1037/cns0000131

McNamee, P., Mendolia, S., & Yerokhin, O. (2021). Social media use and emotional and behavioural outcomes in adolescence: Evidence from British longitudinal data. *Economics and human biology*, *41*, 100992. https://doi.org/10.1016/j.ehb.2021.100992

Meuwissen, I., & Over, R. (1991). Multidimensionality of the content of female sexual fantasy. *Behaviour Research and Therapy, 29*(2), 179–189. https://doi.org/10.1016/0005-7967(91)90046-6

Moreault, D., & Follingstad, D. R. (1978). Sexual fantasies of females as a function of sex guilt and experimental response cues. *Journal of Consulting and Clinical Psychology, 46*, 1385-1393. https://doi.org/10.1037/0022-006X.46.6.1385

Mushquash, A. R., Charlton, J. K., MacIsaac, A., & Ryan, K. (2022). Romance behind the screens: Exploring the role of technoference on intimacy. *Cyberpsychology, behavior and social networking*, *25*(12), 814–820. https://doi.org/10.1089/cyber.2022.0068

Newbury, R., Hayter, M., Wylie, K. R., & Ridell, J. (2012). Sexual fantasy as clinical intervention. *Sexual and Relationship Therapy, 27*(4), 358–371. https://doi.org/10.1080/14681994.2012.733816

Nobre, P. J., & Pinto-Gouveia, J. (2008). Cognitions, emotions, and sexual response: Analysis of the relationship among automatic thoughts, emotional responses, and sexual arousal. *Archives of sexual behavior*, *37*(4), 652–661. https://doi.org/10.1007/s10508-007-9258-0

Oei, N. Y., Rombouts, S. A., Soeter, R. P., van Gerven, J. M., & Both, S. (2012). Dopamine modulates reward system activity during subconscious processing of sexual stimuli. *Neuropsychopharmacology, 37*(7), 1729–1737. https://doi.org/10.1038/npp.2012.19

Osman, A., Wong, J. L., Bagge, C. L., Freedenthal, S., Gutierrez, P. M., & Lozano, G. (2012). The Depression Anxiety Stress Scales—21 (DASS-21): Further examination of dimensions, scale reliability, and correlates. *Journal of Clinical Psychology, 68*(12), 1322–1338. https://doi.org/10.1002/jclp.21908

Panagiotidi, M., & Overton, P. (2022). Attention deficit hyperactivity symptoms predict problematic mobile phone use. *Current Psychology, 41*(5), 2765–2771. https://doi.org/10.1007/s12144-020-00785-2

Pascoal, P. M., Sanchez, D. T., Raposo, C. F., & Pechorro, P. (2016). Initial validation of the Sexual Pleasure Scale in clinical and non-clinical samples of partnered heterosexual people. *Journal of Sexual Medicine, 13*(9), 1408–1413. https://doi.org/10.3390/ijerph17217864

Pawlikowska, A., Szuster, E., Kostrzewska, P., Mandera, A., Biernikiewicz, M., Sobieszczańska, M., Rożek-Piechura, K., Markiewicz, M., Rusiecka, A., & Kałka, D. (2022). Internet addiction and Polish women's sexual functioning: The role of social media, online pornography, and game use during the COVID-19 pandemic - Online surveys based on FSFI and BSMAS questionnaires. *International Journal of Environmental Research and Public Health, 19*(13), 8193. https://doi.org/10.3390/ijerph19138193

Pechorro, P., Diniz, A., Almeida, S., & Vieira, R. (2009). Validação portuguesa do Índice de Funcionamento Sexual Feminino (FSFI). *Laboratório de Psicologia, 7*, 33–44. https://doi.org/10.14417/lp.684

Pinho, M. S., Simões, M. R., Beato, M. S., & Díez, E. (2007). Questionário de vivacidade de imagens visuais - Versão revista (VVIQ-RV). In M. R. Simões, C. Machado, M. Gonçalves, & L. Almeida (Eds.), *Avaliação psicológica: Instrumentos validados para a população portuguesa* (Vol. 3, pp. 187–201). Quarteto.

Ribeiro, J. L. P., Honrado, A. A. J. D., & Leal, I. P. (2004). Contribuição para o estudo da adaptação portuguesa das Escalas de Ansiedade, Depressão e Stress (EADS) de 21 itens de Lovibond e Lovibond. *Psicologia, Saúde & Doenças, 5*(2), 229–239.

Roberts, J. A., & David, M. E. (2016). My life has become a major distraction from my cell phone: Partner phubbing and relationship satisfaction among romantic partners. *Computers in Human Behavior, 54*, 134–141. https://doi.org/10.1016/j.chb.2015.07.058

Rosen, R., Brown, C., Heiman, J., Leiblum, S., Meston, C., Shabsigh, R., Ferguson, D., & D'Agostino, R., Jr (2000). The female sexual function index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. *Journal of sex & marital therapy*, *26*(2), 191–208. https://doi.org/10.1080/009262300278597

Sihoe, C. E., Mueller, U., & Liu, S. (2023). Perceived smartphone addiction predicts ADHD symptomatology in middle school adolescents: A longitudinal study. *Computers in Human Behavior Reports, 12*, 100335. https://doi.org/10.1016/j.chbr.2023.100335

Skowronek, J., Seifert, A., & Lindberg, S. (2023). The mere presence of a smartphone reduces basal attentional performance. *Scientific Reports, 13*(1), 9363. https://doi.org/10.1038/s41598-023-36256-4

Smith, D., & Over, R. (1990a). Male sexual arousal as a function of the content and the vividness of erotic fantasy. *Psychophysiology, 24*(3), 334–339. https://doi.org/10.1111/j.1469-8986.1987.tb00304.x

Smith, D., & Over, R. (1990b). Enhancement of fantasy-induced sexual arousal in men through training in sexual imagery. *Archives of Sexual Behavior, 19*(5), 477–489. https://doi.org/10.1007/BF02442349

Soldati, L., Bianchi-Demicheli, F., Schockaert, P., Köhl, J., Bolmont, M., Hasler, R., & Perroud, N. (2020). Sexual function, sexual dysfunctions, and ADHD: A systematic literature review. *The Journal of Sexual Medicine, 17*(9), 1653–1664. https://doi.org/10.1016/j.jsxm.2020.03.019

Spiering, M., & Everaerd, W. (2007). *The sexual unconscious. In E. Janssen (Ed.), The Psychophysiology of Sex* (pp. 166–184). Indiana University Press.

Symonds, T., Perelman, M. A., Althof, S., Giuliano, F., Martin, M., May, K., & Morris, M. (2007). Development and validation of a premature ejaculation diagnostic tool. *European Urology*, 52(3), 565–573. https://doi.org/10.1016/j.eururo.2007.01.028

Tandon A, Dhir A, Mäntymäki M. Jealousy due to social media? A systematic literature review and framework of social media-induced jealousy. *Internet Res 2021; 31*(5): 1541-1582. https://doi.org/10.1108/INTR-02-2020-0103

Tavares, I. M., Moura, C. V., & Nobre, P. J. (2020). The role of cognitive processing factors in sexual function and dysfunction in women and men: A systematic review. *Sexual medicine reviews, 8*(3), 403–430. https://doi.org/10.1016/j.sxmr.2020.03.002

Tavares, I. M., Santos-Iglesias, P., & Nobre, P. J. (2022). Psychometric validation of the Sexual Distress Scale in male and female Portuguese samples. *The Journal of Sexual Medicine, 19*(5), 834–845.

Toates, F. (2009). An integrative theoretical framework for understanding sexual motivation, arousal, and behavior. *Journal of Sex Research, 46*(2–3), 168–193. https://doi.org/10.1080/00224490902747768

Tokatlidis, O., & Over, R. (1995). Imagery, fantasy, and female sexual arousal. *Australian Journal of Psychology, 47*(2), 81–85. https://doi.org/10.1080/00049539508257504

Tran, T. D., Tran, T., & Fisher, J. (2013). Validation of the Depression Anxiety Stress Scales (DASS-21) as a screening instrument for depression and anxiety in a rural community-based cohort of northern Vietnamese women. *BMC Psychiatry, 13*, 24. https://doi.org/10.1186/1471-244X-13-24

Tromholt, M. (2016). The Facebook experiment: Quitting Facebook leads to higher levels of well-being. *Cyberpsychology, Behavior, and Social Networking, 19*(11), 661–666. https://doi.org/10.1089/cyber.2016.0259

Turel, O., Cavagnaro, D. R., & Meshi, D. (2018). Short abstinence from online social networking sites reduces perceived stress, especially in excessive users. *Psychiatry Research, 270*, 947–953. https://doi.org/10.1016/j.psychres.2018.11.017

Velten, J., Milani, S., Margraf, J., & Brotto, L. A. (2021). Visual attention and sexual arousal in women with and without sexual dysfunction. *Behaviour Research and Therapy, 144*, Article 103915. https://doi.org/10.1016/j.brat.2021.103915

Wang, J. L., Yin, X. Q., Wang, H. Z., King, D. L., & Rost, D. H. (2024). The longitudinal associations between internet addiction and ADHD symptoms among adolescents. *Journal of behavioral addictions*, *13*(1), 191–204. https://doi.org/10.1556/2006.2023.00080

Woertman, L., & van den Brink, F. (2012). Body image and female sexual functioning and behavior: A review. *Journal of Sex Research, 49*(2–3), 184–211. https://doi.org/10.1080/00224499.2012.658586

Yamamiya, Y., Cash, T. F., & Thompson, J. K. (2006). Sexual experiences among college women: The differential effects of general versus con textual body images on sexuality. *Sex Roles, 55*, 421–427. https://doi.org/10.1007/s11199-006-9096-x

4

Chapter 4: The role of sexual fantasy on sexual desire, distress and sexual worries. A randomized controlled study

This chapter is based on the paper

Campos, P., Leal, I., & Costa, R. M (2025). The role of sexual fantasy on sexual desire, distress and sexual worries. A randomized controlled study. Manuscript submitted for publication.

Chapter 4: The role of sexual fantasy on sexual desire, distress and sexual worries. A randomized controlled study

Abstract

Sexual fantasies may enhance sexual desire and reduce sexual distress by redirecting focus toward emotionally salient and arousing imagery. Despite promising evidence, few experimental studies have tested whether repeated engagement in sexual fantasies can improve sexual functioning, reduce sexual distress and reduce cognitive distractions during sexual activity. This randomized controlled trial tested the preregistered hypotheses that a four-week sexual fantasy task increases sexual desire, reduces sexual distress, and reduces worries with body image and performance during sexual activity. Two exploratory objectives were also examined: (4) whether sexual pleasure would increase, and (5) whether partner-focused vividness of imagination would be enhanced. Sixty heterosexual adults with an opposite-sex partner in the past four weeks were randomly assigned to either a sexual fantasy group (n = 30), instructed to write erotic narratives at least twice weekly, or a control group (n = 30), instructed to write a non-sexual positive narrative about dining with friends). Analyses followed an intention-to-treat approach. Repeated-measures ANOVAs revealed significant Group × Time interactions for all (preregistered) and exploratory outcomes. Only participants in the sexual fantasy group showed increases in sexual desire, pleasure, and partner-focused imagination vividness along with reductions in sexual distress and worries. Findings suggest that structured sexual fantasy engagement can enhance key aspects of sexual functioning and well-being, for example, by shifting attention from negative cognitive patterns to vivid, emotionally positive erotic imagination. Sexual fantasy exercises may serve as a brief, home-based intervention to improve sexual well-being. Future research should examine long-term effects and test applicability in clinical populations.

Keywords: Sexual fantasy; sexual desire; sexual distress; sexual pleasure; partner-focused imagination, randomized controlled trial

Introduction

Attention and sexual response

Sexual functioning emerges from the interplay of multiple interdependent systems, encompassing neurobiological, cognitive, emotional, and contextual processes. Among these, attentional mechanisms have garnered increasing empirical interest due to their central role in shaping how individuals perceive, process, and respond to sexual stimuli. Attention not only governs the selection and prioritization of environmental and internally generated stimuli but also influences the subsequent appraisal and activation of sexual responses. Specifically, the capacity to direct attentional resources, whether involuntarily (e.g., captured by salient sexual cues) or voluntarily (e.g., cognitive appraisal of sexual stimuli; or oriented toward internally generated erotic content), has been shown to modulate the subjective quality and intensity of sexual experiences (Barlow, 1986; Both, et al., 2007; De Jong, 2009; Spiering & Everaerd, 2007; Tavares et al., 2020; Toates, 2009; Velten et al., 2021). Within this framework, the distinction between external and internal attention becomes particularly relevant, as each pathway may differentially impact the dynamics of sexual arousal and desire.

Sexual fantasies and sexual functioning

One important aspect of internal attention is visual mental imagery (Benedek et al., 2016), broadly defined as the capacity to generate perceptual-like experiences in the absence of external sensory input, represents a key cognitive process that supports memory, planning, creativity, and emotional regulation (Kosslyn et al., 2001). When applied to the domain of sexuality, this capacity is expressed through sexual fantasies, internally generated mental representations that elicit sexual arousal, often and involving affective engagement with the imagined content (Leitenberg & Henning, 1995; Costa, 2022). A substantial body of research has underscored the role of sexual fantasies in facilitating desire and arousal, with higher frequency of sexual fantasies being consistently and positively associated with sexual functioning with associations with sexual satisfaction being mixed (Birnbaum et al., 2019; Busch et al., 2025; Carvalheira et al., 2010; Costa, 2022, 2023; Langeslag & Davis, 2022; Nutter & Condron, 1983, 1985).

Although sexual fantasies may not constitute a necessary condition for healthy sexual functioning (Carvalheira et al., 2010), individuals with sexual dysfunction often experience an absence or scarcity of such fantasies, and some studies in nonclinical samples suggest that interventions aimed at increasing that partner-oriented sexual fantasy frequency lead to higher

sexual desire and satisfaction, suggesting that fantasy stimulation can be a promising means of increasing sexual desire (Birnbaum et al., 2019; Langeslag & Davis, 2022). Moreover, therapeutic approaches that promote the development and acceptance of sexual fantasies have been linked to improvements in sexual functioning (Newbury et al., 2012). Given that the literature has consistently pointed out the benefits of sexual fantasies in both clinical and non-clinical samples, the current study aims at testing whether a sexual fantasy stimulation task, conducted over four weeks, leads to enhancement of sexual desire and to reduction in sexual distress and concerns about performance and body image during sexual relations. For this purpose, we preregistered three objectives: 1) the sexual fantasy task enhances sexual desire; 2) the sexual fantasy task reduces sexual distress; 3) sexual fantasy task reduces worries about performance and body image during sexual activity (https://osf.io/sz3mb).

We had two additional, non-registered, exploratory objectives. First, we explored whether sexual fantasy stimulation increases sexual pleasure (we treated this objective as exploratory given the mixed findings regarding sexual fantasies and sexual satisfaction). Second, because vividness of sexual fantasies may enhance sexual arousal (Harris et al., 1980; Koukounas & Over, 1997; Meuwissen & Over, 1991; Smith & Over, 1990a,b; Tokatlidis & Over, 1995) and enhancing sexual fantasy frequency might have the effect of increasing partner-related mental imagery vividness (Busch et al., 2025; Smith & Over, 1990b), we explored whether the sexual fantasy stimulation task increases partner-focused mental imagery vividness.

Method

Participants

A total of 60 heterosexual adult participants (30 in each condition) took part in a randomized controlled trial. All participants reported being in a sexually active relationship with a regular opposite-sex partner. The control group comprised 12 men and 18 women, while the experimental group included 13 men and 17 women ($\chi^2 = .07$, $p = .793$). Twelve individuals were excluded prior to analysis for not meeting the inclusion criteria, namely not having engaged in sexual intercourse with an opposite-sex partner within the previous four weeks. The sample size was determined a priori using *G*Power 3.1.9.7*, based on effect sizes reported by Langeslag and Davis (2022), who found that imagining sexual interactions with a partner increased sexual desire (f = .405). For a repeated-measures design with two groups and two time points, a sample of 60 participants was sufficient to detect an interaction effect size of f = .184, with a statistical power of .80. Descriptive statistics for each group are presented in Table 18 and Table 19. Thirteen participants did not complete the number of at-home fantasy stimulation tasks required (at least eight) but were retained in the analyses following the Intention-To-Treat principle. Of these, five were assigned to the control group and eight to the experimental group ($\chi^2 = .88$, $p = .347$). This approach preserves the benefits of randomization, mitigates potential biases introduced by attrition or non-compliance, and provides a more ecologically valid estimate of the intervention's effectiveness in real-world conditions (Gupta, 2011; Montori & Guyatt, 2001). Complete outcome data were collected for all participants at both time points.

