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Perceived ostracism and paranoia: A test of potential moderating effects of psychological flexibility and inflexibility.

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Abstract

Ostracism is known to lead to negative psychological outcomes; however, little is known as to how ostracism may be a predictor of paranoid thoughts. The present paper examined the relationship between perceived ostracism and paranoid thoughts (social reference, persecution) by focusing on the potential moderating roles of psychological flexibility and inflexibility. As expected, data from a sample of 315 internet users ($M_{age} = 31.5$ years) showed that perceived ostracism was positively related to both social reference and persecution. Psychological flexibility did not moderate the ostracism-paranoid thought relationships. However, psychological inflexibility was a moderator of the ostracism-social reference relationship, but not for ostracism-persecution. Specifically, at both high and low levels of psychological inflexibility, there was a significant positive relationship between ostracism and social reference. These unexpected findings suggest that future research is needed to elucidate the mechanisms by which perceived ostracism may lead to paranoia.

Keywords: Ostracism, paranoia, psychological inflexibility, psychological flexibility, social reference.

Introduction

Ostracism – being ignored and/or excluded – is a painful and stressful experience for many individuals (Wesselmann & Williams, 2017). Moreover, according to the Temporal Need Threat Model (TNTM) of ostracism, such events may lead to short-term pain and long-term adverse psychological consequences (Williams, 2009). Indeed, being ostracised has been linked with reduced life satisfaction (e.g., Zhang & Shi, 2017), increased stress (e.g., Blackhart et al., 2007), addictive behavior (Poon, 2018), depression (Niu et al., 2016), psychological distress (e.g., Waldeck et al., 2017), poor sleep quality (e.g., Waldeck, Banerjee, et al., 2020), and thwarted psychological needs such as depleted levels of belonging and self-esteem (e.g., Williams, 2009; Zadro et al., 2004). Ostracism is a ubiquitous social stressor that can occur in many different forms (e.g., no responses to social media messages, avoided on the train, not being listened to when someone is using their phone) and can be experienced several times daily (e.g., Nezlek et al., 2012). As such, ostracism can lead to ongoing (long-term) negative psychological outcomes for some individuals. However, there is one longer-term outcome that should, theoretically, be strongly related to ostracism which has, thus far, received limited empirical examination – that of paranoia. This is the focus of the present investigation.

Ostracism and Paranoia

Paranoia is characterized by excessive mistrust (e.g., Elahi et al., 2017; Freeman et al., 2021) and interpersonal threat beliefs that are unfounded (Freeman et al., 2005; Sood et al., 2021). A commonly held view is that paranoia lies along a continuum from non-clinical to clinical levels, with psychological distress associated right along this continuum, and with persecutory delusions at the extreme end often seen in persons with schizophrenia or psychosis (Freeman et al., 2005; Freeman et al., 2021). Indeed, according to Freeman et al.'s

(2005) hierarchical model of paranoia, lower-order paranoid thoughts (e.g., social reference) are considered at the base of the hierarchy, whereas persecutory thoughts are at the top (i.e., higher-order paranoid thoughts). Social reference is characterized by thoughts such as people are talking about you and you are being watched, whereas social persecution refers to very elevated suspicion that social harm will be done to you (Freeman et al., 2005). For this study, we will be assessing these two ends of the paranoia continuum.

According to the TNTM (Williams, 2009), when ostracism is perceived, people reflect on and try to make sense of such events. Williams (2009) suggests that people often either make internal (e.g., 'I am to blame') or *external* attributions (e.g., 'you are to blame'; 'it was just the situation') following perceived ostracism. Externalizing the cause of one's perceived ostracism (e.g., 'they are hostile') is a mechanism that can potentially help redeem the initial depletion of their primary needs (e.g., self-esteem; Williams, 2009). Indeed, research has demonstrated that being able to externally attribute (vs internally attributing) can reduce ostracism-related distress in the short-term (Yaakobi, 2022). Thus, for some individuals, attributing externally following ostracism can be a protective mechanism (at least initially). However, having an external attribution bias (e.g., habitually externalizing blame to *other people* rather than the situation) has been shown to strengthen the link between social stress and paranoid ideation (Pot-Kolder et al., 2018). As such, a greater frequency of perceived social stressors (e.g., ostracism) may lead to more vulnerability to over-detect signs of threat (e.g., paranoid thoughts), particularly for those who externally attribute habitually. Riva et al. (2017) suggested that over time (and if perceived ostracism persists), people may lose the ability or motivation to reappraise their ostracism. Therefore, in the long-term, people may become resigned and accept the *content* of their distressing external personal attributions (e.g., believing that everyone is conspiring against them). Moreover, the maintenance of such threat beliefs often involves people seeking evidence to confirm their

thoughts (e.g., 'see, I knew people are avoiding me, they are plotting against me') and disregarding any evidence to the contrary (Freeman et al., 2002).

