Graduate Student Journal of Psychology

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About the Artist:

Artist Marina Jijina (also known as author Marina G Ogden) is an award-winning British oil painter and academic. Classically trained, Marina has exhibited her artwork at solo and group exhibitions around the world for over twenty years. Her paintings, drawings and collages can be found in private and public collections worldwide. In addition to Marina's professional career as an artist, she is an interdisciplinary researcher and published author. Dr Ogden is currently a Visiting Fellow at The Warburg Institute, School of Advanced Study, University of London. The area of her academic research lies at the intersection between the philosophy of art, religious studies and art theory. Her first book, *Lev Shestov's Angel of Death: Memory, Trauma and Rebirth* was published in 2021 by Peter Lang. Her second monograph, titled *The Renewal of Art: Aby Warburg, Wassily Kandinsky and Lev Shestov* will be published by Lexington Books in 2025/26.

Graduate Student Journal of Psychology

FOREWORD

ARTICLES

Graduate Student Journal of Psychology

Letter from the Editors:

We are thrilled to introduce Volume 23 of the *Graduate Student Journal of Psychology*. This edition exemplifies our ongoing commitment to presenting rigorous research that deepens our understanding of psychological complexities and addresses the challenges of our diverse world.

This volume showcases a compelling array of articles that highlight the diverse challenges and opportunities within psychological research and practice. Bélisle et al. offer a thought-provoking scoping review on sexual and intimate partner violence against women with schizophrenia, shedding light on the heightened risks faced by these women and the urgent need for targeted care-setting interventions. Holly and Dickens explore the complex relationship between gendered racism, identity centrality, and binge-eating symptoms among Black women and highlight the critical need for culturally informed approaches to eating disorder treatment. Kaiser and Wheaton investigate attentional biases in adults with separation anxiety disorder, uncovering nuanced emotional interference effects related to disorder-specific threats, which pave the way for tailored therapeutic strategies. Moment delves into the intricate relationship between maladaptive daydreaming and adverse childhood experiences, exploring how childhood trauma shapes coping mechanisms and proposing trauma-informed approaches for clinical interventions. Finally, Tong and Watkins provide insights from a single-case series on absorption training for individuals with anhedonia, examining its potential to enhance positive activity experiences and offering valuable methodological recommendations for future clinical trials. We are proud to feature these impactful studies, which underscore the importance of addressing mental health challenges through diverse lenses, from trauma and anxiety to therapeutic interventions.

This edition also marks an exciting new chapter for our editorial team. As several esteemed members graduate and embark on new journeys, we are thrilled to welcome a talented cohort of graduate scholars to our editorial board. Their fresh perspectives and dedication have been instrumental in shaping this volume, and we are eager to continue building on the journal's legacy of academic rigor and meaningful impact.

As always, we extend our deepest gratitude to our contributors, peer reviewers, and faculty sponsor, Dr. Matt Blanchard, for their unwavering support and guidance. Special thanks are also due to our outgoing editors for their remarkable contributions and leadership, which have set a high standard for our continued work.

As we invite you to engage with the insightful research presented in this volume, we also encourage you to join the conversation. Connect with us at gsjp@tc.columbia.edu or through our social media platforms to share your thoughts, ideas, and feedback. Thank you for being part of our readership and for your continued support as we work together to advance the field of psychology.

    Warm regards,

    The Editors - Xi Pan, Yutong Zhu, Emma Langsford, Niklas Nyblom, Rachel Shin, Camila Domínguez-Imbert Nieto, & Seraphima Ogden

Sexual and Intimate Partner Violence Against Women with Schizophrenia: A Scoping Review

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Background: Globally, 641 million women are touched by intimate partner violence (IPV), establishing it as the most prevalent form of violence affecting women. Women, who are already disproportionately affected by sexual and IPV, face an elevated risk when dealing with severe mental illnesses (SMI) compared to the general population. Schizophrenia, classified as an SMI, poses numerous obstacles that impact women's ability to maintain employment, good health, and sustain stable relationships. Nevertheless, limited data exists on IPV against women with schizophrenia and its effect. **Aims:** The objective of this scoping review was to summarize the available literature on sexual and IPV against women with schizophrenia and underlie future avenues of research. **Methods:** We conducted an electronic search using keywords in the following databases: APA PsychInfo, PubMed, Scopus, Google Scholar, and Psychology and Behavioral Sciences Collection. The search yielded a total of 6,099 articles. Upon title and abstract review, 97 articles were retained for full-text reading, after which 7 articles were included in this review. **Results:** The available articles reveal an association between sexual violence and IPV against women with schizophrenia. Younger women diagnosed with schizophrenia, especially those with low income or unemployed, are at a higher risk of experiencing sexual and IPV. This victimization increases the likelihood of suicide and exacerbates psychopathology. **Conclusion:** Research should examine care-setting interventions for women with schizophrenia, who are at increased risk of sexual and IPV, aiming to prevent severe harm. Implementation of preventive measures is essential for enhancing healthcare and societal transformation.

Keywords: IPV, sexual violence, schizophrenia, women, victimization

Intimate partner violence (IPV) is defined as any conduct occurring within an intimate relationship that inflicts physical, sexual, or psychological harm. IPV has sparked significant public health apprehension due to the growing prevalence highlighted by diverse global news outlets. It has infiltrated all societal levels, emerging as the predominant manifestation of gender-based violence, leading to immediate and enduring health repercussions for those affected. Population-based prevalence estimates typically fail to accurately represent the problem's magnitude due to substantial underreporting; nonetheless, IPV still significantly contributes to crime statistics in all societies (Afe et al., 2016). Indeed, as many as 38% of all murders of women are committed by intimate partners (World Health Organisation [WHO], 2021). Research findings, as highlighted by Afe et al. (2017), indicate that women, who are disproportionately impacted by sexual violence— covering non-consensual sexual activities, coercion, exploitation, harassment, or advances, irrespective of the perpetrator's relationship with the victim or the setting— and IPV are at heightened risk if they experience severe mental illness (SMI). SMI is defined as individuals with persistent or recurrent mental disorders significantly affecting their functioning, compared to the general population. This negatively affects women's physical, mental, sexual, and reproductive health (WHO, 2021). Thus, minimal research has been conducted on the sexual and IPV victimization experienced by women with schizophrenia, a severe mental illness characterized by hallucinations, delusions, social withdrawal, diminished pleasure and motivation, cognitive deficits, and other symptoms (Darves-Bornoz et al., 1995). As such, the objective of this research is to elucidate our knowledge on this topic. While IPV encompasses verbal, psychological, physical, and sexual abuse, we have opted to draw a distinction between IPV and sexual violence. Specifically, our discussion of IPV encompasses sexual violence perpetrated by intimate partners, whereas the section on sexual violence includes acts perpetrated by intimate partners as well as by individuals other than partners.

Intimate Partner Violence Against Women

Globally, 641 million women are affected by partner violence, establishing it as the most prevalent form of violence affecting women (Buchholz, 2021). During their lives, one out of three women worldwide will experience IPV (Buchholz, 2021). Adding to this distressing statistic, globally, women constitute 20 percent of all murder victims, and the majority of these cases involve killings by a partner or ex-partner (Buchholz, 2021). Characterized by any behaviour within an intimate relationship causing physical, sexual, or psychological harm, IPV can account for physical aggression, sexual manipulation, psychological maltreatment, and controlling conduct done by a present or past partner (Afe et al., 2016). The rising media coverage of this behaviour has raised substantial public health concerns

globally. Beyond the immediate potential traumatic events, it is imperative to acknowledge the enduring short and long-term consequences faced by survivors. This underscores the urgent need for multifaceted approaches to prevention and intervention, addressing the root causes of IPV while providing comprehensive support for survivors to rebuild their lives.

Sexual Violence Against Women

According to the World Health Organization's Multi-Country Study (MCS), the lifetime prevalence of women experiencing sexual abuse by a partner was between 6% and 59% (WHO, 2002). Sexual violence is a profound human rights violation that encompasses any sexual activity involving coercion, sexual exploitation, harassment, or advances committed by an individual, irrespective of the relationship with the victim, and the environment (Dartnall & Jewkes, 2013; Krug et al., 2022). As perpetrators are generally men known by the victims and commonly intimate partners, it is important to acknowledge that sexual violence is pervasive in every society and frequently targets women (Dartnall & Jewkes, 2013; WHO, 2002). Notably, women facing mental health challenges experience a higher victimization rate, reaching 53 incidents per 1000 individuals, in contrast to the general population's rate of 17 incidents per 1000 people (Van Deinse et al., 2019). Indeed, violent victimization against women with SMI was estimated at 25% greater than the general population (Van Deinse et al., 2019). Therefore, it is crucial to acquire deeper insights into the topic, given that sexual violence can lead to lasting adverse effects, worsen mental health challenges, and contribute to the emergence of concurrent disorders.

Schizophrenia

As of 2019, approximately 0.3 percent of the world population was reported to have schizophrenia (OWID, 2019). This disorder can disturb various facets of an individual's mental faculties such as thoughts, perception, speech, emotions, behaviour, and social functioning (Schultz et al., 2007). Symptoms may encompass hallucinations (e.g., hearing voices), delusions (e.g., paranoia), social withdrawal, lack of pleasure, loss of motivation, cognitive deficits, and other problems disrupting patients' lives (Schultz et al., 2007).

As schizophrenia affects various facets of women's lives, many have difficulty relating and connecting to the world around them, making these women vulnerable to feelings of loneliness and isolation. Moreover,

the entourage of women with schizophrenia may have difficulty understanding that their illness may complicate their relationships. This challenge becomes especially daunting when attempting to establish intimate relationships, as these women are more vulnerable to emotional and physical victimization. Indeed, in Chernomas's (2000) research, women expressed how they feared intimacy as many felt preyed upon once their psychiatric history was known. Additionally, numerous women shared experiences of childhood abuse, rape, and physical mistreatment, leading to a strong reluctance and fear towards engaging in sexual intimacy (Chernomas et al., 2000). These acute stressors have been identified as factors contributing to an elevated risk of suicidal behaviours (Chernomas et al., 2000). As the lifetime prevalence of suicide in the schizophrenia population has been estimated to be ten times higher than in the general population, the severity of symptoms and victimization leads to a greater number of suicide attempts in women with schizophrenia (Carlborg et al., 2010; Thara & Kamath, 2015).

In terms of employment, certain women opt to be homemakers, remain on disability pensions, or engage in work fields (Chernomas et al., 2000). While some express a desire to work, they are apprehensive about their ability to cope with the stress of employment. They fear the potential of falling ill and being financially strained, coupled with the challenge of finding alternative employment (Chernomas et al., 2000). Moreover, many women diagnosed with schizophrenia have encountered limiting messages regarding their ability to pursue employment or education due to their disability, underscoring their apprehension about entering the workforce (Chernomas et al., 2000).

Schizophrenia has devastating effects not only on women's emotional and cognitive health but also on their physical health. The negative impacts of antipsychotic medications include weight gain, amenorrhea, reduced libido, lactation, and facial hair growth (Chernomas et al., 2000). These side effects have a detrimental impact on women's well-being and undermine their sense of self and femininity. Furthermore, women with schizophrenia have expressed a lack of sufficient information from health professionals regarding family planning, pregnancy, parenting, or menopause, particularly in light of their mental health condition and its psychopharmacologic treatment (Chernomas et al., 2000). The lack of communication and sup-

port from healthcare professionals can lead women to be hesitant to discuss menstrual irregularities and sexuality as they face insufficient responses to their concerns on these matters (Chernomas et al., 2000).

Women with schizophrenia constitute a vulnerable population as their illness impacts multiple aspects of their lives, including their potential for employment, pursuit of higher education, health, and ability to establish and maintain stable relationships. Given that symptoms may exacerbate in the face of challenges, women with schizophrenia also exhibit a higher likelihood of suicide compared to the general population, highlighting the pressing need to improve our comprehension of women's circumstances and their vulnerability to victimization.

IPV, Sexual Violence and Schizophrenia

As IPV against women is highly prevalent, past literature has indicated that women with SMI are at elevated risk of being victims of sexual and IPV (Afe et al., 2017). Across various research, the lifetime exposure to sexual and physical abuse fell between 43% and 81% for women with SMI (Kim et al., 2006). These women are more susceptible to abusive and violent relationships due to the persistent, debilitating impact of the illness and social stigmatization. Particularly, it was found by Thara & Kamath (2015), that women with schizophrenia were severely disabled compared to women with other diagnoses. This highlights the need to intensify focus on schizophrenia, particularly considering the insufficient available data regarding the prevalence of sexual and IPV against women diagnosed with schizophrenia and its potential impact on their condition.

Following the methodological framework proposed by Arksey and O'Malley (2005) and Levac et al. (2010), this scoping review seeks to describe the present literature regarding IPV and sexual violence among women with schizophrenia worldwide. Given the pervasive nature of violence against women worldwide, causing harm to millions, and being especially prevalent among women with SMI, it is imperative to thoroughly investigate this phenomenon. The impact of such violence on symptoms, treatment complexities, and the overall quality of life for these women cannot be understated. Mental health professionals must be aware and diligent surrounding this issue by carefully assessing for this factor (Afe et al., 2016). By gaining a deeper understanding of the relationship between sexual violence, IPV, and wom-

en with schizophrenia, more effective strategies for prevention, intervention, and support can be developed. Ultimately, this examination can contribute to an enhanced comprehension of the issue, offering insights into potential avenues for future research.

Methodology

As a scoping review, this article is based on the methodological framework developed by Arksey and O'Malley (2005) and refined by Levac et al. (2010) following PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Tricco et al., 2018). The purpose of scoping reviews is to provide a comprehensive overview of a new area of research and identify potential gaps that need to be addressed. According to recent literature, five key steps are necessary for conducting scoping reviews: 1) identifying the research question; 2) identifying relevant studies; 3) selecting studies; 4) charting the data; and 5) collating, summarizing, and reporting results (Arksey and O'Malley, 2005; Levac et al., 2010). The main question directing this review is "What is the state of knowledge regarding sexual and intimate partner violence against women with schizophrenia?"

Literature Research

An electronic literature search was initiated on September 6, 2023, through the following databases: APA PsychInfo, PubMed, Scopus, Google Scholar, and Psychology and Behavioral Sciences Collection. In collaboration with an academic librarian, KAB developed a search strategy using controlled vocabulary (MeSH and index terms) and keywords relevant to "sexual violence," "intimate partner violence (IPV)" and "schizophrenia." Continual collaboration, validation, and discussion followed with SH and AM.

For sexual violence and intimate partner violence, the terms employed for the search were: "sexual violence" OR "intimate partner violence" OR "intimate partner abuse" OR "sexual viol*" OR "sexual abuse" OR "sexual assault" OR "sexual coercion" OR "sexual harassment" OR "sex offenses" OR "acquaintance rape" OR "domestic violence" OR "victimization" OR "marital rape." For schizophrenia, the terms employed were: "schizophrenia." The search strategy is presented in Figure 1.

Study Selection

After conducting the database search, all identified literature was imported into Zotero reference

management software (v6). The search generated 6,099 articles, of which 4,459 remained after removing duplicates. To determine eligibility for full-text review, KAB and SH screened titles and abstracts. To be selected, studies had to meet the following inclusion criteria: (1) the primary theme had to be related to both sexual violence, IPV, and schizophrenia (2) articles were published in a peer-reviewed journal, (3) articles were available in English or French, (4) articles could not be systematic reviews, (5) article population had to be women (included studies that distinguished findings between sexes), (6) excluded children and (7) article population was diagnosed with schizophrenia. The authors chose to exclude children from the study due to childhood-onset schizophrenia being recognized as a distinct subtype of the disorder, necessitating separate research. Incorporating studies involving children would primarily delve into child sexual abuse, which warrants dedicated investigation on its own.

A total of 97 articles were retained for full-text review, and the final selection was agreed upon by SH and AM. Following the full-text review, seven articles were retained and included in the review. For each included article, references, authors, and "cited by" were scanned to identify additional relevant studies. The flowchart of the study selection and screening process can be seen in Figure 2.

Data extraction and analysis

A charting form was used to facilitate team discussion and approval during full-text screening and descriptive analysis. Using charting forms developed by Peters et al. (2020), Lauzon-Schnittka et al. (2022), and Arnstein et al. (2020), we extracted the following information for each article: authors, journal, year of publication, study location, the number of participants, age of participants, the aim of the study, methodology, and important results. The extraction was done by KAB and validated by SH and AM. The results were then summarized, and narrative synthesis was employed to report the findings (Popay et al., 2006).

Results

The characteristics of the 7 retained articles are displayed in Table 1.

Study characteristics

Among the selected articles, one was published in 1995 (Darves-Bornoz et al., 1995) and one in 2006 (Kim et al., 2006). A total of 5 articles were published after 2013 (Afe et al., 2016, 2017; Khalifeh et al., 2015; Leslie et al., 2023; Yildirim et al., 2014). Two studies were conducted in Nigeria (Afe et al., 2016, 2017), one in Turkey (Yildirim et al., 2014), one in South Korea (Kim et al., 2006) and one in Canada (Leslie et al., 2023). Two studies were from Europe, including one from France (Darves-Bornoz et al., 1995) and the other from England (Khalifeh et al., 2015). The number of participants in the selected studies ranged from 70 to 1,802,645. Two articles examined female outpatients diagnosed with schizophrenia with an average age of 38.3 years (Afe et al., 2016, 2017), while Kim et al. (2006) had an average age of 33.5 years. Two studies consisted of in-patients undergoing treatment (Khalifeh et al., 2015; Yildirim et al., 2014). Yildirim et al. (2014) sample consisted of female patients with an average age of 39.24 years. Khalifeh et al. (2015) randomly recruited patients with SMI (59.7% with schizophrenia) through community mental health services, with an average age of 40.8 years. Two studies had a sample of in and outpatients with schizophrenia (Darves-Bornoz et al., 1995; Kim et al., 2006). Kim et al. (2006) had a sample with an average age of 33.5 years while Darves-Bornoz and colleagues (1995), recruited females with an average age of 34.3 years. Lastly, Leslie et al. (2023) study compared women in Ontario with or without schizophrenia and who became pregnant between April 1, 2004, and March 31, 2018, with an average age of 30.6 years.

Methodology

The seven articles were quantitative (Afe et al., 2016, 2017; Darves-Bornoz et al., 1995; Khalifeh et al., 2015; Kim et al., 2006; Leslie et al., 2023; Yildirim et al., 2014). One article was surveyed through a computer-assisted face-to-face interview while also incorporating a self-completion module (Khalifeh et al., 2015). One article utilized a population-based cohort study involving the registry of administrative health and clinical data from 2004 to 2018 in Ontario, Canada (Leslie et al., 2023). Two studies employed semi-structured interviews (Darves-Bornoz et al., 1995; Kim et al., 2006). Finally, Afe et al. (2016, 2017) studies employed interviews to survey women. Even though these studies share the same sample, they vary in terms of the assessment measures employed and the number of participants recruited.

Prevalence of Intimate Partner Violence Among Women with Schizophrenia

In four articles, the authors aimed to explore IPV among women with schizophrenia (Afe et al., 2016, 2017; Khalifeh et al., 2015; Leslie et al., 2023). The four studies reported a higher prevalence of IPV among women with schizophrenia than women without this diagnosis. Afe et al.'s (2016) aim was to study the various patterns of IPV against women with schizophrenia and its association with psychopathology. The results indicated that 75% of the participants experienced at least one occurrence of IPV (Afe et al., 2016). Afe et al. (2017) investigated socio-demographic and other attributes of partners of women with schizophrenia in Nigeria. They reported that 73% of the participants experienced IPV at least once which is much higher than the prevalence of non-mentally ill women found at 40% in Nigeria (Afe et al., 2017).

Khalifeh et al. (2015) assess and compare the prevalence and consequences of domestic and sexual violence among individuals with SMI, with 59.7% of the participants diagnosed with schizophrenia, and the general population. Their research found that women with SMI reported higher domestic violence (69%) compared to the control group (33%) (Khalifeh et al., 2015). The SMI population also had a higher rate of sexual violence (10%) compared to the control group (2%) (Khalifeh et al., 2015). Lastly, Leslie et al. (2023), aimed to assess and compare the risk of interpersonal violence necessitating an emergency department (ED) visit during pregnancy or within one year postpartum among women with and without schizophrenia. They found a higher risk of ED visits for interpersonal violence among women with schizophrenia (4%) compared to women without schizophrenia (0.4%) (Leslie et al., 2023).

Prevalence of sexual violence among women with schizophrenia

In three studies, the authors examined sexual violence committed against women with schizophrenia (Darves-Bornoz et al., 1995; Kim et al., 2006; Yildirim et al., 2014). All three studies indicated that women with schizophrenia have a high prevalence of sexual abuse. In Kim et al.'s (2006) article, the aim was to present findings on the prevalence of sexual abuse in female patients attending a mental hospital for schizophrenia in South Korea. They found that 37% of the study's population had a history of sexual abuse where 29.7% were abused by a family member, 32.4% by an unrelated perpetrator and 60% by a stranger (Kim et al., 2006). In Darves-Bornoz et al. (1995), the aim was to study women with schizophrenia and bipolar disorder in relation to sexual victimization. It was discovered that the prevalence of rape was found to be 23% among women with schizophrenia, in contrast to the general population rate of 7% or 8% (Darves-Bornoz et al., 1995). In this research, the perpetrators of sexual violence were family members (Darves-Bornoz et al., 1995). Lastly, Yildirim et al. (2014), aimed to explore the effect of adulthood trauma such as sexual harassment and sexual abuse experienced by patients with schizophrenia who did not have a history of child abuse. They found that 24.3% of patients had experienced sexual abuse during their adulthood whereas 14.3% were abused by a stranger and 10% by someone they knew (Yildirim et al., 2014). For sexual harassment, 28.6% were sexually harassed (Yildirim et al., 2014).

These three studies focused on sexual abuse not committed within an intimate relationship. Nonetheless, three articles which focused on IPV also assessed sexual assaults committed towards schizophrenic women. Khalifeh et al. (2015), found in their population that 61% of women experience sexual assault compared to 21% of women without schizophrenia. In both Afe et al.'s (2016, 2017) studies, the authors reported that 24% of the sample was sexually assaulted.

IPV & Sexual Violence Association with Symptomology

Out of the seven articles, four found an association between IPV, sexual violence and higher psychopathology (Afe et al., 2016, Darves-Bornoz et al., 1995; Kim et al., 2006; Yildirim et al., 2014), while Afe et al. (2017) revealed that patients who do not adhere to treatment and experience symptom improvement are more likely to become victims of IPV. Afe et al. (2016) found that participants who reported sexual, verbal, and physical IPV indicated higher psychopathology (e.g., worsened psychiatric symptoms). Higher psychopathology was also associated with a decrease in physical health, such as "injuries, gynecological problems, depression of immunity and possibly untimely death" (Afe et al., 2016, p. 8). Kim et al. (2006), identified higher psychopathology scores within the abused population indicating increased distress in somatization, obsessive-compulsive behaviours, depression, and anxiety, while also indicating greater dissociative

expression. Yildirim et al. (2014), reported higher psychopathology such as anxiety, aggression, hallucinations, and delayed gratification among patients who experienced sexual abuse. Darves-Bornoz et al. (1995) also stated a relationship between the occurrence of rape and the increased chronicity of the disorder. Lastly, regarding treatment adherence, Afe et al. (2017) noted a counterintuitive finding suggesting that irregular medication use increases the odds of IPV and individuals with a shorter duration of illness are more likely to experience sexual, physical and verbal IPV.

Suicide

Among the seven articles, five studies discussed the risk of suicide when victimized (Afe et al., 2016, 2017; Darves-Bornoz et al., 1995; Khalifeh et al., 2015; Kim et al., 2006). Kim et al. (2006), discovered a higher risk of suicidal attempts among abused patients compared to non-abused patients. Darves-Bornoz et al. (1995) found that victimization of women with schizophrenia was associated with an elevated risk of suicidal attempts. Afe et al. (2016) claimed that victimization increased the rates of suicide risks while Afe et al. (2017) emphasized how abuse within SMI like schizophrenia raises the incidence of suicide. Lastly, Khalifeh et al. (2015), revealed that half of the women in their sample who were coping with SMI and had encountered sexual assault went on to report instances of attempted suicide.

Age

Of the seven selected articles, five discussed the relationship between age and victimization. Afe et al. (2016), found that the younger group had higher chances of reporting IPV than the general population. Afe et al. (2017), similarly showed a higher prevalence of IPV reports within adults younger than 40 years old. Yildirim et al. (2014) discovered that patients who had experienced sexual abuse were notably younger compared to those who did not report a history of sexual abuse. Leslie et al. (2023) indicated that younger mothers had a higher risk for an ED visit for interpersonal violence. Lastly, Darves-Bornoz et al. (1995) found that women with schizophrenia were more at risk of being raped during the end of adolescence and early adulthood.

Unemployment/ Low Income

Five studies assessed victimization and its association with unemployment/low income. Afe et al. (2016) found higher rates of IPV, more precisely verbal abuse among unemployed women. Afe et al. (2017) also found that participants' unemployment status was linked with higher chances of experiencing IPV. Indeed, women who were unemployed and had low or no income were found to have increased odds of experiencing physical, verbal and sexual abuse from their partners (Afe et al., 2017). Darves-Bornoz et al. (1995), also expressed how low income had an important role in sexual victimization. Leslie et al. (2023), found in their sample that women who experienced interpersonal violence were residing in lower-income neighbourhoods and were also more likely to have an ED visit for interpersonal violence. Lastly, Khalifeh et al. (2015), indicated that within their population who experienced domestic and sexual violence, 80% of the participants were unemployed.

Discussion

The objective of this scoping review was to analyze the existing peer-reviewed literature on sexual and IPV against women with schizophrenia to summarize the current state of knowledge on this subject and highlight future research avenues. As shown through the seven selected studies in this scoping review, a strong association was found between sexual violence, IPV, and women with schizophrenia. Across four studies, it was observed that women diagnosed with schizophrenia demonstrated a significantly higher prevalence of experiencing IPV compared to women without this diagnosis (Afe et al., 2016, 2017; Khalifeh et al., 2015; Leslie et al., 2023). In Leslie et al.'s (2023) study, women with schizophrenia were ten times more likely to experience IPV when pregnant. In contrast, research by Afe et al. (2017) and Khalifeh et al. (2015) showed that women with schizophrenia were twice as likely to experience IPV. The findings from the three remaining studies pointed toward a heightened prevalence of sexual abuse of approximately 28% among women diagnosed with schizophrenia (Darves-Bornoz et al., 1995; Kim et al., 2006; Yildirim et al., 2014). This highlights how women with schizophrenia are more likely to be victims of sexual and IPV. Yet, this issue is rarely discussed by mental health professionals and physicians creating a lack of awareness (Afe et al., 2017).

Through the seven articles, various themes arose describing the risk factors and effect of victimization upon women with schizophrenia. Regarding symptomology, four articles found a relationship between IPV, sexual violence, and elevated psychopathology (Afe et al., 2016, Darves-Bornoz et al., 1995; Kim et

al., 2006; Yildirim et al., 2014). Studies have identified that instances of abuse and victimization contribute to heightened psychiatric symptoms in women. This is manifested through increased levels of depression, anxiety, dissociative expression, and hallucinations (Darves-Bornoz et al., 1995; Kim et al., 2006; Yildirim et al., 2014). The amplification of symptoms can be attributed to women's response to victimization and having limited resources in a society that stigmatizes them (Chernomas et al., 2000). Furthermore, women not only face heightened psychiatric symptoms but also encounter physical health issues. Given that individuals with schizophrenia confront a notably shorter life expectancy than the general population, with approximately 90% of deaths attributed to physical illnesses, it becomes apparent that sexual and IPV play a role as contributing factors to the deterioration of health (Chernomas et al., 2000). This form of violence can result in injuries, gynecological problems, and compromised immune function, thereby intensifying the overall health challenges experienced by these women (Chernomas et al., 2000; Seeman, 2018). Conversely, Afe et al. (2017) demonstrated that individuals who do not comply with treatment and show symptom improvement are at a higher risk of IPV. This counterintuitive finding suggests the need to further explore the repercussions of victimization on symptomology.

Among the seven articles analyzed, five studies (Afe et al., 2016, 2017; Darves-Bornoz et al., 1995; Khalifeh et al., 2015; Kim et al., 2006) investigated the relationship between victimization and the risk of suicide. In each instance, there was a uniform observation of an increased risk of suicide. Given that suicide is more prevalent in women with schizophrenia compared to the general population (Seeman, 2018), research indicates that suicidal behaviour increases during acute social crises. Crucial predictive factors for suicide in women with schizophrenia include a history of sexual abuse, IPV, and the loss of children (Carlborg et al., 2010). These traumatic events also have repercussions on women's psychiatric symptoms, with depression and hopelessness identified as significant contributing risk factors to suicide (Carlborg et al., 2010). In schizophrenia, the risk factors for suicide appear to be less associated with typical core symptoms of psychosis, such as delusions and hallucinations, and more linked to depressive symptoms, including agitation, hopelessness, and feelings of worthless-

ness (Carlborg et al., 2010). Consequently, as suicide risk is already high among people with schizophrenia, victimization exacerbates their situation, leading to an even higher likelihood of committing suicide.

Additionally, an increased likelihood of experiencing sexual and IPV during younger years was found in five studies (Afe et al., 2016, 2017; Darves-Bornoz et al., 1995; Leslie et al., 2023; Yildirim et al., 2014). The vulnerability of younger women with schizophrenia may stem from the decline in social skills and cognition linked to the chronicity of the illness (Afe et al., 2017). Younger women also tend to be more dependent on their partner, increasing their risk of IPV, especially among women with SMI (Afe et al., 2017). Regarding employment, unemployed or low-income women with schizophrenia were more likely to be victims of sexual and IPV (Afe et al., 2016, 2017; Darves-Bornoz et al., 1995; Khalifeh et al., 2015; Leslie et al., 2023). As the study of Afe et al. (2017) pointed out, individuals with schizophrenia are more likely to have a lower socioeconomic status due to the debilitating effect of the illness on their cognition, social skills, and ability to be productive. Moreover, barriers still exist regarding employment and the improvement of the socioeconomic status of people with schizophrenia due to the ongoing stigma and discrimination (Afe et al., 2017). Thus, this becomes even more difficult for women with schizophrenia as gender barriers exist (e.g., men having better economic opportunities, more education, and more employment opportunities) (Afe et al., 2017). Given that employment offers substantial support, contributes to a dignified existence, and fosters financial independence, it is noteworthy that many women with schizophrenia lack jobs or sufficient income (Afe et al., 2017). Consequently, these women face an increased likelihood of experiencing violence, primarily attributable to their socioeconomic status and lower income in comparison to the general population (Afe et al., 2017). These results suggest that younger women diagnosed with schizophrenia, particularly those with low income and/or unemployed status, face an elevated risk of becoming victims of sexual and IPV. This victimization, in turn, amplifies the risk of suicide and heightened psychopathology. The findings also suggest that IPV worsens the progression of schizophrenia, leading to an increase in symptoms and a higher risk of suicide.