Table 18. Descriptive Statistics ($N = 60$)

Experimental *(n* = 30)	*N* (%) or Mean (SD)
Age (years)	27.27 (8.10)
Marital status	
Single	28 (93.3%)
Married	1 (3.3%)
Divorced	1 (3.3%)

Educational qualifications	
High school	12 (40%)
Undergraduate	7 (23.3%)
Master's	11 (36.7%)
Relationship characteristics	
Ongoing relationship	26 (86.7%)
Cohabiting	10 (33.3%)
Relationship duration (months)	34.33 (34.58)
Control (*n* = 30)	
Age (years)	25.80 (6.35)
Marital status	
Single	29 (96.7%)
Married	1 (3.3%)
Educational qualifications	
High school	13 (43.3%)
Undergraduate	12 (40%)
Master's	5 (16.7%)
Relationship characteristics	
Ongoing relationship	24 (80%)
Cohabiting	14 (46.7%)
Relationship duration (months)	41.95 (28.53)

Table 19. Frequency of sexual behaviours at baseline (days in past month; N = 60)

Experimental *(n* = 30)	Mean (SD)
Penile-vaginal intercourse	6.70 (4.92)
Penile-vaginal orgasm [1]	6.54 (4.88)
Penile-vaginal orgasm with direct clitoral stimulation [2]	5.29 (5.17)

Penile-vaginal orgasm without direct clitoral stimulation [2]	1.71 (3.06)
Noncoital sex	4.53 (4.58)
Noncoital sex orgasm	3.60 (4.56)
Masturbation alone	6.17 (6.37)
Masturbation orgasm	6.10 (6.36)
Sexual fantasies	9.07 (8.62)
Control (*n* = 30)	
Penile-vaginal intercourse	7.20 (5.26)
Penile-vaginal intercourse orgasm [1]	7.42 (4.14)
Penile-vaginal orgasm with direct clitoral stimulation [2]	5.61 (5.52)
Penile-vaginal orgasm without direct clitoral stimulation [2]	1.94 (2.96)
Non-coital sex	6.07 (5.02)
Noncoital sex orgasm	4.77 (4.96)
Masturbation alone	6.53 (8.17)
Masturbation orgasm	6.13 (8.25)
Sexual fantasies	10.10 (9.46)

Study design and procedure

The research adopted a randomized controlled design with two time points for assessment: a baseline evaluation (T1) and an evaluation conducted four weeks later (T2). Participants were randomly allocated to one of two between-subjects groups: (1) an experimental condition involving sexual fantasy stimulation, or (2) a control condition involving the stimulation of a non-sexual, positively valenced fantasy, centred on a dinner with friends. A simple randomization procedure was employed.

The initial session was conducted in the psychology laboratory at the university. Upon arrival, participants were greeted and provided with comprehensive information regarding the study's objectives, procedures, and expected duration. They were then invited to read and sign an informed consent form. It was made clear that participation was entirely voluntary, that all collected data would be kept confidential, and that participants retained the right to withdraw from the study at any moment without any negative consequences. Additionally, they were informed that any item or task they found uncomfortable or intrusive could be skipped without justification. As compensation, participants were offered a total of €40 in shopping vouchers,

distributed as €10 after the first session and €30 after a second, and final, session. Due to logistical constraints, it was not possible to provide compensation to some participants, who, however, agreed to participate in the study without remuneration (before starting the experiment).

In the first session, participants completed a comprehensive battery of online questionnaires, using a computer in a private room within the psychology lab. Once the baseline data were collected, individuals were randomly assigned to either the experimental or the control group. Those in the experimental condition were instructed to engage, over the course of four weeks, in an open-ended, online narrative-writing task designed to elicit erotic fantasies. Specifically, they were asked to write at least twice per week about a sexual episode involving a partner, real, imagined, or a combination of both, as though recounting it to another person. They had full freedom to include explicit sexual content, use metaphorical or emotional language, and describe physiological reactions. This strategy for inducing sexual fantasies through narrative responses has been successfully applied in prior research (e.g., Costa & Oliveira, 2016; Goldey & van Anders, 2011, 2012; Langeslag & Davis, 2022). In the control condition, participants completed a comparable open-ended task for the same period and frequency, but instead were prompted to describe an enjoyable, non-sexual situation, specifically, a dinner with friends. The prompts in both conditions were structurally and stylistically matched, differing only in the thematic focus: erotic versus socially positive. Before and after each fantasy-writing session, participants responded to a brief online questionnaire assessing their current levels of sexual desire, arousal, genital sensations, and emotional states (including joy, surprise, sadness, disgust, fear, anger, shame, and guilt). Contact information (email) was collected to facilitate scheduling of the second session and to provide assistance or clarification during the intervention period.

After completing the four weeks of fantasy exercises at home, all participants completed the same set of questionnaires as in the baseline assessment.

Measures

Sexual desire was measured with sexual desire dimensions of the Female Sexual Function Index (Pechorro et al., 2009; Rosen et al., 2000) or the International Index of Erectile Function (Gomes & Nobre, 2012; Rosen et al., 1997), for women and men, respectively. The male and female subscales of sexual desire are similar: worded and have the same number of items (2), scored in similar Likert type scale (from 1 to 5), with higher scores indicating higher

sexual desire. Hence, data from these measures can be analysed for male and female subgroups together. Participants completed the rest of the FSFI and IIEF, and men also completed the Premature Ejaculation Diagnostic Tool (Symonds et al., 2007), but these data are not pertinent for the present study.

Sexual distress was evaluated using the Sexual Distress Scale-Revised (SDS-R) – Portuguese Version (Tavares et al., 2022). This scale consists of 13 items that measure distress related to sexual activity, including feelings of frustration, anxiety, guilt, and dissatisfaction. Each item is rated on a 5-point Likert scale, with higher scores reflecting greater levels of sexual distress.

Sexual pleasure was assessed using the Portuguese version of the Sexual Pleasure Scale - SPS (Pascoal et al., 2016). This measure includes three items that evaluate the degree of pleasure across key dimensions of intimate experience: sexual relationships, sexual activities, and sexual intimacy. Although the original scale employs a 7-point response format (1 = not pleasurable at all to 7 = very pleasurable), the present study adopted the validated Portuguese adaptation, which ranges from -3 (source of displeasure) to +3 (source of pleasure), with 0 indicating neutrality. The overall score varies between 9 and +9, with higher values representing greater sexual pleasure.

Additionally, participants reported the number of days in the previous month they engaged in sexual fantasies and various sexual behaviours.

Distractions during sexual activity due to body image concerns and performance concerns were assessed with the Portuguese version of the Cognitive Distraction Scale (CDS), originally developed by Dove and Wiederman (2000). The CDS includes two dimensions: distraction based on body appearance and distraction based on sexual performance (Carvalheira et al., 2017). Participants rate their answers on a 6-point Likert scale (1 = Never to 6=Always), in which higher scores indicate greater cognitive distraction.

The Vividness of Visual Imagery Questionnaire (Pinho et al., 2007) is a self-report measure designed to assess the clarity and vividness of mental images. Participants are asked to visualize specific scenes or objects and rate the vividness of their mental imagery on a 5-point Likert scale, ranging from 1 to 5. An adapted subscale was used for imagining one's partner (whereas the original scale asks participants to imagine an acquaintance). Higher scores indicate greater vividness of visual imagery.

There were also data collected on general inattention (Kessler et al., 2005), problematic smartphone use (Kwon et al., 2013), and dysphoric mood (Ribeiro et al., 2004), but these were not relevant for the present study.

Statistical Analysis

Data were analysed using IBM SPSS Statistics (version 30.0). Descriptive statistics were computed for all variables of interest. Assumptions of normality and homogeneity of variance were assessed. Prior to the main analyses, independent samples t-tests were conducted to compare the experimental and control groups on measures at baseline (T1), to ensure that the groups did not significantly differ before the intervention. The distributional properties of the dependent variables were evaluated to assess the assumptions of normality and homogeneity of variance. The Shapiro -Wilk test was used to test for normality, while Levene's test assessed homogeneity of variances. Additionally, skewness and kurtosis values were inspected to ensure there were no severe violations of normality assumptions that could bias parametric analyses.

To examine the effects of the experimental manipulation over time, a series of 2 (Group: Sexual Fantasy vs. Control) × 2 (Time: Baseline vs. post-intervention) repeated measures ANOVAs were conducted for each dependent variable: sexual desire, sexual distress, sexual pleasure, sexual worries, sexual worries, and partner-focused imagination vividness (participants' sex was entered as a covariate to control for possible differences between men and women in response to sexual fantasy engagement). Interaction effects (Group × Time) were the primary focus of analysis, as they assessed whether changes in outcome variables differed across experimental conditions over time. The analyses were conducted under an intention-to-treat framework. Accordingly, participants who did not complete the intervention task were still invited to participate in the second assessment session, ensuring that all randomized participants were included in the analysis according to their original group allocation.

In accordance with an intention-to-treat (ITT) approach, all participants who were initially randomized were included in the final analyses according to their original group assignment, regardless of their level of adherence to the intervention protocol. This analytic strategy preserves the benefits of randomization, avoids potential biases introduced by differential dropout or non-compliance, and reflects a more ecologically valid estimation of the intervention's effectiveness in real-world contexts (Gupta, 2011; Montori & Guyatt, 2001). Given that the primary aim of the study was to evaluate the overall efficacy of the fantasy-based intervention, the ITT principle was applied, without conducting separate per-protocol analyses.

Missing values only occurred for 1 participant in a single item of the SDS-R and for another participant in two items of the SPS-R. These were replaced by the median (1.67% of the imputations; Bennet, 2001), but running the analyses without imputation gave basically the same results.

Results

Table 20 presents a comparison between the experimental and control groups at baseline across variables of interest. The results indicate that there were no statistically significant differences between the groups prior to the intervention, suggesting that the random assignment procedure was effective in producing equivalent groups.

Table 20. Independent samples t-test comparing sexual function variables and distraction-related measures at baseline (T1) between experimental and control groups ($N = 60$).

	Experimental		Control				
	M	*SD*	*M*	*SD*	*df*	*t*	*p*
Sexual desire	7.63	1.50	8.00	1.39	58	.98	.330
Sexual distress	10.70	8.93	9.76	10.60	58	-.37	.713
Body appearance worries	20.57	10.74	19.73	8.54	58	-.33	.741
Sexual performance worries	28.17	7.83	29.5	10.21	58	.57	.573
Sexual worries	48.73	16.95	49.23	16.24	58	.12	.908
Sexual pleasure	5.82	2.14	5.500	2.36	58	-.56	.579
Partner-focused imagination vividness	9.70	1.78	9.83	2.18	58	.26	.797

As observed in Table 21, although the Shapiro–Wilk test indicated a statistically significant deviation from normality for all dependent variables with the exception of performance worries, in both experimental and control groups, the corresponding values of skewness and kurtosis remained within acceptable thresholds. Specifically, all skewness values were below |1.65| and all kurtosis values below |2.67|, well within the conservative limits of |2| for skewness and |7| for kurtosis suggested by Kline (2011). This indicates that the observed deviations from normality were not severe. Therefore, the data were suitable for parametric analysis, repeated-measures ANOVA.

Table 21. Shapiro–Wilk normality test for dependent variables at baseline (T1) in experimental and control groups ($N = 60$).

	Experimental			Control		
	Statistic	*df*	*p*	*Statistic*	*df*	*p*
Sexual Desire	.86	30	.001	.88	30	.003
Sexual Distress	.90	30	.008	.80	30	<.001
Body image worries	.83	30	<.001	.89	30	.004
Performance worries	.98	30	.720	.94	30	.076
Sexual Pleasure	.93	30	.044	.91	30	.016
Partner-focused imagination vividness	.90	30	.007	.86	30	.001

In Table 22, repeated measures ANOVAs revealed significant interaction effects between time and group for sexual desire, sexual distress, sexual pleasure, performance worries, and combined performance and body image worries, as well as for sexual pleasure and partner-focused imagination vividness. These findings indicate that changes in these outcomes over time differed significantly between the experimental and control groups. Specifically, sexual desire, sexual pleasure, and partner-focused imagination vividness, only increased in the group who engaged in the sexual fantasy task. Sexual distress and performance worries only decreased in the sexual fantasy task group. No significant main effects of time were found.

Table 22. Repeated measures ANOVAs comparing sexual fantasy and control groups.

	T1 M (SD)	**T2 M (SD)**	**Mean differences (Standard error) [95% CI]**	**Main effect *F* (partial η^2)**	**Time*condition interaction F^* (partial η^2)[1]**

Sexual Desire					
Sexual fantasy group	7.63 (1.50)	8.77 (1.17)	1.14 (.22) [.70, 1.58] $p < .001$	.48 (.008) $p = .493$	39.71 (.411) $p < .001$
Control group	8.00 (1.39)	7.17 (1.72)	-.84 (.22) [-1.28, -.40] $p < .001$		
Sexual Distress					
Sexual fantasy group	10.70 (8.93)	7.27 (7.90)	-3.44 (.85) [-5.14, -1.75] $p = < .001$	.10 (.002) $p = .751$	8.32 (.134) $p = .004$
Control group	9.43 (10.56)	9.53 (10.13)	.11 (.85) [-1.58, 1.80] $p = .896$		
Sexual worries (performance and body image combined)					
Sexual fantasy group	48.73 (16.95)	46.40 (15.35)	-2.40 (2.05) [-6.51, 1.71] $p = .247$	2.14 (.035) $p = .149$	4.41 (.072) $p = .040$
Control group	49.23 (16.24)	52.87 (15.06)	3.70 (2.05) [-.41, 7.81] $p = .077$		
Body Image Worries					
Sexual fantasy group	20.57 (10.74)	20.27 (10.20)	-.34 (1.22) [-2.79, 2.11] $p = .780$	3.36 (.056) $p = .072$	2.18 (.037) $p = .074$

Control group	19.73 (8.54)	22.50 (9.19)	2.81 (1.22) [.36, 5.26] p = .025		
Performance Worries					
Sexual fantasy group	28.17 (7.83)	26.13 (6.47)	-2.06 (1.03) [-4.117, -.001] p = .050	.55 (.010) p = .462	4.12 (.067) p = .047
Control group	29.50 (10.21)	30.37 (8.41)	.89 (1.03 [-2.95, 1.17] p = .389		
Sexual Pleasure					
Sexual fantasy group	5.87 (2.11)	6.47 (2.21)	.60 (.24) [.11, 1.09] p = .017	.10 (.002) p = .752	4.12 (.067) p = .047
Control group	5.50 (2.36)	5.40 (2.39)	-.10 (.20) [-.59, .39] p = .682		
Partner-focused imagination					
Sexual fantasy group	9.70 (1.78)	10.40 (1.61)	.70 (.26) [.18, 1.23] p = .010	.001 (.000) p = .979	6.41 (.101) p = .014
Control group	9.83 (2.18)	9.60 (2.34)	-.24 (.26) [-.76, .29] p = .372		

[1] Degrees of freedom = 1, 57. Participants' sex was entered as a covariate

Discussion

Main findings

The present study sought to examine whether repeated engagement in sexual fantasies focused on a partner could influence key aspects of sexual functioning, namely, sexual desire, distress, worries, and pleasure, as well as vividness of partner-focused mental imagery. Results indicate that, compared to a positive but non-sexual control condition, the sexual fantasy task was associated with statistically significant improvements across all outcomes. Notably, participants in the experimental group reported increased levels of sexual desire and reduced levels of both sexual distress and sexual worries. These hypotheses have been preregistered and were confirmed. Moreover, the sexual fantasy task increased sexual pleasure and partner-focused imagination vividness. Significant improvements in outcomes were only observed for those in the fantasy task conditions. For the control group, changes were generally nonsignificant (there was even a small decrease in desire).

Sexual desire

The observed increase in sexual desire in the experimental group aligns with previous research suggesting that repeated engagement with erotic fantasy content may serve as a viable cognitive strategy for enhancing sexual desire (Birnbaum et al., 2019; Langeslag & Davis, 2022). These findings are consistent with the notion that sexual fantasies can act as potent internal stimuli capable of engaging attentional and motivational systems involved in sexual desire. Notably, the effects were observed in a non-clinical, sexually active sample, highlighting the potential relevance of cognitive-affective mechanisms even among individuals not presenting with clinical dysfunction.

Sexual distress and sexual worries

The finding that sexual distress and worries (especially performance worries) during sexual activity decreased in the experimental group following repeated engagement in partner-focused sexual fantasies suggests that erotic imagination may help reduce the subjective experience of suffering associated with sexuality. Sexual distress is often linked to concerns such as self-monitoring, negative body image, or fear of failure (Barlow, 1986; Nobre & Pinto-Gouveia, 2006). By engaging in guided fantasies centred on a partner, participants may have begun to counteract these maladaptive cognitive cycles, fostering a mental space more oriented toward bodily sensations and positive erotic engagement. By stimulating sexual fantasy, other sources of sexual distress may also be dissipated. These findings seem consistent with clinical

observations that promoting sexual fantasies may help people with sexual difficulties (Newbury et al., 2012).

One possible mechanism behind this improvement involves a shift in attentional focus over time. Repeatedly engaging in partner-focused fantasies may help redirect attention away from evaluative concerns and toward pleasurable, emotionally salient representations. The affective tone of these fantasies, often infused with themes of desire, connection, and acceptance, may further support the integration of more adaptive emotional associations with one's sexuality. These results are in line with transtheoretical models that highlight the role of cognitive-affective factors in the maintenance of sexual distress (Guerreiro et al., 2024; Pascoal et al., 2020), and they are consistent with the view that such factors may be modifiable through psychological interventions.

The finding that performance worries were reduced in the experimental group align with theoretical frameworks that conceptualize such worries as attentional distractions that impair sexual response (Barlow, 1986; Nobre & Pinto-Gouveia, 2006). Through sustained internal focus on vivid and pleasurable imagery involving their partner, participants may have weakened maladaptive patterns such as self-spectatoring or unrealistic standards, replacing them with more affirming and emotionally engaging representations. In line with previous literature about the role of positive mental imagery on stress and anxiety (Landkroon et al, 2022; Williams et al., 2021), this intervention may have contributed to an attentional redirection, thus attenuating anticipatory anxiety and intrusive cognitive patterns.