As noted previously, little research has explored direct links between ostracism and paranoia. Although not paranoia-related per se, a somewhat relevant strand of research has examined whether being ostracised is associated with, or leads to, the development of conspiracy beliefs (e.g., Graeupner & Coman, 2017). Conspiracy beliefs are generally viewed as explanatory frameworks that individuals or groups are working with a particular goal in mind that is malicious or sinister. An overlap between paranoia and conspiracy beliefs can be viewed in the context that they reflect cognition and behavior that are not necessarily in touch with reality (see Poon et al., 2020). Researchers have posited ostracism could potentially be a key stressor that increases the vulnerability of people to absorb or accept such conspiracy beliefs. Indeed, Graepner and Coman (2017) found a positive correlation between self-reported ostracism and belief in conspiracies (Study 1). Poon et al. (2020) expanded on this work by examining the role of perceived vulnerability (e.g., 'I feel vulnerable') in a series of studies, one with self-reported chronic experiences of ostracism (Study 1) and three with experimentally induced ostracism (Studies 2-4). Ostracism was strongly associated with the endorsement of conspiracy beliefs, with this relationship mediated by the perceived vulnerability.

The potential link between ostracism and paranoia seems relevant to experiences across the psychosis spectrum (Lincoln et al., 2021). As summarized by Lincoln et al. (2021) in a systematic review, research suggests that how ostracism and rejection are experienced and processed may aggravate symptoms of psychosis and exacerbate levels of paranoia. Some researchers propose that clinical psychosis can develop from mechanisms associated with non-clinical paranoia (cf. Sood et al., 2021; Van Ost et al., 2001). Given this, it seems that elucidating our understanding of how everyday negative and unpleasant experiences such

as ostracism could potentially lead to paranoid ideation, which could, feasibly, subsequently lead to vulnerability to the development of clinical levels of paranoia or psychosis is an important line of investigation to pursue. However, it should be acknowledged here that the present study focuses on non-clinical paranoia.

Ostracism, Psychological Flexibility, and Psychological Inflexibility

Psychological Flexibility, and its corollary – psychological inflexibility, is proposed as the process that underpins the Acceptance and Commitment Therapy (ACT; Hayes et al., 2012) model of emotional wellbeing and behavior change. Psychological flexibility comprises six core factors (acceptance, cognitive defusion, self-as-context, present moment awareness, values clarity, and committed action; see Hayes et al., 2006). Psychological inflexibility also comprises six key processes (experiential avoidance [EA], cognitive fusion, self-as-content, lack of present moment awareness, lack of values clarity, and no commitment to action). A handful of studies have explored whether psychological flexibility/inflexibility moderates the relationship between perceived ostracism and psychological distress with cross-sectional (Tyndall et al., 2018; Waldeck et al., 2017) and experimental (Waldeck, Bissell, et al., 2020) designs. Across two studies, Waldeck et al. (2017) found that those low in psychological flexibility reported more psychological distress (i.e., higher levels of depression, anxiety, and stress) following perceived ostracism than those high in psychological flexibility.

To unpack this moderation effect further, Tyndall et al. (2018) focused on two of the six psychological inflexibility processes that are viewed as central to emotional distress, cognitive fusion, and EA. While both processes seem theoretically important to difficulties with coping with negative emotional content following perceived ostracism, EA, rather than cognitive fusion, explained greater variance in accounting for levels of distress experienced

following perceived ostracism over the longer-term (up to 6 months). Hochard et al. (2021) advanced upon this line of work and examined the potential therapeutic effects of a one-hour non-expert delivered psychological flexibility-based intervention (i.e., acceptance + values clarification-based exercise) for distress following experimentally induced ostracism, using Cyberball. Hochard and colleagues found some support for the efficacy of this psychological flexibility-informed intervention in terms of increased willingness to engage in social interaction, as compared to ostracised participants in cognitive restructuring and psychoeducation intervention groups.

Psychological Inflexibility and Paranoia

While, as noted above, psychological inflexibility comprises six-component processes, the research to date in the context of paranoia has tended to focus on two processes, in particular, experiential avoidance (e.g., Castilho et al., 2017; Nunez et al., 2021; Udachina et al., 2009; Udachina et al., 2014), and cognitive fusion (e.g., Sood & Newman-Taylor, 2020; Sood et al., 2021). Experiential avoidance (EA) is defined as attempts to change or alter the frequency of undesired thoughts, emotions, and feelings, even when these efforts result in personal harm (Hayes et al., 2006; Tyndall et al., 2020). Cognitive fusion refers to a process where there is excessive focus on the literal believability of thoughts (i.e., that thoughts experienced are true) that leads to rigid control over overt behavior (Hayes et al., 2006).