These findings underscore the need to enhance interventions that could better support women with

schizophrenia experiencing sexual violence and IPV. Certainly, mental health professionals should routinely inquire about IPV among women with schizophrenia to identify potential victims. By making both direct and indirect inquiries about IPV, clinicians can better detect IPV and develop comprehensive therapy plans that include social interventions to support women with schizophrenia. Additionally, clinicians need to be aware of the elevated prevalence of sexual and physical abuse in this population. They should thoroughly evaluate psychosocial, familial, and clinical histories collectively (Kim et al., 2006). Studies have shown that clinicians can identify IPV risk and address relationship dynamics, socioeconomic challenges, and pharmacological therapy effectively by giving proper attention to women's socio-demographic background, economic circumstances, and partners (Afe et al., 2017). Hence, the integration of regular violence screening and the establishment of a robust therapeutic rapport with clients offers health professionals a vital opportunity for intervention to prevent severe physical, psychological, and social harm to these women.

This review also denotes how the selected articles assessed women in the same age range (between 30 and 40 years old) indicating scarce data for sexual and IPV among women with schizophrenia in younger and elderly populations. As a result, it is recommended that forthcoming studies take into account diverse populations, sexual diversity, and gender while adopting a non-binary perspective. Lastly, the selected studies, published between 1995 and 2023, with a majority published after 2013 (n=5), suggest a recent emergence of reporting sexual and IPV incidences against women with schizophrenia. While most studies were cross-sectional, there is a need for qualitative and mixed-method studies to fully understand the experience of women with schizophrenia to prevent and protect them from sexual and IPV. Overall, this scoping review reveals that more studies are needed to improve our knowledge of sexual and IPV against women with schizophrenia.

Study Limitations

This scoping review has some limitations to consider. To begin, only peer-reviewed articles published in scientific journals were included in this review, excluding grey literature. The authors decided to exclude grey literature to prioritize the most rigorous reviewed and established research. This helps in providing a clearer picture of the current state of knowledge by ensuring the quality and reliability of the articles. Thus, this limited our ability to identify potential research and advance our understanding. Moreover, the study selection criteria restricted this review to English and French, which prevented studies in other languages from being considered. Furthermore, this research constrained its focus to adult women, omitting post-pubertal schizophrenia in children and young adolescents. Lastly, the chosen articles lacked clear distinctions between sex and gender, with a majority frequently remaining ambiguous about whether they were addressing gender, sex, or both. As such, studies in other languages, the inclusion of grey literature, and the inclusion of a broader population could provide further insight into this subject.

Conclusion

The aim of this scoping review was to identify and synthesize literature on sexual and IPV against women with schizophrenia. The studies included in this review revealed a higher prevalence of sexual abuse and IPV among women with schizophrenia relative to the general population. The findings indicate that younger women diagnosed with schizophrenia, especially those with low income and/or unemployed status, are at an increased risk of experiencing sexual and IPV. This victimization, subsequently, raises the likelihood of suicide and heightened psychopathology. These results underscore the necessity of fostering interdisciplinary collaboration among healthcare professionals, social workers, and policymakers to effectively tackle IPV against women diagnosed with schizophrenia. While the retained articles for this review were small, there is a need for further investigation. Future research should explore current care setting interventions to prevent severe physical, psychological, and social harm, while also examining the impact of victimization on symptomatology as current results are mixed. Additional research should also explore childhood-onset psychosis and its association with sexual and intimate partner violence.

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Figure 1

Summary of the search strategy

Keywords	
Sexual Violence & Intimate Partner Violence	*Schizophrenia*
("sexual violence" OR "intimate partner violence" OR "intimate partner abuse" OR "sexual viol*" OR "sexual abuse" OR "sexual assault" OR "sexual coercion" OR "sexual harassment" OR "sex offenses" OR "acquaintance rape" OR "domestic violence" OR "victimization" OR "martial rape")	("schizophrenia")
Databases searched	
APA PsychInfo PubMed Scopus Psychology and Behavioral Sciences Collection Google Scholar	

Figure 2

Flowchart of study selection and screening process

Identification of Studies via Databases

Articles identified from:
PsychINFO (*n*=255)
PubMed (*n*=484)
Scopus (*n*=2252)
Psychology and Behavioural Science Collection (*n*=1828)
Google Scholar (*n*=1280)

Records identified through database searching
(*n*=6099)

Duplicates removed
(*n*=1640)

References screened
(*n*=4459)

Title and abstract screen
Total excluded *n*=4421

Not related to the main concepts   (*n*=4421)

Additional studies identified from
Total *n*=59
References screen   (*n*=50)
"Cited by" screen   (*n*=9)
Authors   (*n*=0)

Full-text screen
Total excluded n=90

Schizophrenia is not the primary   (*n*=22)
Diagnosis

Sexual & IPV is not the central subject   (*n*=13)

The main theme is not related to our main
concepts   (*n*=20)

The population was not women   (*n*=7)

Full article inaccessible   (*n*=15)

Systematic review   (*n*=13)

References retrieved for evaluation (*n*=97)

Studies included
(*n*=7)

Studies included
(*n*=7)

Identification

Screening

Eligibility

Included

Table 1

Authors, year	Country	Population/ Sample	Methodology	Assessment Tools	Objectives	Conclusion
Afe et al. (2016)	Nigeria	*N*= 77 Female Age: ~38.3 years old Female patients diagnosed with schizophrenia who were outpatients at the Federal Neuro-psychiatric Hospital.	Cross-sectional descriptive survey Interview based	Socio-demographic Questionnaire Diagnosis: The Structured Clinical Interview for DSM-IV (SCID) The Brief Psychiatric Rating Scale (BPRS) IPV: Intimate Partner Violence questionnaire.	The aim of this study was to survey and explore the various patterns of IPV associated with women with schizophrenia and the association with psychopathology.	The study highlighted the high rate of various forms of IPV among women with schizophrenia. Sexual assault and physical abuse are associated with higher scores on the psychopathology scale.
Afe et al. (2017)	Nigeria	*N*= 79 Female Age: ~ 38.3 years old Female patients diagnosed with schizophrenia were recruited from the Federal Neuro-psychiatric Hospital.	Cross-sectional descriptive survey Interview based	Socio-demographic questionnaire Diagnosis: Research Version of Structured Clinical Interview SCID (SCID-1) IPV: Intimate partner violence questionnaire .	The aim of this study was to explore the socio-demographic and other characteristics of partners of women in Nigeria diagnosed with schizophrenia	The findings show that the prevalence of IPV among women with schizophrenia is high (73%).
Darves-Bornoz et al. (1995)	France	*N*= 90 (64 schizophrenics, 26 Bipolars) Female Age: ~ 34.3 years old for schizophrenics ~32.7 years old for bipolar Female in-or outpatients with schizophrenia and bipolar disorder were recruited through twelve public hospitals in the department of psychiatry.	Quantitative Semi-structured interviews	Sociodemographic questionnaire Diagnosis: The positive and negative syndrome scale (PANSS) Schizophrenia with deficit syndrome Sexual violence: "Were you ever a victim of rape?"	The aim of the present study was to study two populations, women with schizophrenia and those with bipolar disorder, with reference to sexual victimization.	The study found that it is likely that women with schizophrenia and bipolar disorder are at risk of rape that usually occurs at the end of adolescents or in adulthood.
Yildirim et al. (2014)	Turkey	*N*= 70 Women Age: ~ 39.24 years old Female inpatients under treatment for schizophrenia at Bakirkoy Research and Training Hospital for Psychiatry, Neurology and Neurosurgery.	Quantitative Interview based	Diagnosis: Positive and Negative Syndrome Scale (PANSS) Effect Rating Scale (UKU) Calgary Depression Scale for Schizophrenia (CDSS) Sexual Violence: Traumatic Experiences Checklist (TEC)	The aim of the study was to investigate the effects of adulthood trauma (sexual harassment and sexual abuse) in a sample of patients with schizophrenia who did not report childhood trauma.	We observed that traumatic life events and exposure to violence were common among female patients with schizophrenia.

Table 1 (cont.)

Khalifeh et al. (2015)	England	*N*= 303 Gender: Male = 170 (56.1%) Female = 133 (43.9%) Age: ~ 40.8 years old Recruited patients with SMI under the care of community mental health services. Schizophrenia and related disorders 181 (59.7%) Bipolar affective disorder 35 (11.6%) Recurrent depressive disorder 30 (9.9%) Personality disorder 23 (7.6%) Other 34 (11.2%)	Quantitative Survey through a computer-assisted face-to-face interview	IPV: The British Crime Survey domestic/sexual violence questionnaire	This study compared domestic and sexual violence among SMI patients and the general population.	Men and women with SMI who are under the ongoing care of psychiatric services are 2–8 times more likely to experience sexual and domestic violence than the general population.
Kim et al. (2006)	South Korea	*N*= 100 Female Age: ~33.5 years old Female patients from a psychiatric hospital that were hospitalized for schizophrenic conditions.	Quantitative study Semi-structured interview	Diagnosis: Symptom Checklist-90-Revised (SCL-90-R) Dissociative Experience Scale–Korean version (DES-K) Barron Ego Strength Scale (ES Scale) The PANSS for schizophrenia The Scale for Assessment of Positive Symptoms Sexual violence: Russell's typology (Russell, 1986) of severe and very severe abuse.	The present study reports descriptive data on the prevalence of previous exposure to severe forms of sexual and physical abuse among female patients who were admitted to a mental hospital for schizophrenia in South Korea.	Female patients with schizophrenia had experiences of sexual or physical abuse prior to the onset of their illness. In many cases, abusive treatment continued after the onset of the current illness and hospital admission for psychiatric treatment.
Leslie et al. (2023)	Canada	*N*= 1 802 645 Gender: Female Age: ~30.6 years old for schizophrenics Compared women with and without schizophrenia in Ontario and who became pregnant between Apr. 1, 2004, and Mar. 31, 2018. Control Group: 1 798 175 Schizophrenia group: 4470	Quantitative Accessed administrative health and clinical registry data from 2004 to 2018 in Ontario, Canada	Diagnosis: International Statistical Classification of Diseases and Related Health Problems, 10th Revision [ICD- 10]) IPV: Health care providers screened for interpersonal violence and disclosure of violence by asking patient to "threat of or actual physical, sexual, psycho- logical, emotional, or financial abuse"	The aim of the study was to compare the risk of an emergency department (ED) visit for interpersonal violence during pregnancy and until 1 year postpartum among people with and without schizophrenia in Ontario.	They found that pregnant and postpartum people with schizophrenia are a population at high risk of ED visits for interpersonal violence. .

Exploring the Relationship Between Gendered Racism, Identity Centrality, and Binge-Eating Symptoms Among Black Women

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Black women often experience gendered racism, the intersection of racism and sexism. They adopt coping mechanisms in response, such as avoidance, spirituality, and disordered eating behaviors. The researchers focused on binge eating, defined as eating a large amount of food within a relatively short period; it is often accompanied by feelings of distress and a loss of control when eating. The high prevalence of binge eating among Black women led the researchers to explore the psychosocial risk factors that contribute to binge eating among Black women. They employed the intersectionality theory to investigate the relationship between gendered racism, identity centrality, and binge eating. The current study sought to understand the relationship between gendered racism and binge eating as moderated by gendered racial identity centrality, the degree to which Black women view their race and gender as integral to their identity. Participants were 281 Black women from 18-35 who completed an online survey via Qualtrics. The moderation results indicated that participants with low or medium levels of identity centrality and more experiences with gendered racism were associated with higher levels of binge eating. Conversely, when participants' identity centrality was high, there was a non-significant influence on the relationship between gendered racism and binge eating behaviors. To implement effective interventions for Black women, healthcare providers must gain a better understanding of their unique lived experiences, such as the influence of gendered racism and Black women's barriers to receiving proper diagnosis and treatment for disordered eating.

Keywords: loneliness, isolation, mental health, alcohol use, traumatic stress

Gendered racism refers to discrimination based on gender and racial identity, which is a common experience for many Black women. To cope with gendered racism, Black women may utilize behaviors that are associated with adverse mental health outcomes known as maladaptive coping. Examples of maladaptive coping include disordered eating, like binge eating and emotional eating (Brown, 2022). Binge eating is marked by eating a large amount of food within a relatively short period; it is often accompanied by feelings of distress and a loss of control when eating (American Psychiatric Association, 2013). Binge eating disorder (BED) occurs when this behavior happens at least once a week for at least three months (American Psychiatric Association, 2013). Emotional eating is when an individual is in a negative emotional state and consumes food often high in fat or sugar as a coping response to stress (Arnow et al., 1995; Volpe et al.,2024).

The literature has reported varying rates of binge eating in Black women as percentages have ranged from 1.5%-36% (Goode et al., 2020; Scott et al., 2018). For binge eating, research has primarily focused on White women and often has regarded it as a disorder that was more prominent in this racial group (Marques et al., 2011; Watson et al., 2019). Yet, other research has shown that binge eating rates are higher for Black women compared to their White counterparts (Goode et al., 2018). Binge eating is an imperative maladaptive disor-

der to focus on in Black women due to its high prevalence rates in this community, which are not matched with equally as high diagnosis and treatment rates.

The researchers chose to focus on binge eating for this study due to its high prevalence among Black women. Black women have some of the lowest rates of receiving care and treatment for disordered eating despite their high prevalence rates of binge eating (Goode et al., 2020). So much so that less than 8% of Black women with binge eating disorder seek treatment in comparison to the 20% of White women with BED who seek treatment, showcasing that Black women have some of the lowest rates of access to eating disorder care (Goode et al., 2022; Wilfley et al., 2001).

Even for the Black women who do access treatment, their retention is low (Thompson-Brenner et al., 2013). The health disparities that exist for Black women plagued by binge eating suggest that the current eating disorder treatment and interventions are not the best fit for Black women in a way that is understanding of their lived experiences, culture, and gendered racial identity (Goode et al., 2020; Marques et al., 2011). Gendered racism, the intersection of racism and sexism, can be used to explain the intersectional, discriminatory lived experiences that Black women often encounter (Behrendt-Mihalski, 2017; Thomas et al., 2008). Encounters of gendered racism occur throughout Black women's lifetimes, so it is crucial

to examine the ways that such encounters negatively impact the way that they interact with the world (Jackson et al., 2010; Volpe et al., 2024). The purpose of this current study was to examine the relationship between gendered racism, gendered racial identity centrality, and binge eating behaviors in Black women.

Binge Eating in Black Women

As defined by the American Psychiatric Association (2013), binge eating occurs when an individual's eating patterns are of a higher quantity than what would typically be eaten in a discrete period, in addition to the feeling of losing control when eating. Past research has examined Black women's binge eating symptoms, but more research is required to understand the factors that influence Black women's binge eating. While past researchers have found that binge eating is almost twice as prevalent in Black women, 5%, as it is in White women, 2.5%, significant disparities exist in Black women's access to treatment for this disorder (Goode et al., 2022; Striegel-Moore et al., 2000).

The loss of control when eating, characterized by binge eating, is associated with feelings of psychological distress, in addition to and is exacerbated by the discrimination that Black women face from gendered racism (Brown et al., 2022; Tanofsky-Kraff et al., 2012). Such findings highlight the racial disparities often seen in both research and healthcare treatment for Black women as they are frequently overlooked in the discussion of care for maladaptive eating behaviors. Black women have such high prevalence rates for binge eating, but little research exists to identify the psychosocial factors contributing to these rates. In understanding the lived experience of Black women, it is critical to know the different avenues through which discrimination and oppression can maladaptively be seen in Black women's health behaviors, which influences poorer health outcomes.

Black Women's Experiences with Gendered Racism and Eating Behaviors

Experiences with gendered racism, the intersection of sexism and racism, can serve as a chronic stressor for Black women and are linked to increased psychological distress, lowered well-being, and maladaptive coping strategies (Lewis, 2023; Lewis et al., 2017). These encounters can also be seen via gendered racist microaggressions, which are more subtle, everyday experiences with gendered racism that contribute to the perpetuation of this form of discrimination in Black women's everyday lives (Lewis & Neville, 2015). Gendered racism can cause Black women to become hyper-cognizant of their racial and gender identities, as these discriminatory experiences make them hyperaware of the negative stereotypes often attributed to them (Williams & Lewis, 2021).

Past research has examined the relationship between experiences of gendered racism and emotional eating as mediated by the Superwoman schema. They found that there was a significant relationship between gendered racial microaggressions and emotional eating. In addition to the superwoman schema and self-compassion, which mediated the relationship between gendered racial microaggressions and emotional eating (Volpe et al., 2024). According to these researchers, high alignment with the Superwoman schema and lower levels of self-compassion mediated the relation between gendered racial microaggressions and emotional eating. This finding suggests the vital role that such factors play in maladaptive eating behaviors in Black women. While the literature has examined the relationship between gendered racism and emotional eating through the context of stereotypes, research has not yet examined how one's alignment with one's identity as a Black woman can impact maladaptive eating as a response to gendered racism.

Gendered racism also highlights the need for research to incorporate an intersectional lens to understand Black women's encounters with discrimination, as they cannot be defined solely by their race or gender. As a response to experiences with gendered racism, research shows that Black women will turn to emotional eating, which can help to understand further the maladaptive health behaviors that Black women adopt in response to the stress created by gendered and racial discrimination (Diggins et al., 2015; Volpe et al., 2024). Though it is showcased in the literature that Black women often adopt emotional eating, the current research primarily focuses on this behavior as solely a response to racism or examines racism and sexism separately (Pickett et al., 2020; Volpe et al., 2024). There is a lack of understanding of the intersectional impact that gendered racism has on emotional eating and other disordered eating behaviors, such as binge eating, among Black women.

Buffering Effects of Gendered Racial Centrality

While past literature has noted that stronger identification with racial identity can serve as a buffer for

racial discrimination, much less is known about how gendered racial identity centrality can impact the experiences and impacts of discrimination on Black women (Sellers & Shelton, 2003; Syzmanski & Lewis, 2016). Gendered racial identity centrality entails the extent to which Black women integrally define themselves by their gender and race and the degree to which these aspects of their identity are significant to their self-concept (Thomas et al., 2011; Thomas, 2004). Moreover, past research has also found that Black women who have higher levels of gendered racial identity centrality are more likely to engage in avoidance or denial of a stressor, otherwise known as disengagement coping, when experiences of gendered racism are high (Szymanski & Lewis, 2016). Also, Black women with more positive perceptions of their identities were associated with lower levels of distress (Sellers & Shelton, 2003; Williams & Lewis, 2019). Few studies have explored the relationship between gendered racial identity centrality, discrimination, and mental health in Black women. Thus, more research needs to be conducted to examine whether gendered racial centrality can have a buffering influence on the relationship between gendered racism and adverse behaviors like binge eating.

Currently, little research exists to fully understand the extent to which gendered racial identity buffers against prevalent adverse mental health outcomes faced by Black women, such as disordered eating. Past research has examined the moderating role that gendered racial centrality has on the relationship between gendered racism and Black women's psychological distress. Also, the literature has explored how gendered racial identity centrality is linked to increased psychological distress in Black women. Dickens et al. (2023) found that gendered racial identity centrality did not moderate or decrease the relationship between gendered racism and identity shifting. Similarly, Behrendt-Mihalski (2017) found that gendered racial identity centrality did not moderate the relationship between gendered racism and depressive symptoms in Black women. To enhance disordered eating interventions for Black women, it must be understood how they perceive the aspects of their identity, such as race and gender, as they relate to their lived experience and the intersections of their gendered racial identities.

Intersectionality Theory

The overarching framework for this study was intersectionality theory, which illustrates how Black women's identities should be understood in interaction with each other (Collins, 2015). Intersectionality theory is a framework that encompasses how a Black woman's experiences of oppression must be understood through interlocking systems of oppression. Their multiple marginalized identities, such as race, gender, and class, cannot be seen as separate from each other and instead need to be understood as interlocked (Crenshaw, 1989). Considering the multiple forms of discrimination that Black women encounter is crucial to recognizing factors that exacerbate the high prevalence of their binge eating. To understand how gendered racism contributes to Black women's adverse health outcomes, an intersectional approach to aspects of this group's identity was utilized (Collins, 2015). Given the limited research on Black women in the eating disorder literature, often intersectionality theory is not used   to recognize how discrimination faced at the intersection of race and gender can influence one's disordered eating (Gwira, 2024). Intersectionality theory (Crenshaw, 1989) is a necessary framework to examine the influence of Black women's intersectional experiences of oppression on binge eating symptoms.

Utilizing intersectionality theory (Crenshaw, 1989) can help to understand how holding multiple marginalized identities, such as being a woman and Black, puts Black women at greater risk for experiencing discrimination, which is associated with greater negative health outcomes (Burke et al., 2020; Rouhani, 2014). The intersectionality framework can support the knowledge of Black women's eating disorders, as past literature has noted how psychological distress related to their identity is linked to maladaptive coping and disordered eating behaviors (Brown et al., 2022; Watson et al., 2019). To best understand the multiple avenues in which discrimination negatively impacts Black women's lived experience and, in turn, their disordered eating behavior, an intersectional lens must be utilized. The literature has started to integrate intersectionality theory more in eating disorder research by considering how the intersection of Black women's identities can contribute to the recognition and treatment of binge eating (Dickens et al., 2024; Gwira, 2024). The researchers utilized intersectionality theory to help identify why such significant health disparities exist with Black women's disordered eating.

The Present Study

Research on Black women's disordered eating be-

havior often focuses on singular aspects of their identity, such as solely their race or their gender. However, much less is understood about how the intersections of their identities contribute to how they respond to and cope with experiences with gendered racism. Thus, the researchers used intersectionality theory to guide their study on how Black women's racial and gender identities, along with the discrimination they face due to these identities, contribute to their maladaptive eating behaviors. The influence of gendered racial identity centrality on binge eating behaviors in Black women and the link between experiences with gendered racism and disordered eating are imperative areas of study. It is essential to explore this topic among Black women to understand why disordered eating, like binge eating, is seen at such high rates in Black women.

Due to this, the current study aimed to examine how encounters with gendered racism are related to binge eating behaviors in Black women. Along with to what degree Black women's gendered-racial identity centrality moderated this relationship. The researchers hypothesized that experiences with gendered racism will positively influence the binge eating behaviors of Black women (Hypothesis 1). Also, the researchers hypothesized that gendered racial identity centrality would moderate the relationship between gendered racism and binge eating behaviors in Black women (Hypothesis 2). So, higher levels of gendered racial identity centrality would buffer against the positive relationship between gendered racism and binge eating behaviors. The researchers hypothesized that lower levels of gendered racial identity centrality would be associated with a stronger influence on the relationship between gendered racism and binge eating. So, lower levels of gendered racial identity centrality would strengthen the positive relationship between gendered racism and binge eating behaviors in Black women.

Method
Participants and Procedure

Participants were recruited via social media and emails to professional and personal contacts from various areas across the United States. The eligibility criteria for this study were that participants had to identify as Black/African American women and be in the 18-35 age range. The current study was part of a larger study that examined Black women's experiences with stereotypes and discrimination and their health behaviors among participants between the ages of 18-35 (Jones et al., 2021). This study's sample consisted of 281 women in the United States. Their ages ranged from 18-35 (M = 27.29, SD = 5.78). The majority of the participants self-identified as either Black or of African descent, 81.5% (n = 242), heterosexual, 81.5% (n = 242), Christian, 71.0% (n = 211). For educational attainment, the highest percentage of participants had received a high school diploma/GED, 20.9% (n = 62). The median household income for the participants was $15,000–30,000. See Table 1 for more detailed demographic information.

The researchers received IRB approval from Spelman College and Chicago State University to conduct this study. A survey was administered via the web platform Qualtrics, where participants completed questionnaires about their experiences with discrimination and stereotypes, coping mechanisms, and their influences on health behaviors and well-being. The Qualtrics survey was distributed through online community boards for Black women, social media sites, professional listservs (e.g., APA's Section 1: Division 35 – Black Women Psychologists), student organizations, and personal and professional connections (e.g., recruitment emails to personal connections, professional colleagues). The researchers also used Qualtrics to further recruit a larger sample of Black women. The participants not recruited via Qualtrics were entered into a raffle where they could win one out of four $25 gift cards. While the participants recruited via Qualtrics received $5 in compensation (an amount Qualtrics established given the survey length).

Measures
Gendered Racism

The Scheduled Sexist Events (SSE; Klonoff & Landrine, 1995) was used to examine the participant's experiences with gendered racism. The scale was revised to be specific to Black women's experiences with discrimination based on their gendered racial identities. It assessed the frequency with which a woman has experienced recent racist and sexist discrimination. The scale consisted of 20 items that utilized questions related to experiences of racism and sexism from the participant's childhood to the present. The scale had four dimensions: "(a) sexist degradation, (b) sexism in distant relationships, (c) sexism in close relationships, and (d) sexist discrimination in the workplace" (Jones et al., 2021). Sample items from this scale include "How

many times were you denied a raise, a promotion, tenure, a good assistant, a job, or other such things,   at work that you deserved because you are a Black woman?" and "How many times have you been treated unfairly by strangers because you are a Black woman?".

The SSE was rated on a six -point Likert scale where participant's responses to the items ranged between one (*never*) and six (*all the time*). The scores of each item were averaged, and higher scores indicated that participants experienced more encounters with gendered racism and lower scores suggested that participants had fewer experiences with gendered racism. For past studies, the reliability scores for the original SSE-Lifetime sample by Klonoff & Landrine (1995) scored 0.92, and the revised scale had a reliability score of 0.93 (Thomas et al., 2008). The Croncbach's α for the current study was 0.95.

Gendered Racial Identity Centrality

The researchers assessed gendered racial identity centrality using the Multidimensional Inventory of Black Identity Centrality subscale (MIBI- Centrality; Sellers et al., 1997), modified to measure gendered racial identity centrality. The scale contained ten items on a seven-point Likert scale where responses ranged from one (*strongly disagree*) to seven (*strongly agree*). Sample items were "I have a strong sense of belonging to Black women" and "Being a Black woman is an important reflection of who I am". Average scores were taken where higher scores indicated greater feelings that one's gender and race were central to their overall identity and lower scores denoted participants who felt that their gender and race were less central to their overall identity. Jones et al. (2021) reported the scores from the MIBI-Centrality scale and had internal consistency scores of 0.76, while Croncbach's α for the current study was 0.77.

Binge Eating Symptoms

The Binge Eating Scale (BES; Gormally et al., 1982) was utilized to examine binge eating behaviors in the participants. The BES consists of 16 items that examine eating behaviors, such as the quantity of food consumed and feelings after eating. Participants were given three   or four   selections and were asked to choose whichever best fit their eating behaviors with varying severities. A sample item reads, "a. I usually am able to stop eating when I want to. I know when "enough is enough," "b. Every so often, I experience a compulsion to eat which I can't seem to control," "c. Frequently,

I experience strong urges to eat which I seem unable to control, but at other times I can control my eating urges," "d. I feel incapable of controlling urges to eat. I have a fear of not being able to stop eating voluntarily.". The average scores were taken; higher scores indicated more severe binge eating behaviors, while lower scores indicated fewer binge eating behaviors. The internal reliability score for the original BES was 0.87, while Croncbach's α for the current study was 0.91.

Data Analysis

The data from the Qualtrics survey was exported to Statistical Package for Social Sciences (SPSS) Version 24 (IBM Corporation, 2016). Descriptive statistics were calculated for the demographic variables, which included the percentage and frequency. Preliminary correlation analyses were conducted to examine the correlations between the variables. Multiple regression was performed via PROCESS macro model 1(Hayes, 2017), with the bootstrapping method based on 5000 resamples to analyze the variables that influenced binge eating behaviors in Black women, including gendered racism and gendered racial identity centrality.

Results

Preliminary Analysis

H1 proposed that gendered racism will be positively related to binge eating behaviors in Black women. Gendered racism was positively associated with binge eating behaviors in Black women, $r = .14$, $p < .01$. Therefore, H1 was supported. Correlations were run to explore the relationship between all the study's variables. The results indicated a significantly positive relationship between gendered racism and gendered racial identity centrality, $r(241) = .14$, $p = .03$. The relationship between gendered racism and binge eating was significantly positively correlated, $r(241) = .28$, $p < .001$. There was no significant correlation between gendered racial identity centrality and binge eating, $r(241) = -.06$, $p = .32$. On average, the participants rated their experiences with gendered racism as lower ($M = 2.55$, $SD = 1.07$). The mean scores indicated that with experiences with gendered racism, participants, on average, answered either "Once in a while" or "Sometimes" as their responses for the gendered racism items. Participants reported higher than average ratings for their gendered racial identity centrality ($M = 5.05$, $SD = 1.20$). Most participants rated "Slightly agree" for their responses to the gendered racial identity centrali-

ty items. For binge eating behaviors, participants rated lower levels (*M* = 1.07, *SD* = .55). On average, participants answered the items about binge eating with responses that correlated with low binge eating behaviors.

Moderators of Binge Eating Behaviors

The hypothesized moderated model was tested using moderation analysis via PROCESS macro model 1. H2 stated that the influence of gendered racism on binge eating behaviors for Black women would be moderated by gender-racial identity centrality. Before the analyses, variables were mean-centered to lessen multicollinearity (Aiken & West, 1991). Predictor variables accounted for a significant amount of variance in binge eating, R^2 = .10, $F(3, 237)$ = 9.05, $p < .001$.