Experimental evidence further supports the idea that mental imagery evokes stronger emotional responses than verbal processing. For instance, participants exposed to negative scenarios using imagery reported more intense anxiety compared to those using verbal elaboration (Holmes & Mathews, 2005). Similarly, imagery of positive content has been shown to elicit greater improvements in mood than verbal thought alone (Holmes et al., 2006; Holmes et al., 2009), consistent with broader evidence indicating that emotionally salient memories are richer in sensory detail (Arntz et al., 2005). These processes might have played a role in the effects of the sexual fantasy exercise observed in the present study by opening participants to strong and positive sex-related emotions.

The results of the present study are consistent with the idea that targeted cognitive strategies, such as guided sexual fantasy, may influence not only arousal and desire, but also deeper cognitive-affective processes linked to distress and dysfunction.

Sexual pleasure

Research has showed consistent links between sexual fantasies and sexual desire, with links with sexual satisfaction being less consistent (Costa, 2022, 2023). Nevertheless, those in the sexual fantasy group reported increases in sexual pleasure, suggesting that fantasies may do more than increase desire and reduce sex-related negative emotions and processes by enhancing pleasure with sexual activity. This is notable, as the sample was non-clinical, and hence levels of sexual pleasure were not generally low. Nevertheless, the statistical effect of the sexual fantasy task on pleasure was weaker than that on desire (the strongest effect), probably because fantasies influence desire primarily, but desires are not always fulfilled and reflected on satisfaction and pleasure (Costa, 2022).

Vividness of visual mental imagery

Visual mental imagery closely mirrors perceptual processing, engaging neural representations in early visual cortex comparable to those activated by actual perception, thereby supporting the idea that mental imagery can generate perceptually rich, depictive internal representations (Pearson et al., 2015). Over time, research has provided a growing body of evidence suggesting a substantial overlap between the mechanisms that support imagination and those involved in perception (Kreiman et al., 2000; Mozhdehfarahbakhsh et al., 2024). Beyond the primary outcomes, a secondary analysis revealed that the sexual fantasy task led to a significant increase in the vividness of partner-focused imagination, indicating greater internally generated attention to partner-related mental imagery (Huang et al., 2023). While causal mechanisms remain to be fully established, one possible interpretation is that repeated engagement in guided sexual fantasy may contribute to enhancing the vividness of internally generated erotic images (Smith & Over, 1990b).

From a cognitive perspective, this change could reflect a more efficient recruitment of internal attentional resources, potentially linked to the activation of attentional networks associated with imagery vividness (Huang et al., 2023). The absence of a similar effect in the control group suggests that the increase in vividness was content-specific, though this interpretation warrants further investigation. Based on previous evidence from domains such as sports psychology, where systematic imagery training has been associated with improvements in both vividness and performance (Morone et al., 2022), it is reasonable to hypothesize that similar mechanisms might apply to sexual imagery. Repeated practice may help individuals generate more vivid, emotionally engaging internal representations, which could, in turn, support sexual arousal,

desire, and pleasure, while mitigating the impact of distracting or negatively valenced cognitions, and dissipating sexual distress. Future studies are needed to directly test this hypothesis and clarify the conditions under which vividness of sexual imagery can be enhanced through intentional mental practice.

Limitations

Limitations should be acknowledged. First, while the sample size was sufficient to detect strong-to-moderate interaction effects, it is a convenience, not quite large Portuguese sample. Second, although a pleasant non-sexual control condition was used, we cannot fully rule out the influence of unspecific factors such as positive affect, relaxation, or expectation effects. Third, the reliance on self-report measures limits the ability to draw conclusions about behavioural or physiological changes. Future research should incorporate follow-ups to assess the durability of effects, and explore potential moderators such as the content, intensity, and emotional tone of the fantasies. In addition, multimethod approaches integrating physiological, behavioural, and neurocognitive markers could offer a more comprehensive understanding of how internally generated sexual imagery influences sexual functioning and emotional regulation. While these findings are promising, further investigation is necessary.

Conclusion

Taken together, the present findings provide preliminary evidence suggesting that brief cognitive exercises centred on sexual fantasy may be associated with improvements in sexual desire, reductions in sexual distress and sexual worries, enhancement of sexual pleasure, partner-focused imagination vividness, over a short time frame. Although the observed changes were statistically significant, the underlying mechanisms remain to be fully elucidated. One possible interpretation is that engaging in positive representations of a sexual partner could help redirect attention from negative or evaluative thoughts, potentially easing cognitive distractions during sexual activity, while enhancing attentional focus on internal stimulation driving desire. Importantly, the fact that the intervention was delivered in a home-based context may support its acceptability and feasibility, although further research is needed to assess its generalizability and longer-term effects.

References

Arntz, A., de Groot, C., & Kindt, M. (2005). Emotional memory is perceptual. *Journal of Behavior Therapy and Experimental Psychiatry, 36*(1), 19-34. https://doi.org/10.1016/j.jbtep.2004.11.003

Barlow, D. H. (1986). Causes of sexual dysfunction: The role of anxiety and cognitive interference. *Journal of Consulting and Clinical Psychology, 54*(2), 140–148. https://doi.org/10.1037/0022-006X.54.2.140

Benedek, M., Jauk, E., Beaty, R. E., Fink, A., Koschutnig, K., & Neubauer, A. C. (2016). Brain mechanisms associated with internally directed attention and self-generated thought. *Scientific Reports*, *6*(1), 22959. https://doi.org/10.1038/srep22959

Bennett, D. A. (2001). How can I deal with missing data in my study? *Australian and New Zealand Journal of Public Health, 25*(5), 464–469. https://doi.org/10.1111/j.1467-842X.2001.tb00294.x

Birnbaum, G. E., Kanat-Maymon, Y., Mizrahi, M., Recanati, M., & Orr, R. (2019). What fantasies can do to your relationship: The effects of sexual fantasies on couple interactions. *Personality and Social Psychology Bulletin, 45*(3), 461–476. https://doi.org/10.1177/0146167218789611

Both, S., Everaerd, W., & Laan, E. (2007). Desire emerges from excitement: A psychophysiological perspective on sexual motivation. In E. Janssen (Ed.), *The Psychophysiology of Sex* (pp. 327–339). Indiana University Press.

Busch, T. M., Goodwin, G. J., Dempsey, M. R., Conrads, G. S., & Wilson, S. M. (2025). Exploring the impact of fantasizing on romantic relationships and attachment. *Sexuality & Culture*, *29*(2), 610–635. https://doi.org/10.1007/s12119-024-10289-x

Carvalheira, A. A., Brotto, L. A., & Leal, I. (2010). Women's motivations for sex: Exploring the Diagnostic and Statistical Manual, Fourth Edition, Text Revision criteria for hypoactive sexual desire and female sexual arousal disorders. *The Journal of Sexual Medicine, 7*(4 Pt 1), 1454–1463. https://doi.org/10.1111/j.1743-6109.2009.01693.x

Carvalheira, A., Godinho, L., & Costa, P. A. (2017). The impact of body dissatisfaction on distressing sexual difficulties among men and women: The mediator role of cognitive distraction. Journal of Sex Research, 54(3), 331–340. https://doi.org/10.1080/00224499.2016.1168771

Costa, R. M. (2022). Sexual fantasies. In T. K. Shackelford (Ed.), *The Cambridge handbook of evolutionary perspectives on sexual psychology* (Vol. 3, *Female sexual adaptations*, pp. 209–240). Cambridge University Press. https://doi.org/10.1017/9781108943567.011

Costa, R.M. (2023). Sexual fantasies and sexual functioning/desire. In: Shackelford, T.K. (ed.) *Encyclopedia of Sexual Psychology and Behavior.* Springer, Cham. https://doi.org/10.1007/978-3-031-08956-5_2203-1

Costa, R. M., & Oliveira, R. F. (2015). Maladaptive defense mechanisms are associated with decoupling of testosterone from sexual desire in women of reproductive age. *Neuropsychoanalysis, 17*, 121–134. https://doi.org/10.1080/15294145.2015.1089184

de Jong, D. C. (2009). The role of attention in sexual arousal: Implications for treatment of sexual dysfunction. *Journal of Sex Research, 46*(2–3), 237–248. https://doi.org/10.1080/00224490902747230

Dove, N. L., & Wiederman, M. W. (2000). Cognitive distraction and women's sexual functioning. *Journal of Sex & Marital Therapy, 26*(1), 67–78. https://doi.org/10.1080/009262300278650

Goldey, K. L., & van Anders, S. M. (2011). Sexy thoughts: Effects of sexual cognitions on testosterone, cortisol, and arousal in women. *Hormones and Behavior, 59*(5), 754–764. https://doi.org/10.1016/j.yhbeh.2010.12.005

Goldey, K. L., & van Anders, S. M. (2012). Sexual thoughts: Links to testosterone and cortisol in men. *Archives of Sexual Behavior*, *41*(6), 1461–1470. https://doi.org/10.1007/s10508-011-9858-6

Gomes, A. L. Q., & Nobre, P. (2012). The International Index of Erectile Function (IIEF-15): Psychometric properties of the Portuguese version. *Journal of Sexual Medicine, 9*(1), 180–187. https://doi.org/10.1111/j.1743-6109.2011.02467.x

Gupta S. K. (2011). Intention-to-treat concept: A review. *Perspectives in clinical research*, *2*(3), 109–112. https://doi.org/10.4103/2229-3485.83221

Guerreiro, P. P., Raposo, C. F., Salvador, Á., Manão, A. A., & Pascoal, P. M. (2024). A transdiagnostic approach to sexual distress and pleasure: The role of worry, rumination, and emotional regulation. *Current Psychology*, *43*(17), 15385–15396. https://doi.org/10.1007/s12144-023-05320-7

Harris, R., Yulis, S., & LaCoste, D. (1980). Relationships among sexual arousability, imagery ability, and introversion–extraversion. *Journal of Sex Research, 16*(1), 72–86. https://doi.org/10.1080/00224498009551063

Holmes, E. A., Mathews, A., Dalgleish, T., & Mackintosh, B. (2006). Positive interpretation training: Effects of mental imagery versus verbal training on positive mood. *Behavior Therapy*, *37*(3), 237–247. https://doi.org/10.1016/j.beth.2006.02.002

Holmes, E. A., Lang, T. J., & Shah, D. M. (2009). Developing interpretation bias modification as a "cognitive vaccine" for depressed mood: Imagining positive events makes you feel better than thinking about them verbally. *Journal of Abnormal Psychology, 118*(1), 76–88. https://doi.org/10.1037/a0012590

Holmes, E. A., & Mathews, A. (2005). Mental imagery and emotion: A special relationship? *Emotion, 5*(4), 489–497. https://doi.org/10.1037/1528-3542.5.4.489

Huang, J. Y., Xue, X. J., Wang, Z. X., Li, Z. F., Rui-Su, Wang, N. N., Huang, X. Y., Li, H., Ma, H. L., Liu, M., & Zhang, D. L. (2023). The relationship between attention networks and individual differences in visual mental imagery vividness: An EEG study. *Neuropsychologia, 191*, 108736. https://doi.org/10.1016/j.neuropsychologia.2023.108736

Kessler, R. C., Adler, L., Ames, M., Demler, O., Faraone, S., et al. (2005). The World Health Organization Adult ADHD Self-Report Scale (ASRS): A short screening scale for use in the general population. *Psychological Medicine, 35*(2), 245–256. https://doi.org/10.1017/S0033291704002892

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). The Guilford Press.

Kosslyn, S. M., Ganis, G., & Thompson, W. L. (2001). Neural foundations of imagery. *Nature Reviews Neuroscience, 2*(9), 635–642. https://doi.org/10.1038/35090055

Koukounas, E., & Over, R. (1999). Allocation of attentional resources during habituation and dishabituation of male sexual arousal. *Archives of Sexual Behavior, 28*(6), 539–552. https://doi.org/10.1023/A:1018769200845

Kreiman, G., Koch, C., & Fried, I. (2000). Imagery neurons in the human brain. *Nature, 408*(6810), 357–361. https://doi.org/10.1038/35042575

Kwon, M., Kim, D. J., Cho, H., & Yang, S. (2013). The smartphone addiction scale: Development and validation of a short version for adolescents. *PLOS ONE, 8*(12), e83558. https://doi.org/10.1371/journal.pone.0083558

Landkroon, E., van Dis, E. A. M., Meyerbröker, K., Salemink, E., Hagenaars, M. A., & Engelhard, I. M. (2022). Future-oriented positive mental imagery reduces anxiety for exposure to public speaking. *Behavior Therapy*, *53*(1), 80–91. https://doi.org/10.1016/j.beth.2021.06.005

Langeslag, S., & Davis, L. L. (2022). A preliminary study on up-regulation of sexual desire for a long-term partner. *The Journal of Sexual Medicine, 19*(5), 872–878. https://doi.org/10.1016/j.jsxm.2022.02.017

Leitenberg, H., & Henning, K. (1995). Sexual fantasy. *Psychological Bulletin, 117*, 469–496. https://doi.org/10.1037/0033-2909.117.3.469

Meuwissen, I., & Over, R. (1991). Multidimensionality of the content of female sexual fantasy. *Behaviour Research and Therapy, 29*(2), 179–189. https://doi.org/10.1016/0005-7967(91)90046-6

Morone, G., Ghanbari Ghooshchy, S., Pulcini, C., Spangu, E., Zoccolotti, P., Martelli, M., Spitoni, G. F., Russo, V., Ciancarelli, I., Paolucci, S., & Iosa, M. (2022). Motor imagery and sport performance: A systematic review on the PETTLEP model. *Applied Sciences*, *12*(19), 9753. https://doi.org/10.3390/app12199753

Montori, V. M., & Guyatt, G. H. (2001). Intention-to-treat principle. *CMAJ : Canadian Medical Association Journal = Journal de l'Association Medicale Canadienne*, *165*(10), 1339–1341.

Mozhdehfarahbakhsh, A., Hecker, L., Joos, E., & Kornmeier, J. (2024). Visual imagination can influence visual perception – towards an experimental paradigm to measure imagination. *Scientific Reports*, *14*(1), 24486. https://doi.org/10.1038/s41598-024-74693-x

Newbury, R., Hayter, M., Wylie, K. R., & Ridell, J. (2012). Sexual fantasy as clinical intervention. *Sexual and Relationship Therapy, 27*(4), 358–371. https://doi.org/10.1080/14681994.2012.733816

Nobre, P. J., & Pinto-Gouveia, J. (2006). Dysfunctional sexual beliefs as vulnerability factors for sexual dysfunction. *Journal of Sex Research, 43*(1), 68–75. https://doi.org/10.1080/00224490609552300

Nutter, D. E., & Condron, M. K. (1983). Sexual fantasy and activity patterns of females with inhibited sexual desire versus normal controls. *Journal of Sex & Marital Therapy, 9*(4), 276–282. https://doi.org/10.1080/00926238308410914

Nutter, D. E., & Condron, M. K. (1985). Sexual fantasy and activity patterns of males with inhibited sexual desire and males with erectile dysfunction versus normal controls. *Journal of Sex & Marital Therapy, 11*(2), 91–98. https://doi.org/10.1080/00926238508406074

Pascoal, P. M., Raposo, C. F., & Roberto, M. S. (2020). A Transdiagnostic approach to sexual distress and sexual pleasure: A preliminary mediation study with repetitive negative thinking. *International Journal of Environmental Research and Public Health*, *17*(21), 7864. https://doi.org/10.3390/ijerph17217864

Pascoal, P. M., Sanchez, D. T., Raposo, C. F., & Pechorro, P. (2016). Initial validation of the Sexual Pleasure Scale in clinical and non-clinical samples of partnered heterosexual people. *Journal of Sexual Medicine, 13*(9), 1408–1413. https://doi.org/10.3390/ijerph17217864

Pearson, J., Naselaris, T., Holmes, E. A., & Kosslyn, S. M. (2015). Mental imagery: Functional mechanisms and clinical applications. *Trends in Cognitive Sciences*, *19*(10), 590–602. https://doi.org/10.1016/j.tics.2015.08.003

Pechorro, P., Diniz, A., Almeida, S., & Vieira, R. (2009). Validação portuguesa do Índice de Funcionamento Sexual Feminino (FSFI). *Laboratório de Psicologia, 7*, 33–44. https://doi.org/10.14417/lp.684

Pinho, M. S., Simões, M. R., Beato, M. S., & Díez, E. (2007). Questionário de vivacidade de imagens visuais - Versão revista (VVIQ-RV). In M. R. Simões, C. Machado, M. Gonçalves, & L. Almeida (Eds.), *Avaliação psicológica: Instrumentos validados para a população portuguesa* (Vol. 3, pp. 187–201). Quarteto.

Ribeiro, J. L. P., Honrado, A. A. J. D., & Leal, I. P. (2004). Contribuição para o estudo da adaptação portuguesa das Escalas de Ansiedade, Depressão e Stress (EADS) de 21 itens de Lovibond e Lovibond. *Psicologia, Saúde & Doenças, 5*(2), 229–239.

Rosen, R., Brown, C., Heiman, J., Leiblum, S., Meston, C., Shabsigh, R., Ferguson, D., & D'Agostino, R., Jr (2000). The female sexual function index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. *Journal of sex & marital therapy*, *26*(2), 191–208. https://doi.org/10.1080/009262300278597

Rosen, R. C., Riley, A., Wagner, G., Osterloh, I. H., Kirkpatrick, J., & Mishra, A. (1997). The International Index of Erectile Function (IIEF): A multidimensional scale for assessment of erectile dysfunction. *Urology*, *49*(6), 822–830. https://doi.org/10.1016/s0090-4295(97)00238-0

Smith, D., & Over, R. (1990). Enhancement of fantasy-induced sexual arousal in men through training in sexual imagery. *Archives of Sexual Behavior, 19*, 477-489. https://doi.org/10.1007/BF02442349

Smith, D., & Over, R. (1990b). Male sexual arousal as a function of the content and the vividness of erotic fantasy. *Psychophysiology, 24*(3), 334–339. https://doi.org/10.1111/j.1469-8986.1987.tb00304.x

Spiering, M., & Everaerd, W. (2007). *The sexual unconscious. In E. Janssen (Ed.), The Psychophysiology of Sex* (pp. 166–184). Indiana University Press.

Symonds, T., Perelman, M. A., Althof, S., Giuliano, F., Martin, M., May, K., & Morris, M. (2007). Development and validation of a premature ejaculation diagnostic tool. *European Urology*, 52(3), 565–573. https://doi.org/10.1016/j.eururo.2007.01.028

Tavares, I. M., Moura, C. V., & Nobre, P. J. (2020). The role of cognitive processing factors in sexual function and dysfunction in women and men: A systematic review. *Sexual medicine reviews, 8*(3), 403–430. https://doi.org/10.1016/j.sxmr.2020.03.002

Tavares, I. M., Santos-Iglesias, P., & Nobre, P. J. (2022). Psychometric validation of the Sexual Distress Scale in male and female Portuguese samples. *The Journal of Sexual Medicine, 19*(5), 834–845. https://doi.org/10.1016/j.jsxm.2022.02.026

Toates, F. (2009). An integrative theoretical framework for understanding sexual motivation, arousal, and behavior. *Journal of Sex Research, 46*(2–3), 168–193. https://doi.org/10.1080/00224490902747768

Tokatlidis, O., & Over, R. (1995). Imagery, fantasy, and female sexual arousal. *Australian Journal of Psychology*, *47*(2), 81–85. https://doi.org/10.1080/00049539508257504

Velten, J., Milani, S., Margraf, J., & Brotto, L. A. (2021). Visual attention and sexual arousal in women with and without sexual dysfunction. *Behaviour Research and Therapy, 144*, Article 103915. https://doi.org/10.1016/j.brat.2021.103915

Williams, S. E., Quinton, M. L., Veldhuijzen van Zanten, J. J. C. S., Davies, J., Möller, C., Trotman, G. P., & Ginty, A. T. (2021). Mastery imagery ability is associated with positive anxiety and performance during psychological stress. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.568580

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Chapter 5: General Discussion

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Sexual functioning is a complex and multifaceted phenomenon, emerging from the dynamic interplay of biological, cognitive, emotional, and relational processes. These processes are further shaped by contextual, cultural, and interpersonal factors, requiring a dynamic integration of attention, motivation, and affect to sustain adaptive sexual responses (Calabrò et al., 2019). This complexity underscores the importance of adopting multilevel perspectives to understand how internal states and external cues converge to shape desire, arousal, pleasure, and overall sexual well-being

Theoretical frameworks have already established that attentional mechanisms are crucial for initiating and sustaining erotic engagement and sexual function: directing attention toward partner-related and erotic stimuli promotes sexual arousal, desire, and connection, whereas attentional distractions, including self-monitoring or intrusive sexual worries, disrupt the unfolding of sexual response (Barlow, 1986; Janssen et al., 2000; Nobre, 2023; Nobre & Pinto-Gouveia, 2006; Spiering & Everaerd, 2007; Tavares et al., 2020; Toates, 2009;). Building on this premise, the present research examined how cognitive distractions, including sexual worries, problematic smartphone use, general inattention, and the vividness of partner-focused imagination, shape the quality of sexual experiences. Specifically, this project investigated how these mechanisms contribute to adaptive outcomes, such as sexual desire, pleasure, and overall functioning, as well as maladaptive outcomes, including sexual distress and sexual/intrusive worries.

By integrating cross-sectional, longitudinal, and experimental approaches, this project offers a comprehensive and temporally informed account of how attentional dynamics, partner-focused vividness of imagination, and the deliberate use of sexual fantasies shape sexual experiences. Collectively, these studies advance a more nuanced conceptualization of sexual functioning and highlight how individuals regulate attentional focus, manage cognitive distractions, and engage with internally generated erotic representations to foster intimacy, pleasure, and overall sexual well-being. Across studies, this thesis consistently showed that sex-specific attentional distractions, particularly intrusive sexual worries and smartphone-driven attentional drains, undermine sexual functioning and well-being, while the capacity to vividly imagine one's partner emerged as a protective and enhancing factor linked to greater desire, pleasure, and lower sexual distress. The experimental findings further demonstrated that guided sexual fantasy practice can strengthen these imaginative and attentional capacities, and lead improvements in desire, pleasure, and reductions in sexual worries and distress over time.

Building on prior research highlighting the centrality of attentional processes and sexual fantasies in sexual functioning, this thesis adopted a multimethod and temporally informed approach to examine these mechanisms in an integrated manner. By combining cross-sectional, longitudinal, and experimental designs, the project explored how various attention factors shape sexual desire, pleasure, and distress. This comprehensive perspective advances the field by offering a more nuanced understanding of how attentional and imaginal dynamics jointly influence sexual well-being, both in daily life and in response to targeted fantasy-based interventions.

Main findings

Sexual Worries as Cognitive Distraction

Attention plays a pivotal role in sexual experience, acting both as a facilitator when directed toward erotic or partner-related stimuli and as a barrier when attentional resources are diverted by internal or external distractions.

In the cross-sectional Study 1, intrusive sexual worries, encompassing concerns about performance and body image, were associated with all sexual variables with exception of male pleasure in simple correlations. In multiple regressions, sexual worries still predicted poorer female sexual function and lower pleasure, and male distress, independently of dysphoria and other attentional factors, underscoring the unique and robust role of sex-specific worries in undermining adaptive sexual responses. These findings align closely with cognitive-behavioural and cognitive-emotional models of sexual dysfunction (Barlow, 1986; Nobre & Pinto-Gouveia, 2006; Nobre, 2023; Tavares et al., 2020), which conceptualise such worries as attentional disruptions that interfere with erotic focus, heighten self-monitoring, and perpetuate maladaptive cycles of anxiety and avoidance. Yet, in the longitudinal Study 2 worries did not emerge as significant independent predictors of changes in sexual outcomes after controlling for baseline levels of baseline levels of sexual outcomes, dysphoric mood, and other attentional factors. Notably, one-month temporal stability of sexual worries was strong.

The experimental study provided preliminary evidence suggesting that these patterns may be modifiable through targeted interventions. Participants who engaged in a four-week, partner-focused sexual fantasy practice reported significant reductions in sexual worries, particularly those related to performance. This reduction coincided with measurable improvements in sexual desire, pleasure, and distress. These findings align with evidence from the broader mental imagery literature showing that repeated engagement with emotionally

salient imagery can amplify positive affect and reduce negative cognitive intrusions (Holmes & Mathews, 2005; Holmes et al., 2006; Holmes et al., 2009). In this context, regularly practicing partner-focused sexual fantasies may help attenuate evaluative or self-critical thoughts and redirect attentional resources toward more rewarding and emotionally engaging representations, thereby fostering cognitive and emotional conditions more conducive to adaptive sexual experiences. This finding aligns with transtheoretical perspectives, which conceptualise sexual distress as intertwined with cognitive patterns such as rumination and sexual worries, suggesting that targeting these patterns may alleviate distress and facilitate more adaptive sexual responses (Guerreiro et al., 2024; Pascoal et al., 2020)

Together, these results reinforce the conceptualisation of sexual worries as a central mechanism through which attentional disruption impairs sexual functioning. They also highlight that, although these cognitive patterns can be stable, they are not immutable. Interventions that cultivate intentional and emotionally engaging attentional focus, such as sexual fantasy, may offer a promising pathway for reducing intrusive worries and fostering more adaptive sexual experiences.

General Inattention

General inattention, reflecting diffuse lapses in attentional control unrelated to the sexual context, demonstrated a more modest and nuanced role in sexual functioning across the three studies. In the cross-sectional analysis (Study 1), higher levels of general inattention were associated with sexual functioning and greater sexual distress, but not with pleasure in both men and women in simple correlations, but these associations disappeared once dysphoria and smartphone-related distraction were statistically controlled. In the longitudinal Study 2, general inattention demonstrated weak and inconsistent associations with sexual outcomes, in simple correlations, and did not emerge as a significant predictor of changes in sexual well-being over the one-month follow-up period, when baseline levels of sexual outcomes and negative mood were accounted for. Taken together, these findings suggest that general inattention is less disruptive to sexual functioning than sex-specific cognitive distractions, especially in non-clinical samples. They also raised the possibility that the observed associations between ADHD and sexual difficulties (Jabalkandi et al., 2020; Soldati et al., 2020) are, to a large extent, due to comorbidities, such as dysphoric mood. Future research should explore these interactions more directly, ideally through multimethod approaches that combine self-report measures with behavioural or neurocognitive indices of attention, to clarify the boundary between diffuse

attentional lapses and context-specific cognitive disruptions in shaping sexual functioning and distress.

Problematic smartphone use

Problematic smartphone use, emerged as a factor associated with diminished sexual functioning and pleasure, and increased sexual distress across studies. In the cross-sectional analysis (Study 1), simple correlation analyses showed higher levels of problematic smartphone use correlating with poorer sexual function, greater sexual distress, and, in men, reduced sexual pleasure. In multiple regression analyses, problematic smartphone use predicted greater sexual distress in women and lower sexual pleasure in men. The longitudinal Study 2 provided stronger temporal evidence for this relationship in women. In addition to a similar simple correlation pattern, it was found that over a one-month period, higher baseline problematic smartphone use predicted declines in sexual functioning and reductions in sexual pleasure, after adjusting for initial levels of the sexual outcomes. Interestingly, however, problematic smartphone use did not predict changes in sexual distress over time, suggesting that its disruptive effects may primarily erode the quality of sexual engagement and satisfaction rather than directly intensify distress-related experiences.

These findings align with broader evidence linking problematic smartphone use to diminished relational and emotional well-being, but the significant independent associations between problematic smartphone use and sexual variables in Studies 1 and 2 remained after controlling for dysphoric mood and general inattention, indicating that these associations are not simply driven by the potential effects of problematic smartphone use on mood (Hunt et al., 2018; Kross et al., 2013; Lambert et al., 2022; Tromholt, 2016; Turel et al., 2018) or on a general tendency for distraction (Aydin et al., 2024; Boer et al., 2020; McNamee et al., 2021; Sihoe et al., 2023; Wang et al., 2024). Indeed, according to our results, general inattention, after accounting for negative mood, does not appear to have adverse effects on sexual life.

Studies have documented that excessive engagement with smartphones or social media can erode intimacy, foster conflict, and increase relational dissatisfaction through mechanisms such as phubbing (the act of ignoring one's partner to engage with a phone) and constant availability pressures (Hipps & Carlson, 2021; Mushquash et al., 2022; Roberts & David, 2016). From a cognitive perspective, smartphones act as continuous sources of external attentional competition, diverting resources from partner-focused engagement and erotic stimuli, thereby potentially undermining conditions necessary for desire, arousal, and satisfaction. Another

plausible mechanism involves social comparison and internalized insecurities fostered by online environments. Exposure to curated images, idealized bodies, and unrealistic sexual norms may increase body image concerns or performance anxieties, which in turn disrupt erotic focus and satisfaction (Costa et al., 2023; Carvalheira et al., 2017; Woertman & van den Brink, 2012). This pathway is particularly salient for women, who may be more vulnerable to body-related comparisons in online spaces, but evidence suggests that men are not immune to these pressures, particularly in contexts of pornography consumption or sexualized digital content (here the pressure for performance anxiety might be an issue).

At a broader psychological level, problematic smartphone use has been associated with dysphoric mood, attentional fragmentation, and reduced interoceptive awareness (Wallman-Jones et al., 2023). Reduced interoception, the ability to attend to internal bodily signals, may inhibit the perception of sexual arousal cues and pleasure, further constraining the quality of sexual experiences (Berenguer et al., 2019). This is an important topic for future research.

Partner-focused mental imagery vividness and sexual fantasy

Partner-focused mental imagery emerged as consistently associated with better sexual function and lower sexual distress (and more weakly and inconsistently with sexual pleasure) in simple cross-sectional correlations in Study 1 (for both men and women), as well as in Study 2. Further, in the multiple regressions conducted in Study 1, partner-focused imagery vividness predicted better sexual function and lower sexual distress in women and men. In Study 2, partner-focused imagery vividness was a longitudinal predictor of lower distress and greater pleasure in women, after accounting for baseline levels of these outcomes. This temporal pattern strengthens the view that vividness is not merely a correlate of sexual well-being but may represent a cognitive-affective resource that supports erotic engagement and buffers against maladaptive patterns, such as sexual worries or distress.

The experimental Study 3 corroborated the important role of imagination in sexual function and well-being and provided preliminary evidence of partner-focused imagination vividness modifiability. Participants engaging in structured sexual fantasy practice not only reported increases in sexual desire and pleasure (and decreases in sexual distress and performance worries), but also significant improvements in the vividness of partner-focused imagery over four weeks. These findings suggest that deliberate engagement with erotic imagery may strengthen attentional and imaginative systems, enabling individuals to access more vivid and emotionally salient internal representations. This aligns with evidence from

cognitive neuroscience showing that imagery shares overlapping neural substrates with perception (Pearson, 2019; Kreiman et al., 2000) and that imagination vividness is supported by the alerting and executive networks of attention (Posner & Petersen, 1990; Huang et al., 2023). In this framework, repeated erotic imagery practice could act as a form of attentional training, enhancing the capacity to sustain focus on rewarding internal content while reducing susceptibility to intrusive or evaluative cognitions.

Taken together, these mechanisms suggest that vivid erotic imagery may functions not only as a passive correlate of sexual desire but also as a modulator of attentional and emotional processes central to adaptive sexual functioning. From a cognitive-emotional perspective, the ability to vividly imagine erotic and partner-related scenarios may operate through multiple mechanisms: 1) Enhanced attentional engagement: vivid imagery may help anchor attention to internally generated erotic cues, counteracting external distractions and internal disruptions (e.g., sexual worries); 2) Emotional amplification: vivid mental representations tend to evoke stronger affective responses than verbal or abstract thoughts, as demonstrated in imagery research (Holmes & Mathews, 2005; Holmes et al., 2009), thereby deepening erotic engagement and subjective pleasure; 3) Positive reappraisal: constructing rich, emotionally salient fantasies involving the partner may help reframe negative self-beliefs, reduce evaluative pressure, and strengthen relational intimacy, consistent with findings in positive imagery interventions in clinical psychology (Landkroon et al., 2022).

Clinically, these findings highlight the potential of fantasy-based or imagery-focused interventions to promote sexual well-being. Structured exercises that foster erotic imagination, especially those anchored in partner-related content, could be incorporated into therapeutic protocols for individuals experiencing low desire, sexual distress, or performance-related worries. Such approaches would be consistent with cognitive-behavioral frameworks that emphasize attentional retraining and cognitive restructuring as pathways to improving sexual functioning (Barlow, 1986; Nobre, 2023). However, further research is needed to clarify the optimal parameters of such interventions, including frequency, personalization of fantasy content, and integration with relational dynamics. Longitudinal and multimethod studies, incorporating physiological and neurocognitive measures, will be critical to delineate the mechanisms through which imagery vividness influences sexual response and to determine its potential for sustained change. According to a previous study, one means to stimulate both fantasy generation and fantasy vividness beneficial for sexual life might consist in, after a period of relaxation, forming sexual or partner-directed mental images following a script, keep

concentrated on their details for about one minute with eyes closed, and then write them down. With repetition this might lead to higher sexual or partner-directed mental imagery vividness and higher levels of sexual arousal (Smith & Over, 1990). Research is warranted to explore the effects of this kind of intervention on sexual function, pleasure, and distress, as well as on relationship quality.