Then, we examined whether the relationship between gendered racism and binge eating in Black women was moderated by gendered-race identity centrality (see Figure 1). The interaction term was significant, b = -.05, p < 0.05. Therefore, H2 was partially supported. Next, we conducted simple slope analyses and probed interactions. When gendered racial identity centrality was low (*b* = .20, *p* < 0.001) and medium (*b* = .14, *p* < 0.001), gendered racism was associated with higher levels of binge eating in Black women. However, when gendered racial centrality was high, this relationship was nonsignificant (*b* = 07, *p* = .15). Therefore, lower levels of gendered racial centrality amplify the influence of gendered racism on binge eating behaviors in Black women. H2 was partially supported.

The researchers hypothesized that lower levels of gendered racial identity centrality would moderate the relationship between gendered racism and binge eating. Their hypothesis was supported at low levels for gendered racial identity centrality. The researchers hypothesized that high levels of gendered racial identity centrality would have a buffering influence on the positive relationship between gendered racism and binge eating in Black women. Instead, the relationship was not significant.

Discussion

The literature has yet to examine how Black women's experiences with their gendered racial identity and gendered racism influence their maladaptive eating, such as binge eating. The current study adds to the dearth of research that exists on disordered eating in Black women. Disparities exist for healthcare interventions on Black women's disordered eating

behaviors. Biases among healthcare providers prevent them from accurately inquiring about, detecting, or understanding eating disorders in Black women (Goode et al., 2022; Marques et al., 2011). The lack of proper diagnosis, treatment, and care for this marginalized group highlights the need for an intersectional approach to the examination of Black women's experiences with disordered eating. Past research has examined how race or gender impacts Black women's maladaptive behaviors (McCoy & Major, 2003; Syzmanski & Lewis, 2016). However, such factors were examined separately from each other rather than looking at the intersection of racism and sexism.

The purpose of the present study was to investigate the relationship between gendered racism and binge eating behaviors in Black women, as well as to analyze the moderating influence that gendered racial identity centrality has on this relationship. The current study, along with previous research, highlights a need to understand the factors that impact Black women's maladaptive eating behaviors to understand better the risk factors that lead them to engage in binge eating (Pickett et al., 2020; Volpe et al., 2024). Past research has examined how racism or sexism separately influence the eating behaviors of Black women as a coping mechanism but seldom have researchers analyzed how gendered racism can influence the relationship between gendered racism and binge eating in Black women. The researchers adopted an intersectional framework in their methodology to highlight the interrelated nature of Black women's experiences of oppression. We examined how the interaction of race and gender identities, in addition to the prejudice they face, can serve as either a protective or risk factor for Black women's binge eating.

Gendered Racism and Binge Eating

Consistent with Hypothesis 1, there was a significant positive relationship between gendered racism and binge eating. Such that participants who had more experiences with gendered racism were associated with higher binge eating behaviors. Intersectionality theory exemplifies the need to understand the factors that contribute to and influence Black women's disordered eating behaviors. To understand the factors that influence how Black women respond to discriminatory experiences, their multiple marginalized identities must be examined as they relate to and interact with each other. This finding is consistent with previous

research, which found that higher levels of discrimination based on one's gendered racial identity led to greater utilization of disordered eating behaviors, such as emotional eating, as a maladaptive coping response (Diggins et al., 2015; Hoggard et al., 2019; Volpe et al., 2024). In alignment with the intersectionality theory (Crenshaw, 1989) and given the negative impacts of the intersections of oppression, such as gendered racism, Black women's experiences with discrimination based on race and gender and their interactions exacerbate their issues with health and well-being. Since the researchers focused on gendered racism, it allowed them to see this relationship at the intersection of racism and sexism and binge eating behaviors in Black women.

Binge eating in Black women has been associated with worsened physical health and a higher risk of being overweight or obese, as more than 30% of Black women with obesity also report binge eating (Goode et al., 2020; Wilson et al., 2012). Binge eating disorder has also been found to be comorbid with several somatic and psychiatric disorders, such as mood disorders and substance use disorders, along with obesity (Goode et al., 2020; Hudson et al., 2010). Thus, furthering the understanding of the factors, such as gendered racism, that contribute to Black women's binge eating behaviors is imperative for adequately tackling the health care issues that they face. Research has been conducted to identify aspects of maladaptive eating treatment that can be beneficial for Black women. Such treatments are based on culturally competent care that recognizes Black women as a population that has unique factors that influence their binge eating behaviors.

Past research has found that interventions conducted in a group using cognitive-behavioral therapy can be effective. These interventions address the dysfunctional cognitions and maladaptive behaviors associated with binge eating to create an impactful intervention for BED in Black women (Goode et al., 2020;2022; Q da Luz et al., 2021). Along with this, interventions that tackle the physical health of Black women have been supported by researchers to be effective interventions. These approaches educate Black women to be aware of their eating behaviors and increase their physical activity (Goode et al., 2018;2022). Intersectionality theory was integral for the researchers of this study as it allowed them to investigate the relationship between gendered racism and binge eating among Black women. The theory illuminated how

the intersection of racial and gender discrimination influenced Black women's binge eating as well as how their identity centrality related to this connection.

Gendered Racial Identity Centrality

Black women's use of disordered eating has seldom been researched via the influence of their gendered racial identity. Gendered racial identity centrality has been linked to research that suggests it can be a buffer or amplifier of the negative impact of discrimination (Jones et al., 2021; Thomas et al., 2011). Consistent with the hypothesis, gendered-racial identity centrality moderated the relationship between gendered racism and binge eating. While gendered-racial identity centrality was a moderator, the influence was not in the direction that the researchers hypothesized. Only for participants who reported low or medium gendered-racial identity centrality, gendered racism was associated with higher levels of binge eating in Black women.

However, participants with high levels of gendered racial identity centrality produced a non-significant moderating influence between gendered racism and binge eating. Thus, Hypothesis 2 was supported in the opposite direction than they hypothesized. The researchers speculated that higher levels of gendered racial identity centrality would buffer the relationship. It may be that lower levels of gendered racial identity centrality have a much more significant impact because it makes individuals vulnerable to more discriminatory experiences. Still, this is consistent with the overarching framework of the intersectionality theory. The researchers believed that Black women with lower gendered racial centrality are more prone to the adverse effects of gendered racism, which can lead to binge eating.

The current findings about high gendered racial identity centrality are inconsistent with previous research, as the researchers found a nonsignificant moderating relationship between gendered racism and binge eating behaviors. Symanski & Lewis (2016) examined the moderating effect that identity centrality had on detachment coping and the psychological distress formed in response to gendered racism. They found that when identity centrality was high, gendered racism predicted psychological distress. The researchers hypothesized that a higher gendered racial identity centrality would serve as a buffer against the positive relationship between gendered racism and binge eating. The literature on Black women's gendered racial identity centrality found it to be a

significant moderator in the relationship between factors related to gendered racism and coping. Yet, the findings are mixed regarding whether it serves as a buffer (Lewis et al., 2017; Williams & Lewis, 2019).

Past research has found that lower levels of gendered racial identity centrality are linked to higher usage of disengagement coping and poor mental and physical health outcomes, which is consistent with this study's results (Williams & Lewis, 2019; Lewis et al., 2017). The finding that high gendered racial identity centrality did not serve as a moderator is inconsistent with past research that has found it to be associated with lower levels of distress (Sellers & Shelton, 2003; Williams & Lewis, 2019). Based on the literature, there are mixed findings on the influence of gendered racial centrality as a buffer or harmful factor with experiences of discrimination among Black women (Jones et al., 2021; Symanski & Lewis, 2016).

Also, given that the sample of participants had a moderate level of gendered racial centrality, such that being a Black woman was somewhat important to their overall sense of self, this might have influenced the effect of the relationship between gendered racism and binge eating behaviors. More research needs to be done on the moderating influences of identity centrality on Black women to understand this relationship better. Such contrasts in the study of high identity centrality demonstrate the need for a further examination of the influence that high identity centrality has on Black women's experiences with distress.

Limitations

While the researchers were able to find significant results from this study regarding Black women's binge eating behaviors as it relates to their identity, there were some limitations. The majority of the participants were younger, identified as Christian, and with more than half having an associate's degree or higher. Thus, the participants of this study may be less representative of the population. The age of the participants was relatively younger than that of the broader population; thus, it is less generalizable to the greater public. Much like Black women, older populations are much less regarded in eating disorder research. Hence, a lack of understanding exists about the age-related factors that can influence the maladaptive eating behaviors of older people.

In the literature, researchers have found that psychosocial stressors, as well as stressors associated with major life events, can put older women at increased risk for disordered eating (Koumoutzis & Cichy, 2020). Thus, the relationship between gendered racism and binge eating, as well as the moderating influence of identity centrality, could be higher if the participants of the study were older. Such research highlights the need to understand the factors that contribute to the increase in depressive symptoms from middle age to older age. Also, participants had lower levels of binge eating overall, so the results might differ in individuals who, on average, have higher levels of binge eating behaviors. For older Black women with higher levels of binge eating behaviors, identity centrality could have an even more significant moderating influence. Identity centrality in older populations possibly would lessen the strength of the relationship between gendered racism and binge eating.

Moreover, the researchers recognize further limitations of this study due to their use of a survey, which could lead to social desirability bias when answering questions about binge eating. Participants may have felt less comfortable being truthful about their binge eating behaviors due to stigma towards eating disorders and maladaptive eating behaviors. Stigmatization related to engaging in binge eating behaviors may have led participants to report lower scores that are less representative of their behavior. This may lessen the significance of the data on the relationship between gendered racism, identity centrality, and binge eating in Black women.

Future Directions

These findings are imperative for understanding how to make culturally relevant disordered eating interventions for Black women. As many healthcare professionals do not have the proper knowledge of how maladaptive eating behaviors manifest for Black women, they often overlook Black women who could benefit from disordered eating treatment and care (Goode et al., 2022; Marques et al., 2011). The current study and previous research are critical for equipping healthcare providers with the knowledge to best approach and care for their Black women patients. Providers must approach their Black women patients with an understanding of how disordered eating can manifest for them. Such an understanding is necessary for providing Black women with the proper diagnosis, care, and treatment they need for their maladaptive eating behaviors. An understanding of how Black women center their gendered racial

identity is crucial for mental health professionals and healthcare providers to assist their patients properly. In addition, this study can help healthcare providers with their Black women clients by promoting a more culturally aware approach to care. This approach would recognize Black women's gendered racial identity and its importance to their sense of self.

Despite its limitations, the study has highlighted the need to research Black women's maladaptive eating behaviors further. Future researchers can expand upon this study by examining participants over an extended period in an experiment to see if Black women's binge eating behaviors fluctuate. They can also explore if this relationship is moderated by gendered racial identity centrality. Further study could expand the literature by examining a potential causal relationship between gendered racism, gendered identity centrality, and binge eating. In addition, since the researchers found that identity centrality does influence the relationship between gendered racism and binge eating behaviors in Black women, this suggests a need for further study. Subsequent studies could identify how identity centrality influences Black women's other maladaptive coping responses, such as disengagement or avoidance, to discrimination (Diggins et al., 2015; Syzmanski & Lewis, 2016; Volpe et al., 2024). The current literature highlights that gaps exist in the research on Black women and disordered eating behaviors. In addition to how such behaviors can present differently for Black women compared to their White counterparts. Therefore, more research needs to be done to address the gaps in research on why binge eating rates are so high for this marginalized group, in addition to investigating the factors that influence Black women's disordered eating behaviors.

Conclusion

While eating disorders are not often attributed to being prevalent among Black women, this must change. To adequately address the high rates of disordered eating seen among Black women, this population must be further studied. Black women's identity and how they perceive it is imperative for understanding how they approach and cope with distress. Properly understanding Black women's multiple marginalized identities is crucial for implementing effective interventions for maladaptive eating. To promote effective social change for Black women, researchers and practitioners must understand the barriers that impede this group from receiving eating disorder treatment. Such barriers for Black women include a lack of recognition of their engagement in disordered eating behaviors. These women may not have adequate knowledge of disordered eating to detect their use of maladaptive behaviors, considering the stereotype that eating disorders primarily impact White women (Good et al., 2022; Scott et al., 2023). As shown by past research, the high rates of eating disorders, such as binge eating, in Black women warrant a need to create approaches that allow them to receive proper diagnosis, care, and treatment for their disordered eating behaviors.

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Table 1

Sociodemographic Characteristics of Participants

Characteristics	*n* (%)	*M*	*SD*
Age		27.29	5.78
Weight		163.18	57.16
Race			
African American/Black	242 (81.5%)		
African	7 (2.4%)		
Caribbean/West Indian	5 (1.7%)		
Black & Caribbean/West Indian	5 (1.7%)		
Black Latinx	5 (1.7%)		
Black & African	4 (1.3%)		
Sexual Orientation			
Straight	242 (81.5%)		
Bisexual	24 (8.1%)		
Lesbian	5 (1.7%)		
Unsure	3 (1.0%)		
Missing/No Response	23 (7.7%)		
Religion			
Christian	211 (71.0%)		
Agnostic	17 (5.7%)		
Muslim	8 (2.7%)		
Atheist	8 (2.7%)		
Hindu	3 (1.0%)		
Buddhist	2 (0.7%)		
Jewish	2 (0.7%)		
Other	23 (7.7%)		
Missing/No Response	23 (7.7%)		
Education			
Some High School	7 (2.4%)		
High School/GED	62 (20.9%)		
Associate's degree	29 (9.8%)		
Bachelor's degree	41 (13.8%)		
Master's degree	38 (12.8%)		
Some graduate school	11 (3.7%)		
Doctoral Degree	20 (6.7%)		
Graduate/Professional Degree	16 (5.4%)		
Missing/No Response	24 (8.1%)		
Income			
Below 15,000	81 (27.0%)		
$15,000 – 30,000	58 (19.5%)		
$30,001 - $50,000	55 (18.5%)		
$50,001 -$75,000	40 (13.5%)		
$75,001 and up	42 (14.1%)		
Missing/No Response	21 (7.1%)		

Note. n (%), *M*, and *SD* represent the number of participants, mean, and standard deviation, respectively.

Figure 1.

Interaction between Gendered Racism and Binge Eating Symptoms in Black Women

GENDERED RACIAL IDENTITY CENTRALITY AS A MODERATOR
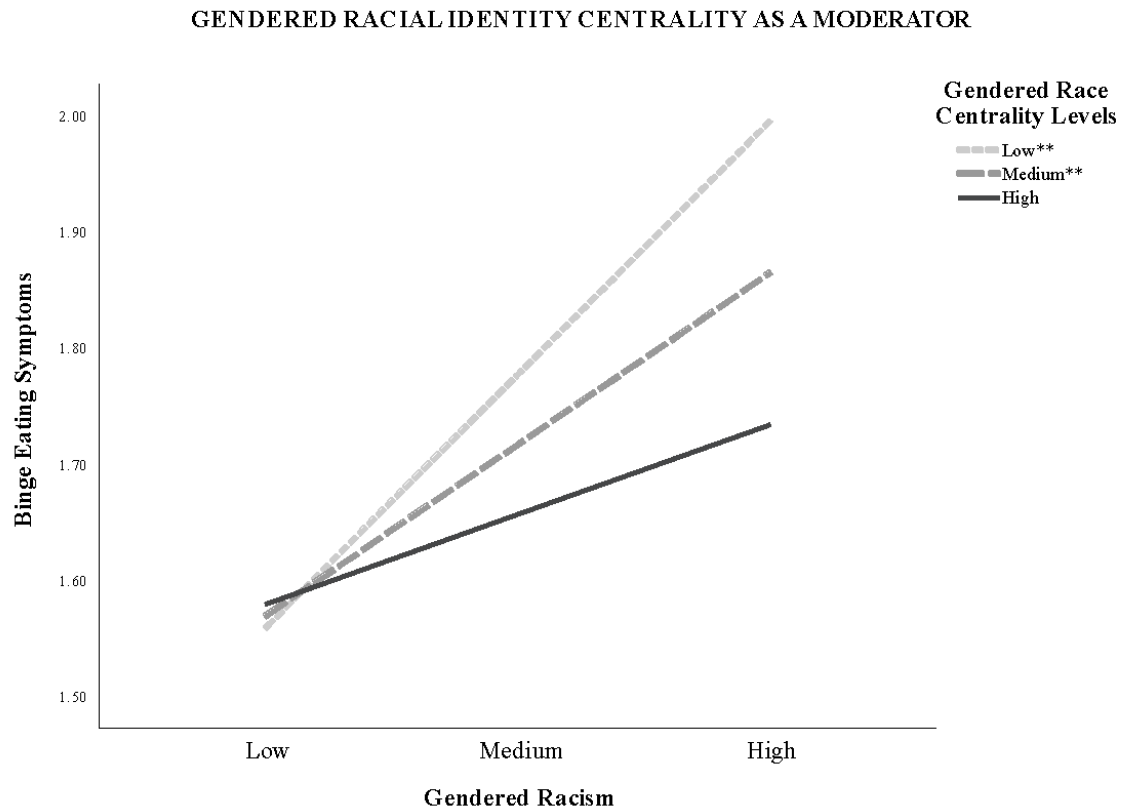
Figure. 1 This figure illustrates the relationships between low (-1 *SD*), medium (average), and high (+1 *SD*) levels of gendered racism and binge eating symptoms at low (-1 *SD*), medium (average), and high (+1 *SD*) levels of gendered racial identity centrality. Statistically significant values (p < .001) were denoted with **.

Questionnaires can be made available upon request.

Exploring the Relationship Between Attentional Bias Towards Threat and Symptoms of Adult Separation

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Purpose: Research has identified attentional bias towards threatening stimuli as a contributing factor to anxiety disorders, and treatment targeting this bias has been shown to reduce symptoms of anxiety (Azriel & Bar-Haim, 2020). Studies have found attentional bias to threats among children with separation anxiety disorder (SAD) when tested with dot-probe tasks, with a stronger bias seen when threats are disorder-congruent (Pergamin-Hight et al., 2015). No study has yet investigated this relationship among adults, despite growing recognition that separation anxiety is frequent in this population. Therefore, we investigated the relationship between SAD symptoms and attentional bias toward threatening stimuli (general and separation-specific) on a dot-probe task in a sample of adults, with the goal of informing targeted treatment for adult separation anxiety disorder (ASAD). **Methods:** Undergraduate participants ($n = 57$) completed a measure of ASAD symptom severity (ASA-27) and two versions of the dot-probe task, one with separation-specific threatening words and one with generally threatening words. Attentional bias was tested using detection latency. **Results:** Spearman's rho correlations between ASA-27 and separation-specific threat trials ($r_s = -.07$; $p = .62$) and general threat trials ($r_s = .07$; $p = .60$) were not significant. However, ASAD symptoms were correlated with reduced accuracy on trials following ASAD-specific threat words ($r_s = -.38$, $p = .004$), but not general threat words ($r_s = -.16$, $p = .22$). **Conclusions:** We did not find that ASAD symptoms related to attentional bias. However, individuals with more ASAD symptoms were less accurate on trials that involved ASAD-threat words, suggesting an emotional interference effect of disorder-specific threats on task performance.

Keywords: separation anxiety, attentional bias, interference effects

Separation anxiety disorder (SAD) is characterized by persistent and excessive distress or worry related to separation from home or significant attachment figures (American Psychiatric Association [APA], 2022). An attachment figure is often a parent when the disorder is present in a child, but when seen in adults, the figure may be a parent, partner, child, or spouse. Whether seen in a child or adult, symptoms can include fears about harm befalling the attachment figure, nightmares about separation, somatic complaints when separated, and a reluctance to leave the attachment figure even for short periods of time. In prior editions of the *Diagnostic and Statistical Manual of Mental Disorders (DSM)*, SAD was categorized under "Disorders First Diagnosed in Infancy, Childhood, or Adolescence" and included a required diagnostic criterion of onset prior to the age of 18 years old (APA, 1994). The 5th edition of the DSM (APA, 2013) removed this criterion and amended features of the disorder, reflecting the growing recognition that SAD frequently occurs among adults, which has been referred to in the literature as adult separation anxiety disorder (ASAD).

Empirical support for the notion of ASAD continues to grow, with data establishing high prevalence rates, high comorbidity with anxiety and mood disorders, and most notably, evidence of poor prognoses for those diagnosed (Manicavasagar & Silove, 2020; Shear et al., 2006). ASAD can be debilitating in a variety of

functional areas, many of which can lead to long-term impairment (APA, 2022). For example, individuals may be unable to leave their homes out of fear of leaving their attachment figure during the day, or they may be unable to form or maintain healthy relationships due to the pervasive need to be with their attachment figure.

Given that SAD was formally seen as primarily a childhood disorder, the bulk of studies and treatment explorations surrounding SAD centers on children and adolescents (Bogels et al., 2013). Although SAD is characterized by the same symptoms in both children and adults, the attachment figure and the impairment in daily functioning differ between the two populations (APA, 2022). For example, a child with SAD might wish to stay home with their parent and therefore have poor school attendance. An adult with SAD may be unable to leave their spouse and therefore repeatedly miss work, leading to loss of employment. To date, very little research exists on ASAD, creating a gap in not only the understanding of the disorder's mechanisms, but also in the possibility of creating tailored treatments (Baldwin et al., 2016; Bogels et al., 2013).

A rich area of literature has investigated attentional bias towards threat as a prominent maintenance for many anxiety disorders, with a premise that modifying biases in attention may be foundational to anxiety disorder treatment (Barry et al., 2015). Attentional bias is the phenomenon of a person's attention being more

focused toward or away from a threatening stimulus in comparison to a neutral stimulus (Azriel & Bar-Haim, 2020). When an individual has an attentional bias towards a threat, they may excessively focus on potentially threatening stimuli, leading to heightened anxiety and distress. Having a bias to direct attention toward threats may result in difficulties with concentration, decision-making, and problem-solving. For example, an individual with ASAD may need to immediately check their phone after the arrival of every new notification, worried it may be about their loved one. This bias towards potential threats can distract from important duties or responsibilities and may impair daily functioning. Furthermore, by repeatedly attending to threatening cues, individuals may amplify and sustain their anxiety responses, causing heightened sensitivity towards potential threats and further reinforcing a cycle (Azriel & Bar-Haim, 2020).

The presence of attentional bias is often tested with a visual dot-probe task (Price et al., 2013). In this task, participants are presented with an emotionally neutral stimulus and an emotionally threatening stimulus, such as a neutral face and an angry face, on a computer monitor for a set display length of milliseconds (Bantin et al., 2016). A target probe, such as a dot or arrow, then appears behind either the neutral or threatening stimulus, and the participant is asked to identify the probe's shape or location by a key press or mouse click. Detection latency, the time from the target's arrival to the participant's detection of the target, as indicated by a key press or mouse click, is recorded for each trial. A shorter detection latency on trials in which the target is behind the threatening stimulus would indicate an attentional bias toward threatening stimuli. Specifically, decreased response latency to detect the probe when it is located behind a threatening word or image implies the person's attention was drawn to the area of the threatening stimulus compared to the neutral stimulus (Bantin et al., 2016).

Another task utilized to study the effect of threat cues on attention and information process is the emotional Stroop task, a modified version of the classic Stroop task, in which participants are asked to name the color of a shown word (Bar-Haim et al., 2007). In the original Stroop task, the presented word is either congruent with a color (such as the word "green" shown in the color green) or incongruent with a color (such as the word "green" shown in the color red). The emotional Stroop task displays words relating to threatening and neutral stimuli instead of the names of colors (i.e., *death* and *harm* instead of *blue* and *green*). A slower response to identifying the color of threatening words as compared to neutral words indicates biased processing of the threat. It is inferred that the participant is unable to focus exclusively on processing the color of the word as their attention is distracted by the presence of a threatening stimulus (Bar-Haim et al., 2007).

A meta-analysis conducted by Bair-Haim et al. (2007) examined 172 studies that tested attentional bias, most of which used either the dot-probe task or the emotional Stroop task. Overall, a significant attentional bias towards threat was found in anxious individuals and was absent in non-anxious individuals. Furthermore, no difference in threat bias was found when comparing results from studies that used the dot-probe task measure to studies that used the emotional Stroop task measure. Within analyses of the dot-probe task, attentional bias toward threat was found in trials that used pairs of faces as well as pairs of words, with no significant difference between the two stimuli. These results were shown to be true for both adult and child participants, with no significant difference between the two populations. Attentional bias was found in all anxiety disorders analyzed: panic disorder, post-traumatic stress disorder, social phobia (social anxiety disorder), and specific phobia (Bar-Haim et al., 2007).

SAD was not specifically analyzed as a discrete diagnostic category in Bar-Haim et al.'s (2007) meta-analysis, as research on the relationship between attentional bias and SAD was extremely limited. Only a handful of studies that examined attentional bias have included participants with SAD, all of which were conducted with children given the previous categorization of this disorder (Roy et al., 2008; Salum et al., 2013; Waters et al., 2014). However, given ASAD and SAD in children overlap in symptomatology, it is important to review the existing literature on SAD and attentional processes to better inform study design when researching this phenomenon in adults. To present an overview of the current literature regarding SAD and attentional bias, the results of these studies are summarized below.

In perhaps the largest SAD and attentional bias study, Roy et al. (2008) assessed attentional bias in 101 clinically anxious children, 59 of whom met the criteria for SAD. The study used a visual dot-probe task that showed pairs of angry/neutral and

happy/neutral faces and compared detection latency between a clinically anxious group and a non-anxious control group. Results indicated that clinically anxious children more quickly detected the probe located behind an angry face, suggesting an attentional bias toward threatening stimuli. Furthermore, no significant differences were found in attentional bias toward threat between anxiety disorders.

Another study analyzed the dot-probe task performance of 363 children in three disorder groups: fear-related, distress-related, and behavioral (Salum et al., 2013). The fear-related sample was comprised of 86 children, 30 of whom met the criteria for SAD. Of the three disorder groups, only the 'fear' group showed attentional bias directed away from the threat rather than toward the threat. This finding was explained through the theoretical lens of the fear versus distress structural model of emotional disorders. Anxiety disorders categorized by distress are more likely to result in hypervigilance toward threat, such as general anxiety disorder and post-traumatic stress disorder, whereas anxiety disorders categorized by fear (such as SAD and social phobia) would result in an avoidance of fearful stimuli and therefore a bias away from threat. In line with this model, this study found that high internalizing symptoms in the 'distress' group resulted in a greater bias towards threatening stimuli, whereas in the 'fear' group, high internalizing symptoms resulted in a greater bias away from threatening stimuli. A study conducted by Waters et al. (2014) found similar results among a sample of anxious children, some of whom had a primary diagnosis of SAD. Although these studies included children with SAD, results were presented in aggregate in which these participants were combined with those suffering from other anxiety disorders.

Importantly, the extant studies have not yet accounted for specific threat-related content for SAD. The dot-probe task and the emotional Stroop task can be conducted with general threatening stimuli or disorder-specific threatening stimuli (Pergamin-Hight et al., 2015). Specific threatening stimuli refer to pictures or words that are congruent to the disorder being analyzed, such as social-related words for social anxiety disorder. General threatening stimuli refer to pictures or words that are disorder-incongruent and related to an anxiety disorder different from that of the person being tested. To illustrate, for a person with SAD, generally threatening words might be dis-

ease and danger, and specific threatening words, or disorder-congruent words, might include "alone" and "abandoned", which have specific content relevant to the notion of separation from loved ones.

A recent meta-analysis examining attentional bias in youth and adults with measures including disorder-congruent threats versus disorder-incongruent threats found that clinically anxious participants displayed a larger bias toward disorder-congruent threats (Pergamin-Hight et al., 2015). The analysis included studies that used the emotional Stroop task as well as studies that used the dot-probe task, and effect sizes were combined to reach an overall effect of threat bias. When the combined effect sizes of the two tasks were compared, the difference between the two tasks was not statistically significant. This meta-analysis only included one study that examined attentional bias in participants with SAD (exclusively in children): a single study that found no evidence of attentional bias in general-threat trials or specific-threat trials (Kindt et al., 2003).

The primary takeaway from the literature available is ultimately that it has been scarce and inconclusive (Roy et al., 2008; Salum et al., 2013; Waters et al., 2014). Though meta-analyses have shown evidence for attentional bias toward threat in children and adults with various anxiety disorders, the limited number of studies involving participants with SAD has left the field with less than substantial answers regarding attentional processes in those with SAD. This is an important topic for study, as prior research has investigated attentional training as a treatment for other forms of anxiety, and therefore extending research on attention in ASAD might be used to develop new interventions for this condition.

Moreover, the studies discussed above were conducted with children; no studies have yet examined the role of attentional bias in adults with SAD. Though results have been mixed, the bulk of previous research has shown that children with SAD show an attentional bias in regard to threat, and adults with other anxiety disorders show an attentional bias toward threat, with a greater bias towards disorder-specific threat (Bar-Haim et al., 2007; Pergamin-Hight et al., 2015). Attentional bias has been shown to be a pivotal mechanism in maintaining anxiety disorders, and treatment targeting this bias has proven successful in reducing anxiety (Azriel & Bar-Haim, 2020; Hakamata et al., 2010). It is

reasonable to assume that ASAD, which overlaps considerably with SAD in children and is often comorbid with other anxiety disorders, might also be maintained by an attentional bias mechanism. Therefore, understanding attentional bias in ASAD is crucial to informing targeted treatment.

The present study aimed to address this important gap in the literature. We sought to determine if adults with greater levels of ASAD symptoms would also display greater attentional bias to threatening stimuli (general and disorder-specific) when tested with versions of the dot-probe task. We elected to use the dot-probe task to test this aim because, unlike the Stroop task, it is possible to measure if attentional bias is directed towards or away from threatening stimuli by calculating how long it takes for participants to detect the probe behind threatening words compared to neutral words (with a slower response indicating bias directed away from threat and a faster response indicating bias towards threat). Furthermore, we included trials with facial stimuli and trials with word stimuli to replicate the methods of past SAD and attentional bias studies (Roy et al., 2008; Salum et al., 2013; Waters et al., 2014), and to test both general threats and disorder-specific threats via word pairs. Based on previous research findings, it was hypothesized that higher ASAD symptom severity would correlate with greater attentional bias to threat, with a stronger bias toward threat in trials with disorder-relevant stimuli.

Methods

Participants

This study received approval from the Institutional Review Board (IRB) of Barnard College. All ethics guidelines were adhered to while conducting this study. Participants were given a written consent form to sign prior to beginning participation. Fifty-seven participants were recruited through Barnard College's Sona system. Each participant received laboratory credit for their Introduction to Psychology course after completing the study. The sample was 89% female and had a mean age of 18.92 years (SD = 0.98, range 18-21). The racial-ethnic composition was as follows: 55.9% non-Hispanic White, 5.1% African American, 6.8% Hispanic, 27.1% Asian/Pacific Islander, and 5.1% "other."