Practical implications

Although the present project was conducted in non-clinical samples, the findings point to potential applications in therapeutic contexts. Structured practices that foster partner-focused imagery and attentional engagement could complement established interventions for sexual difficulties, offering low-cost and accessible strategies to support desire enhancement, reduce distress, and improve sexual well-being. Nevertheless, these implications should be considered preliminary, and future research with clinical populations and multimethod assessments is needed to evaluate their feasibility, effectiveness, and long-term impact. Although further research, particularly in clinical and applied contexts, is needed to validate and extend these findings, the present work highlights several areas of potential practical relevance:

1) Clinical and health contexts: structured exercises that promote partner-focused imagination and intentional attentional engagement could complement existing therapeutic approaches, such as cognitive-behavioural or mindfulness-based interventions for sexual difficulties. These practices may help individuals reduce intrusive sexual worries, enhance desire, and foster more rewarding sexual experiences;

2) Relational and social dynamics: The consistent association between problematic smartphone use and poorer sexual functioning and pleasure underscores the importance of addressing external attentional interference in relational counselling. Interventions promoting healthier technology boundaries, such as reducing partner-phubbing or encouraging periods of device-free intimacy, may support both relational and sexual well-being;

3) Educational and preventive settings: these results also point to opportunities for sexual education programs to integrate concepts of attentional focus and sexual imagination. Teaching individuals to manage distractions and to engage in adaptive erotic imagination could foster healthier sexual development and enhance intimacy and pleasure within consensual relationships;

While these implications are promising, they remain preliminary. Future research in clinical and applied settings, including diverse populations, is essential to establish feasibility, efficacy, and long-term benefits of these strategies.

Limitations and Future Directions

This thesis presents several strengths, including the integration of cross-sectional, longitudinal, and experimental designs, the preregistration of hypotheses for the randomized trial, and the use of an intention-to-treat approach to preserve the integrity of randomization. However, several limitations should be acknowledged to contextualize the findings and guide future research: 1) all three studies relied exclusively on self-report measures and convenience samples; 2) The cross-sectional study (Study 1), while allowing the collection of larger sample, cannot establish causal relations; 3) The longitudinal study (Study 2) covered only a one-month interval, allowing the detection of temporal relationships, and used a moderate sample size, which, while sufficient to detect medium effects, may have lacked power for smaller effects; also, the sample consisted exclusively of women; other studies might should explore whether the mechanisms observed here operate similarly in me, as well as in sexual minority groups; 4) The randomized trial (Study 3) focused on short-term outcomes; no follow-up was conducted to evaluate the durability of the observed changes over time.

Conclusion

This thesis advances the understanding of sexual functioning by integrating evidence from cross-sectional, longitudinal, and experimental approaches to examine how attentional factors (underlying both internal and external attention) shape desire, pleasure, and distress. Across studies, the findings consistently highlight that sex-related distractions—such as intrusive sexual worries—and problematic smartphone use (providing a constant stream of stimuli that compete for and disrupt attention) undermine sexual well-being, while the capacity to vividly imagine one's partner emerges as a protective mechanism. Additionally, it was shown that guided engagement with sexual fantasies increases sexual desire and pleasure, and reduces sexual distress and performance worries, while enhancing partner-focused imagery vividness. This underscores the potential role of this type of intervention as an accessible and effective cognitive-affective strategy to enhance sexual well-being.

By combining robust theoretical frameworks with complementary methodologies, this work provides a more nuanced conceptualization of how attentional and imaginal dynamics contribute to sexual experiences in daily life. These insights not only refine cognitive-affective

models of sexual response but also point to promising directions for applied practice, where attentional training and guided imagination could complement existing therapeutic approaches.

Looking forward, these findings open opportunities for research in more diverse populations, clinical contexts, and ecological settings, including the use of physiological and multimodal measures to capture the complex interplay of attention, cognition, and emotion in sexual functioning. In doing so, this line of work holds the potential to inform both theory and practice, promoting interventions that are evidence-based, accessible, and attuned to the lived experiences of individuals.

References

Aydin, T., Parris, B. A., Arabaci, G., & Demirci, I. (2024). Trait-level non-clinical ADHD symptoms in a community sample and their association with technology addictions. *Current Psychology, 43*(15), 10682–10692. https://doi.org/10.1007/s12144-023-05203-x

Barlow, D. H. (1986). Causes of sexual dysfunction: The role of anxiety and cognitive interference. *Journal of Consulting and Clinical Psychology, 54*(2), 140–148. https://doi.org/10.1037/0022-006X.54.2.140

Berenguer, C., Rebôlo, C., & Costa, R. M. (2019). Interoceptive awareness, alexithymia, and sexual function. *Journal of Sex & Marital Therapy, 45*(8), 729–738. https://doi.org/10.1080/0092623X.2019.1610128

Boer, M., Stevens, G., Finkenauer, C., & van den Eijnden, R. (2020). Attention deficit hyperactivity disorder-symptoms, social media use intensity, and social media use problems in adolescents: Investigating directionality. *Child development, 91*(4), e853–e865. https://doi.org/10.1111/cdev.13334

Calabrò, R. S., Cacciola, A., Bruschetta, D., Milardi, D., Quattrini, F., Sciarrone, F., La Rosa, G., Bramanti, P., & Anastasi, G. (2019). Neuroanatomy and function of human sexual behavior: A neglected or unknown issue? *Brain and Behavior, 9*(12), e01468. https://doi.org/10.1002/brb3.1389

Carvalheira, A., Godinho, L., & Costa, P. (2017). The impact of body dissatisfaction on distressing sexual difficulties among men and women: The mediator role of cognitive distraction. *Journal of Sex Research, 54*(3), 331–340. https://doi.org/10.1080/00224499.2016.1168771

Costa, R. M., Pestana, J., & Costa, D. (2018). Self-transcendence, sexual desire, and sexual frequency. *Journal of Sex & Marital Therapy, 44*(1), 56–60. https://doi.org/10.1080/0092623X.2017.1314397

Costa, R. M., Pimenta, F., Ferreira-Valente, A., & Patrão, I. (2023). Social media addiction is associated with sexual dissatisfaction: A cross-sectional study with quota sampling in Portugal [Preprint]. *OSF Preprints*. https://doi.org/10.31219/osf.io/eb9c7

Guerreiro, P. P., Raposo, C. F., Salvador, Á., Manão, A. A., & Pascoal, P. M. (2024). A transdiagnostic approach to sexual distress and pleasure: The role of worry, rumination,

and emotional regulation. *Current Psychology, 43*(17), 15385–15396. https://doi.org/10.1007/s12144-023-05320-7

Hipp, C. J., & Carlson, R. G. (2021). The dyadic association among technoference and relationship and sexual satisfaction of young adult couples. *Journal of Sex & Marital Therapy, 47*(5), 508–520. https://doi.org/10.1080/0092623X.2021.1922562

Holmes, E. A., Mathews, A., Dalgleish, T., & Mackintosh, B. (2006). Positive interpretation training: Effects of mental imagery versus verbal training on positive mood. *Behavior Therapy*, *37*(3), 237–247. https://doi.org/10.1016/j.beth.2006.02.002

Holmes, E. A., Lang, T. J., & Shah, D. M. (2009). Developing interpretation bias modification as a "cognitive vaccine" for depressed mood: Imagining positive events makes you feel better than thinking about them verbally. *Journal of Abnormal Psychology, 118*(1), 76–88. https://doi.org/10.1037/a0012590

Holmes, E. A., & Mathews, A. (2005). Mental imagery and emotion: A special relationship? Emotion, 5(4), 489–497. https://doi.org/10.1037/1528-3542.5.4.489

Huang, J.-Y., Xue, X., Wang, Z.-X., Li, Z.-F., et al. (2023). The relationship between attention networks and individual differences in visual mental imagery vividness: An EEG study. *Neuropsychologia, 191*, 108736. https://doi.org/10.1016/j.neuropsychologia.2023.108736

Hunt, M. G., Marx, R., Lipson, C., & Young, J. (2018). No more FOMO: Limiting social media decreases loneliness and depression. Journal of Social and Clinical Psychology, 37(10), 751–768. https://doi.org/10.1521/jscp.2018.37.10.751

Jabalkandi, A. S., Raisi, F., Shahrivar, Z., Mohammadi, A., Meysamie, A., Firoozikhojastefar, R., & Irani, F. (2020). A study on sexual functioning in adults with attention-deficit/hyperactivity disorder. *Perspectives in Psychiatric Care, 56*(3), 642–648. https://doi.org/10.1111/ppc.12480

Janssen, E., & Bancroft, J. (2007). The dual control model: The role of sexual inhibition and excitation in sexual arousal and behavior. In E. Janssen (Ed.), *The psychophysiology of sex* (pp. 197–222). Indiana University Press.

Janssen, E., Everaerd, W., Spiering, M., & Janssen, J. (2000). Automatic processes and the appraisal of sexual stimuli: Toward an information processing model of sexual arousal. *Journal of Sex Research, 37*(1), 8–23. https://doi.org/10.1080/00224490009552016

Kreiman, G., Koch, C., & Fried, I. (2000). Imagery neurons in the human brain. *Nature, 408*(6810), 357–361. https://doi.org/10.1038/35042575

Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., Lin, N., Shablack, H., Jonides, J., & Ybarra, O. (2013). Facebook use predicts declines in subjective well-being in young adults. *PLOS ONE, 8*(8), e69841. https://doi.org/10.1371/journal.pone.0069841

Lambert, J., Barnstable, G., Minter, E., Cooper, J., & McEwan, D. (2022). Taking a one-week break from social media improves well-being, depression, and anxiety: A randomized controlled trial. *Cyberpsychology, Behavior and Social Networking, 25*(5), 287–293. https://doi.org/10.1089/cyber.2021.0324

Landkroon, E., van Dis, E. A. M., Meyerbröker, K., Salemink, E., Hagenaars, M. A., & Engelhard, I. M. (2022). Future-oriented positive mental imagery reduces anxiety for exposure to public speaking. *Behavior therapy, 53*(1), 80–91. https://doi.org/10.1016/j.beth.2021.06.005

McNamee, P., Mendolia, S., & Yerokhin, O. (2021). Social media use and emotional and behavioural outcomes in adolescence: Evidence from British longitudinal data. *Economics and human biology, 41*, 100992. https://doi.org/10.1016/j.ehb.2021.100992

Mushquash, A. R., Charlton, J. K., MacIsaac, A., & Ryan, K. (2022). Romance behind the screens: Exploring the role of technoference on intimacy. *Cyberpsychology, Behavior, and Social Networking, 25*(12), 814–820. https://doi.org/10.1089/cyber.2022.0068

Nobre, P. J. (2023). Nobre's cognitive–emotional model of sexual dysfunction. In A. D. Lykins (Ed.), *Encyclopedia of sexuality and gender.* Springer. https://doi.org/10.1007/978-3-319-59531-3_116-1

Nobre, P. J., & Pinto-Gouveia, J. (2006). Dysfunctional sexual beliefs as vulnerability factors for sexual dysfunction. *Journal of Sex Research, 43*(1), 68–75 https://doi.org/10.1080/00224490609552300

Pascoal, P. M., Raposo, C. F., & Roberto, M. S. (2020). A transdiagnostic approach to sexual distress and sexual pleasure: A preliminary mediation study with repetitive negative thinking. *International Journal of Environmental Research and Public Health, 17*(21), 7864. https://doi.org/10.3390/ijerph17217864

Pearson, J. (2019). The human imagination: The cognitive neuroscience of visual mental imagery. *Nature Reviews Neuroscience, 20*(10), 624–634. https://doi.org/10.1038/s41583-019-0202-9

Posner, M. I., & Petersen, S. E. (1990). The attention system of the human brain. *Annual Review of Neuroscience, 13*(1), 25–42. https://doi.org/10.1146/annurev.ne.13.030190.000325

Roberts, J. A., & David, M. E. (2016). My life has become a major distraction from my cell phone: Partner phubbing and relationship satisfaction among romantic partners. *Computers in Human Behavior, 54*, 134–141. https://doi.org/10.1016/j.chb.2015.07.058

Sihoe, C. E., Mueller, U., & Liu, S. (2023). Perceived smartphone addiction predicts ADHD symptomatology in middle school adolescents: A longitudinal study. *Computers in Human Behavior Reports, 12*, 100335. https://doi.org/10.1016/j.chbr.2023.100335

Smith, D., & Over, R. (1990b). Enhancement of fantasy-induced sexual arousal in men through training in sexual imagery. *Archives of Sexual Behavior, 19*(5), 477–489. https://doi.org/10.1007/BF02442349

Soldati, L., Bianchi-Demicheli, F., Schockaert, P., Köhl, J., Bolmont, M., Hasler, R., & Perroud, N. (2020). Sexual function, sexual dysfunctions, and ADHD: A systematic literature review. *The Journal of Sexual Medicine, 17*(9), 1653–1664. https://doi.org/10.1016/j.jsxm.2020.03.019

Spiering, M., & Everaerd, W. (2007). The sexual unconscious. *The Journal of Sex Research, 44*(2), 214–230.

Tavares, I. M., Moura, C. V., & Nobre, P. J. (2020). The role of cognitive processing factors in sexual function and dysfunction in women and men: A systematic review. *Sexual Medicine Reviews, 8*(4), 512–530. https://doi.org/10.1016/j.sxmr.2020.03.002

Toates, F. (2009). An integrative theoretical framework for understanding sexual motivation, arousal, and behavior. *Journal of Sex Research, 46*(2–3), 168–193. https://doi.org/10.1080/00224490902747768

Tromholt, M. (2016). The Facebook experiment: Quitting Facebook leads to higher levels of well-being. *Cyberpsychology, Behavior, and Social Networking, 19*(11), 661–666. https://doi.org/10.1089/cyber.2016.0259

Turel, O., Cavagnaro, D. R., & Meshi, D. (2018). Short abstinence from online social networking sites reduces perceived stress, especially in excessive users. *Psychiatry Research, 270*, 947–953. https://doi.org/10.1016/j.psychres.2018.11.017

Wallman-Jones, A., Nigg, C., Benzing, V., Schimdt, M. (2023). Leave the screen: the influence of everyday behaviors on self-reported interoception. *Biological Psychology*, *181*, 108600. https://doi.org/10.1016/j.biopsycho.2023.108600

Wang, J. L., Yin, X. Q., Wang, H. Z., King, D. L., & Rost, D. H. (2024). The longitudinal associations between internet addiction and ADHD symptoms among adolescents. *Journal of behavioral addictions, 13*(1), 191–204. https://doi.org/10.1556/2006.2023.00080

Woertman, L., & van den Brink, F. (2012). Body image and female sexual functioning and behavior: A review. *Journal of Sex Research, 49*(2–3), 184–211. https://doi.org/10.1080/00224499.2012.658586

6

Chapter 6: Appendices

Appendix A

Informed consent study 1

Atenção, Imaginação e Funcionamento Sexual

Este estudo, realizado no âmbito da psicologia da saúde, enquadra-se num projeto de investigação, levado a cabo no Ispa - Instituto Universitário e tem como principal objetivo compreender de que modo a atenção e a imaginação se relacionam com o funcionamento sexual. **O estudo destina-se à população heterossexual, sexualmente ativa.**

Este questionário destina-se a maiores de 18 anos.

Preencha este questionário só quando estiver a sós.

As suas respostas serão anónimas e confidenciais.

Pode fechar o questionário antes de o completar e recomeçar o preenchimento voltando a clicar no link. Este questionário demorará cerca de 15 minutos. Caso surja alguma dúvida ou questão por favor contacte a equipa de investigação – projectoaifs@gmail.com

Informed consent study 2

Atenção, Imaginação e Funcionamento Sexual

Este estudo, realizado no âmbito da psicologia da saúde, enquadra-se num projeto de investigação, levado a cabo no Ispa - Instituto Universitário e tem como principal objetivo compreender de que modo a atenção e a imaginação se relacionam com o funcionamento sexual. **O estudo destina-se à população heterossexual, sexualmente ativa.**

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As suas respostas serão confidenciais.

Pode fechar o questionário antes de o completar e recomeçar o preenchimento voltando a clicar no link. Este questionário demorará cerca de 15 minutos. Caso surja alguma dúvida ou questão por favor contacte a equipa de investigação – projectoaifs@gmail.com

Informed consents study 3

Experimental Group

ESTUDO: IMAGINE – SEXUALIDADE E FANTASIA

O laboratório de Psicologia do ISPA - Instituto Universitário empenha-se na protecção dos participantes nas experiências aqui realizadas. O objectivo deste estudo é entender os efeitos da fantasia na função sexual da população heterossexual, adulta, sexualmente activa com o sexo oposto e é levado a cabo pela equipa constituída por Pedro Campos e Rui Miguel Costa, investigadores do William James Center for Research.

A informação seguinte permitir-lhe-á tomar uma decisão informada relativamente à sua participação neste estudo. A sua participação é voluntária. Os seus dados serão confidenciais.

Se decidir participar, esteja ciente de que pode interromper a sua participação a qualquer altura. Se considerar alguma das questões ou procedimentos invasivos ou ofensivos, é livre de não responder ou participar nessa parte do estudo.

A participação neste estudo tem os seguintes passos:

1) Preenchimento de um questionário online com questões sobre humor, atenção,

imaginação e funcionamento sexual.

2) Adicionalmente, ser-lhe-á solicitado para preencher um questionário online com questões que visam estimular a fantasia erótica e está estruturado para ser como se estivesse a contar uma história a terceiros. Para tal, são solicitadas respostas que descrevem uma relação sexual e o seu contexto. Não tem de dar detalhes sexualmente explícitos, mas poderá fazê-lo se o entender. Poderá simplesmente falar de emoções ou de usar metáforas. Este questionário também contém questões sobre sentimentos e reacções fisiológicas desencadeadas, incluindo desejo e excitação sexuais.

3) Esta parte do estudo tem a compensação de 10 euros em vale de compras. Se resolver desistir a meio da primeira sessão, continuará com direito ao vale de compras.