Measures

Adult Separation Anxiety Questionnaire (ASA-27): This 27-item questionnaire is used to determine ASAD symptom severity. Each item states a symptom or feature of ASAD and participants choose a response on a 4-point scale from 0, "this has never happened to me," to 3, "this happens very often" (Manicavasagar et al., 2003). Scores on the ASA-27 were treated as a continuous variable, with a higher score indicating greater symptoms of ASAD.

Dot-Probe Task: A plus sign was fixed in the center of a display to focus participants' attention. Emotionally neutral stimuli and emotionally threatening stimuli were then displayed on the screen in pairs. After 500ms, an arrow appeared behind either the neutral or threatening stimulus, and the participant was instructed to indicate which direction the arrow was pointing by clicking the corresponding mouse button (i.e., right-click for a right-pointing arrow). Detection latency was then recorded, with a shorter detection latency on threatening trials indicating an attentional bias toward threatening stimuli (MacLeod et al., 1986). The following three versions of the dot-probe task were administered:

1) Facial Stimuli: A pair of faces were displayed on the screen for 500ms. Pairs either depicted two happy faces, or an angry face and a happy face. 30 pairs were displayed in total; 15 pairs contained only happy faces and 15 pairs contained an angry face. The faces shown were black-and-white pictures of White men and women; the stimuli were not altered based on the gender or racial appearance of the participants.

2) General Threat Word Stimuli: A pair of words were displayed on the screen for 500ms (see Fig. 1). On threatening trials, one word was neutral (i.e., signature), and one word was a randomly selected generally threatening word (i.e., strangled). 30 pairs were displayed in total; 15 pairs contained only neutral words and 15 pairs contained a generally threatening word (see Table 1 for examples).

3) Specific Threat Word Stimuli: A pair of words were displayed on the screen for 500ms (see Fig. 1). On threatening trials, one word was neutral (i.e., hotel), and one word was a randomly selected specifically threatening word (i.e., alone). 30 pairs were displayed in total; 15 pairs contained only neutral words and 15 pairs contained a specifically threatening word (see Table 1 for examples).

Procedure

The design of this study was cross-sectional. After signing a written consent form, each participant was seated at a desk in a quiet laboratory testing room and asked to complete an online survey which included a demographics section inquiring about gender, age, race, and ethnicity, and the ASA-27 questionnaire. Upon finishing

the surveys, participants completed three dot-probe tasks: one consisting of facial pairs, one consisting of general threat words and neutral words, and one consisting of specific threat words and neutral words. For each trial, words and faces were displayed in a randomized order to reduce bias. After completing all study measures, participants were debriefed.

Statistical Analysis

Each participant's total score on the ASA-27 (ASATotal) was calculated, as well as any attentional bias toward threatening faces, specifically threatening words (i.e., ASAD-congruent words), or generally threatening words. To calculate attentional bias for each type of threat (FacialThreatBias, SpecificThreatBias, GeneralThreatBias), reaction time on trials during which the target followed an angry face, specifically threatening word, or generally threatening word (threat trials) was subtracted from reaction time on trials during which the target followed a neutral word (neutral trials). Due to the presence of outlier responses on the ASA-27, Spearman's rho was used to test for associations between ASATotal and threat bias on all tasks. Within-subject accuracy between Specific Word task threat trials and Specific Word task neutral trials, and between General Word task threat trials and General Word task neutral trials, was calculated by subtracting accuracy on threat trials from accuracy on neutral trials and was then correlated with participants' total score on the ASA-27 using Spearman's rho.

Results

The sample mean on the ASA-27 (M = 12.93, SD = 7.82) was similar to that reported in other undergraduate samples, while the observed range (minimum = 1, maximum = 33) indicated a sufficient range of ASAD symptom severity to consider this variable as a continuous marker of ASAD symptoms. No significant correlations were found between ASATotal and GeneralThreatBias (r_s = .07; p = .60), between ASATotal and SpecificThreatBias (r_s = -.07; p = .62), or between ASATotal and FacialThreatBias (r_s = .12, p = .37).

Average accuracy at detecting the arrow direction on all trials within the Specific Word task and the General Word task was high (see Table 2 for individual task accuracy percentages). To determine whether participants might be less accurate on trials that contained threatening stimuli (as compared to neutral-only trials) which would represent a marker

of emotional interference effects, we calculated intra-individual difference scores in accuracy for these trial types by subtracting accuracy on threat trials from accuracy on neutral trials. The within-subject difference in accuracy, as calculated, was then correlated with participants' total score on the ASA-27. Spearman's rho showed a weak to moderate negative correlation between differences in accuracy on Specific Word task trials and total score on the ASA-27 (r_s = -.38, p = .004), which was statistically significant. In contrast, there was no relationship between ASAD symptoms and the difference in accuracy comparing trials involving general threat words to neutral words as there was no significant correlation found between the difference in accuracy on General Word task trials and total score on the ASA-27 (r_s = -.16, p = .22).

Discussion

This study sought to determine if adults with greater levels of ASAD symptoms would also display greater attentional bias to threatening stimuli (general and separation-specific). The hypothesis that those who score higher on a measure of ASAD would have a greater attentional bias toward specifically threatening words was not supported, as the correlations between reaction time on dot-probe tasks and total scores on the ASA-27 were not significant. However, the significant correlation between difference in accuracy on Specific Word task trials and total score on the ASA-27 indicates that participants with higher levels of ASAD symptoms had a greater reduction in accuracy on separation-specific threat trials than on neutral trials. This reduction in accuracy would suggest that seeing the words related to separation caused impaired accuracy in identifying the target, possibly an emotional interference effect specific to words related to separation that did not extend to general threat.

One possible explanation for these results is the vigilance-avoidance theory of attentional bias (In-Albon et al., 2010). The vigilance-avoidance theory of attention theorizes that anxious individuals may initially be vigilant towards threat in their surroundings, but upon detecting threat, subsequently avoid the threat and divert attention away from it. In-Albon et al. (2010) found that in the first 1000ms of a task, both anxious and non-anxious participants gazed at threatening images and neutral images for a similar length of time, but after 1000ms, anxious participants gazed at

threatening images longer than at the neutral images. After 3000ms, anxious participants gazed at threatening images for a shorter duration than they did the neutral images, indicating that within the duration of 1000ms to 3000ms anxious individuals may be vigilant toward threat before subsequently disengaging from the threat and avoiding it. The display duration of the dot-probe task word pairs used in this study was 500ms, which may have been too short a duration to assess attentional bias away from threat. If the display duration was longer than 1000ms, it is possible that vigilance toward threatening words would have been seen.

Though the original hypothesis of this paper was not supported by the results, there was a significant correlation between a reduction in accuracy on the dot-probe tasks and ASAD symptom levels. Participants who scored higher on the ASA-27 performed less accurately on trials that included an ASAD-specific threat rather than a general threat. Based on these results, we hypothesize that ASAD-specific threats may have led to an emotional trigger that resulted in poorer task performance. However, it is important to note that these findings are correlational, and additional research is needed to further understand the nature of this relationship and any potential causal factors involved.

Limitations of this study included a small sample size, a limited participant age range of 18-21, and using convenience sampling to recruit participants, which may have resulted in bias. This was a non-clinical sample, and therefore all results are based on ASAD symptom levels rather than a clinical diagnosis. Furthermore, we recognize a major limitation in the fact that we did not screen participants for any comorbid disorders, and it is possible that subjects had co-occurring anxiety disorders. Another limitation was including only one length of our dot-probe task trials, which as discussed above, may have impacted our findings. In addition, our facial stimuli were limited and did not include images from all racial-ethnic groups. Future studies should seek to investigate the role of attentional bias in a large population of adults with varying ages and a primary diagnosis of ASAD, as a greater sample size and clinical sample are both necessary to replicate and extend these findings. This study was also limited by its correlational design; future studies should investigate this topic with experimental approaches.

Additionally, testing the use of dot-probe tasks with varying display duration could provide addition-

al understanding of how attentional bias operates in ASAD and provide insight into what specific factors may impede cognitive processes. For example, dot-probe tasks with a duration greater than 3000ms on trials may show an attentional bias towards specific threats but not general threats. Results of the current study suggest that there may be a negative effect of disorder-specific threats on task performance, which should be further researched due to its possible applications, such as informing treatment. For instance, in work settings, individuals with ASAD may struggle to perform well on tasks when exposed to stimuli related to their separation anxiety, such as reminders of separation from attachment figures. This can affect job performance and overall success. Through cognitive restructuring and attentional training exercises, individuals can learn to redirect their attention away from threat cues and develop more adaptive coping strategies (Hakamata et al., 2010). This highlights the importance of considering disorder-specific threats and attentional biases in the assessment and treatment planning for ASAD, enhancing the effectiveness of interventions and improving overall outcomes for individuals experiencing separation anxiety. Researchers might test the effects of ASAD-specific threat words in a clinical sample on various tasks, including the Stroop task which has been previously used to assess emotional interference effects. Future work could also investigate if disorder-specific triggers affect task performance in those with other anxiety disorders in the same manner.

Conclusion

This study examined attentional bias in a sample of adults, some of whom experienced symptoms of ASAD, using the dot-probe task. The aim was to elucidate the relationship between these two variables and inform the creation of targeted treatment. Although the initial hypothesis that higher ASAD symptom severity would correlate with greater attentional bias toward threatening stimuli was not supported, there was a significant correlation between ASAD symptom levels and reduced accuracy in trials involving ASAD-specific threat words. These results suggest that there may be emotional interference occurring in ASAD-specific threat trials which affects task performance. However, this study's findings were correlational, and additional research is needed to better understand the relationship and mechanisms.
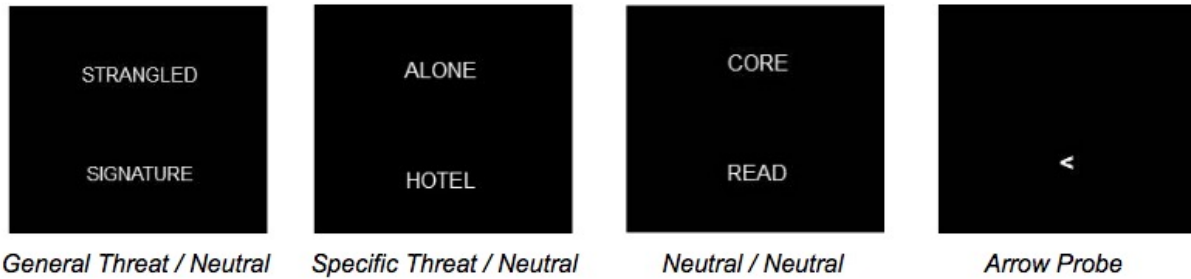
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Figure 1

Examples of the Dot-Probe Tasks' Displays

| General Threat / Neutral | Specific Threat / Neutral | Neutral / Neutral | Arrow Probe |

Note. This figure provides examples of how word pairs were displayed in the General Threat Word dot-probe task and the Specific Threat Word dot-probe task, as well as the arrow probe used in all trials.

Table 1

Examples of Word Pairs Used in the Dot-Probe Tasks

General Threat – Neutral	Neutral – Neutral	Specific Threat – Neutral
Anxiety – Journal	Pat – Via	Abandoned – Sheltered
Danger – League	Campus – Confer	Alone – Hotel
Afraid – Detail	Shearing – Textured	Lonely – Fabric
Disease – Remarks	Scans – Tract	Unaccompanied – Thermometers
Terror – Pupils	Fitted – Midway	Companionless – Sentimentally
Fear – Note	Core – Read	Deserted – Icebox
Worry – Inner	Fireplace – Reclaimed	Solitary – Whistle
Harm – Pond	Cleaners – Hallmark	Unescorted – Appliances

Table 2

Mean Percentage of Accurate Responses

Trial Type	Mean Percentage of Accurate Responses
Specific Word Task Threat Trials	94.65%
Specific Word Task Neutral Trials	94.98%
General Word Task Threat Trials	94.70%
General Word Task Neutral Trials	94.62%

Note. This table displays the mean percentage of accurate responses in indicating the direction of the arrow probe on four trial types.

Exploring the Relationship Between Maladaptive Daydreaming and Adverse Childhood Experiences

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This study explores the intricate relationship between maladaptive daydreaming (MD) and adverse childhood experiences (ACEs). MD, characterized by immersive daydreaming that may disrupt daily functioning, has garnered attention as a potential coping mechanism for trauma. ACEs encompass a range of traumatic experiences, such as abuse, neglect, and family dysfunction, which have been associated with various mental health challenges. Using the MD Scale (MDS-16) and the ACEs scale, data were collected from a sample of $N = 386$ individuals. Significant positive correlations were found between MD and specific ACEs, including verbal abuse, mental illness or suicide, sexual abuse, and physical neglect. Regression analyses revealed that individuals with higher levels of ACEs were more likely to engage in MD. The relationship between ACEs and MD may involve MD serving as a psychological escape or coping strategy for the emotional and psychological impacts of trauma. Conversely, separation or divorce was found to have a negative association with MD scores, suggesting that different types of ACEs may affect MD tendencies differently. These findings highlight the importance of addressing childhood trauma in interventions targeting MD behaviors. Future research should delve deeper into the specific types of ACEs and their differential impacts on MD to better inform targeted interventions. This study highlights the critical role of childhood experiences in shaping MD behaviors and emphasizes the need for trauma-informed approaches in clinical practice.

Keywords: maladaptive daydreaming, trauma, adverse childhood experiences

Maladaptive daydreaming (MD) is an intriguing yet underexplored phenomenon within psychology. It is characterized by extensive and immersive daydreaming that may disrupt daily functioning and overall well-being (Mariani et al., 2021). Despite growing recognition, the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) does not classify MD as a disorder, leaving a gap in its formal conceptualization. Nevertheless, recent research has begun associating MD with Adverse Childhood Experiences (ACEs), positioning MD as a potential coping mechanism for trauma (Pietkiewicz et al., 2018; Sándor et al., 2020). This intersection between ACEs and MD remains an underdeveloped area of inquiry, with a lack of studies comprehensively exploring the psychological and neurobiological mechanisms underlying this relationship.

The existing literature often compares MD and other psychological constructs, such as fantasy proneness (FP), which involves immersive fantasies that may mimic real-life experiences. However, FP includes dissociative mystical and religious experiences not typically associated with MD, suggesting nuanced differences between these constructs (Wilson & Barber, 1982). While daydreaming can serve adaptive functions—such as enhancing creativity, planning, or cognitive relief—MD is characterized as persistent and immersive, potentially impairing academic, interpersonal, and professional functioning (Klinger, 2012; Singer, 1975).

A gap in the current body of research is the limited understanding of how ACEs, as severe early life stressors, may influence the development and per-

sistence of MD. Studies have shown that individuals with a history of ACEs—such as childhood bullying, abuse, or neglect—are more likely to engage in MD as a coping strategy to escape from distressing realities (Somer et al., 2021). However, more nuanced research is needed to explore whether MD exacerbates trauma-related symptoms or provides temporary relief.

Recent estimates suggest that approximately 4% of the general population may meet the criteria for MD, underscoring its prevalence (Soffer-Dudek & Theodor-Katz, 2022). However, the precise mechanisms by which ACEs contribute to MD's development remain unclear, as does the bidirectional relationship between MD and trauma (Ross et al., 2020). Current neurobiological research into MD is still in its infancy, though some studies have begun exploring alterations in brain regions related to emotion regulation and self-referential processing (Bigelsen et al., 2016). This leaves a significant gap in understanding how MD and trauma influence each other over time and how this relationship affects mental and physical health outcomes across the lifespan.

This study addresses these gaps by examining the relationship between Adverse Childhood Experiences (ACEs) and Maladaptive Daydreaming (MD), hypothesizing that individuals who experience more ACEs will exhibit a higher prevalence of MD. The research aims to distinguish MD from related constructs and explore the psychological and neurobiological mechanisms underlying this relationship. By focusing on this intersection, the study seeks to contribute

to the literature by offering a more precise conceptualization of MD and its association with childhood trauma. This approach could pave the way for more effective interventions targeting both MD and the long-term impacts of ACEs on mental and physical health.

Methods

Recruitment

These data were collected during the Summer of 2020. The study aimed to assemble a representative sample of participants, as outlined in Table 1. To achieve this, the researcher employed various recruitment strategies. Initially, an advertisement was crafted using Canva, a popular graphic design tool known for its user-friendly interface and versatile templates. Subsequently, recruitment efforts were undertaken across multiple online platforms, including Canvas, Facebook, Twitter, Instagram, and Reddit. Each platform contributed differently to the overall sample.

The primary recruitment source, Facebook MD groups, was particularly effective in engaging respondents. These targeted groups proved highly effective in reaching individuals actively discussing and identifying with maladaptive daydreaming. On Reddit, recruitment was carried out in relevant subreddits that focus on mental health and maladaptive daydreaming, providing access to a diverse audience sharing their experiences with MD. Twitter was utilized for recruitment by posting targeted advertisements and engaging with hashtags and discussions related to maladaptive daydreaming and childhood trauma. Announcements and recruitment efforts on Canvas were made within university courses, targeting students with relevant interests in maladaptive daydreaming and childhood adversity. On Instagram, recruitment involves using posts and stories to connect with users interested in mental health topics. The visual and interactive nature of the platform helped engage potential participants effectively.

The most significant number of participants, totaling 250, were recruited from Facebook MD groups, representing approximately 65% of the total sample. Reddit contributed 60 participants, accounting for about 15% of the total. Twitter provided 30 participants, which is around 8% of the sample. Canvas, used for recruitment within university courses, yielded 20 participants, making up about 5% of the total. Instagram recruited 26 participants through posts and stories, approximately 7% of the sample.

Participants in this study must be 18 years of age or older and must score 50 or higher on the Maladaptive Daydreaming Scale (MDS-16), indicating significant maladaptive daydreaming. They must also report at least one Adverse Childhood Experience (ACE) based on responses to the ACE Questionnaire. All participants must be proficient in English and provide informed consent to participate in the study.

Individuals with severe cognitive impairments, such as intellectual disabilities or dementia, will be excluded, as well as those with active psychosis or severe dissociative disorders. Participants currently experiencing severe substance abuse or ongoing traumatic experiences will also be excluded. Additionally, those who do not meet the threshold for maladaptive daydreaming or do not report any significant ACEs will not be eligible for inclusion.

A total sample size of $N = 386$ individuals participated in the study. Prospective participants were required to meet specific eligibility criteria, including 18 years or older and proficient in English. Participants were asked their age when completing the survey to ensure age criteria were met. These criteria were established to ensure that participants could effectively engage with the study materials and provide accurate responses, thereby enhancing the validity and reliability of the data collected.

Measures

The primary measure utilized in this study was the Maladaptive Daydreaming Scale (MDS-16), a self-report instrument specifically designed to assess MD behaviors among individuals. Developed by Somer et al. (2016), the MDS-16 consists of 16 items (See Appendix G), it has emerged as a valuable tool in clinical and research settings for comprehensively understanding and quantifying the extent of MD tendencies within populations.

The MDS-16 prompts participants to reflect on and report the frequency and intensity of their daydreaming episodes. Unlike dichotomous assessments, this scale delves into the qualitative aspects of daydreaming, allowing for an understanding of normative daydreaming versus MD behaviors. Furthermore, the scale encompasses items exploring MD's emotional and functional dimensions. Participants are asked to rate the emotional content of their daydreams, shedding light on the affective expe-

riences associated with their daydreaming episodes. The scale examines the impact of daydreaming on various aspects of individuals' daily functioning, such as work, relationships, or academic pursuits.

The MDS-16's psychometric properties contribute to its credibility as a reliable and valid measure. It showed appropriate internal consistency and reliability with a Cronbach's alpha of 0.957. Through rigorous validation, the scale has demonstrated its ability to effectively discriminate between individuals with and without MD tendencies. Its reliability ensures consistency in measuring the construct over time and across different populations, facilitating robust comparisons and generalizability of findings.

Furthermore, the study employed the Adverse Childhood Experiences Scale (ACEs), a widely recognized and extensively utilized self-report measure designed to assess the prevalence and impact of various childhood adversities (See Appendix F). It showed appropriate internal consistency and reliability with a Cronbach's alpha of 0.70. Developed by Felitti et al. (1998), the ACEs scale encompasses ten distinct categories, each representing a specific form of adversity individuals may have encountered during their formative years. These categories include emotional abuse, physical abuse, sexual abuse, emotional neglect, physical neglect, as well as family-related adversities such as separation or divorce, witnessing domestic violence, having a drug or alcohol-addicted family member, having a mentally ill family member, and having an incarcerated family member.

The ACEs scale enables researchers and clinicians to evaluate and address the multifaceted nature of childhood adversities, providing valuable insights into the cumulative impact of early life stressors on individuals' well-being. The survey measures ACEs within families in adolescents and has internal consistency, validity, and criterion validity when used with relevant measures.

Procedures

The research conducted for this study was overseen and approved by the Colorado Multiple Institutional Review Board (COMIRB) at the University of Colorado—Denver | Anschutz Medical School. The study was assigned the COMIRB identification number 20-2870 to ensure compliance with ethical guidelines for human subject research.

Participants provided informed consent before completing online surveys, which lasted ap-

proximately 30 minutes each. Responses were anonymized throughout the study. Participants were informed that they would be entered into a raffle to win one of three $50 Amazon gift cards.

Using SPSS Statistics v29, 10 participants identified as MDers were randomly selected for follow-up interviews. They had previously consented to be contacted for further studies and were informed via email about the interview process and compensation, agreeing through a second consent form sent electronically.

Remote interviews lasting around 30 minutes each were conducted via Zoom, focusing on various aspects of daydreaming, guided by questions crafted based on prior research by Bigelsen et al. (2016) (See Appendix E). Participants' responses were transcribed verbatim for accurate documentation.

Quantitative data collected through Qualtrics and exported to SPSS underwent systematic analysis. Data were recorded according to specified scales, cleaned to remove incomplete cases, and descriptive statistics were computed to summarize critical characteristics. Regression and correlation analyses were performed to explore relationships between variables.

Qualitative data from interview recordings were analyzed using NVivo Release 1.5.1. The thematic analysis involved transcribing responses, identifying recurring themes, and categorizing them to facilitate exploration. Thematic nodes were created to capture key concepts, and visualization techniques aided in interpreting and presenting findings.

This systematic analysis approach provided an understanding of quantitative and qualitative data, illuminating the research phenomena under investigation.

Results

The analysis presents descriptive statistics and correlations for ACEs and total MD in Table 2. The variables examined include Verbal Abuse, Emotional Neglect, Physical Abuse, Mental Illness or Suicide, Separation or Divorce, Sexual Abuse, Witness Abuse, Drugs or Alcohol, Physical Neglect, Prison, and Total ACEs.

The mean (M) and standard deviation (SD) for each adverse childhood experience variable are as follows: Verbal Abuse ($M = 0.59$, $SD = 0.49$), Emotional Neglect ($M = 0.37$, $SD = 0.48$), Physical Abuse ($M = 0.29$, $SD = 0.45$), Mental Illness or Suicide ($M = 0.47$, $SD = 0.50$), Separation or Divorce ($M = 0.18$, $SD = 0.39$), Sexual Abuse ($M = 0.33$, $SD = 0.47$),

Witness Abuse (*M* = 0.23, *SD* = 0.42), Drugs or Alcohol (*M* = 0.22, *SD* = 0.41), Physical Neglect (*M* = 0.34, *SD* = 0.47), and Prison (*M* = 0.07, *SD* = 0.25).

Correlation coefficients between each adverse childhood experience variable and total MD are provided. Significant correlations (*p* < .05) are observed for Verbal Abuse (*r* = .32), Mental Illness or Suicide (*r* = .31), Sexual Abuse (*r* = .25), Witness Abuse (*r* = .15), Drugs or Alcohol (*r* = .16), Physical Neglect (*r* = .35), and Total ACEs (*r* = .33).

These results suggest that specific ACEs, such as Verbal Abuse, Mental Illness or Suicide, Sexual Abuse, Witness Abuse, Drugs or Alcohol, Physical Neglect, and the overall accumulation of adverse experiences, are positively correlated with higher levels of MD. Emotional Neglect, Physical Abuse, Separation or Divorce, and Prison do not show significant correlations with MD.

The study investigated the relationship between ACEs and total MD scores. The model included multiple independent variables, each with their respective unstandardized coefficients (*B*), standardized coefficients (*β*), standard errors, and 95% confidence intervals for *B*. See Table 3.

The analysis revealed several significant findings. The constant term had a coefficient of *B* = 34.148 (*SE* = 2.391), indicating the expected total MD score when all independent variables are zero, which was statistically significant (*t* = 14.281, *p* < .001, 95% *CI* [29.439, 38.858]). Verbal abuse significantly correlated with total MD scores (*B* = 7.93, *SE* = 3.64, *β* = 0.16, *t* = 2.18, **p** = .03, 95% *CI* [0.768, 15.084]). Mental illness or suicide also showed a significant positive association (B = 12.359, SE = 3.131, β = 0.247, t = 3.948, p < .001, 95% CI [6.193, 18.524]).

Separation or divorce exhibited a significant negative relationship with total MD scores (*B* = -13.076, *SE* = 4.238, *β* = -0.201, *t* = -3.086, *p* = .002, 95% *CI* [-21.423, -4.73]), indicating lower total MD scores in individuals experiencing separation or divorce.

Sexual abuse also showed a significant positive association (*B* = 8.401, *SE* = 3.396, *β* = 0.159, *t* = 2.473, *p* = .014, 95% *CI* [1.712, 15.09]). Physical neglect was positively associated with total MD scores (*B* = 11.836, *SE* = 3.29, *β* = 0.226, *t* = 3.598, *p* < .001, 95% *CI* [5.357, 18.315]).

Variables such as emotional neglect (*B* = -0.671, *SE* = 3.699, *β* = -0.013, *t* = -0.181, *p* = .856, 95% *CI*

[-7.957, 6.614]), physical abuse (*B* = -1.076, *SE* = 3.713, *β* = -0.019, *t* = -0.29, *p* = .772, 95% *CI* [-8.389, 6.237]), witness abuse (*B* = 1.604, *SE* = 3.819, *β* = 0.027, *t* = 0.42, *p* = .675, 95% *CI* [-5.918, 9.126]), drugs or alcohol (*B* = 0.886, *SE* = 3.842, *β* = 0.015, *t* = 0.231, *p* = .818, 95% *CI* [-6.682, 8.453]), and prison (*B* = -8.919, *SE* = 5.821, *β* = -0.088, *t* = -1.532, *p* = .127, 95% *CI* [-20.384, 2.546]) did not show statistically significant associations with total MD scores.

These findings suggest that experiences of verbal abuse, mental illness or suicide, sexual abuse, and physical neglect are significant predictors of higher total MD scores. Separation or divorce is associated with lower total MD scores. Other variables examined did not show significant relationships with MD.

In the regression analysis examining the relationship between total ACEs and MD, the total ACEs yielded a significant effect on MD scores (*B* = 3.40, *SE* = 0.60, *β* = 0.33, *t* = 5.64, *p* < .001**). The 95% confidence interval for the coefficient of total ACEs ranged from 2.21 to 4.59 (see Table 4). These findings convey the importance of total ACEs in predicting MD behaviors.

Case Studies

The case studies illustrate individuals' experiences with MD and its association with ACEs. Each case highlights the impact of childhood trauma on personality traits and coping mechanisms, such as excessive daydreaming. Common themes across the cases include emotional distress, difficulties forming relationships, and coping mechanisms involving vivid daydreaming.

In Case #1, a Ph.D. candidate's trauma history includes bullying and a physical assault by a peer. They cope with past trauma through daydreaming, which both alleviates stress and interferes with academic responsibilities. They state, "I often find myself lost in a world of my creation, where I am in control, and everything is perfect."

Similarly, Case #2 portrays an individual using MD to escape their painful reality, experiencing emotional exhaustion and social difficulties as a result. As a child, they experienced the trauma of witnessing domestic abuse and two car accidents, one of which left them permanently injured. The interviewee said, "Sometimes I feel like I am daydreaming more than other people. Several hours have passed before I realize how long I have been daydreaming."

Case #3 depicts an individual with elaborate daydreams, developed as a coping mechanism for child-

hood abuse and neglect, which persist into adulthood. They experienced an assault as a young child. They mention, "My daydreams are a refuge, a place where I can be myself without fear of judgment or harm."

In Case #4, an individual's childhood trauma leads to intense daydreaming, impairing their focus and relationships in adulthood. As a child, they were diagnosed with ADHD. They were bullied for having this diagnosis. Their peers often avoided them and made disparaging comments about their intellectual abilities. The participant says, "I often daydream to cope with negative emotions, stress, and anxiety."

Case #5 highlights how childhood adversity can fuel excessive daydreaming. The interviewee mentions that, as a child, they did not have adequate resources. Their childhood consisted of scarce food and clothing. This led to the interviewee needing help to focus on school and making friends. Thus, they were often alone. They say, "In my daydreams, I can rewrite my past and create a happier, more fulfilling narrative for myself."

Case #6 portrays a student overwhelmed by daydreaming, stemming from past abuse and isolation, affecting academic and social functioning. This case is a student who spends most of their time alone, like their childhood. As a child, they often moved to different locations, which made them unable to make and keep friends. They state, "I struggle to stay grounded in reality because my daydreams feel more vivid and exciting."

Case #7 illustrates how childhood emotional abuse and neglect contribute to dissociative daydreams and disconnection from reality. Parents and peers often insulted and disparaged them as a child. This caused them to have feelings of inadequacy. They mention, "I feel guilty for spending so much time daydreaming, but it helps me cope."

In Case #8, ACEs manifest in low self-esteem and avoidance behaviors, prompting the individual to seek solace in daydreams. As a child, this patient was bullied for having acne by parents and peers. They often utilized daydreaming to escape into a world where their appearance reflected their ideal. They say, "My daydreams often feature characters who protect and comfort me, fulfilling the roles I lacked in real life."

Case #9 portrays an individual using daydreaming as a coping mechanism for childhood trauma despite efforts to manage it through therapy and social engagement. This case experienced several assaults as a child. They have since sought thera-

py but still used MD as a coping mechanism. They mention, "I feel that my daydreaming is becoming an addiction, but I do not know how else to cope."

In Case #10, childhood sexual trauma leads to MD accompanied by hallucinations, highlighting the severe impact of ACEs on cognitive processes and mental health. They state: "Even though I know my daydreams are not real, they feel more comforting and real than anything in my life."

These cases collectively emphasize the complex interplay between childhood trauma, personality development, and maladaptive coping mechanisms like excessive daydreaming.

Future research should further explore how childhood trauma influences MD severity and associated symptoms, such as dissociation and hallucinations, to inform targeted interventions for individuals affected by both ACEs and MD.

Discussion

The findings from the present study shed light on the complex relationship between ACEs and MD. This discussion section will delve into the implications of the results obtained from the descriptive statistics, correlations, and regression analyses.

Descriptive statistics and correlations unveiled specific patterns in the relationship between individual ACEs and MD. Notably, significant positive correlations were observed between MD and several ACEs, including verbal abuse, mental illness or suicide, sexual abuse, witness abuse, drugs or alcohol, and physical neglect. These findings suggest that individuals who have experienced these adverse events during childhood may be more likely to engage in MD behaviors. On the contrary, emotional neglect, physical abuse, separation or divorce, and prison did not show significant correlations with MD. While this may seem unexpected, it underscores the multifaceted nature of the relationship between childhood experiences and MD, indicating that not all adverse experiences may contribute equally to the development of MD.

Further insights were gained through regression analyses, which aimed to identify the unique contribution of each ACE and the cumulative effect of total ACEs on MD. Results revealed significant associations between certain ACEs and MD scores. Specifically, verbal abuse, mental illness or suicide, sexual abuse, and physical neglect emerged as signif-

icant predictors of higher MD scores. Conversely, separation or divorce showed a negative association with MD scores, suggesting that individuals who have experienced these circumstances may exhibit lower levels of MD. These findings accentuate the differential impact of various ACEs on MD and emphasize the importance of considering the specific nature of adverse experiences in understanding MD behaviors.

Of particular significance is the role of total ACEs in predicting MD. The regression analysis demonstrated a robust positive relationship between total ACEs and MD scores, indicating that individuals with more ACEs are more likely to engage in MD. This highlights the cumulative effect of childhood adversities on MD and emphasizes the importance of addressing broader adverse experiences in interventions targeting MD tendencies.

The present study contributes to understanding the intricate interplay between childhood experiences and MD behaviors. By identifying specific ACEs and their cumulative impact on MD, these findings provide valuable insights for the development of targeted interventions aimed at mitigating MD tendencies and promoting mental well-being in individuals with a history of ACEs.

Future Directions

The present study offers valuable insights into the relationship between ACEs and MD, but further exploration is necessary to deepen our understanding of this complex phenomenon. Future research should focus on clarifying the mechanisms through which ACEs contribute to the development and persistence of MD. Specifically, studies could investigate how trauma-related factors, such as emotional regulation difficulties or dissociation, mediate the relationship between early adversity and MD tendencies.

Exploring potential interventions aimed at addressing trauma could be a fruitful avenue for further investigation. Trauma-informed therapeutic approaches, such as cognitive-behavioral therapy (CBT) or Eye Movement Desensitization and Reprocessing (EMDR), might offer promising avenues for mitigating the impact of ACEs on MD. Investigating whether such interventions reduce the severity or frequency of MD could provide critical information for clinicians working with individuals affected by both trauma and MD.

Additionally, research could benefit from examining the long-term mental and physical health conse-quences of MD in individuals with ACEs. Studies that track the trajectory of MD over time, focusing on trauma-related outcomes like depression, anxiety, or somatic symptoms, may shed light on how MD evolves and interacts with other mental health conditions. This could help inform early intervention strategies, particularly for individuals at high risk for maladaptive coping mechanisms due to their trauma history.

By building on the established link between ACEs and MD, future research can contribute to developing more effective interventions and preventative strategies, ultimately improving outcomes for individuals experiencing both childhood trauma and MD.

Limitations

This study has limitations that warrant acknowledgment. The data collection occurred during the COVID-19 pandemic, potentially introducing bias due to the unique circumstances surrounding this period. Factors such as increased stress levels, social isolation, and disruptions to daily routines may have influenced participants' experiences of maladaptive daydreaming and recollection of adverse childhood experiences. In addition, there is an overrepresentation of women in the sample. This gender disparity may skew the results and overlook potential differences in the relationship between maladaptive daydreaming and adverse childhood experiences among men. Reliance on self-report measures introduces the possibility of response bias and inaccuracies in participants' responses. Social desirability bias, memory recall errors, and interpretation discrepancies may affect the validity and reliability of the data collected. Lastly, the Adverse Childhood Experiences scale can vary widely from person to person. It is not a diagnostic tool to assess the biology of stress, yet it is a tool to evaluate potential outcomes due to adversity experienced in childhood.

Conclusion

The results of this study provide valuable insights into the complex relationship between ACEs and MD, with significant implications for clinical practice.

The findings underscore the importance of assessing childhood trauma history in individuals presenting with symptoms of MD. Clinicians should recognize that specific types of ACEs, such as verbal abuse, mental illness or suicide, sexual abuse, and physical neglect, are associated with higher levels of MD. Therefore, incorporating routine screening for ACEs into clinical assessments can help

identify individuals at heightened risk for MD and guide the development of tailored interventions.

The negative association observed between separation or divorce and MD scores suggests that individuals who have experienced these circumstances may exhibit lower levels of MD. Clinicians should explore the protective factors associated with separation or divorce, such as social support networks or adaptive coping strategies, to inform interventions aimed at reducing MD symptoms in this population.

The cumulative effect of total ACEs on MD emphasizes the importance of addressing broader adverse experiences in interventions targeting MD tendencies. Clinicians should adopt a holistic approach to treatment, addressing both the specific ACEs contributing to MD and the overall impact of childhood trauma on individuals' mental health. This may involve incorporating trauma-informed therapy modalities, such as cognitive-behavioral therapy (CBT) or eye movement desensitization and reprocessing (EMDR), to address underlying trauma and develop healthier coping mechanisms.

These findings highlight the need for greater awareness and understanding of the interplay between childhood trauma and MD in both clinical and lay settings. Educating clinicians and the public about the potential psychological consequences of ACEs, including their association with MD, can facilitate early intervention and support for affected individuals. By fostering a trauma-informed approach to mental health care and promoting resilience-building strategies, clinicians can empower individuals to overcome the adverse effects of childhood trauma and lead healthier, more fulfilling lives.

This study emphasizes the critical role of childhood experiences in shaping MD behaviors and elucidates the importance of trauma-informed care in clinical practice. By addressing the underlying trauma and providing targeted interventions, clinicians can help individuals affected by ACEs navigate their journey toward healing and recovery from MD.

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Table 1

Table of Demographic Data

Country	Total	Female	Male	Min. Age	Max. Age
United States	242	163	79	18	51
Canada	71	52	19	18	45
Mexico	29	29	0	20	31
South Africa	12	8	4	18	27
Egypt	10	5	5	25	48
Russia	11	9	2	18	19
Turkey	5	5	0	19	53
United Kingdom	4	3	1	18	37
Ukraine	4	2	0	28	45

Note: Nationality, Age, and Sex of Participants.

Table 2

Descriptive Statistics and Correlations for Adverse Childhood Experience and Total Maladaptive Daydreaming

Adverse Childhood Experience	n	M	SD	Total Maladaptive Daydreaming
Verbal Abuse	386	0.59	0.49	.32**
Emotional Neglect	386	0.37	0.48	.13*
Physical Abuse	386	0.29	0.45	0.0
Mental Illness or Suicide	386	0.47	0.50	.31**
Separation or Divorce	386	0.18	0.39	0.0
Sexual Abuse	386	0.33	0.47	.25**
Witness Abuse	386	0.23	0.42	.15*
Drugs or Alcohol	386	0.22	0.41	.16**
Physical Neglect	386	0.34	0.47	.35**
Prison	386	0.07	0.25	0.0
Total Adverse Childhood Experiences	386	3.06	2.41	.33**

Note. The table includes Descriptive Statistics and Correlations for Adverse Childhood Experiences and Total Maladaptive Daydreaming. The table includes mean (M), standard deviation (SD), and correlations.

*$p < .05$, **$p < .01$.

Table 3

Regression for Individual Adverse Childhood Experiences and Maladaptive Daydreaming

Adverse Childhood Experience	B	SE	β	t	p	95.0% CI LL	UL
Verbal Abuse	7.93	3.64	0.16	2.18	0.03*	0.77	15.08
Emotional Neglect	-0.67	3.70	-0.01	-0.18	0.86	-7.96	6.61
Physical Abuse	-1.08	3.71	-0.02	-0.29	0.77	-8.39	6.24
Mental Illness or Suicide	12.36	3.13	0.25	3.95	<.001**	6.19	18.52
Separation or Divorce	-13.08	4.24	-0.20	-3.09	0.00**	-21.42	-4.73
Sexual Abuse	8.40	3.40	0.16	2.47	0.01*	1.71	15.09
Witness Abuse	1.60	3.82	0.03	0.42	0.68	-5.92	9.13
Drugs or Alcohol	0.89	3.84	0.02	0.23	0.82	-6.68	8.45
Physical Neglect	11.84	3.29	0.23	3.60	<.001**	5.36	18.32
Prison	-8.92	5.82	-0.09	-1.53	0.13	-20.38	2.55

Note. The table presents unstandardized coefficients (*B*), standardized coefficients (*β*), Lower Limit (*LL*), Upper Limit (*UL*), t-values, p-values, and 95% confidence intervals for each Adverse Childhood Experience in relation to Maladaptive Daydreaming.

p < .05, **p* < .01.

Table 4

Regression for Total Adverse Childhood Experiences and Maladaptive Daydreaming

	B	SE	β	t	p	95% CI LL	UL
TOTAL ADVERSE CHILDHOOD EXPERIENCES	3.40	0.60	0.33	5.64	<.001**	2.21	4.59

Note. The table presents unstandardized coefficients (*B*), standardized coefficients (*β*), Lower Limit (*LL*), Upper Limit (*UL*), t-values, p-values, and 95% confidence intervals for each Total Adverse Childhood Experiences in relation to Maladaptive Daydreaming.

p < .05, **p* < .01

Appendix A

The 16-item Maladaptive Daydreaming Scale (MDS-16)
Eli Somer, Jayne Bigelsen, Jonathan Lehrfeld & Daniela Jopp

In answering the following questions, please refer to your daydreaming activities in the last month, if not otherwise specified. Choose the option that best fits your experience. For example: Some people get so caught up in their daydreaming that they forget where they are. How often do you forget where you are when you daydream? In this example, 20% is chosen.

0%	10%	~~20%~~	30%	40%	50%	60%	70%	80%	90%	100%

Never   Extremely frequent
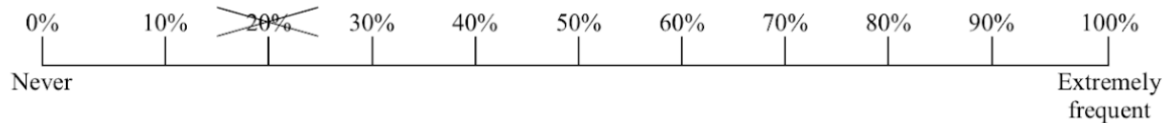
1. Some people notice that certain music can trigger their daydreaming. To what extent does music activate your daydreaming?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Never   Very often
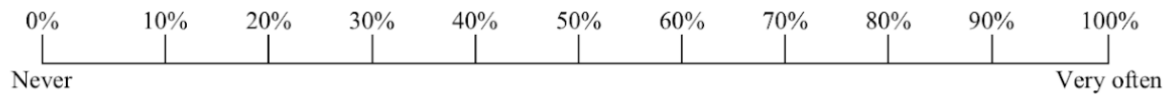
2. Some people feel a need to continue a daydream that was interrupted by a real world event at a later point. When a real world event has interrupted one of your daydreams, how strong was your need or urge to return to that daydream as soon as possible?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

No urge at all   Extreme urge
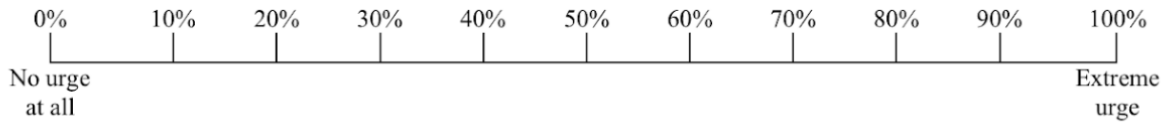
3. How often are your current daydreams accompanied by vocal noises or facial expressions (e.g. laughing, talking or mouthing the words)?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Never   Extremely frequent
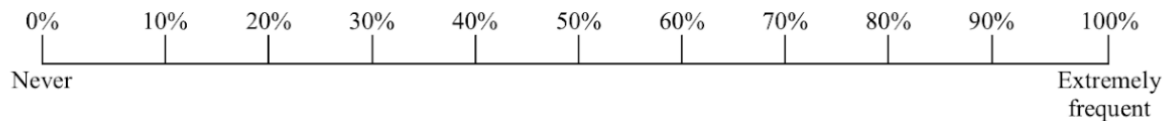
4. If you go through a period of time when you are not able to daydream as much as usual due to real world obligations, how distressed are you by your inability to find time to daydream?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

No distress at all   Extreme distress
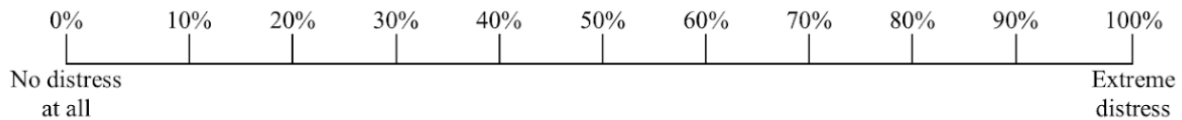
Appendix A (cont.)

5. Some people have the experience of their daydreaming interfering with their daily chores or tasks. How much does your daydreaming interfere with your ability to get basic chores accomplished?

```
    0%      10%    20%    30%    40%    50%    60%    70%    80%    90%    100%
No interference                                                    Extreme
    at all                                                      interference
```
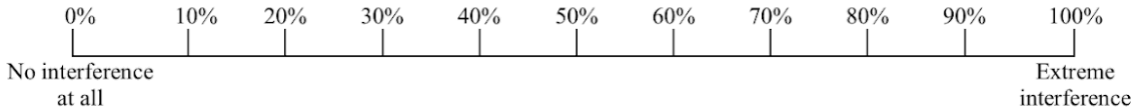
6. Some people feel distressed or concerned about the amount of time they spend daydreaming. How distressed do you currently feel about the amount of time you spend daydreaming?

```
    0%      10%    20%    30%    40%    50%    60%    70%    80%    90%    100%
No distress                                                        Extreme
   at all                                                          distress
```
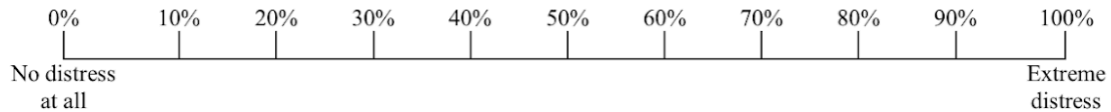
7. When you know you have had something important or challenging to pay attention to or finish, how difficult was it for you to stay on task and complete the goal without daydreaming?

```
    0%      10%    20%    30%    40%    50%    60%    70%    80%    90%    100%
No difficulty                                                      Extreme
    at all                                                        difficulty
```
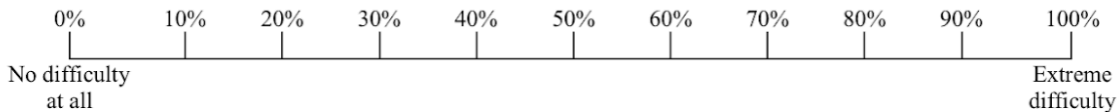
8. Some people have the experience of their daydreaming hindering the things that are most important to them. How much do you feel that your daydreaming activities interfere with achieving your overall life goals?

```
    0%      10%    20%    30%    40%    50%    60%    70%    80%    90%    100%
No interference                                                    Extreme
    at all                                                      interference
```
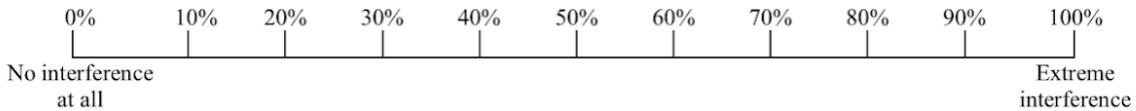
9. Some people experience difficulties in controlling or limiting their daydreaming. How difficult has it been for you to keep your daydreaming under control?

```
    0%      10%    20%    30%    40%    50%    60%    70%    80%    90%    100%
No difficulty                                                      Extreme
    at all                                                        difficulty
```
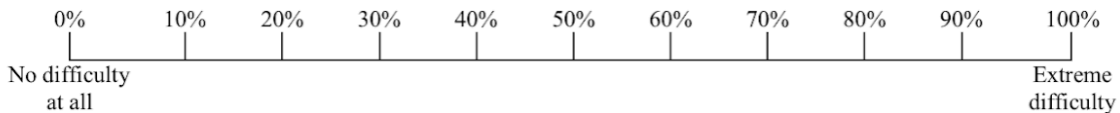
10. Some people feel annoyed when a real world event interrupts one of their daydreams. When the real world interrupts one of your daydreams, on average how annoyed do you feel?

```
    0%      10%    20%    30%    40%    50%    60%    70%    80%    90%    100%
No annoyance                                                       Extreme
    at all                                                         annoyance
```
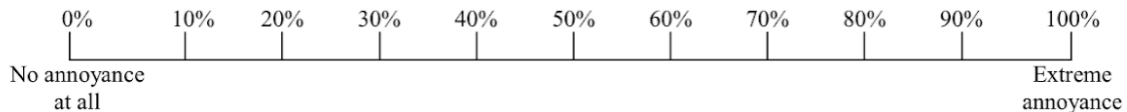
Appendix A (cont.)

11. Some people have the experience of their daydreaming interfering with their academic/occupational success or personal achievements. How much does your daydreaming interfere with your academic/occupational success?

```
0%      10%     20%     30%     40%     50%     60%     70%     80%     90%     100%
```
No interference   Extreme
at all   interference
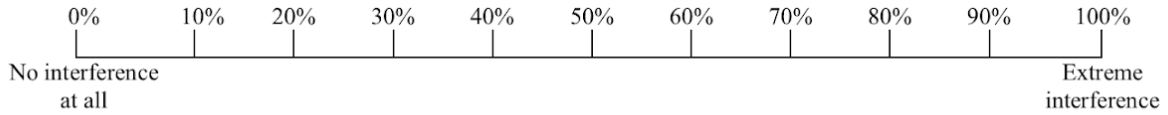
12. Some people would rather daydream than do most other things. To what extent would you rather daydream than engage with other people or participate in social activities or hobbies?

```
0%      10%     20%     30%     40%     50%     60%     70%     80%     90%     100%
```
Not at all   To the fullest
                                                                                    extent
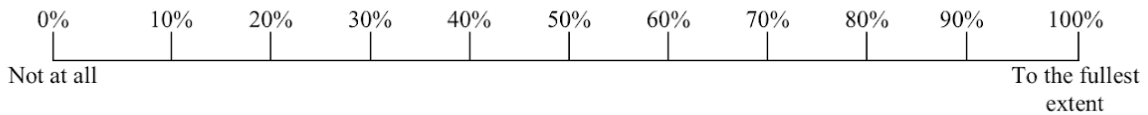
13. When you first wake up in the morning, how strong has your urge been to immediately start daydreaming?

```
0%      10%     20%     30%     40%     50%     60%     70%     80%     90%     100%
```
No urge   Extreme
at all   urge
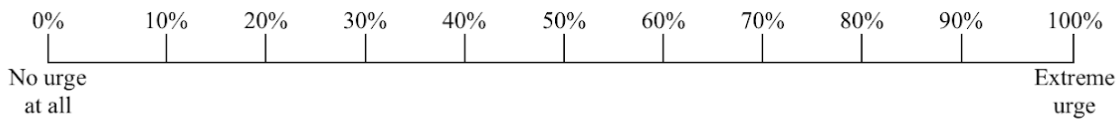
14. How often are your current daydreams accompanied by physical activity such as pacing, swinging or shaking your hands?

```
0%      10%     20%     30%     40%     50%     60%     70%     80%     90%     100%
```
Never   Very often
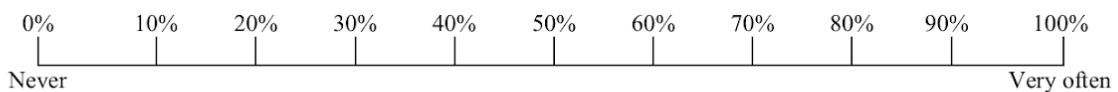
15. Some people love to daydream. While you are daydreaming, to what extent do you find it comforting and/or enjoyable?

```
0%      10%     20%     30%     40%     50%     60%     70%     80%     90%     100%
```
Not   Very
comforting/enjoyable   comforting/enjoyable
at all
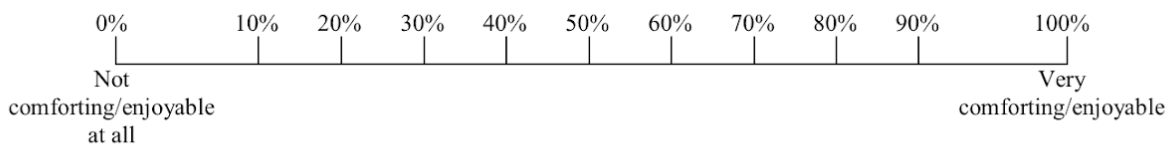
16. Some people find it hard to maintain their daydreaming when they are not listening to music. To what extent is your daydreaming dependent on continued listening to music?
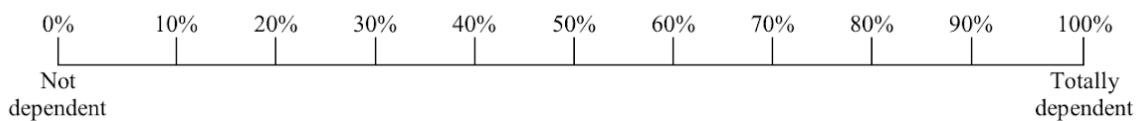
```
0%      10%     20%     30%     40%     50%     60%     70%     80%     90%     100%
```
Not   Totally
dependent   dependent

Appendix B

Adverse Childhood Experiences (ACEs)

Instructions: Below is a list of 10 categories of Adverse Childhood Experiences (ACEs). From the list below, please place a checkmark next to each ACE category that you experienced prior to your 18th birthday. Then, please add up the number of categories of ACEs you experienced and put the total number at the bottom.

1. Did you feel that you didn't have enough to eat, had to wear dirty clothes, or had no one to protect or take care of you?

2. Did you lose a parent through divorce, abandonment, death, or other reason?

3. Did you live with anyone who was depressed, mentally ill, or attempted suicide?

4. Did you live with anyone who had a problem with drinking or using drugs, including prescription drugs?

5. Did your parents or adults in your home ever hit, punch, beat, or threaten to harm each other?

6. Did you live with anyone who went to jail or prison?

7. Did a parent or adult in your home ever swear at you, insult you, or put you down?

8. Did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way?

9. Did you feel that no one in your family loved you or thought you were special?

10. Did you experience unwanted sexual contact (such as fondling or oral/anal/vaginal intercourse/penetration)?

Appendix C

Interview Questions

1. How much time do you spend daydreaming on a typical day?

2. How much time do you spend daydreaming on a high daydreaming day?

3. How much time do you spend daydreaming while in a moving vehicle?

4. How much time do you spend daydreaming when you are alone?

5. How much time do you spend daydreaming when you are in public?

6. How often do your daydreams include fictional characters or plots?

7. How often do your daydreams include people you do not personally know?

8. How often do you return to daydreams involving similar people or plots?

9. How often is the content of your daydreams positive or pleasurable?

10. How often is the content of your daydreams negative or disturbing?

11. How often are your current daydreams accompanied by physical activity?

12. How often were your childhood daydreams accompanied by physical activity?

13. How often are your current daydreams accompanied by vocal noises?

14. How often were your childhood daydreams accompanied by vocal noises?

15. How often do you confuse your daydreams with reality?

16. How difficult is it for you to keep your daydreaming under control?

17. How strong is the urge to return to a daydream that was interrupted?

18. How much influence do you have over the direction of your daydreams?

19. How strong is the urge to start daydreaming after waking up?

20. How difficult is it for you to stay on-task for something important while daydreaming?

21. How difficult is it for you to stay on-task for something boring while daydreaming?

22. How difficult is it for you to focus on what others are saying while you are daydreaming?

23. How annoyed do you feel when your daydreams are interrupted?

24. How distressed are you about the amount of time you spend daydreaming?

25. How distressed are you about your daydreaming in general?

26. How distressed are you by the content of your daydreams?

27. How ashamed are you to tell others about your daydreaming?

28. How distressed are you when you are unable to find time to daydream?

29. Would you rather daydream than be social or engage in hobbies?

Appendix C (cont.)

30. Does daydreaming add creativity to your life?

31. Do you find daydreaming comforting or enjoyable?

32. Does daydreaming help you deal with everyday life?

33. Is your life more interesting because of your daydreaming?

34. Does daydreaming interfere with your sleep?

35. Does daydreaming interfere with doing basic chores?

36. Does daydreaming interfere with your relationships?

37. Does daydreaming interfere with your academic or occupational goals?

38. Does daydreaming interfere with your life goals?

Effects of Absorption Training on Positive Activity Experiences for Individuals with Anhedonia: A Single Case Series

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Existing literature has suggested an association between being absorbed in activities and improved experience in activities in terms of better mood gain and reducing rumination. This single-case series aimed to collect methodological information and preliminary data for future trials regarding the effects of absorption training; a rumination-focused CBT component, on improving positive activity experiences among individuals with anhedonia using a multiple baseline design (*N*=16). There were no significant effects of absorption training found regarding the level of absorption, positive affect, and rumination during the positive activities which might be due to high baselines, limiting the effects of intervention. The effect sizes indicated that absorption training might have larger effects on improving absorption and reducing rumination than increasing positive affect during activities. In terms of suggestions for methodology, future clinical trials should target participants with higher levels of anhedonia using a larger and homogenous sample and provide higher-intensity training. It is also worth exploring whether absorption training has larger effects on specific types of populations such as clinically depressed individuals.

Keywords: absorption training, Rumination-focused CBT, absorption, positive activities, rumination

'A good life is characterised by complete absorption of what one does' (Nakamura & Csikszentmihalyi, 2009, p.195). Studies have suggested that being fully absorbed in activities is crucial to well-being and happiness (Csikszentmihalyi, 1990; Nakamura & Csikszentmihalyi, 2009; Tse et al., 2020). Specifically, the inability to be absorbed in pleasurable activities seems to prevent people from enjoying the associated benefits such as improving one's positive mood (Killingsworth & Gilbert, 2010; Lambert & Csikszentmihalyi, 2020; Watkins, 2016). For instance, Killingsworth and Gilbert (2010) found that individuals reported being less happy when their minds wandered regardless of how enjoyable the activities were. Furthermore, previous studies also raised the possibility that increased absorption in activities may counter rumination (Hvenegaard et al., 2019; Watkins et al., 2011; Watkins et al., 2012) which may interfere with an individual's ability to experience pleasure and rewards from positive activities (Watkins, 2016). This study sets out to explore the effects of Absorption Training (AT), a component of rumination-focused cognitive behavioural therapy (RFCBT), which aims to increase absorption, in improving the experiences of positive activities in terms of positive affect and rumination among individuals with anhedonia, as suggested by the literature.

Absorption and Positive affect

One potential benefit of increased absorption is improving positive affect (PA) gained from activities (Asakawa, 2004; Collin et al., 2008; Fullagar & Kelloway, 2009; Rogatko, 2007; Tse et al., 2020). Absorption is conceptualised as a flow experience that is associated with positive experiences and affect (Norsworthy et al., 2021). Flow, introduced by Csikszentmihalyi (1975), refers to a state of deep absorption in an activity (Csikszentmihalyi, 1999). This absorbing state is characterised by nine components such as simultaneous feelings of action-awareness merging, time transformation, complete concentration, a sense of control, a loss of self-consciousness, and an intrinsically rewarding experience (Csikszentmihalyi, 1990; Nakamura & Csikszentmihalyi, 2009). Furthermore, individuals possessing traits like curiosity and persistence may have higher tendencies to experience flow (Csikszentmihalyi, 1990; Nakamura & Csikszentmihalyi, 2009). According to Csikszentmihalyi (1990), through repeated experiences of flow from positive activities providing potential for growth such as sports or work, people's happiness and life satisfaction would increase (Csikszentmihalyi, 1999).

This association between flow and PA is supported by empirical studies (Asakawa, 2004; Collin et al., 2008; Fullagar & Kelloway, 2009; Rogatko, 2007; Tse et al., 2020). In Asakawa's (2004) experience-sampling study (ESS) of Japanese undergraduates' experiences of daily activities, participants' levels of PA, such as enjoyment, were the highest in the flow condition compared to feeling relaxed or apathetic. Similarly, more intense daily flow experiences were associated with higher daily PA in a diary study of US adults (Collins et al., 2008). However, it is worth noting that the causal relationship between flow and PA is not strongly established since most studies on the two are correlational (Asakawa, 2004; Collin et al., 2008; Tse et al., 2020).

Nevertheless, there is some indirect evidence regarding the causal relationship between flow and PA (Fullagar & Kelloway, 2009; Rogatko, 2007). For instance, the experimental study by Rogatko (2007) found that participants' levels of PA were higher after conducting high-flow than low-flow-inducing activities, yet, since flow and PA were measured simultaneously after the activities, the study could not conclude their temporal relationship. An ESS on architectural students doing studio work also found a positive association between the two and importantly, its time-lag analysis suggested flow preceded the changes in affect (Fullagar & Kelloway, 2009). Though more direct evidence regarding the causal relationship is required, these studies provide support that interventions that can increase absorption in positive activities may increase PA gain.