4) Posteriormente, se concordar, ser-lhe-á solicitado que preencha o questionário de estimulação de fantasia fora do laboratório pelo menos duas vezes por semana durante quatro semanas. Se concordar, solicitar-lhe-emos um email de contacto para marcarmos a segunda sessão de avaliação e podermos estar em contacto durante o decurso do estudo de forma a poder esclarecer dúvidas que lhe surjam.

5) O preenchimento do questionário de estimulação de fantasia no laboratório na primeira sessão tem meramente como objectivo a familiarização com o mesmo. Por isso, responda às questões apenas se quiser. Deve apenas perceber se estará confortável e disposta/o a preenchê-lo pelos menos duas vezes por semana durante quatro semanas.

6) Passadas as quatro semanas de preenchimento do questionário de estimulação de fantasia, solicitar-lhe-emos para vir a uma segunda sessão de avaliação no laboratório para novamente preencher novamente o primeiro questionário online que inclui questões sobre humor, atenção, imaginação e funcionamento sexual. Ao completar esta parte do estudo, tem a compensação de 30 euros em vales de compras.

7) Os investigadores poderão contactá-lo/a por email a lembrá-lo/a das tarefas, mas não insistirão mais do que uma vez.

8) A todo o momento a equipa de investigação estará disponível para esclarecer questões através do email projectoimagine2023@gmail.com. Não é previsível que surja algum tipo de desconforto, mas se surgir, contacte-nos.

Por favor, indique com a sua assinatura que compreendeu os seus direitos e pretende participar no estudo.

Data _____

Assinatura_____

Control Group

ESTUDO: IMAGINE – SEXUALIDADE E FANTASIA

O laboratório de Psicologia do ISPA - Instituto Universitário empenha-se na protecção dos participantes nas experiências aqui realizadas. O objectivo deste estudo é entender os efeitos da fantasia na função sexual da população heterossexual, adulta, sexualmente activa com o sexo oposto e é levado a cabo pela equipa constituída por Pedro Campos e Rui Miguel Costa, investigadores do William James Center for Research.

A informação seguinte permitir-lhe-á tomar uma decisão informada relativamente à sua participação neste estudo. A sua participação é voluntária. Os seus dados serão confidenciais.

Se decidir participar, esteja ciente de que pode interromper a sua participação a qualquer altura. Se considerar alguma das questões ou procedimentos invasivos ou ofensivos, é livre de não responder ou participar nessa parte do estudo.

A participação neste estudo tem os seguintes passos:

1) Preenchimento de um questionário online com questões sobre humor, atenção, imaginação e funcionamento sexual.

2) Adicionalmente, ser-lhe-á solicitado para preencher um questionário online com questões que visam estimular a fantasia e está estruturado para ser como se estivesse a contar uma história a terceiros. Para tal, são solicitadas respostas que descrevem um jantar com amigos. Não tem de dar detalhes concretos, mas poderá fazê-lo se o entender. Poderá simplesmente falar de emoções ou de usar metáforas. Este questionário também contém questões sobre sentimentos e reacções fisiológicas desencadeadas, incluindo desejo e excitação sexuais.

3) Esta parte do estudo tem a compensação de 10 euros em vale de compras. Se resolver desistir a meio da primeira sessão, continuará com direito ao vale de compras.

4) Posteriormente, se concordar, ser-lhe-á solicitado que preencha o questionário de estimulação de fantasia fora do laboratório pelo menos duas vezes por semana durante quatro semanas. Se concordar, solicitar-lhe-emos um email de contacto para marcarmos a segunda sessão de avaliação e podermos estar em contacto durante o decurso do estudo de forma a poder esclarecer dúvidas que lhe surjam.

5) O preenchimento do questionário de estimulação de fantasia no laboratório na primeira sessão tem meramente como objectivo a familiarização com o mesmo. Por isso, responda às

questões apenas se quiser. Deve apenas perceber se estará confortável e disposta/o a preenchê-lo pelos menos duas vezes por semana durante quatro semanas.

6) Passadas as quatro semanas de preenchimento do questionário de estimulação de fantasia, solicitar-lhe-emos para vir a uma segunda sessão de avaliação no laboratório para novamente preencher novamente o primeiro questionário online que inclui questões sobre humor, atenção, imaginação e funcionamento sexual. Ao completar esta parte do estudo, tem a compensação de 30 euros em vales de compras.

7) Os investigadores poderão contactá-lo/a por email a lembrá-lo/a das tarefas, mas não insistirão mais do que uma vez.

8) A todo o momento a equipa de investigação estará disponível para esclarecer questões através do email projectoimagine2023@gmail.com. Não é previsível que surja algum tipo de desconforto, mas se surgir, contacte-nos.

Por favor, indique com a sua assinatura que compreendeu os seus direitos e pretende participar no estudo.

Data _____

Assinatura_____

Appendix B

Ethics committee approval documents

Comissão de Ética de Investigação
ISPA - Instituto Universitário de Ciências Psicológicas, Sociais e da Vida
Rua Jardim do Tabaco, 34,
1149-041 Lisboa
Telefone: (351) 218 811 700
Fax: (351) 218 860 954

COMISSÃO DE ÉTICA

PARECER

Título do projeto: Atenção, Imaginação e Funcionamento Sexual

Investigador responsável: Pedro Campos / Rui Costa

Instituição/Curso: ISPA – Instituto Universitário

O protocolo do estudo apresenta objetivos relevantes. Foram descritos adequadamente os métodos e procedimentos a adotar e estes respeitam os direitos humanos e as recomendações constantes nos documentos nacionais e internacionais relativos à ética em investigação.

Assim, o parecer da Comissão de Ética do ISPA-Instituto Universitário é favorável à realização do estudo em epígrafe.

Qualquer alteração futura aos procedimentos descritos do estudo que possam colidir com os critérios éticos de investigação com seres humanos ou animais não humanos constantes nos referidos regulamentos, exigem uma reapresentação do pedido de apreciação a esta Comissão.

Comissão Ética do ISPA – Instituto Universitário

(Assinatura P'lo Presidente da CE)

Lisboa, 20 de março de 2023.

Ethics committee approval documents

Comissão de Ética de Investigação
ISPA - Instituto Universitário de Ciências Psicológicas, Sociais e da Vida
Rua Jardim do Tabaco, 34,
1149-041 Lisboa
Telefone: (351) 218 811 700
Fax: (351) 218 860 954

COMISSÃO DE ÉTICA

PARECER – Referência D-73-12-23

Título do projeto: Atenção, Imaginação e Funcionamento sexual – Estudo 3 ("Imagine")

Investigador responsável: Pedro Campos e Rui Costa

Instituição/Curso: Ispa – Instituto Universitário

O protocolo do estudo apresenta objetivos relevantes. Foram descritos adequadamente os métodos e procedimentos a adotar e estes respeitam os direitos humanos e as recomendações constantes nos documentos nacionais e internacionais relativos à ética em investigação.

Assim, o parecer da Comissão de Ética do Ispa-Instituto Universitário é favorável à realização do estudo em epígrafe.

Qualquer alteração futura aos procedimentos descritos do estudo que possam colidir com os critérios éticos de investigação com seres humanos ou animais não humanos constantes nos referidos regulamentos, exigem uma reapresentação do pedido de apreciação a esta Comissão.

Comissão Ética do Ispa – Instituto Universitário

(Assinatura P'lo Presidente da CE)

Lisboa, 7 de dezembro de 2023.

Ethics committee approval documents

COMISSÃO DE ÉTICA DO CENTRO DE INVESTIGAÇÃO DO ISPA – INSTITUTO UNIVERSITÁRIO

COMPROMISSO ÉTICO

Título do projeto ou estudo: Projecto IMAGINE

Pessoa responsável pelo projeto: Pedro Campos | Rui Miguel Costa

Instituição de acolhimento: William James Center for Research, Ispa - Instituto Universitário, Lisboa

1. Considero-me obrigado a conhecer e a respeitar os Direitos Humanos.
2. Considero-me obrigado a cumprir os princípios éticos nacionais e internacionais, nomeadamente a "Declaração de Genebra" (2002), a "Declaração de Helsínquia" e emendas (2008) e a "Convenção de Oviedo" (1997).
3. Em todas as minhas ações manterei a atitude ética que a moral exige e cumprirei a legislação em vigor.
4. Não me desviarei sem notificação prévia dos procedimentos expostos no projeto que entrem em conflito com os princípios éticos assumidos.
5. Considero-me obrigado(a) a esclarecer individualmente cada participante do estudo sobre a finalidade do mesmo e sobre os procedimentos a que estará sujeito (não aplicável a participantes não humanos).
6. Considero-me obrigado(a) a não utilizar procedimentos que lesem a integridade moral e/ou física dos participantes e tomarei em linha de conta a relação entre a possível utilidade dos resultados e o conjunto dos procedimentos executados.
7. Mesmo com a anuência do participante, não praticarei atos que atentem contra a sua vida ou contra a sua saúde, física ou mental.
8. Evitarei todos os procedimentos desnecessários ou que se preveja que sejam inconsequentes.
9. Não usarei dados nem resultados que ponham em risco o bom nome ou a integridade dos participantes.

24/10/2023

Appendix C

Research protocol Study 1, 2, 3

Atenção, Imaginação e Funcionamento Sexual

Este estudo, realizado no âmbito de um doutoramento em Psicologia da Saúde, enquadra-se num projeto de investigação levado a cabo no Ispa - Instituto Universitário e tem como objetivo compreender de que modo a atenção e a imaginação se relacionam com o funcionamento sexual. O estudo destina-se a maiores de 18 anos, heterossexuais, sexualmente ativos com o sexo oposto. Este questionário contém questões relativas à intimidade sexual, assim como questões relativas à atenção e ao estado de humor. A sua participação será voluntária. Preencha este questionário só quando estiver a sós. As suas respostas serão confidenciais. Pode fechar o questionário antes de o completar e recomeçar o preenchimento voltando a clicar no link. Este questionário demorará cerca de 15 minutos. Caso surja alguma dúvida ou questão por favor contacte a equipa de investigação – projectoimagine2023@gmail.com Membros da equipa de investigação: Pedro Campos e Rui Miguel Costa, William James Center for Research, Ispa- Instituto universitário, Lisboa

Este estudo destina-se à população heterossexual, sexualmente ativa.

Escolha uma das seguintes opções.

a) Sou homem, tenho mais de 18 anos e no mês passado só tive relações sexuais com o sexo oposto.
b) b) Sou mulher, tenho mais de 18 anos e no mês passado só tive relações sexuais com o sexo oposto.
c) c) Outra situação

Idade: _____

Profissão: _____

Habilitações literárias:

- Ensino Primário
- Ensino Básico
- Ensino Secundário
- Licenciatura
- Mestrado

- Doutoramento

Estado Civil:_____

- Solteiro(a)
- Casado(a)
- Viúvo(a)
- Divorciado(a)

Nacionalidade:_____

Por favor, leia cada uma das afirmações abaixo e assinale na escala o quanto cada afirmação se aplicou a si durante a semana passada. Não há respostas certas ou erradas.

Tive dificuldades em me acalmar.

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Senti a minha boca seca

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Não consegui sentir nenhum sentimento positivo

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Senti dificuldades em respirar

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Tive dificuldade em tomar iniciativa para fazer coisas

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Tive tendência a reagir em demasia a determinadas situações

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Senti tremores

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Senti que estava a utilizar muita energia nervosa

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Preocupei-me com situações em que podia entrar em pânico e fazer figura ridícula

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Senti que não tinha nada a esperar do futuro

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes

- 3 - Aplicou-se a mim a maior parte das vezes

Dei por mim a ficar agitado

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Senti dificuldade em me relaxar

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Senti-me desanimado e melancólico

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Estive intolerante em relação a qualquer coisa que me impedisse de terminar aquilo que estava a fazer

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Senti-me quase a entrar em pânico

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Não fui capaz de ter entusiasmo por nada

- 0 - Não se aplicou nada a mim

- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Senti que não tinha muito valor como pessoa

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Senti que por vezes estava sensível

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Senti alterações no meu coração sem fazer exercício físico

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Senti-me assustado sem ter tido uma boa razão para isso

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Senti que a vida não tinha sentido

- 0 - Não se aplicou nada a mim
- 1 - Aplicou-se a mim algumas vezes
- 2 - Aplicou-se a mim muitas vezes
- 3 - Aplicou-se a mim a maior parte das vezes

Assinale a opção que melhor o/a descreve na seguinte escala

Com que frequência comete erros por falta de atenção quando tem de trabalhar num projeto aborrecido ou difícil?

- 0 - Nunca
- 1 - Raramente
- 2 - Algumas vezes
- 3 – Frequentemente
- 4 - Muito frequentemente

Com que frequência tem dificuldade em manter a atenção quando está a fazer um trabalho aborrecido ou repetitivo?

- 0 - Nunca
- 1 - Raramente
- 2 - Algumas vezes
- 3 – Frequentemente
- 4 - Muito frequentemente

Com que frequência tem dificuldade em se concentrar no que as pessoas dizem, mesmo quando elas estão a falar diretamente consigo?

- 0 - Nunca
- 1 - Raramente
- 2 - Algumas vezes
- 3 – Frequentemente
- 4 - Muito frequentemente

Com que frequência deixa uma tarefa pela metade depois de já ter feito as partes mais difíceis?

- 0 - Nunca
- 1 - Raramente
- 2 - Algumas vezes
- 3 – Frequentemente
- 4 - Muito frequentemente

Com que frequência tem dificuldade em fazer um trabalho que exige organização?

- 0 - Nunca
- 1 - Raramente

- 2 - Algumas vezes
- 3 – Frequentemente
- 4 - Muito frequentemente

Quando precisa de fazer algo que exige muita concentração, com que frequência evita ou adia o início?

- 0 - Nunca
- 1 - Raramente
- 2 - Algumas vezes
- 3 – Frequentemente
- 4 - Muito frequentemente

Com que frequência põe as coisas fora do lugar ou tem dificuldade em encontrar as coisas em casa ou no trabalho?

- 0 - Nunca
- 1 - Raramente
- 2 - Algumas vezes
- 3 – Frequentemente
- 4 - Muito frequentemente

Com que frequência se distrai com as atividades ou barulho à sua volta?

- 0 - Nunca
- 1 - Raramente
- 2 - Algumas vezes
- 3 – Frequentemente
- 4 - Muito frequentemente

Com que frequência tem dificuldade em se lembrar de compromissos ou obrigações?

- 0 - Nunca
- 1 - Raramente
- 2 - Algumas vezes
- 3 – Frequentemente
- 4 - Muito frequentemente

Indique até que ponto cada uma das seguintes afirmações se aplica a si. As possibilidades de resposta variam entre 1 (discordo totalmente) e 6 (concordo totalmente)

Não acaba trabalhos planeados devido ao uso do smartphone.

1 2 3 4 5 6

Tem dificuldade em concentrar-se na aula, durante tarefas, ou durante o horário de trabalho devido ao uso do smartphone

1 2 3 4 5 6

Sente dor nos pulsos ou na nuca devido ao uso do smartphone.

1 2 3 4 5 6

Não é capaz de fazer nada sem o smartphone.

1 2 3 4 5 6

Sente-se impaciente e preocupado quando não tem o seu smartphone.

1 2 3 4 5 6

Tem o smartphone em mente mesmo quando não está a usá-lo.

1 2 3 4 5 6

Nunca vai deixar de usar o seu smartphone mesmo sabendo que a sua vida diária está afetada por isso.

1 2 3 4 5 6

Olha para o smartphone constantemente para ter a certeza que não perde conversas entre outras pessoas no Twitter, no Facebook, (ou outra rede social).

1 2 3 4 5 6

Usa o seu smartphone durante mais tempo do que planeou.

1 2 3 4 5 6

As pessoas à sua volta dizem-lhe que usa demasiado o seu smartphone.

1 2 3 4 5 6

Indique o seu grau de concordância em relação a cada uma das seguintes afirmações. As possibilidades de resposta variam entre 1 (discordo totalmente) e 5 (concordo totalmente).

Frequentemente tenho lampejos inesperados de clareza enquanto estou a descansar.

1 2 3 4 5

Às vezes sinto-me com se fizesse parte de algo sem limites ou fronteiras no tempo e no espaço.

1 2 3 4 5

Eu já tive momentos de muita alegria nos quais subitamente tive uma sensação clara e profunda de estar intimamente ligado a tudo o que existe.

1 2 3 4 5

Frequentemente fico tão encantado com o que estou a fazer que me perco por alguns momentos – é como se estivesse "desligado" do tempo e do espaço.

1 2 3 4 5

Frequentemente as pessoas acham que estou noutro mundo porque fico completamente desligado de tudo o que está ao meu redor.

1 2 3 4 5

Frequentemente quando olho alguma coisa comum, ocorre algo maravilhoso: tenho a sensação de estar a ver essa coisa pela primeira vez.

1 2 3 4 5

Frequentemente chamam-me distraído porque fico tão envolvido no que estou a fazer que perco de vista tudo o resto.

1 2 3 4 5

Tenho uma imaginação muito viva.

1 2 3 4 5

Com frequência fico tão envolvido no que estou a fazer que por algum tempo esqueço-me de onde estou.

1 2 3 4 5

Tenho tido algumas experiências que tornaram o meu papel na vida tão claro para mim que me senti muito entusiasmado e feliz.

1 2 3 4 5

Pense na/no sua/seu parceira/o sexual. Considere a imagem que lhe vier à mente. Nas próximas afirmações, assinale o grau de nitidez da imagem mental.

O contorno exacto da cara, cabeça, ombros e tronco.

- 0 - Ausente
- 1 - Fraca
- 2 - Boa
- 3 – Excelente

Poses características da cabeça, tronco, etc.

- 0 - Ausente
- 1 - Fraca
- 2 - Boa
- 3 – Excelente

O porte característico, largura do passo, etc., ao andar.

- 0 - Ausente
- 1 - Fraca
- 2 - Boa
- 3 – Excelente

As várias cores que usa nalgumas roupas familiares.

- 0 - Ausente
- 1 - Fraca
- 2 - Boa
- 3 – Excelente

Questões sobre a sua saúde

Tem problemas de saúde?

- Sim
- Não

Se sim, quais?_____

Toma medicamentos (incluindo suplementos nutricionais)?

- Sim
- Não

Se sim, quais?_____

Questões sobre consumos

Assinale a opção que melhor descreve o seu consumo de álcool.

- Não costumo beber
- Menos de 3 bebidas por semana
- Entre 3 e 10 bebidas por semana
- Entre 11 e 21 bebidas por semana
- Mais de 21 bebidas por semana

Descreva a opção que melhor descreve os seus hábitos tabágicos.

- Não fumo
- Fumo até 10 cigarros por dia
- Fumo mais de 10 cigarros por dia

Se desejar, indique se costuma consumir alguma outra substância psicoactiva e com que regularidade. _____

Sexuality Questionnaire

Das seguintes opções, qual é a que melhor descreve a sua sexualidade?

- Só com o sexo oposto
- Principalmente com o sexo oposto
- Aproximadamente tanto com o sexo oposto como com o mesmo sexo
- Principalmente com o mesmo sexo
- Só com o mesmo sexo

Tem parceira sexual regular?

- Sim
- Não
- Incerto

Se sim, coabitam?

- Sim
- Não

Se sim, qual é a duração da sua relação? _____

Indique a resposta mais adequada às suas relações sexuais com o sexo oposto nas últimas quatro semanas.

Com que frequência foi capaz de conseguir uma ereção durante a sua atividade sexual?

- 0 - Não tive atividade sexual com o sexo oposto
- 1 - Quase nunca /nunca
- 2 - Poucas vezes (muito menos de metade das vezes)
- 3 - Algumas vezes (cerca de metade das vezes)
- 4 - A maior parte das vezes (muito mais de metade das vezes)
- 5 - Quase sempre/ sempre

Quando teve ereções com estimulação sexual, qual a frequência em que estas ereções foram suficientemente rígidas para permitir a penetração?

- 0 - Não tive atividade sexual com o sexo oposto
- 1 - Quase nunca /nunca
- 2 - Poucas vezes (muito menos de metade das vezes)
- 3 - Algumas vezes (cerca de metade das vezes)
- 4 - A maior parte das vezes (muito mais de metade das vezes)
- 5 - Quase sempre/ sempre

Quando tentou ter relações sexuais, quantas vezes foi capaz de penetrar a sua companheira?

- 0 - Não tive atividade sexual com o sexo oposto
- 1 - Quase nunca /nunca
- 2 - Poucas vezes (muito menos de metade das vezes)
- 3 - Algumas vezes (cerca de metade das vezes)
- 4 - A maior parte das vezes (muito mais de metade das vezes)
- 5 - Quase sempre/ sempre

Durante as relações sexuais, quantas vezes foi capaz de manter a sua ereção depois de ter penetrado a sua companheira?

- 0 - Não tive atividade sexual com o sexo oposto
- 1 - Quase nunca /nunca
- 2 - Poucas vezes (muito menos de metade das vezes)
- 3 - Algumas vezes (cerca de metade das vezes)
- 4 - A maior parte das vezes (muito mais de metade das vezes)
- 5 - Quase sempre/ sempre

Durante as relações sexuais, qual a dificuldade que teve para manter a sua ereção até ao fim da relação sexual?

- 0 - Não tive relações sexuais com o sexo oposto
- 1 - Extrema dificuldade
- 2 - Muita dificuldade
- 3 - Dificuldade moderada
- 4 - Ligeira dificuldade
- 5 - Nenhuma dificuldade

Quando tentou ter relações sexuais, qual a frequência com que se sentiu satisfeito?

- 0 - Não tentei ter relações sexuais com o sexo oposto
- 1 - Quase nunca / nunca
- 2 - Poucas vezes (muito menos de metade das vezes)
- 3 - Algumas vezes (cerca de metade das vezes)
- 4 - A maior parte das vezes (muito mais de metade das vezes)
- 5 - Quase sempre / sempre

Qual o grau de satisfação que teve com as suas relações sexuais?

- 0 - Não tive relações sexuais com o sexo oposto
- 1 - Nenhuma satisfação
- 2 - Pouca satisfação
- 3 - Satisfação moderada
- 4 - Grande satisfação
- 5 - Muito grande satisfação

Quando teve relações sexuais, com que frequência ejaculou?

- 0 - Não tive atividade sexual com o sexo oposto
- 1 - Quase nunca /nunca
- 2 - Poucas vezes (muito menos de metade das vezes)
- 3 - Algumas vezes (cerca de metade das vezes)
- 4 - A maior parte das vezes (muito mais de metade das vezes)
- 5 - Quase sempre/ sempre

Quando teve relações sexuais, com que frequência teve a sensação de orgasmo ou clímax?

- 0 - Não tive atividade sexual com o sexo oposto
- 1 - Quase nunca /nunca
- 2 - Poucas vezes (muito menos de metade das vezes)
- 3 - Algumas vezes (cerca de metade das vezes)
- 4 - A maior parte das vezes (muito mais de metade das vezes)
- 5 - Quase sempre/ sempre

Com que frequência sentiu desejo sexual?

- 0 - Quase nunca / nunca

- 1 - Poucas vezes
- 2 - Algumas vezes
- 3 - A maior parte das vezes
- 4 - Quase sempre / sempre

Como classifica o seu desejo sexual?

- 0 - Muito baixo / nenhum
- 1 - Baixo
- 2 - Moderado
- 3 - Elevado
- 4 - Muito elevado

Qual a sua satisfação com a sua vida sexual em geral?

- 0 - Grande insatisfação
- 1 - Insatisfação moderada
- 2 - Igualmente satisfeito e insatisfeito
- 3 - Satisfação moderada
- 4 - Grande insatisfação

Qual a sua satisfação com o relacionamento sexual com a sua parceira?

- 0 - Grande insatisfação
- 1 - Insatisfação moderada
- 2 - Igualmente satisfeito e insatisfeito
- 3 - Satisfação moderada
- 4 - Grande insatisfação

Qual a confiança que tem em conseguir atingir e manter uma erecção?

- 0 - Muito baixa
- 1 - Baixa
- 2 - Moderada
- 3 - Elevada
- 4 - Muito elevada

Indique a resposta mais adequada às suas relações sexuais com o sexo oposto nas últimas quatro semanas.

Até que ponto é difícil para si atrasar a sua ejaculação?

- 0 - Não é difícil
- 1 - Um pouco difícil
- 2 - Moderadamente difícil
- 3 - Muito difícil
- 4 - Extremamente difícil

Ejacula antes de querer?

- 0 - Quase nunca ou nunca (0%)
- 1 - Menos de metade das vezes (25%)
- 2 - Cerca de metade das vezes (50%)
- 3 - Mais que metade das vezes (75%)
- 4 - Quase sempre ou sempre (100%)

A sua ejaculação acontece com pouco estímulo?

- 0 - Quase nunca ou nunca (0%)
- 1 - Menos de metade das vezes (25%)
- 2 - Cerca de metade das vezes (50%)
- 3 - Mais que metade das vezes (75%)
- 4 - Quase sempre ou sempre (100%)

Sente-se frustrado porque ejacula antes de querer?

- 0 - De modo nenhum
- 1 - Levemente
- 2 - Moderadamente
- 3 - Muito
- 4 – Extremamente

Até que ponto fica preocupado por achar que o tempo que demora a ejacular poderá deixar a sua parceira sexual insatisfeita?

- 0 - De modo nenhum
- 1 - Levemente
- 2 - Moderadamente
- 3 - Muito

- 4 – Extremamente

Assinale a resposta mais adequada às suas relações sexuais com o sexo oposto nas últimas quatro semanas.

Com que frequência sentiu desejo ou interesse sexual?

- 0 - Quase sempre / sempre
- 1 - A maior parte das vezes (mais de metade das vezes)
- 2 - Algumas vezes (cerca de metade das vezes)
- 3 - Poucas vezes (menos de metade das vezes)
- 4 - Quase nunca / nunca

Como classifica o seu nível (grau) de desejo ou interesse sexual?

- 0 - Muito elevado
- 1 - Elevado
- 2 - Moderado
- 3 - Baixo
- 4 - Muito baixo / nenhum

Com que frequência se sentiu sexualmente excitada durante as relações sexuais?

- 0 - Quase sempre / sempre
- 1 - A maior parte das vezes (mais de metade das vezes)
- 2 - Algumas vezes (cerca de metade das vezes)
- 3 - Poucas vezes (menos de metade das vezes)
- 4 - Quase nunca / nunca

Como classifica o seu nível de excitação sexual durante as relações sexuais?

- 0 - Muito elevado
- 1 - Elevado
- 2 - Moderado
- 3 - Baixo
- 4 - Muito baixo / nenhum

Qual a sua confiança em conseguir ficar excitada durante as relações sexuais?

- Não tive relações com o sexo oposto
- 0 - Confiança muito elevada

- 1 - Confiança elevada
- 2 - Confiança moderada
- 3 - Confiança baixa
- 4 - Confiança muito baixa / nenhuma

Com que frequência se sentiu satisfeita com a sua excitação sexual durante as relações sexuais?

- 0 - Quase sempre / sempre
- 1 - A maior parte das vezes (mais de metade das vezes)
- 2 - Algumas vezes (cerca de metade das vezes)
- 3 - Poucas vezes (menos de metade das vezes)
- 4 - Quase nunca / nunca

Com que frequência ficou lubrificada (“molhada”) durante as relações sexuais?

- 0 - Quase sempre / sempre
- 1 - A maior parte das vezes (mais de metade das vezes)
- 2 - Algumas vezes (cerca de metade das vezes)
- 3 - Poucas vezes (menos de metade das vezes)
- 4 - Quase nunca / nunca

Qual a dificuldade que teve em ficar lubrificada (“molhada”) durante as relações sexuais?

- Não tive relações sexuais com o sexo oposto
- 0 - Extremamente difícil ou impossível
- 1 - Muito difícil
- 2 - Difícil
- 3 - Ligeiramente difícil
- 4 - Nenhuma dificuldade

Com que frequência manteve a sua lubrificação (“estar molhada”) até ao fim das relações sexuais?

- Não tive relações sexuais com o sexo oposto
- 0 - Quase sempre / sempre
- 1 - A maior parte das vezes (mais de metade das vezes)
- 2 - Algumas vezes (cerca de metade das vezes)

- 3 - Poucas vezes (menos de metade das vezes)
- 4 - Quase nunca / nunca

Qual a dificuldade que teve em manter a sua lubrificação até ao fim das relações sexuais?

- Não tive relações sexuais com o sexo oposto
- 0 - Extremamente difícil ou impossível
- 1 - Muito difícil
- 2 - Difícil
- 3 - Ligeiramente difícil
- 4 - Nenhuma dificuldade

Quando teve relações sexuais, com que frequência atingiu o orgasmo (clímax)?

- Não tive relações sexuais com o sexo oposto
- 0 - Quase sempre / sempre
- 1 - A maior parte das vezes (mais de metade das vezes)
- 2 - Algumas vezes (cerca de metade das vezes)
- 3 - Poucas vezes (menos de metade das vezes)
- 4 - Quase nunca / nunca

Quando teve relações sexuais qual a dificuldade que teve para atingir o orgasmo (clímax)?

- Não tive relações sexuais com o sexo oposto
- 0 - Extremamente difícil ou impossível
- 1 - Muito difícil
- 2 - Difícil
- 3 - Ligeiramente difícil
- 4 - Nenhuma dificuldade

Qual foi o seu nível de satisfação com a sua capacidade para atingir o orgasmo (clímax) durante as relações sexuais?

- Não tive relações sexuais com o sexo oposto
- 0 - Muito satisfeita
- 1 - Moderadamente satisfeita
- 2 - Igualmente satisfeita e insatisfeita
- 3 - Moderadamente insatisfeita

- 4 - Muito insatisfeita

Qual foi o seu nível de satisfação com o grau de proximidade emocional entre si e o seu parceiro durante as relações sexuais?

- Não tive relações sexuais com o sexo oposto
- 0 - Muito satisfeita
- 1 - Moderadamente satisfeita
- 2 - Igualmente satisfeita e insatisfeita
- 3 - Moderadamente insatisfeita
- 4 - Muito insatisfeita

Qual o seu nível de satisfação com o relacionamento sexual que mantém com o seu parceiro?

- Não tive relações sexuais com o sexo oposto
- 0 - Muito satisfeita
- 1 - Moderadamente satisfeita
- 2 - Igualmente satisfeita e insatisfeita
- 3 - Moderadamente insatisfeita
- 4 - Muito insatisfeita

Qual o seu nível de satisfação com a sua vida sexual em geral?

- Não tive relações sexuais com o sexo oposto
- 0 - Muito satisfeita
- 1 - Moderadamente satisfeita
- 2 - Igualmente satisfeita e insatisfeita
- 3 - Moderadamente insatisfeita
- 4 - Muito insatisfeita

Com que frequência sentiu dor ou desconforto durante a penetração vaginal?

- Não tive relações sexuais com o sexo oposto
- 0 - Quase sempre / sempre
- 1 - A maior parte das vezes (mais de metade das vezes)
- 2 - Algumas vezes (cerca de metade das vezes)
- 3 - Poucas vezes (menos de metade das vezes)
- 4 - Quase nunca / nunca

Como classifica o seu nível (grau) de dor ou desconforto durante ou após a penetração vaginal?

- 0 - Muito elevado
- 1 - Elevado
- 2 - Moderado
- 3 - Baixo
- 4 - Muito baixo / nenhum

Indique como se sentiu nas últimas quarto semanas.

As possibilidades de resposta variam entre 0 (Nunca) e 4 (Sempre).

Com que frequência se sentiu angustiado/a com a sua vida sexual?

0 1 2 3 4

Com que frequência se sentiu descontente com o seu relacionamento sexual?

0 1 2 3 4

Com que frequência se sentiu culpado/a relativamente às suas dificuldades sexuais?

0 1 2 3 4

Com que frequência se sentiu frustrado/a pelos seus problemas sexuais?

0 1 2 3 4

Com que frequência se sentiu stressado/a por causa de sexo?

0 1 2 3 4

Com que frequência se sentiu inferior devido a problemas sexuais?

0 1 2 3 4

Com que frequência se sentiu preocupado/a com sexo?

0 1 2 3 4

Com que frequência se sentiu inadequado/a sexualmente?

0 1 2 3 4

Com que frequência teve sentimentos de arrependimento em relação à sua sexualidade?

0 1 2 3 4

Com que frequência se sentiu envergonhado/a por problemas sexuais?

0 1 2 3 4

Com que frequência se sentiu insatisfeito/a com a sua vida sexual?

0 1 2 3 4

Com que frequência se sentiu chateado/a por causa de sexo?

0 1 2 3 4

Com que frequência se sentiu incomodado/a por baixo desejo?

0 1 2 3 4

Foque-se na sua relação atual e pense na vossa vida sexual nas últimas 4 semanas. Por favor assinale a opção que melhor ilustra a sua experiência. As opções de resposta variam entre -3 (muito desprazer) e 3 (muito prazer).

Considero que as relações sexuais me dão:

-3 -2 -1 0 1 2 3 N/A

Considero que as atividades sexuais a sós (e.g., masturbação) ou na ausência de contacto físico com alguém (e.g., troca de mensagens/fotos de cariz sexual) me dão:

-3 -2 -1 0 1 2 3 N/A

Considero que a intimidade sexual me dá:

-3 -2 -1 0 1 2 3 N/A

As seguintes questões referem-se à atividade sexual com a/o sua/seu parceira/o.

Indique a que melhor o/a descreve.