Absorption and Rumination

In addition to increasing PA, increased absorption may also reduce maladaptive rumination (Watkins et al., 2011; Watkins et al., 2012; Watkins, 2016). Rumination has been suggested as both a state response (Martin & Tesser, 1996) and a trait-like tendency (Nolen- Hoeksema, 1991) while maladaptive state rumination (MSR) is defined as the momentary thoughts of focusing on implications and causes of one's distress (Marchetti et al., 2018; Nolen-Hoeksema et al., 2008). Through repeated occurrences of goal discrepancies, MSR may develop into a habitual tendency of depressive rumination (Watkins & Nolen-Hoeksema, 2014) which is suggested as a transdiagnostic process of multiple mental disorders (Ehring & Watkins, 2008; Nolen-Hoeksema, 2000; Nolen-Hoeksema et al., 2008; Nolen-Hoeksema & Watkins, 2011; Watkins, 2008). Furthermore, maladaptive rumination may interfere with the ability to experience rewards from positive activities and contribute to anhedonia (Watkins, 2016), the reduced ability to experience pleasure in normally pleasurable activities (American Psychiatric Association, 2013). These hypothesised effects are supported by existing findings where the negative perception of feedback on one's performance might reduce flow level and its associated benefits such as better performance (Lambert & Csikszentmihalyi, 2020). Similarly, negative mind-wandering was associated with reduced pleasure while doing pleasurable activities (Killingsworth & Gilbert, 2010).

Encouragingly, increased absorption in activities is suggested to counter maladaptive rumination based on several theoretical principles (Watkins, 2016). First, it may shift the abstract processing style characteristic of depressive rumination to a more process-focused and concrete mindset (Dykman, 1998; Watkins, 2008, 2016; Watkins & Roberts, 2020). Additionally, being more immersed and connected in positive activities may counter rumination such as running commentaries that evaluate one's performance in mind and enhance individuals' ability to experience pleasure and rewards from the activities (Watkins, 2016). These theories support the hypothesis that interventions that increase absorption may reduce rumination during activities. However, it is important to note that these proposed effects have not yet been examined.

Absorption Training

Absorption Training, a component of RFCBT, was developed based on the theoretical and empirical evidence in the literature regarding the association between increased absorption on improving PA and reducing maladaptive rumination. RFCBT is a treatment for residual depression by targeting depressive rumination in which absorption is conceptualised as a flow experience (Watkins, 2016). Specifically, AT involves a mental imagery exercise of using a memory of being absorbed in activities to help individuals recapture the experience of being in an absorbed state of mind. Through daily practice, it aims to help participants activate the absorbed mindset more easily during positive activities (Watkins, 2016). It is suggested that by doing more positive activities with an absorbed state of mind, the training can reduce rumination by facilitating a shift to a more helpful absorbed mindset and counter the running commentary that evaluates one's performance during activities (Watkins, 2016). Moreover, it may also help individuals improve their PA by better connecting them with the experiences and rewards of positive activities (Watkins, 2016) based on the suggested association between flow and PA in existing research.

Nevertheless, these proposed effects of AT on absorption, PA, and rumination are yet to be examined. There is indirect evidence of its effects on rumination where previous trials demonstrated that RFCBT has been effective in reducing depressive rumination (Hvenegaard et al., 2019; Watkins et al., 2011; Watkins et al., 2012). Yet, these trials did not examine AT as an isolated component (Hvenegaard et al., 2019; Watkins et al., 2011) and its effects on improving individuals'

experiences of positive activities have not been tested. Previous studies have found that concrete mental imageries of positive memories may increase positive mood (Werner-Seidler & Moulds, 2012), and cognitive training using positive mental imageries may reduce anhedonia in daily activities among depressed individuals (Blackwell et al., 2015). It is yet to be examined whether mental imagery of an absorbing memory can induce an absorbed mindset in positive activities in the present and thus improve the experiences. Hence, studies examining AT as an isolated component are needed to better understand such effects (Hvenegaard et al., 2019; Watkins et al., 2011). Additionally, experimental methodological information is required for examining AT's effects in future clinical trials.

Current Study

The study will explore the effects of absorption training. Its first aim is to use a single case series (SCS) to explore the effects of absorption training in improving individuals' experiences of positive activities based on their levels of absorption (flow), positive affect, and maladaptive state rumination. Specifically, this study targets individuals with anhedonia and examines AT's effects on their experiences of positive activities. The second aim is to collect methodological information for designing future clinical trials.

The hypotheses are as follows: Participants' level of absorption while completing their selected activities will be higher after the introduction of AT compared to baseline (H1). Based on the association between increased absorption on PA and rumination (Asakawa, 2004; Csikszentmihalyi, 1990; Watkins, 2016), it is also hypothesised that while conducting AT, participants will gain more PA from doing their selected activities (H2) and their levels of MSR in selected activities will decrease (H3).

To explore these, this SCS will adopt a multiple baseline design (MBD) to evaluate AT's effects on each participant individually. MBD involves using a baseline period as a control for each individual and introducing intervention at varying baseline lengths. The intervention effects are then explored within the individual and across the participants (Morley et al., 2015). Specifically, this study will take repeated daily measurements of participants' levels of absorption, PA, and MSR in positive activities during the baseline and AT phases and introduce AT to the participants at varying lengths of baseline from seven to fourteen

days (Tanious & Onghena, 2019). The changes in the three variables after the introduction of AT will then be examined. As a preliminary study with resource constraints, a single-case experimental design (SCED) allows detailed and individualised data to be collected with fewer resources, such as not requiring a control group. (Morley et al., 2015; Tanious & Onghena, 2019). Furthermore, by evaluating the intervention effects across multiple participants concurrently within the same general period with the intervention being introduced at various time points, the MBD can increase the likelihood that the changes in the three variables are due to the effects of AT instead of factors such as history, cohort effect, and regression to mean (Morley et al., 2015; Onghena, 2020). Additionally, participants' tendencies to experience pleasure, flow, and maladaptive rumination will be measured.

Method

Participants

Forty-one individuals were recruited through the University of Exeter research platform, SONA, (*N*=16), and snowball sampling on the messaging platform – WhatsApp (*N*=25). Inclusion criteria included individuals aged 18 or above in the UK with access to electronic devices and reporting at least mild levels of anhedonia by scoring 1 or above on the Snaith-Hamilton Pleasure Scale (Snaith et al., 1995). Twenty-five individuals were found eligible after screening and four were unavailable during the study, yielding a final sample of twenty-one participants.

Five participants were excluded from the data analysis since four were unable to carry out the planned activities three times per week and one reported having issues with AT, discontining practice. The remaining 16 participants were included in the analysis. See Table 1 for participants' demographic details. All participants provided written informed consent and received reimbursement of £30 Amazon voucher upon completing the study. The study was approved by the University of Exeter Psychology Research Ethics Committee.

Design

The single case series aimed to explore the effects of absorption training on the experiences of positive activities in terms of absorption, positive affect, and maladaptive state rumination for individuals with anhedonia. A multiple baseline design was employed with participants randomly assigned by an

algorithm using their assigned anonymized participant identifier to varying baseline lengths ranging from 1 to 2 weeks before conducting the AT which lasted for 7 to 14 days. The baseline lengths allowed sufficient time for obtaining a stable baseline which can minimize the effects of confounds such as maturation (Carr, 2005), and sufficient data to explore intervention effects where participants conducted their chosen activities for a minimum of three times in both the baseline and intervention periods.

Materials and Measures

Screening and Dispositional Measures

Individuals who were interested in joining the study completed the screening measure in the online survey during recruitment. The dispositional measures (Dispositional Flow Scale – 2 and Ruminative Response Scale – Short Form) were sent to eligible individuals via email. Participants were required to complete the dispositional measures either before or during the first meeting with the researchers.

Snaith-Hamilton Pleasure Scale (SHAPS; Snaith et al., 1995). The SHAPS is a 14-item self-report measure of the ability to experience pleasure (e.g., I would find pleasure in my hobbies and pastimes) using a 4-point scale (0 - disagree to 3 - strongly agree). Higher total scores indicate lower tendencies to experience pleasure (range 0 to 14). The scale has shown good criterion validity and satisfactory internal reliability, yielding a Kuder-Richardson score of 0.857 (Snaith et al., 1995). It was used as a screening measure to include individuals reporting elevated levels of anhedonia (scored 1 or above).

Dispositional Flow Scale – 2 short form (DFS-2 SF; Jackson et al., 2008). The DFS-2 SF is a 9-item self-report instrument that assesses the tendency of experiencing flow in a target activity (e.g., I am completely focused on the task at hand) using a Likert scale from 1(never) to 5 (always). The scale has shown acceptable internal consistency (α=.77) and good construct and divergent validities (Jackson et al., 2008). Its instruction was modified in this study to target frequencies of flow experiences in 'all daily activities' instead of in a specific activity.

Ruminative Response Scale – Short Form (RRS-SF; Treynor et al., 2003). The RRS-SF is a 10-item, 4-point Likert scale (1 - almost never to 4 - almost always) self-report measure of ruminative tendencies in response to sad and depressive moods. Higher total scores suggest higher tendencies to ruminate (range 10 to 40). It has two subscales – brooding and reflection with brooding suggested as the most pathological rumination (Treynor et al., 2003). Hence, five items from the Brooding subscale which has shown satisfactory internal consistency (α=.77) (Treynor et al., 2003) were administered at the start of the study (e.g., When you feel sad, down, or depressed, how often do you think "Why can't I handle things better?") to assess participants' maladaptive ruminative tendency.

Daily Survey

Throughout the 21-day study, participants were prompted to complete a daily survey once via email or text messages at their preferred time before midnight with questions assessing their levels of absorption, PA, and MSR in positive activities stemming from the validated scales below.

Flow State Scale. The 36-item, 5-point Likert scale (1 - strongly disagree to 5 -strongly agree), Flow State Scale (FSS; Jackson & Marsh, 1996) is a self-report instrument that assesses the situational-specific experience of flow with a satisfactory internal consistency reported (α =.83) (Jackson & Marsh, 1996). Six items from the FSS (e.g., 'When doing the activity, time seemed to alter 'either slowed down or speeded up') measuring absorption-related dimensions - complete concentration, time distortion, loss of self-consciousness, action-awareness merging, autotelic experience (Norsworthy et al., 2021) were included in the daily survey to assess AT's effects on participants' levels of absorption in activities.

Positive Affect. The impacts of AT on participants' PA in activities were assessed by the item 'Doing this activity improved my positive mood' using a Likert scale from 1 (strongly disagree) to 5 (strongly agree).

Brief State Rumination Inventory. The Brief State Rumination Inventory (BSRI; Marchetti et al., 2018) is an eight-item self-report measure of MSR in response to negative mood using a visual analogue scale from 0 (completely disagree) to 100 (completely agree). Higher total scores represent higher degrees of MSR (range from 0 to 800). It has shown high internal consistency (α=.91) and good construct and criterion validities (Marchetti et al., 2018). Five items that correlate positively with the RRS Brooding subscale (Treynor et al., 2003) were included in the daily survey (e.g., 'When doing the activity, it is hard for me to shut off negative thoughts about myself ') to assess whether

AT can reduce participants' level of MSR in activities.

Activities Planning

During the first meeting, participants were guided to select a positive activity to undertake during the study. Specifically, they were first guided to consider a few suitable positive activities. The selection criteria are any activities (1) that they found positive, (2) they could get absorbed in doing, (3) they enjoy doing the activities and would like to do more of them and (4) they could get distracted sometimes and found it hard to engage in the activities. They then selected one planned activity they would like to undertake three times per week and scheduled the time to do it during the study.

Absorption Training

The AT was tailored to the participants' planned activities with a training session followed by daily practices. First, a training session guided by the AT manual was conducted   where participants were first guided to identify a memory of being absorbed in the planned activity according to the flow criteria (Csikszentmihalyi, 1990). Participants were then prompted to imagine themselves in the memory and describe their sensory-perceptual experiences, such as body sensations, smell, and sounds. Next, a mental imagery exercise was conducted to help participants recreate that absorbing experience with the researcher prompting them to recapture the sensory-perceptual experience using the participants' descriptions of the experience. The exercise was recorded while being conducted. After the exercise, the researcher checked whether the participants had a positive experience by asking about their feelings or levels of energy. Participants were then instructed to conduct and schedule the daily practice. Following the session, participants received the audio recordings of the exercise via email or text messages and practiced activating the absorbed mindset by listening to the audio recordings daily.

Procedure

The study targeted individuals who wanted to improve their engagement and performance in activities that they enjoy by advertising on SONA or WhatsApp. Individuals interested in participating clicked on the SONA or WhatsApp link, directing them to an online survey. In the survey, participants first read an information sheet about the study and were told it would investigate whether a mental strategy can improve their moods and performance in pleasurable activities. Those who gave their informed consent to participate could continue with the survey. They then completed the screening measure and were instructed to create their anonymized identifier at the end of the survey. Individuals eligible for the study were later contacted within 48 hours via email or text messages with the link to the baseline measures and arranged a meeting with the researchers. Individuals not eligible were notified and received a debriefing form via email. The participant identifiers of the eligible individuals were sent to the research supervisor via email and were allocated to various baseline lengths using an algorithm by the research supervisor. The researchers were then notified of the randomization results via email.

During the 21-day study, participants completed three meetings with the researchers via video conferencing to encourage participation throughout the study and allow the researchers to make adjustments promptly if participants raised any concerns regarding conducting the planned activities and AT during subsequent meetings. In the first meeting, participants first completed the baseline measures on dispositional flow, trait rumination, and demographic questions followed by an explanation of the study's requirements by researchers and activity planning.

Following the meeting, participants conducted the planned activities a few times per week and recorded their experiences over the 21 days by completing a daily survey as instructed. Participants received the link to the survey once on the online survey tool, Qualtrics, via email or text messages daily at their preferred times and completed it before midnight. Following the baseline period ranging from 1 to 2 weeks, a second meeting was arranged where AT was introduced. Afterward, participants practiced AT daily alongside doing the planned activities and the daily survey until the third meeting. At the end of the study, a third meeting was conducted to review the effects of AT and debrief the participants. Lastly, participants received the reimbursement (£30 vouchers) via email.

Data Analysis

Visual analysis of participants' data on graphical plots (Morley, 2015) and statistical analyses using the RcmdrPlugin.SCDA plug-in package for R software (Bulté & Onghena, 2013) was performed.

To determine the statistical significance of the results, a non-parametric significance test – randomization test (RT), which requires arrangements of intervention being randomized, was used since repeated

measurements of each participant in SCED might result in autocorrelation and violate parametric assumptions (Heyvaert & Onghena, 2014; Tanious & Onghena, 2019). RT was performed for each participant to obtain the individual p-value for AT's effects on absorption, PA, and MSR. The combined p-values were computed from the meta-analyses of individual p-values using Pearson's method (1934) (Bulté & Onghena, 2013).

Regarding effect sizes calculation, the non-parametric effect size index – percentage of data exceeding the median (PEM) which calculates the proportion of data points during the AT phase that exceeds the median of baseline data (Ma, 2006) was used for computing individual effect sizes for the three variables. PEM smaller than 0.7, between 0.7 and 0.89, and between 0.9 and 1, represent questionable, moderate, and high effectiveness (Ma, 2006). The overall effect sizes were computed by taking the average of all individual effect sizes.

Data of participants who did not complete the planned activities and surveys at least three times in both the baseline and intervention periods and did not conduct AT during the intervention period at least three times were excluded from the data analysis.

Results
Statistical Analysis: Randomization Test and Effect Size Calculations

A non-parametric significance test – RT (Tanious & Onghena, 2019) was used to examine whether AT can increase participants' levels of absorption and PA and reduce their level of MSR in the planned activities. The effect sizes regarding the three outcomes were calculated using the index – PEM (Ma, 2006).

The results showed that there were mean increases in absorption (0.38 points) and PA (0.35 points) and decreases in MSR (-30.29 points) after the introduction of AT among the participants. Medium effect sizes were found for the changes in absorption (79.70%) and MSR (77.06%) and a small effect size was found for PA (49.75%) (Table 2). However, the RT indicated that the changes were not significant (p > 0.05).

Regarding the effects of AT on non-planned activities, only three participants conducted the non-planned activities at least twice in both baseline and AT phases. The amount of data collected was limited for conducting a significant statistical analysis.

Visual Analysis

The impacts of AT on participants' experiences of positive activities in this SCS was also examined by visual inspection of the multiple-baseline data in graphical plots concerning the changes in level and trend (Morley, 2015) of absorption, PA, and MSR while doing positive activities across the baseline and AT phases. Data representing the daily scores reported by each participant regarding the three variables during the planned and non-planned activities are presented in Figures 1, 2, and 3 respectively.

Regarding the change in absorption, the daily scores reported for most of the baseline periods were stable. Seven participants showed an increase in absorption after the introduction of AT and four exhibited a slight upward trend continuously. However, the scores of nine participants reflected no change during the AT phase.

Regarding the change in PA, most baseline periods were stable while one participant showed a pattern of decrease. Three participants showed an increase in PA gained after the introduction of AT while one continued to show an upward trend; the level of PA remained stable for the other two participants during the AT phase. Five participants showed no change and conclusions could not be drawn for seven participants due to unstable scores across both phases. One participant's level of PA decreased contrary to the hypothesis.

Regarding the change in MSR, most of the baseline scores were stable or decreasing. After the introduction of AT, three participants exhibited decreases in MSR levels compared to baseline. Ten participants showed no obvious change during the AT phase. Conclusions cannot be drawn for three participants due to unstable scores across both phases.

The visual inspection results were consistent with the RT results for each individual, indicating that there were no significant effects of AT on the three variables shown.

Dispositional Tendencies

Participants reported tendencies to experience flow, pleasure, and rumination. Participants reported moderate tendencies to experience flow (Mean: 2.84, SD: 0.58). The tendencies to experience pleasure (scores ranging from 1 to 14) and rumination (scores ranging from 8 to 20) varied across participants (Table 3).

Discussion

To our knowledge, this single case series is the first to explore the effects of absorption training on

improving the experiences of positive activities among individuals with mild levels of anhedonia. This preliminary study also aimed to collect methodology information for future clinical trials. It is hypothesized that AT can improve absorption and positive affect and reduce maladaptive state rumination experienced during the planned positive activities. Although there were expected increases in absorption and PA and a decrease in MSR shown after AT was introduced, the results indicated that the effects of AT were not significant.

Absorption

Analyses did not show a strong effect of AT on increasing participants' absorption levels during planned activities. This contrasts with the proposed effects of AT where by practicing getting into the absorbed state daily using a mental imagery exercise of an absorbing memory, individuals will be more likely to activate an absorbed mindset during activities (Watkins, 2016). Methodological issues could have contributed to the results, such as participants reporting fairly positive experiences in the planned activities and varied levels of anhedonia at baseline, and the effectiveness of training sessions and daily practice were not monitored. Methodological issues will be discussed further in later sections. Moreover, the medium effect size found for changes in absorption could mean that a larger effect may be found in larger samples.

Positive Affect

Questionable effects of AT on improving PA gained from doing the planned activities were also indicated by the results. Another proposed effect of AT is that by better connecting individuals with the experiences and rewards of positive activities and improving their abilities to experience pleasure with increased absorption, there will be improved positive mood gain (Watkins, 2016). The proposed effect is supported by previous findings demonstrating individuals' PA increased during flow despite their causal relationship not being strongly established (Asakawa, 2004; Collin et al., 2008; Fullagar & Kelloway, 2009; Rogatko, 2007; Tse et al., 2020). The study's results could be due to the negligible increase in absorption among participants after the introduction of AT being insufficient to improve participants' PA. Furthermore, only a small effect size was found which may be explained by only one item being used to measure the changes in PA. Single-item measures could be more prone to random error and are less able to capture different facets of PA

(Sarstedt & Wilczynski., 2009). Moreover, nine participants reported a median of four on the item's 5-point scale at baseline meaning only reporting the highest point of the survey during the AT phase would pass the thresholds for effect size calculations. To address these issues, future studies could use multiple-item measurements such as the Positive and Negative Affect Schedule scale (Watson et al., 1988) which measures different types of PA and has shown high sensitivity to momentary fluctuations of mood (Watson et al., 1988).

Maladaptive State Rumination

Similarly, no particular effects of AT on reducing the MSR experienced by participants during the planned activities were shown. Existing literature suggested AT may reduce rumination by getting individuals immersed in the process of the activities instead of evaluating their performances and inducing the concrete absorbed mindset to counter the ruminative thinking style (Watkins, 2016). Likewise, the result could be due to the increase in absorption in this study following AT being insufficient to counter rumination. Previous findings demonstrated that RFCBT, with AT as a component, was effective in reducing depressive rumination (Hvenegaard et al., 2019; Watkins et al., 2011; Watkins et al., 2012). However, it is important to note that previous RCTs had higher intensities of treatment with multiple therapy sessions. Nevertheless, the medium effect size found suggested that future studies with improved design may detect a stronger effect.

Methodological Limitations and Suggestions

This study has identified methodological information that may be valuable for future large-scale trials. First, the effects of AT shown might be limited by high levels of absorption and PA and low levels of MSR reported at baselines. As this study targeted activities that participants found enjoyable and potentially absorbing, participants might have high activity-specific tendencies to experience flow and PA in these activities despite exhibiting generally mild levels of anhedonia. As previous findings indicated, the results of dispositional measures are not the same as aggregated assessments of momentary trait-relevant behaviour (Augustine & Larsen, 2012). Targeting dispositional tendencies within a particular context such as participants' tendencies to experience flow in a specific activity may better predict participants' experiences than a general dispositional measure (Jackson et al., 2008). Thus, to obtain the desired baseline

levels of the three variables to better examine AT's effects, future studies could use measures assessing participants' activities-specific flow propensity such as the DFS-SF (Jackson et al., 2008) during activities selection to select relatively low-flow inducing activities.

Second, the participants reported varied levels of anhedonia (ranging from 1 to 14). It could be possible that the intensity of AT in this study was insufficient to improve the experiences of positive activities for individuals with high levels of anhedonia. To better explore AT's effects in a population with anhedonia and target individuals with less positive experiences in activities, future studies could include a larger and more homogenous sample of individuals with higher levels of anhedonia; those scoring 3 or above, the cut-off score for anhedonia, in SHAP (Snaith et al., 1995). It may also be useful to explore AT's effects in specific types of population such as those with higher ruminative tendencies.

Third, the study did not monitor the effectiveness of the training session which may impact the intervention outcomes. Mental imagery research has found that higher levels of imagery vividness reported in the training session led to greater reductions in depression symptoms (Blackwell et al., 2015). Although researchers had checked participants' moods or levels of energy after the training session, participants' responses might have been subject to demand characteristics where they overstated the training's effects (Nichols & Maner, 2008). To limit the impacts of demand characteristics and assess the effects of the training session, future studies should administer validated scales such as the FSS (Jackson & Marsh, 1996) to assess participants' level of state flow during the training session.

Fourth, the adherence rates of daily practice were low and only three participants completed the daily practice. Though the impacts of the frequency of daily practice on AT's effects are uncertain due to the small sample size, large effect sizes were found for some changes in absorption, PA, and MSR among participants who completed the AT daily suggesting the impacts of frequency daily practice may be worth exploring. Moreover, there was no measurement of active engagement during the daily practice such as how absorbed participants were. Previous evidence suggested more active engagements with the intervention had led to better treatment outcomes in mental imagery intervention (Blackwell et al., 2015). To examine whether AT could have larger effects, future studies should

require higher completion rates (80%) of daily practice and include measures to monitor the effectiveness of daily practice such as participants' levels of absorption.

Fifth, the study only lasted for a short period with a single training session and a daily practice period of 7 to 14 days. A study examining RFCBT reported latency of treatment effects where the effects only showed within two to six weeks after initiation of treatment (Watkins, 2007). Subsequent RCT also indicated significant treatment effects on reducing depressive rumination resulting from 12 to 16 sessions of RFCBT (Hvenegaard et al., 2019; Watkins et al., 2011; Watkins et al., 2012). Despite this study being conducted in a non-clinical context, a longer period allows potential latency effects to be shown and more data collection. Moreover, multiple sessions may be required to provide more training according to the participants' progress (Blackwell et al., 2015). To improve the training's quality, a longer study period with more than two weeks of daily practice and multiple training sessions may be beneficial.

Sixth, the duration of activities conducted by participants, which might affect their level of absorption, was not recorded. Previous research has suggested that a sufficiently long period may be required to enter into flow (Copperstone, 2004; Rogatko, 2007). For instance, Rogatko (2007) found a positive association between PA and high-flow-inducing activities that were conducted for one hour. In contrast, Copperstone (2004) found no significant improvements for flow components such as time distortion, loss of self-consciousness, and action-awareness merging among counselors in a 10-minute psychotherapy session after receiving flow training. However, it is important to note that the flow training was different from AT and the study by Copperstone (2004) targeted psychotherapy sessions instead of pleasurable activities. Nevertheless, future studies can require participants to conduct the activities for longer periods such as 30 minutes, and examine whether AT's effects would increase.

Lastly, without a control group, this study's results can be attributed to other factors such as history, cohort effect, or regression to mean instead of AT (Morley et al., 2015; Onghena, 2020). Although the MBD could arguably reduce the possibility that the results were influenced by these factors (Morley et al., 2015; Onghena, 2020), future group studies should include control groups to better examine the effects of AT.

Implications and Future Directions

This study indicated that AT warrants further studies with refined methodology. In terms of practice implications, the study raised the possibility that it may benefit individuals who want to improve their experiences in positive activities. However, this assumption requires caution since no strong evidence regarding the effects of AT was found. Nevertheless, nearly all participants reported expected changes in absorption, PA, and MSR, and the medium effect sizes for absorption and rumination were found. This suggested that stronger effects of AT may be found particularly regarding the absorption and rumination in studies with larger sample sizes and refined methodology.

Apart from methodological issues, there are several issues future studies should address. First, it is crucial to explore whether dispositional tendencies to experience rumination, flow or pleasure may influence AT's effects. Stratification of intervention recipients is crucial in examining interventions' effects, which enables early prediction of recipients' response patterns and allows interventions to be tailored to the individual (Fu et al., 2013).

Furthermore, AT's effects on depressed individuals are also worth exploring. Previous evidence found that concrete mental imagery of positive memories can improve mood in depressed individuals (Werner-Seidler & Moulds, 2012). Similarly, AT, a mental imagery exercise recapturing the sensory-perceptual experiences in absorbing memory, may induce an absorbed mindset in positive activities (Watkins, 2016). However, depressed patients were found to have reduced vividness when generating mental imagery of positive memories (Werner-Seidler & Moulds, 2011) and were more prone to compare their current states with the positive memories (Holmes et al., 2016; Rimes & Watkins, 2005; Treynor et al., 2003; Watkins, 2008). These findings indicate that evidence of AT in a non-clinically diagnosed population may not be directly transferable to depressed individuals and a higher intensity of AT interventions may be needed for the clinical population.

Conclusion

In conclusion, this preliminary study is the first to examine the effects of absorption training of rumination-focused CBT in improving experiences of positive activities for individuals with anhedonia, which could be a new application of mental imagery exercises apart from those evidenced in the existing literature.

The effect sizes indicated that absorption training might have stronger effects on improving absorption and reducing rumination than increasing positive affect in activities. Future studies can further explore whether it can benefit individuals to improve their experiences in positive activities for both clinical and non-clinical populations. Additionally, several methodological issues merit consideration in designing future trials, such as high benchmark levels of absorption, rumination, and positive activities in activities at baseline, varied levels of anhedonia reported, and uncertain effectiveness of training components. To refine the methodology and better conclude the effects of absorption training, future studies should target larger and homogenous samples with higher levels of anhedonia and their experiences of low flow-inducing activities. Future studies should also provide higher-intensity training such as having multiple training sessions, requiring more frequent daily practice, and monitoring participants' training progress. As for stratification of intervention recipients to better understand which group will benefit the most from absorption training, exploring whether the effects of absorption training would vary among individuals with different dispositional tendencies such as those with high rumination tendencies and depressed individuals could be beneficial for future intervention development.