Preocupo-me com a aparência do meu corpo durante a atividade sexual.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

Durante a atividade sexual, preocupo-me que a/ minha/meu parceira/o não esteja a gostar da forma como lhe toco.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

Durante a atividade sexual, preocupo-me constantemente que a/o minha/meu parceira/o perca a excitação por me ver sem roupa.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

Durante a atividade sexual, é difícil não pensar se os meus movimentos são agradáveis para a/o minha/meu parceira/o.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

Durante a atividade sexual, só consigo deixar de me preocupar sobre a aparência do meu corpo se estiver às escuras.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente

- 5 – Nunca

Durante a atividade sexual, normalmente preocupo-me com a satisfação da/o minha/meu parceira/o com as minhas ações.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

Durante a atividade sexual é difícil não pensar que o meu corpo não é atraente.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

Durante a atividade sexual, frequentemente preocupo-me com a forma como me comporto com a/o minha/meu parceira/o.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

É-me difícil gozar o sexo por causa da minha preocupação sobre se a/o minha/meu parceira/o se sente atraída pelo meu corpo.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes

- 4 - Raramente
- 5 – Nunca

Durante a interação sexual, preocupo-me se o meu nível de atividade não satisfaz a/o minha/meu parceira/o.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

Quando estou nu em frente à minha/meu parceira/o só penso que o meu corpo é pouco atraente.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

Durante a atividade sexual, penso demasiado sobre os meus movimentos com a minha/meu parceira/o.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

Durante a atividade sexual, distraio-me com pensamentos sobre a minha aparência corporal.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente

- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

Pensamentos sobre se consigo satisfazer a/o minha/meu parceira/o distraem-me durante a atividade sexual.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

Durante a atividade sexual, se a luz estiver acesa, preocupo-me demasiado sobre a aparência do meu corpo.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

Durante atividade sexual, eu penso muito se a/o minha/meu parceira/o está satisfeita/o com a forma como lhe toco.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

Durante a atividade sexual, consigo focar-me mais no meu prazer, se eu estiver numa posição em que a/o minha/meu parceira/o não vê o meu corpo.

- 0 - Sempre

- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

Durante a atividade sexual, distraio-me com pensamentos sobre o que a/o minha/meu parceira/o pensa sobre o meu comportamento.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

Durante a atividade sexual, só consigo deixar de me preocupar com a aparência do meu corpo, se houver alguma coisa a tapar-me.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

Em geral, durante a atividade sexual, distraio-me com pensamentos sobre a minha performance sexual.

- 0 - Sempre
- 1 - Quase sempre
- 2 - Frequentemente
- 3 - Algumas vezes
- 4 - Raramente
- 5 – Nunca

As seguintes questões referem-se ao número de dias (não vezes) que determinadas actividades sexuais ocorreram durante o último mês. Responda de 0 a 30.

Quantos dias teve actividades sexuais não coitais; e.g., sexo oral, anal, ou masturbação pelo parceiro (não considere cibersexo uma relação sexual)? _____

Quantos dias atingiu o orgasmo durante o coito (pénis na vagina) com estimulação direta do clitóris? _____

Quantos dias atingiu o orgasmo durante o coito (pénis na vagina) sem estimulação direta do clitóris? _____

Quantos dias atingiu o orgasmo durante actividades sexuais não coitais? _____

Quantos dias se masturbou a sós? _____

Quantos dias atingiu o orgasmo através da masturbação a sós? _____

Quantos dias teve fantasias sexuais definidas do seguinte modo: Imagens mentais de actividade sexual que prendem a atenção, são sexualmente excitantes e ocorrem na ausência de actividade sexual (incluindo masturbação)? _____

As seguintes questões referem-se ao número de dias (não vezes) que determinadas actividades sexuais ocorreram durante o último mês. Responda de 0 a 30.

Quantos dias desejou ter sexo envolvendo o coito (pénis na vagina)? _____

Quantos dias desejou ter relações sexuais que não envolvam o coito no mesmo dia? _____

Quantos dias desejou masturbar-se a sós? _____

Appendix D

Experimental Fantasy Task

Insira o código que lhe foi atribuído. _____

Neste preciso momento, até que ponto sente cada uma das seguintes emoções / sensações?

Desejo sexual.	1	2	3	4	5	6	7
Excitação sexual.	1	2	3	4	5	6	7
Sensações genitais (ereção, formigueiro)	1	2	3	4	5	6	7
Alegria	1	2	3	4	5	6	7
Surpresa	1	2	3	4	5	6	7
Tristeza	1	2	3	4	5	6	7
Repulsa	1	2	3	4	5	6	7
Medo	1	2	3	4	5	6	7
Raiva	1	2	3	4	5	6	7
Vergonha	1	2	3	4	5	6	7
Culpa	1	2	3	4	5	6	7

As seguintes questões levá-lo-ão a imaginar uma relação sexual com alguém que é atraente para si. Ao responder, poderá basear-se num acontecimento real ou numa criação da sua imaginação, ou num misto de ambas as coisas. As suas respostas serão confidenciais. Sugerimos duas ou três frases (podem ser frases curtas), mas pode escrever mais se o desejar. Não necessita de descrever detalhes sexualmente explícitos, por exemplo, estados emocionais ou metáforas podem servir como resposta.

Descreva a/o sua/seu parceira/o o mais vividamente possível. Pode incluir características físicas, traços de personalidade, etc. _____

Descreva o que sente por ela/e. _____

Descreva o local onde estão e o que sente em relação a este local. _____

Descreva a sucessão de acontecimentos que levaram até à relação sexual. _____

Como é que iniciaram a relação sexual. _____

Descreva a atividade sexual. _____

O que é que na atividade sexual é mais excitante ou divertido para si. _____

O que lhe diz a/o sua/seu parceira/o que é particularmente excitante ou divertido para si.

_____

O que diz à/ao sua/seu parceira/o de particularmente excitante ou divertido. _____

Descreva outros detalhes, se desejar. _____

Até que ponto sentiu cada uma das seguintes emoções / sensações?

Desejo sexual.	1	2	3	4	5	6	7
Excitação sexual.	1	2	3	4	5	6	7
Sensações genitais (ereção, formigueiro)	1	2	3	4	5	6	7
Alegria	1	2	3	4	5	6	7
Surpresa	1	2	3	4	5	6	7
Tristeza	1	2	3	4	5	6	7
Repulsa	1	2	3	4	5	6	7
Medo	1	2	3	4	5	6	7
Raiva	1	2	3	4	5	6	7
Vergonha	1	2	3	4	5	6	7
Culpa	1	2	3	4	5	6	7

Control Fantasy Task

Insira o código que lhe foi atribuído. _____

Neste preciso momento, até que ponto sente cada uma das seguintes emoções / sensações?

Desejo sexual.	1	2	3	4	5	6	7
Excitação sexual.	1	2	3	4	5	6	7
Sensações genitais (ereção, formigueiro)	1	2	3	4	5	6	7
Alegria	1	2	3	4	5	6	7
Surpresa	1	2	3	4	5	6	7
Tristeza	1	2	3	4	5	6	7
Repulsa	1	2	3	4	5	6	7
Medo	1	2	3	4	5	6	7
Raiva	1	2	3	4	5	6	7
Vergonha	1	2	3	4	5	6	7
Culpa	1	2	3	4	5	6	7

As seguintes questões levá-lo-ão a imaginar um jantar com amigos. Ao responder, poderá basear-se num acontecimento real ou uma criação da sua imaginação, num misto de ambas as coisas. As suas respostas serão confidenciais. Sugerimos 2 ou 3 frases (curtas), mas pode escrever mais se o desejar. Não precisa de descrever detalhes concretos, por exemplo, estados emocionais ou metáforas podem servir como resposta.

Descreva os seus amigos o mais vividamente possível. Pode incluir características físicas, traços de personalidade, etc. _____

Descreva o que sente por eles. _____

Descreva o local onde estão e o que sente em relação a este local. _____

Descreva a sucessão de acontecimentos que levaram até ao jantar _____

Como é que iniciaram o jantar. _____

Descreva o jantar propriamente dito. Pode incluir características da comida, interações com amigos, etc. _____

O que é neste jantar o mais excitante/divertido para si. _____

O que dizem os seus amigos de particularmente excitante/divertido. _____

O que diz aos seus amigos de particularmente excitante / divertido. _____

Descreva outros detalhes, se desejar. _____

Até que ponto sentiu cada uma das seguintes emoções / sensações?

Desejo sexual.	1	2	3	4	5	6	7
Excitação sexual.	1	2	3	4	5	6	7
Sensações genitais (ereção, formigueiro)	1	2	3	4	5	6	7
Alegria	1	2	3	4	5	6	7
Surpresa	1	2	3	4	5	6	7
Tristeza	1	2	3	4	5	6	7
Repulsa	1	2	3	4	5	6	7
Medo	1	2	3	4	5	6	7
Raiva	1	2	3	4	5	6	7
Vergonha	1	2	3	4	5	6	7
Culpa	1	2	3	4	5	6	7

Appendix F - supplementary analyses for study 2

Supplementary descriptive analyses for the excluded male participants (N = 15) are presented in Tables A1 and A2. This subgroup had a mean age of 30.13 years (SD = 4.50), with all participants single and the majority in a romantic relationship (73.3%).

Table A1. Descriptive statistics (*N* =15)

	N (%) or Mean (SD)
Age (years)	30.13 (4.50)
Marital status	
Single	15 (100)
Educational qualifications	
High school	5 (33.3)
Undergraduate	4 (26.7)
Master's	6 (40)
Relationship characteristics	
Ongoing relationship	11 (73.3)
Cohabiting	7 (46.7)
Relationship duration (months)	75.33 (46.47)

Table A2. Descriptive statistics of sexual response (days in past month; *N* = 15)

Moment 1	Mean (SD)
Penile-vaginal intercourse	8.07 (7.01)
Penile-vaginal orgasm	7.60 (6.65)
Noncoital sex	9.87 (8.12)
Noncoital sex orgasm	7.20 (9.15)
Masturbation alone	11.67 (9.77)
Masturbation alone orgasm	11.53 (9.23)
Sexual fantasies	14.13 (11.17)
Moment 2	

Penile-vaginal intercourse	7.71 (6.27)
Penile-vaginal orgasm	7.50 (6.43)
Noncoital sex	6.36 (6.80)
Noncoital sex orgasm	4.43 (6.47)
Masturbation alone	13.50 (9.05)
Masturbation alone orgasm	13.14 (9.32)
Sexual fantasies	19.79 (9.01)

Table A3 presents the correlation matrix between study variables for the excluded male participants (N = 15). Across both time points, stronger vividness of imagination was consistently associated with better sexual function and pleasure, and lower sexual distress. Performance worries and body appearance worries were moderately to strongly correlated with each other and with sexual distress, indicating shared variance in negative sexual cognitions. Smartphone overuse showed positive correlations with both types of worries and negative associations with sexual function. Temporal stability was high across moments for most constructs, particularly for sexual function and worries; however, sexual pleasure did not demonstrate temporal stability, suggesting greater variability in this measure over time in this subgroup.

Table A3. Correlation matrix between study variables in the 1st and 2nd moment (*N* =15).

	Vividness of Imagination T1	General Inattention T1	Body Appearance Worries T1	Performance Worries T1	Smartphone Overuse T1	Sexual Function T1	Sexual Distress T1	Sexual Pleasure T1	Vividness of Imagination T2	General Inattention T2	Body Appearance Worries T2	Performance Worries T2	Smartphone Overuse T2	Sexual Function T2	Sexual Distress T2	Sexual Pleasure T2
	r (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)
Vividness of Imagination T1	-	.44	-.32	-.27	-.17	.76***	-.57*	.25	.93***	.40	-.29	.07	-.16	.79***	-.39	.50
General Inattention T1		-	.05	.34	.63**	.29	-16	-.44	.37	.95***	-.03	.30	.66**	.26	-.09	.36
Body Appearance Worries T1			-	.62**	.44	-.38	.06	-.36	-.35	-.07	.97***	.63**	.51	-.44	.18	-.04
Performance Worries T1				-	.52*	-.64**	.37	-.43	-.37	.22	.60**	.75***	.48	-.66**	.52*	-.11
Smartphone Overuse T1					-	-.11	.12	-.72**	-.17	.56*	.33	.45	.91***	-.24	.11	.01
Sexual Function T1						-	-.74**	.21	.75**	.33	-.39	.36	-.06	.97***	-.71**	.54*
Sexual Distress T1							-	.08	-.45	-.14	.10	.07	.03	-.75**	.73**	-.32
Sexual Pleasure T1								-	.40	-33	-.21	-.33	-.65**	.29	-.04	.29
Vividness of Imagination T2									-	.33	-.31	.04	-.19	7.7***	-.47	.44
General Inattention T2										-	-.13	.12	.644**	.29	-.01	.39

Body Appearance Worries T2	-	.59*	.38	-.41	.20	-.03
Performance Worries T2		-	.35	-.37	.20	-.13
Smartphone Overuse T2			-	-.17	.13	.20
Sexual Function T2				-	-.77***	.601**
Sexual Distress T2					-	-.22
Sexual Pleasure T2						-

Note: *** $p \leq .001$; ** $p \leq .01$; * $p \leq .05$

Table A4 presents the hierarchical multiple regression predicting sexual function at T2 among the excluded male participants ($N = 15$). Across all blocks, sexual function at T1 was the only consistent and significant predictor of sexual function at T2, accounting for most of the explained variance. None of the other predictors, including age, dysphoria, general inattention, problematic smartphone use, sexual worries, or partner-focused imagination vividness, reached statistical significance. These findings indicate that, in this subgroup, sexual function at baseline strongly predicted sexual function one month later, with no evidence of incremental predictive value from other factors.

Table A4. Hierarchical multiple regression predicting men's sexual function T2.

Predictors			
Block 1	***β***	***p***	***R^2***
Sexual Function	.99	<.001	.94
Age	.11	.214	
Dysphoria	-.06	.427	
Block 2	***β***	***p***	***R^2***
Sexual Function	.96	<.001	.94
Age	.10	.270	
Dysphoria	-.13	.301	
General inattention	.08	.746	
Block 3	***β***	***p***	***R2***
Sexual Function	.92	<.001	.94
Age	.10	.27	
Dysphoria	-.10	.406	
General inattention	.18	.262	
Problematic smartphone use	-.13	.357	
Block 4	***β***	***p***	***R2***
Sexual Function	.97	<.001	.94
Age	.11	.238	
Dysphoria	-.17	.238	
General inattention	.21	.208	
Problematic smartphone use	-.16	.273	

Sexual Worries	.13	.322	
Block 5	***β***	***p***	***R2***
Sexual Function	.91	.001	.93
Age	.11	.270	
Dysphoria	-.20	.227	
General inattention	.17	.332	
Problematic smartphone use	-.14	.514	
Sexual Worries	.12	.365	
Partner-focused imagination vividness	.09	.597	

Table A5 presents the hierarchical multiple regression predicting sexual distress at T2 among the excluded male participants (N = 15). Sexual function at T1 emerged as the strongest and most consistent predictor of sexual distress across all blocks, with higher baseline sexual function associated with lower sexual distress one month later. None of the other variables, including age, dysphoria, general inattention, problematic smartphone use, sexual worries, or partner-focused imagination vividness, reached statistical significance in predicting sexual distress. These findings suggest that, in this subgroup, sexual distress was primarily driven by baseline sexual functioning, with limited contribution from other factors.

Table A5. Hierarchical multiple regression predicting men's sexual distress T2.

Predictors			
Block 1	***β***	***p***	***R^2***
Sexual Function T1	.84	.002	.49
Age	-.27	.238	
Dysphoria* T1	.02	.926	
Block 2	***β***	***p***	***R^2***
Sexual Function T1	.83	.003	.45
Age	-.30	.232	
Dysphoria* T1	.09	.732	

General inattention	-.13	.640	
Block 3	***β***	***p***	***R2***
Sexual Function	.83	.006	.39
Age	-.30	.268	
Dysphoria	.08	.827	
General inattention	-.14	.667	
Problematic smartphone use	.03	.943	
Block 4	***β***	***p***	***R2***
Sexual Function	.76	.015	.37
Age	-.28	.316	
Dysphoria	-.10	.804	
General inattention	-.04	.908	
Problematic smartphone use	-.04	.921	
Sexual Worries	.27	.42	
Block 5	***β***	***p***	***R2***
Sexual Function	.80	.028	.29
Age	-.27	.358	
Dysphoria	-.14	.764	
General inattention	-.11	.811	
Problematic smartphone use	.029	.952	
Sexual Worries	.30	.422	
Partner-focused imagination vividness	.11	.791	

Table A6 presents the hierarchical multiple regression predicting sexual pleasure at T2 among the excluded male participants ($N = 15$). Sexual function at T1 showed a positive and significant association with sexual pleasure beginning in Block 3, but this effect was no longer significant in the final model after adding other predictors. In the final block, problematic smartphone use and sexual worries emerged as significant predictors, suggesting that greater smartphone use and sexual worries were associated with higher reported sexual pleasure in this subgroup.

Although partner-focused imagination vividness approached significance, it did not reach the conventional threshold.

Table A6. Hierarchical multiple regression predicting men's sexual pleasure T2.

Predictors			
Block 1	***β***	***p***	***R^2***
Sexual Function	.36	.319	-.02
Age	-.36	.242	
Dysphoria	-.10	.779	
Block 2	***β***	***p***	***R^2***
Sexual Function	.41	.165	.37
Age	-.22	.375	
Dysphoria	-.51	.127	
General inattention	.78	.019	
Block 3	***β***	***p***	***R2***
Sexual Function	.79	.033	.50
Age	-.48	.086	
Dysphoria	-.77	.032	
General inattention	.53	.097	
Problematic smartphone use	.77	.088	
Block 4	***β***	***p***	***R2***
Sexual Function	.78	.030	.55
Age	-.47	.082	
Dysphoria	-.99	.017	
General inattention	.67	.048	
Problematic smartphone use	.65	.134	
Sexual Worries	.35	.198	
Block 5	***β***	***p***	***R2***
Sexual Function	.49	.121	.70
Age	-.28	.231	
Dysphoria	-1.27	.004	

General inattention	.37	.212
Problematic smartphone use	.82	.042
Sexual Worries	.59	.038
Partner-focused imagination vividness	.61	.061