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Table 1

Demographic data for participants

	Gender	Age	Ethnicity	Education level
Participant 1	Female	18 - 30 years old	Black	Bachelor's degree
Participant 2	Female	45 + years old	White	Trade/technical/vocational training
Participant 3	Male	18 - 30 years old	Asian	High school/college graduate, diploma or equivalent
Participant 4	Female	18 - 30 years old	White	Bachelor's degree
Participant 5	Male	45 + years old	White	Less than high school
Participant 6	Male	18 - 30 years old	Black	Bachelor's degree
Participant 7	Male	18 - 30 years old	Black	Bachelor's degree
Participant 8	Male	18 - 30 years old	White	Bachelor's degree
Participant 9	Female	18 - 30 years old	Black	Bachelor's degree
Participant 10	Female	18 - 30 years old	Asian	Master's degree
Participant 11	Female	30 - 45 years old	Other ethnic group	Master's degree
Participant 12	Male	18 - 30 years old	Mixed	Bachelor's degree
Participant 13	Female	18 - 30 years old	White	Master's degree
Participant 14	Male	18 - 30 years old	Mixed	Bachelor's degree
Participant 15	Female	18 - 30 years old	Asian	High school/college graduate, diploma or equivalent
Participant 16	Female	18 - 30 years old	Asian	Master's degree

Table 2

Scores at baseline and during absorption training for 16 participants

Outcomes[d]	Score				Analysis		
	Baseline		Absorption training		Mean difference in change of scores[a]	p-value[b]	Effect size (PEM)[c]
	Mean	SD	Mean	SD			
Absorption[e]	3.33	0.36	3.71	0.30	0.38	0.12	79.70%
Positive Affect[f]	3.45	0.56	3.80	0.54	0.35	0.18	49.75%
Rumination[g]	134.86	46.49	104.56	31.51	-30.29	0.96	77.06%

Note. PEM, the percentage of data points exceeding the median

[a]Test statistics used in randomization test: mean difference of change in scores from AT to baseline phases (AT-baseline) of all participants

[b]combined p-values computed by meta-analysis of individual p-values with the multiplicative approach using Pearson's method (1934) in RcmdrPlugin.SCDA plug-in (Bulté & Onghena, 2013)

[c]Average effect size for all participants. PEM: <70% reflects questionable effectiveness. 70% to 89% reflects moderate effectiveness. 90% or above suggests large effects (Ma, 2006)

[d]Average scores from daily survey questions – *Baseline phase*: Questions 4-9[e]; Questions 15[f]; Questions 10-14[g]; *Absorption training phase*: Questions 5-10[e]; Questions 16[f]; Questions 11-15[g]

Table 3

Participants' dispositional tendencies to experience rumination, flow, and pleasure

	Scores		
	RRS-SF (scores range from 5 to 20)	**DFS-2 SF** (scores range from 1 to 5)	**SHAPS** (scores range from 0 to 14)
Participant 1	11	2.44	12
Participant 2	12	3.00	3
Participant 3	9	3.11	5
Participant 4	14	4.22	2
Participant 5	10	2.56	1
Participant 6	12	2.00	8
Participant 7	13	3.33	9
Participant 8	8	3.00	7
Participant 9	10	2.00	14
Participant 10	11	3.67	1
Participant 11	9	2.78	3
Participant 12	12	2.89	7
Participant 13	20	1.78	10
Participant 14	10	2.78	5
Participant 15	10	3.22	1
Participant 16	14	2.67	12
Mean Score for all participants	11.56	2.84	6.25
SD	3.61	0.58	4.66

Note. RRS-SF, Ruminative Response Scale – SF; DFS-2 SF, Dispositional Flow Scale – 2 short form; SHAPS, Snaith-Hamilton Pleasure Scale.
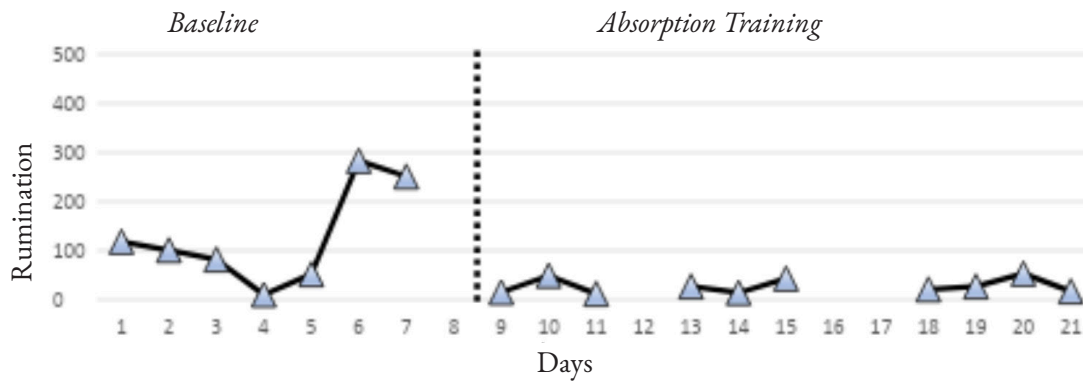
Figure 1

Sixteen participants' levels of absorption during positive activities in a 21-day period
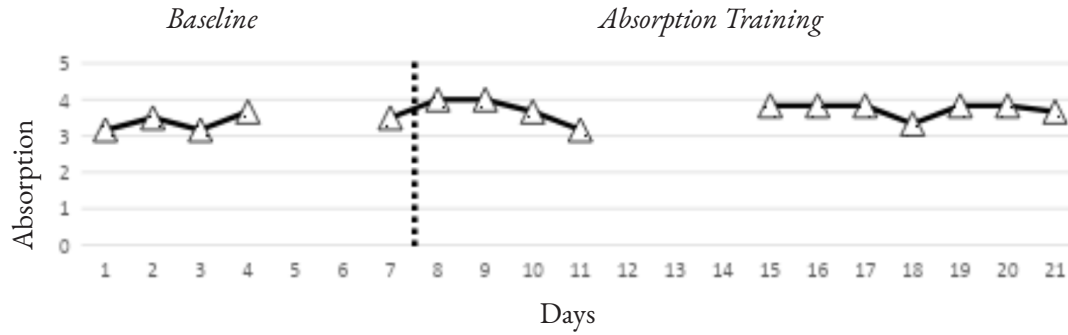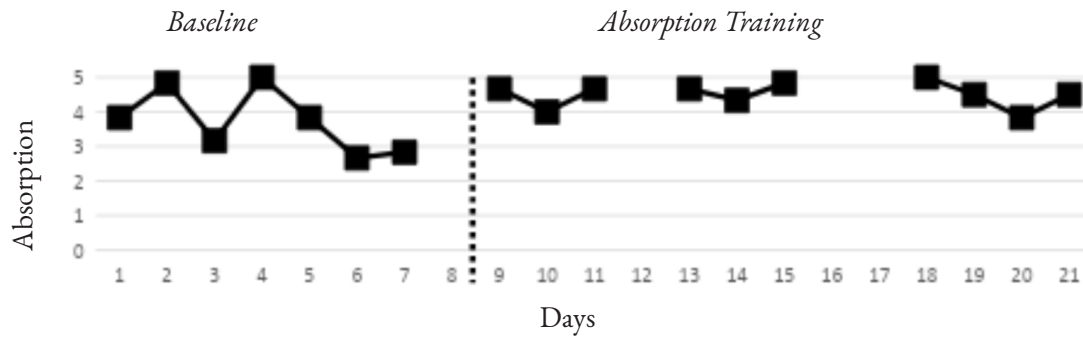
Participant 1
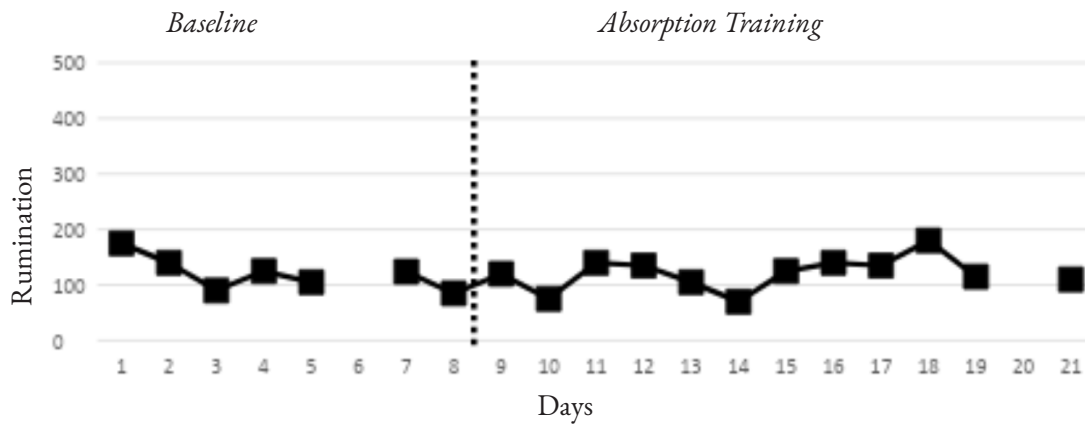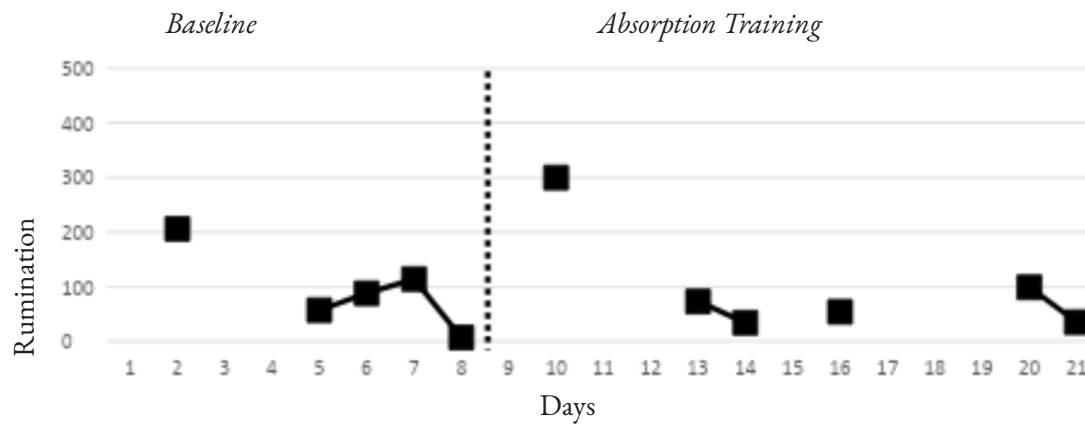

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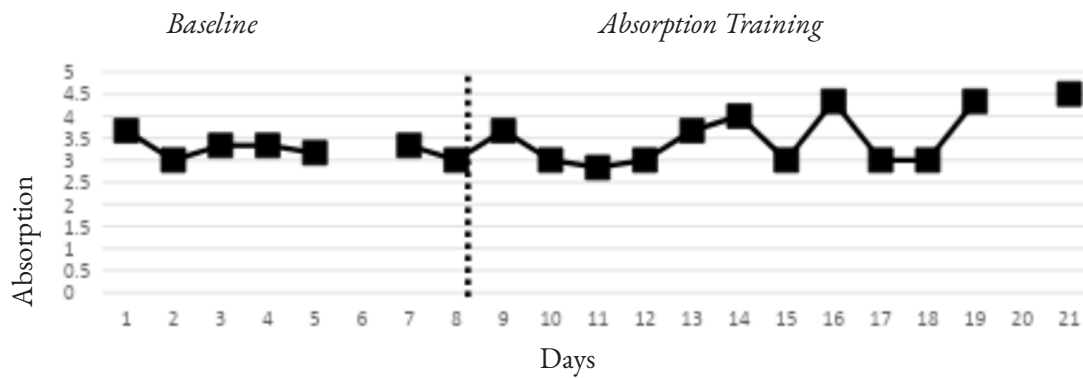
Participant 3

Note. The vertical dotted line is the point of transition from baseline to introduction of absorption training.
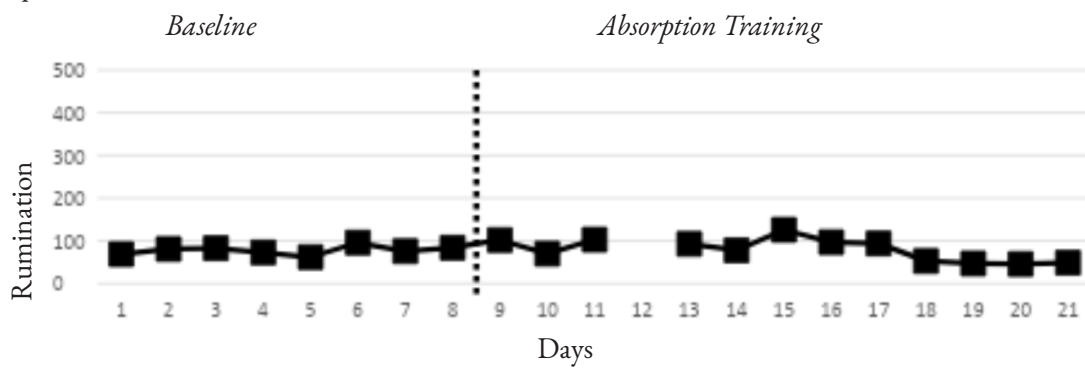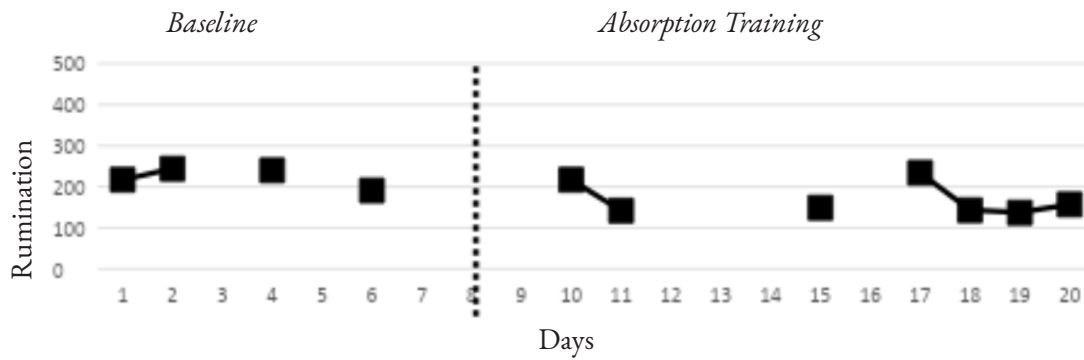
Figure 1 (cont.)
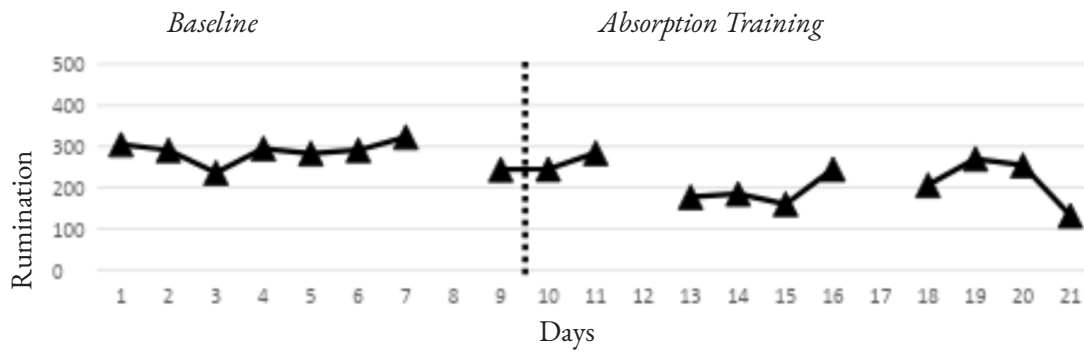
Participant 4
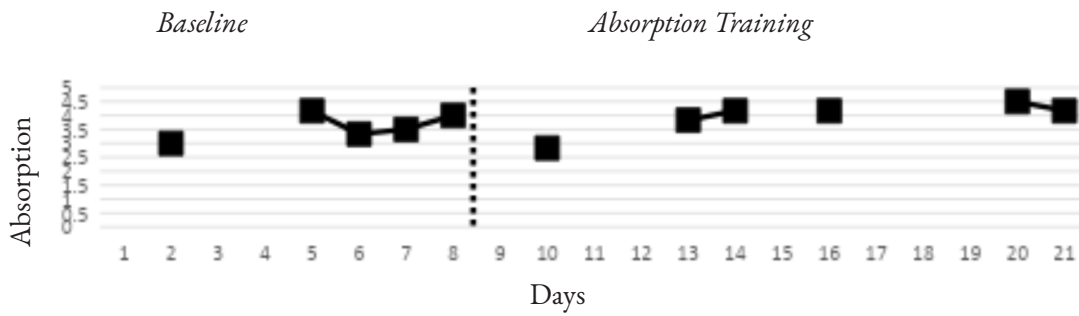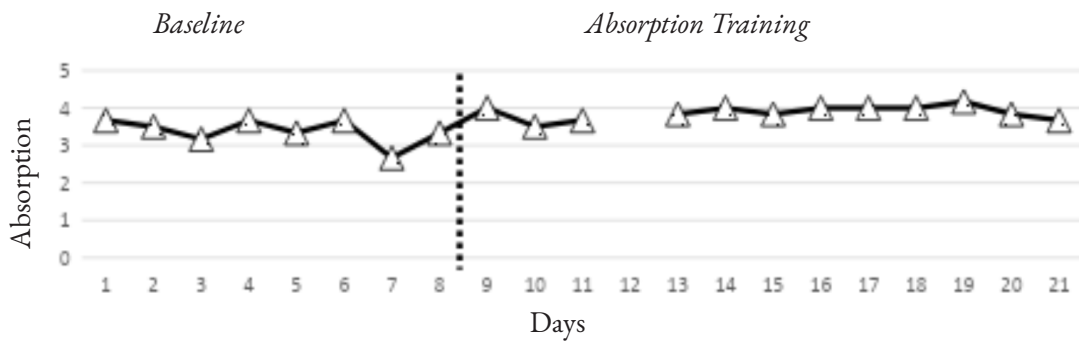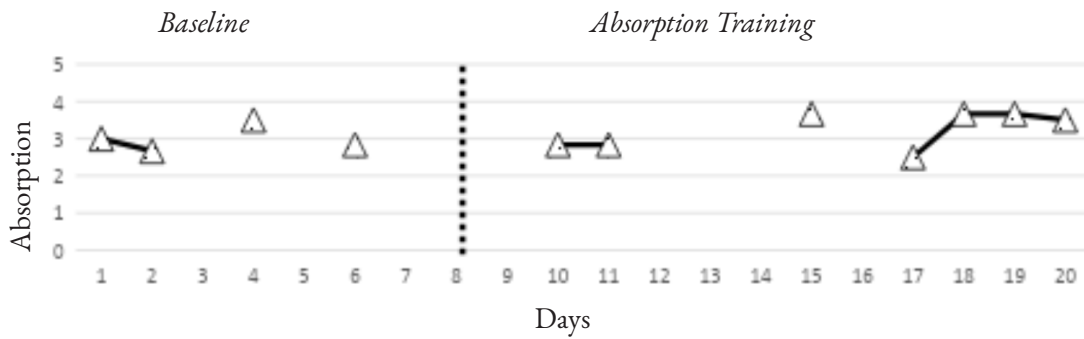
Participant 5

Participant 6

Figure 1 (cont.)
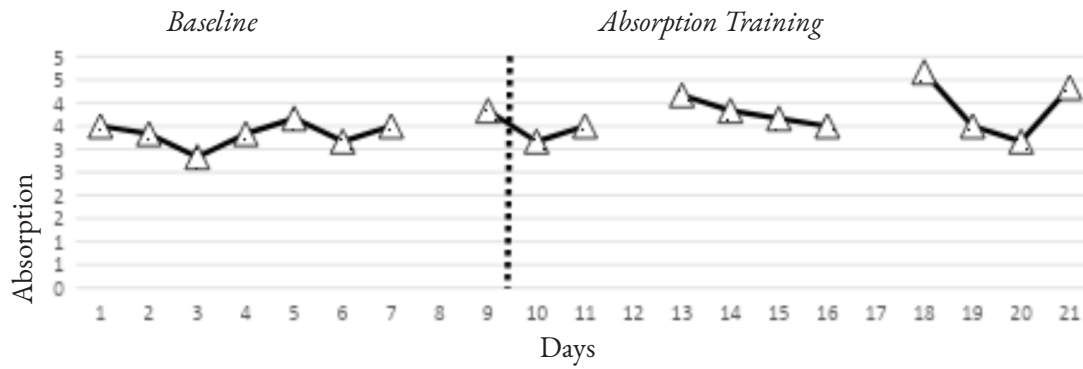
Participant 7
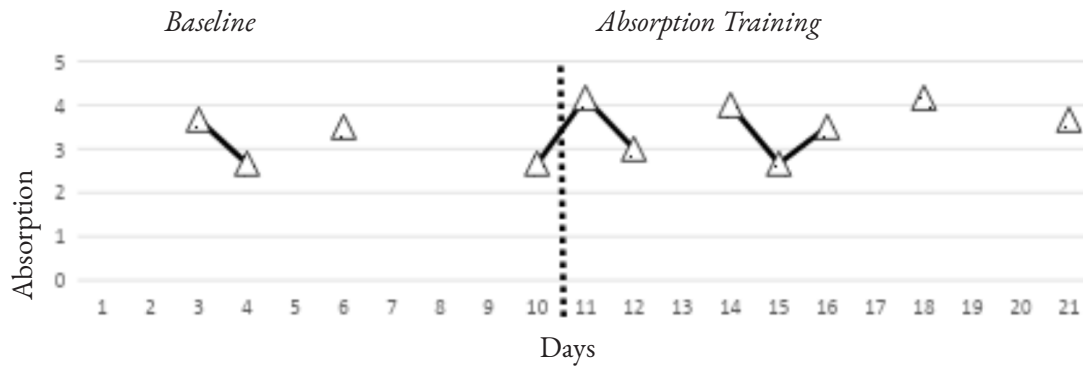
Participant 8

Participant 9

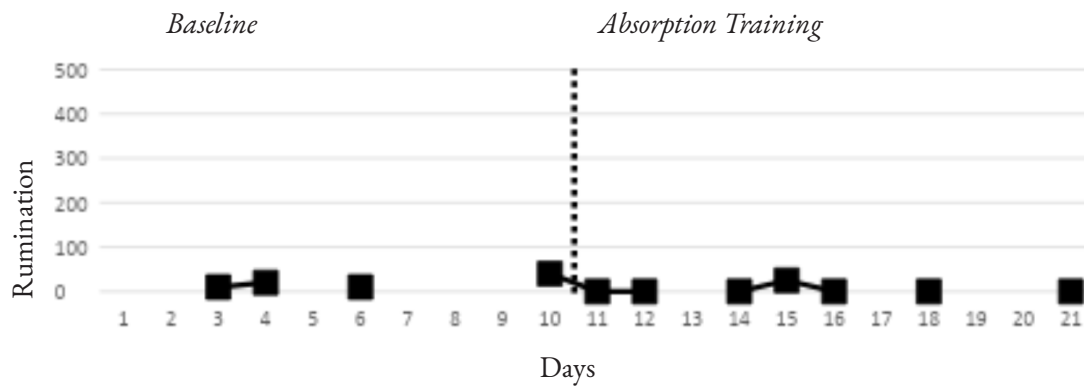**Figure 1 (cont.)**
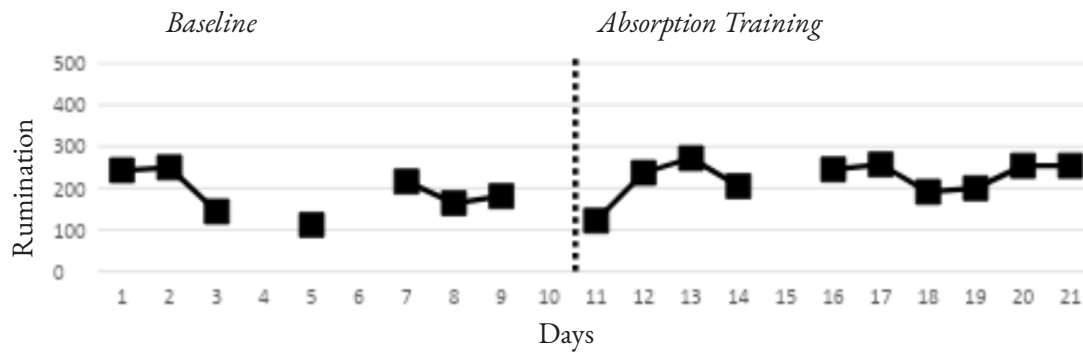
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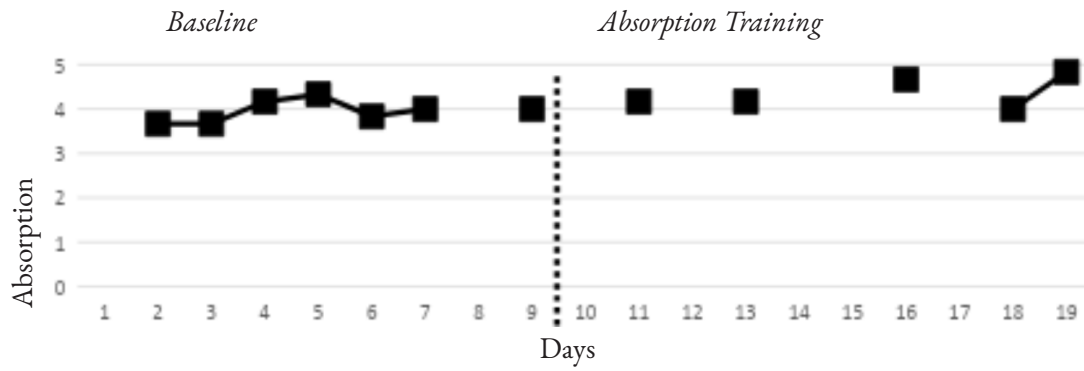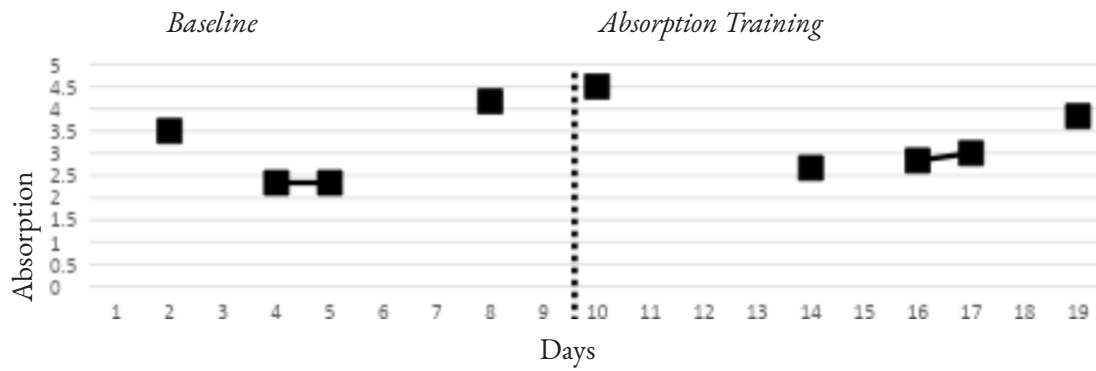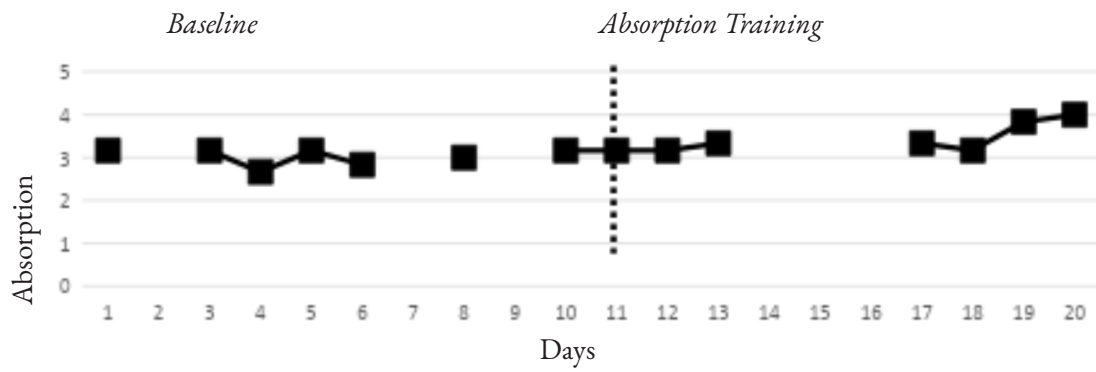
Participant 11

Participant 12

Figure 1 (cont.)
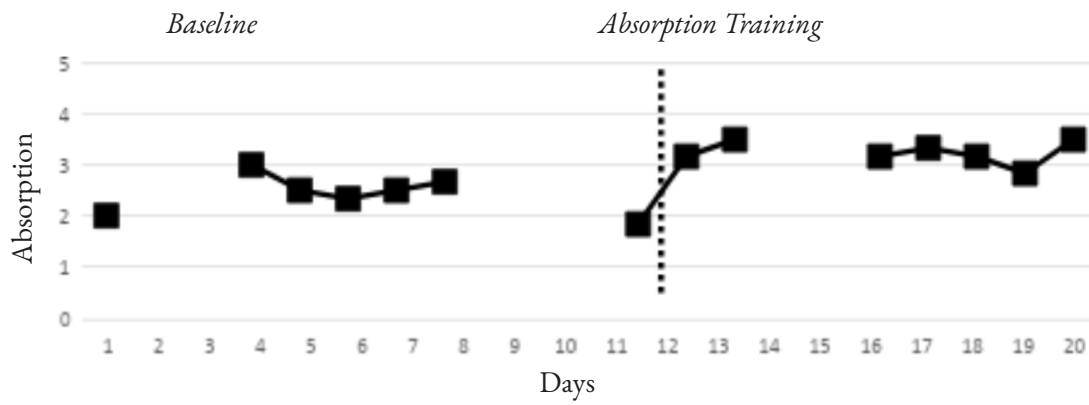
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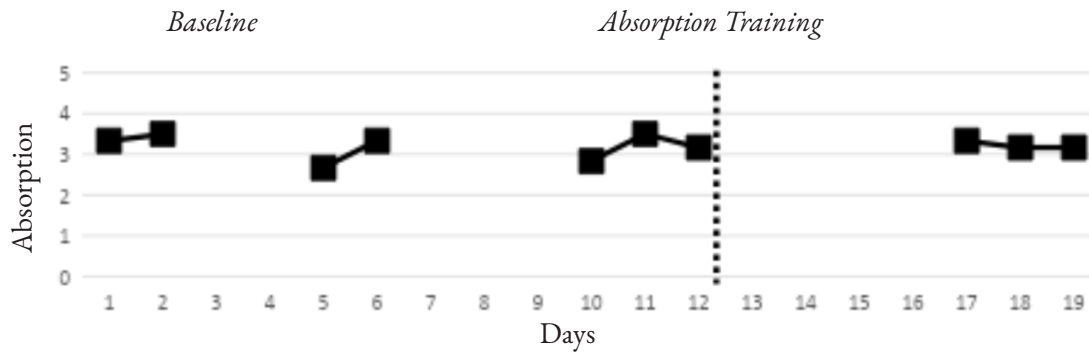
Participant 14

Participant 15

Figure 1 (cont.)

Participant 16
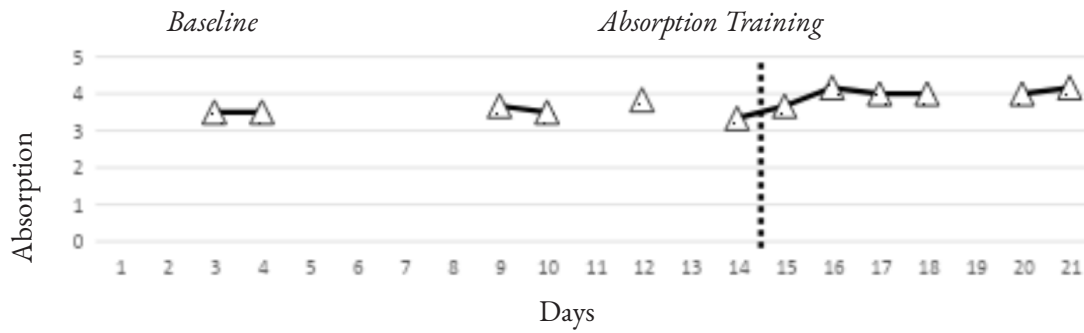
Baseline   *Absorption Training*

Absorption

Days

■ : planned activity without absorption training
△ : planned activity with absorption training
● : non-planned activity without absorption training
○ : non-planned activity with absorption training

Figure 2

Sixteen participants' levels of positive affect during positive activities in a 21-day period.
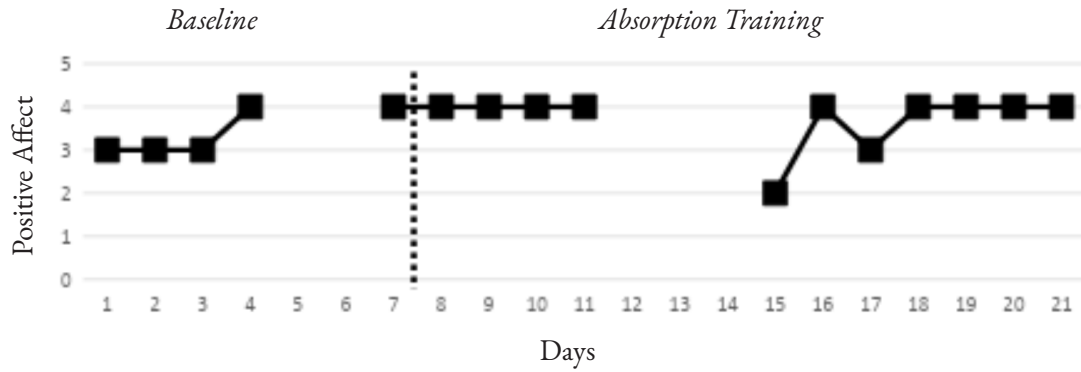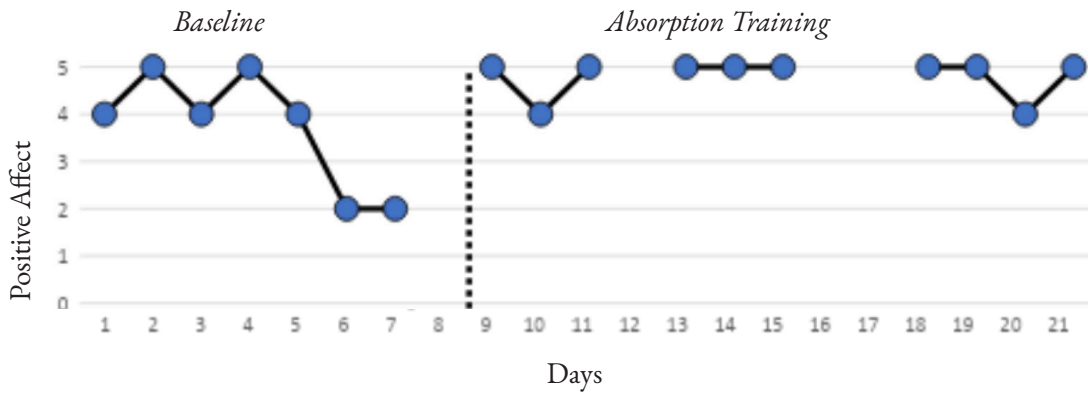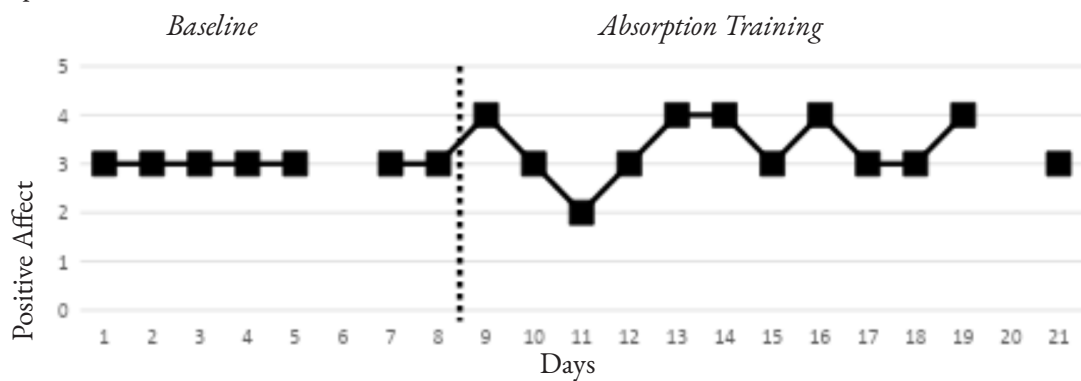
Participant 1

Participant 2

Participant 3

Note. The vertical dotted line is the point of transition from baseline to introduction of absorption training.

Figure 2 (cont.)
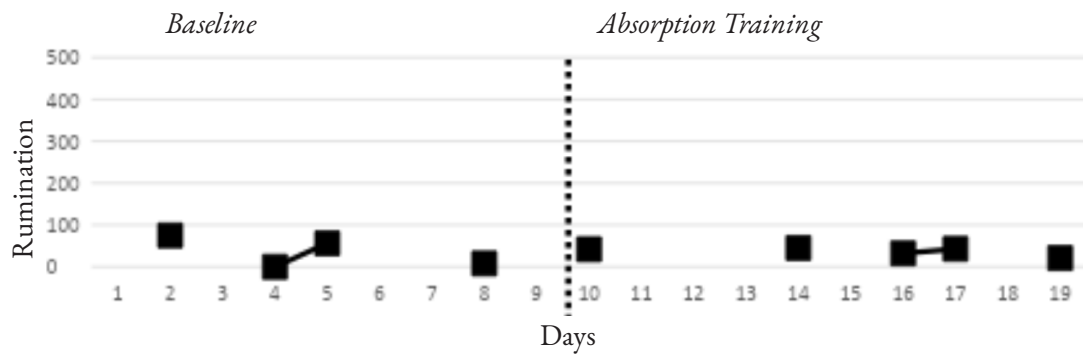
Participant 4
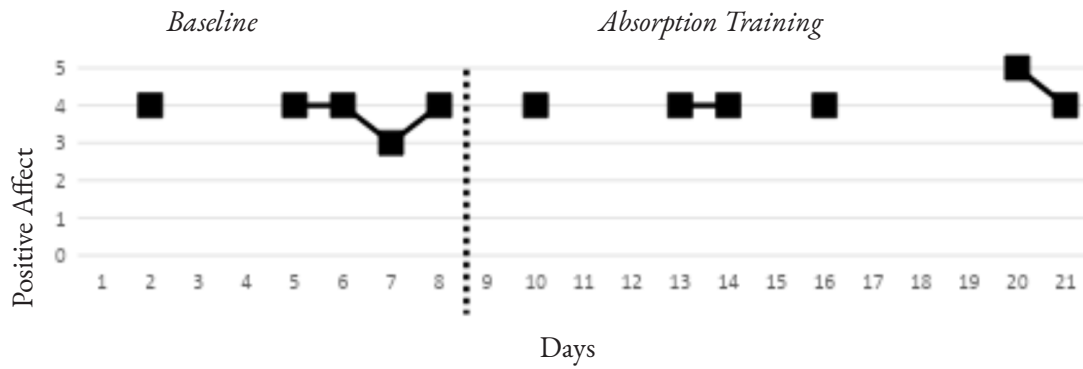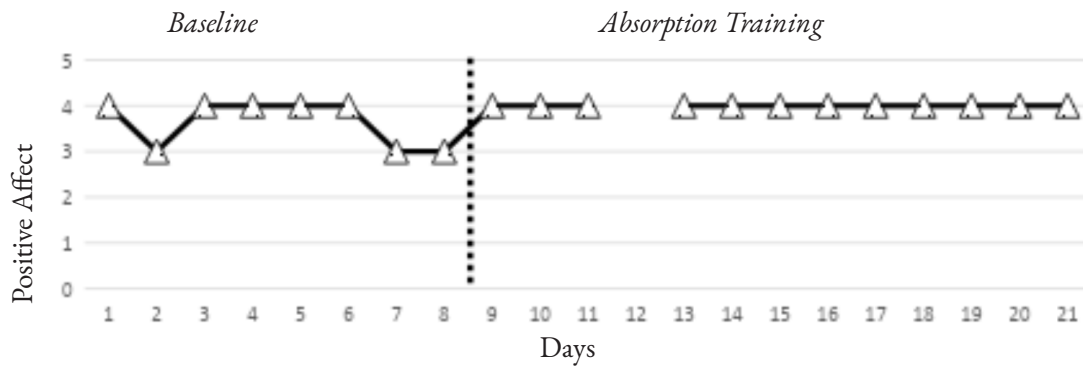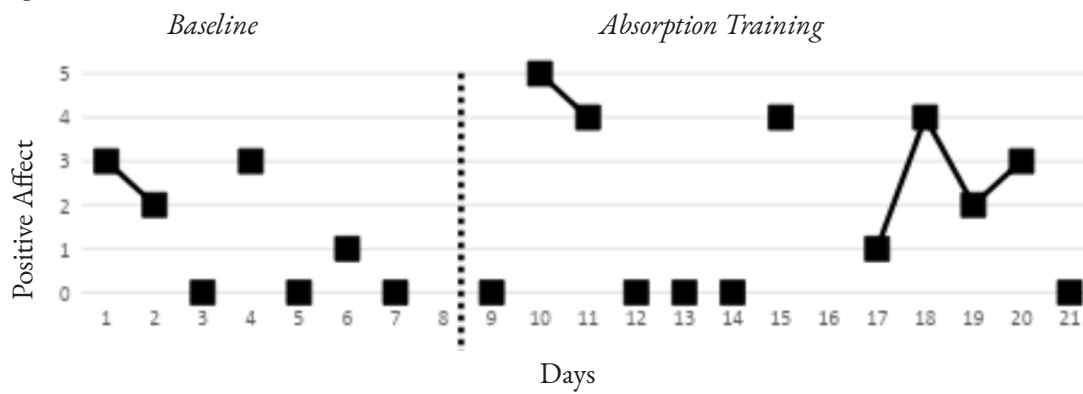
Participant 5

Participant 6

Figure 2 (cont.)
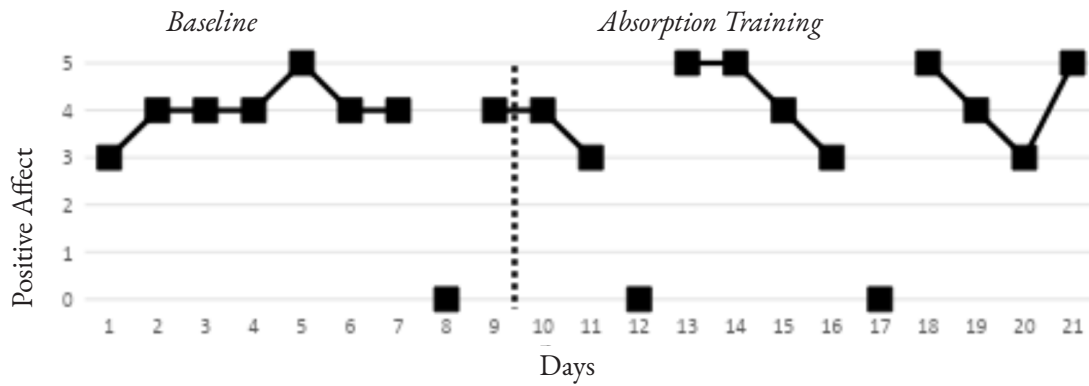
Participant 7
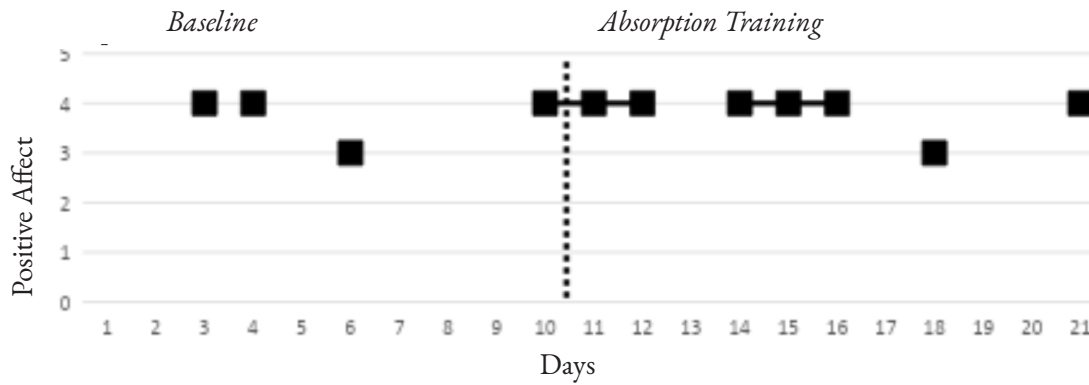
Participant 8

Participant 9

Figure 2 (cont.)

Participant 10
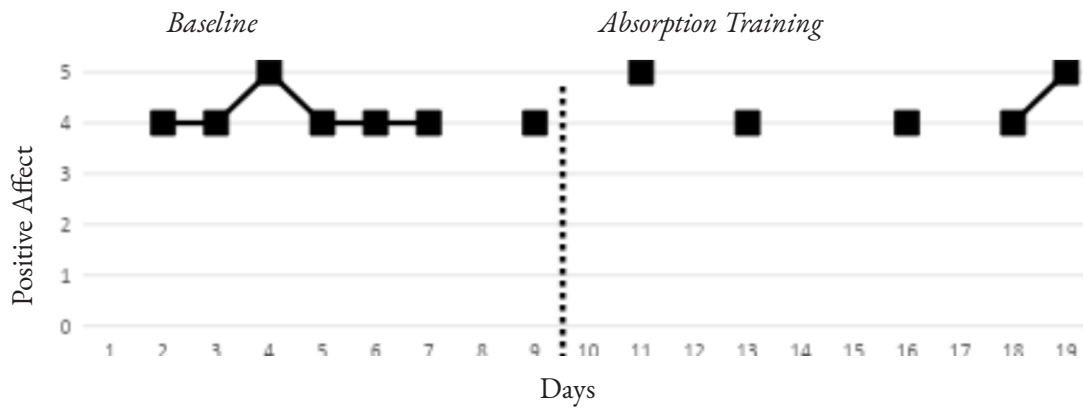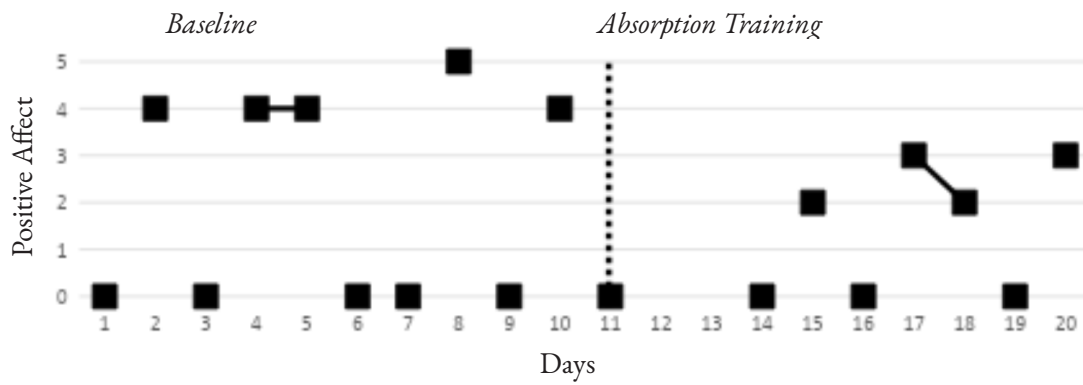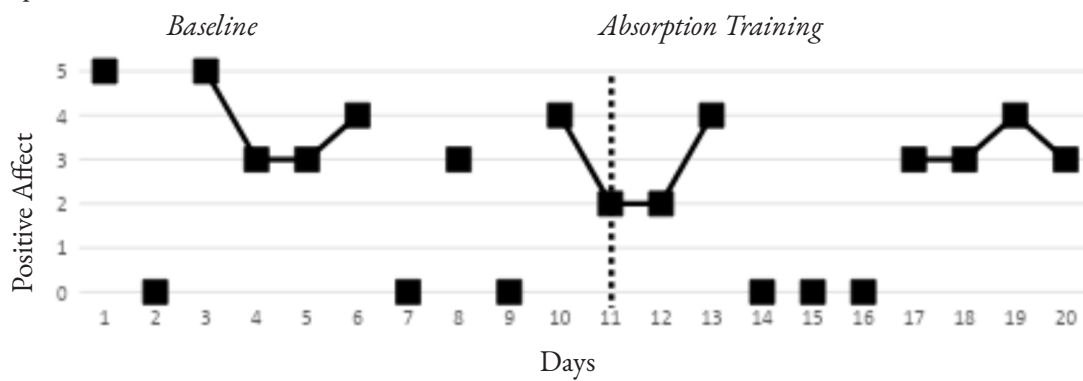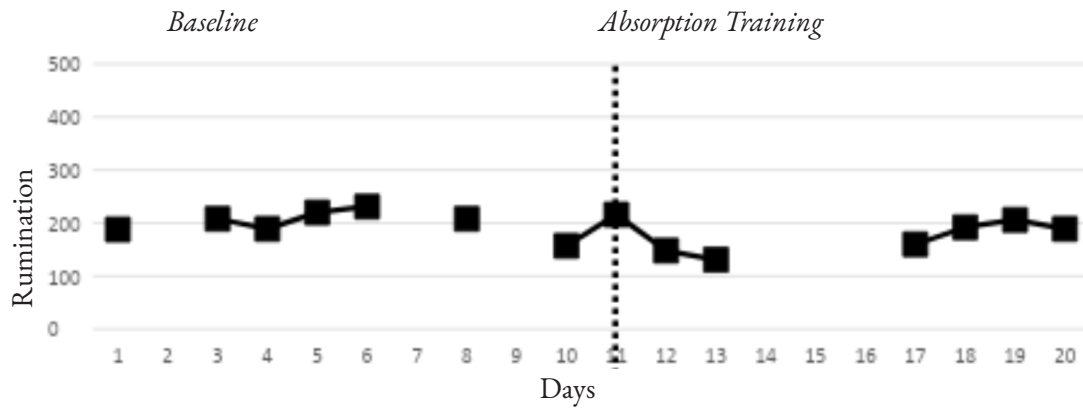

Participant 11

Participant 12

Figure 2 (cont.)
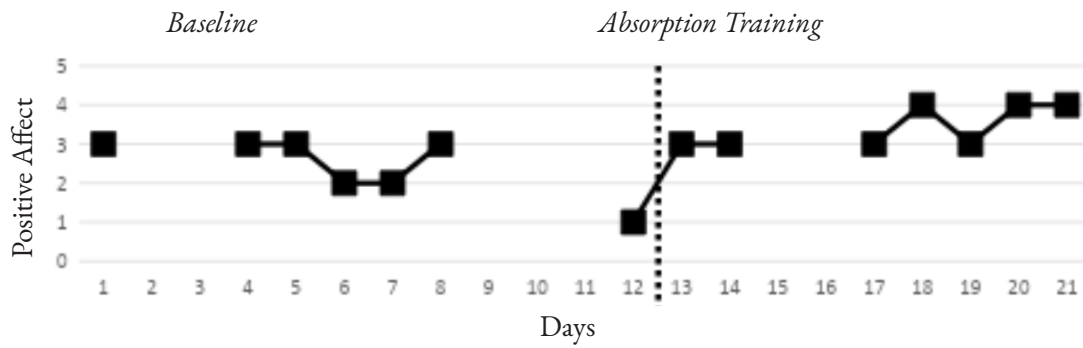
Participant 13
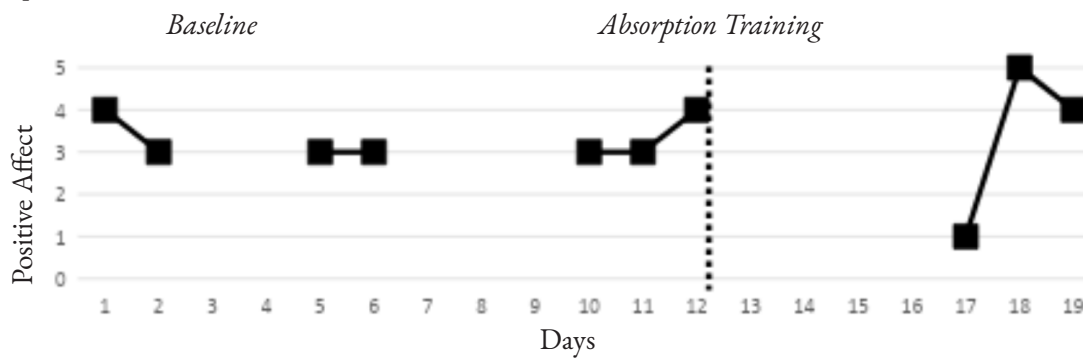
Participant 14

Participant 15

Figure 2 (cont.)

Participant 16

Baseline *Absorption Training*

Days

■	: planned activity without absorption training
△	: planned activity with absorption training
●	: non-planned activity without absorption training
○	: non-planned activity with absorption training
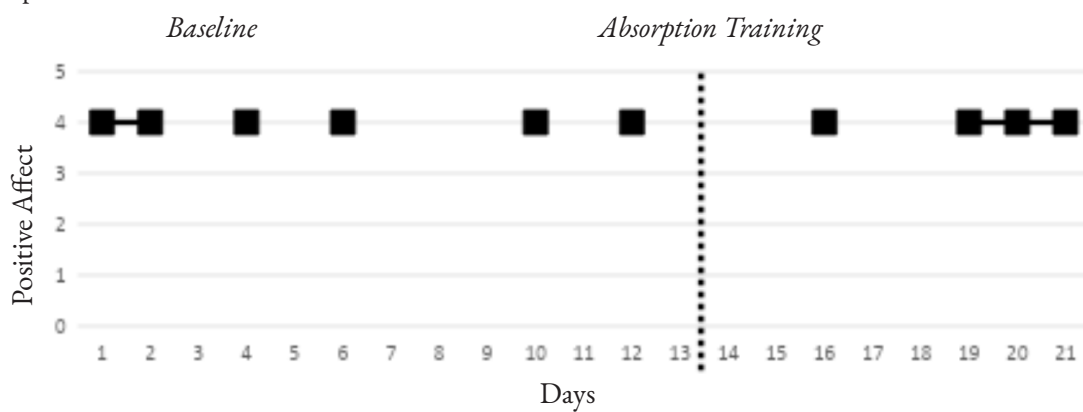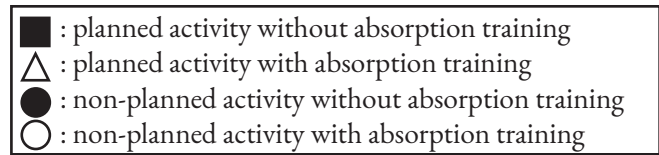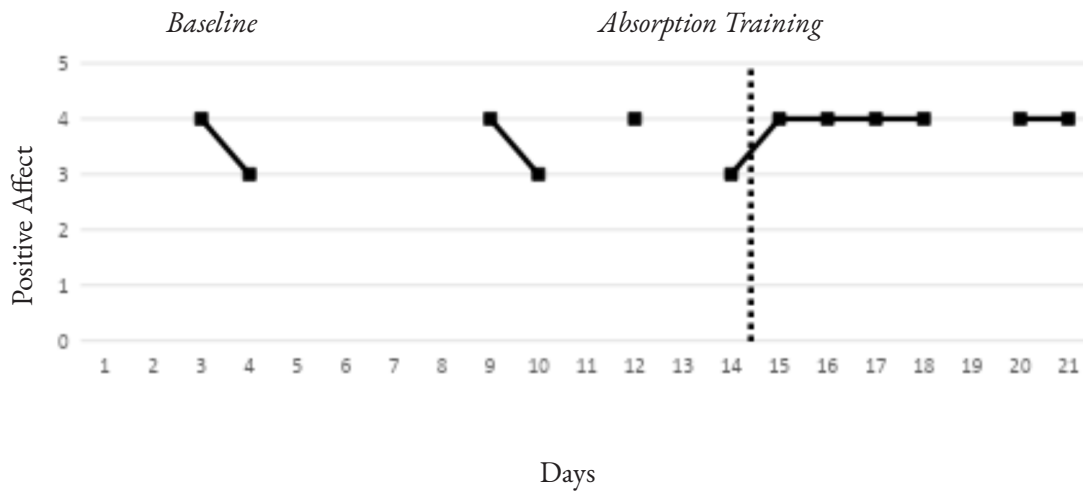
Figure 3

Sixteen participants' levels of maladaptive state rumination during positive activities in a 21-day period.
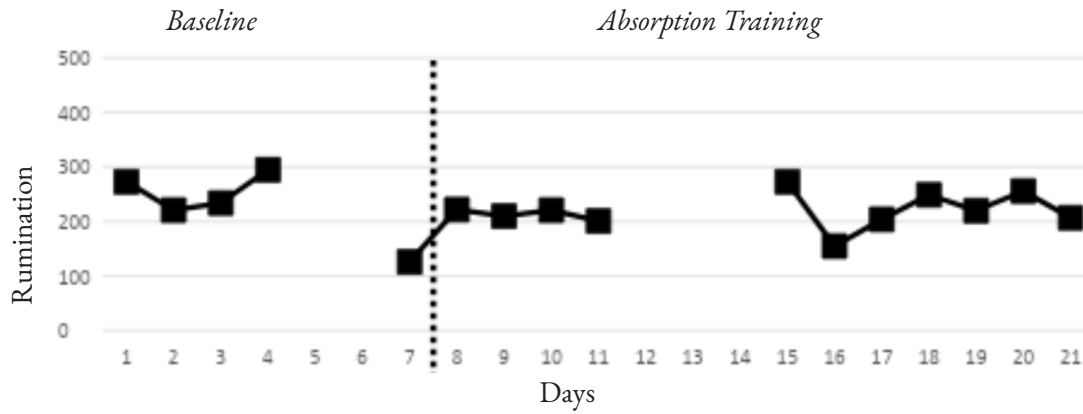
Participant 1

Participant 2

Note. The vertical dotted line is the point of transition from baseline to introduction of absorption training.

Figure 3 (cont.)

Participant 3

Participant 4

Participant 5

Figure 3 (cont.)

Participant 6

Participant 7

Participant 8

Figure 3 (cont.)

Participant 9

Participant 10
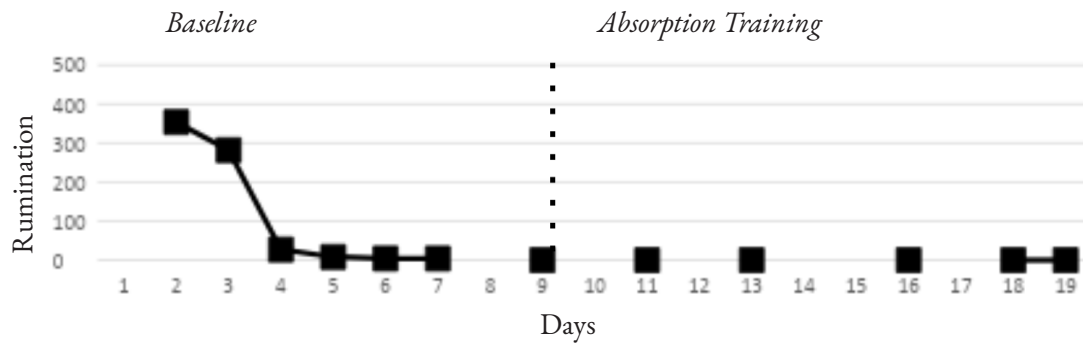
Participant 11

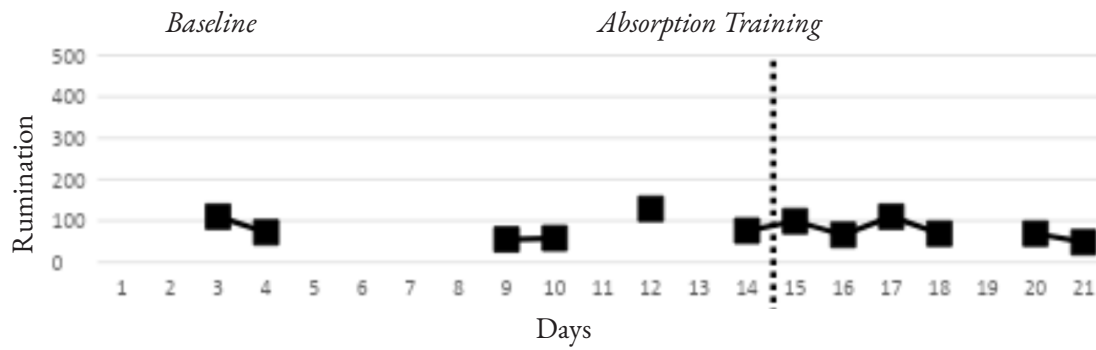**Figure 3 (cont.)**

Participant 12

Participant 13
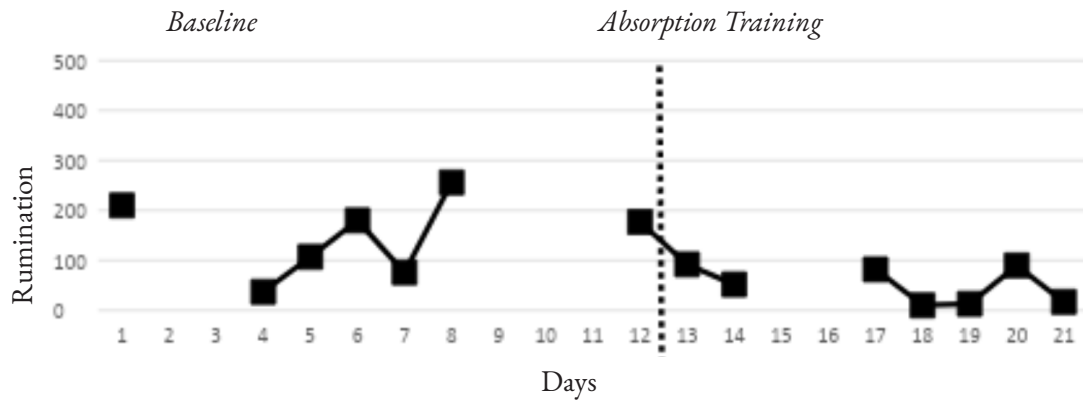
Participant 14

Figure 3 (cont.)

Participant 15

Participant 16

■ : planned activity without absorption training
△ : planned activity with absorption training
● : non-planned activity without absorption training
○ : non-planned activity with absorption training