For example, Udachina et al. (2014) examined whether EA and self-esteem are associated with paranoid delusions, with a daily diary study with 41 patients with paranoia. Experiential avoidance partially mediated the relationship between low self-esteem and paranoia, and low self-esteem partially mediated the relationship between experiential avoidance and paranoia. Udachina and colleagues proposed that the data were in line with

predictions from an attributional model of paranoia (Bentall et al., 2001) that suggests maladaptive efforts to avoid unpleasant thoughts about the self (i.e., EA) could lead to the development of persecutory delusions. Moreover, the authors suggested that EA, as a core psychopathological process (see Hayes et al., 1996), is compatible with a key tenet of Bentall et al.'s (2001) model that paranoid delusions emerge as an outcome of dysfunctional attempts to avoid feelings of low self-worth. Udachina et al. (2009) found similar effects with a non-clinical sample. Both studies indicate that it is the avoidance and intolerance of unwanted or unpleasant negative mental states that lead to the development of paranoid ideation (Udachina et al., 2009; Udachina et al., 2014). This links with Freeman et al.'s (2005) finding that one-third of a sample of 1202 internet users reported heightened levels of paranoia, associated with emotional and avoidant coping, and negative attitudes to emotional expression.

Castilho et al. (2017) also examined the link between EA and paranoia, but in the context of attachment styles in a sample of Portuguese patients with schizophrenia or psychosis (n = 37). According to Brennan et al. (1998), adult attachment can be conceptualized across two dimensions: attachment anxiety (e.g., fearing abandonment and rejection) and attachment avoidance (e.g., withdrawing from social interactions). Where people score low on both dimensions they are considered securely attached (e.g., able to form close bonds with others; Bowlby, 1969). Castilho et al. used the frequency subscale of Freeman et al.'s (2005) Paranoia Checklist scale and found a moderate positive association between EA and paranoid ideation. Castilho and colleagues also reported that the relationship between attachment anxiety and frequency of paranoid ideation was mediated by EA. However, it must be acknowledged that the mediation analyses were conducted on a cross-sectional sample design which does not readily permit causal inferences to be drawn. Nunez et al. (2021) investigated EA as a mediator of the link between paranoid ideation, depression,

and psychotic episodes in a general population sample in Chile. The researchers reported that EA fully mediated the relationship between paranoid ideation and depressive symptoms, while partially mediating the relationship between paranoid ideation and anxiety and stress.

As Newman-Taylor et al. (2020) noted, people with high levels of paranoia are typically fused with their paranoid thoughts which exacerbate psychological distress. In other words, their excessive focus on believing these paranoid thoughts to be true leads to psychological suffering. Using an attachment framework, Sood and Newman-Taylor (2021) found that cognitive fusion mediated the effect of a secure versus insecure or avoidant attachment-focused imagery intervention on paranoia and anxiety in a non-clinical high paranoia sample. Sood et al. (2021) replicated this finding (n = 303), with the insecure and avoidant attachment imagery groups reporting higher levels of cognitive fusion with their negative thoughts and also higher levels of paranoia and anxiety than the secure attachment imagery group.

Much of the earlier literature on ACT-interventions for psychosis did not measure the impact of treatment on paranoid ideation (e.g., Johns et al., 2016; White et al., 2011; but see Bloy et al., 2011 for a case study), although some focused more on effects on hallucinations (e.g., Gaudiano et al., 2010). However, more recently, some randomized controlled trials with non-clinical paranoia (e.g., Davies et al., 2021) and clinical psychosis (e.g., Shawyer et al., 2017) samples have explored the utility of ACT-based interventions for reducing paranoid ideation by increasing levels of psychological flexibility. The present study sought to fill a gap in the literature and bring together these various strands of research to examine the role of psychological flexibility and psychological inflexibility as moderators of the relationship between perceived ostracism and paranoid ideation.

A critical problem with some research on psychological inflexibility in the context of paranoia (e.g., Castilho et al., 2017; Nunez et al., 2021) is an overreliance on one instrument, the Acceptance and Action Questionnaire-II that has questionable construct and discriminant validity and overlaps significantly with general measures of psychological distress (e.g., Rochefort et al., 2018; Tyndall et al., 2019). This issue also arises in ostracism research that used the AAQ-II as a measure of psychological flexibility (e.g., Waldeck et al., 2017).

Relatedly, while Tyndall et al. (2018) found that unpicking individual processes of psychological inflexibility might provide greater insight concerning coping with ostracism, current views by leading scholars in this field lean strongly towards conceptualizing and assessing psychological flexibility or psychological inflexibility as a singular higher-order construct instead (see Gloster et al., 2021; Kashdan et al., 2020). While psychological flexibility and psychological inflexibility were often viewed as opposing ends of a continuum with most of the research employing the AAQ-II to categorize participants as being low in psychological flexibility (i.e., high in psychological inflexibility) or high in psychological flexibility (i.e., low in psychological inflexibility), some researchers propose that they are, in fact, distinct constructs (e.g., Rolffs et al., 2018), and should be measured as such. Therefore, psychological flexibility and psychological inflexibility (although related) may operate independently from each other in a similar fashion to the conceptualization of mental ill-health and wellbeing (e.g., Schotanus-Dijkstra, 2016). For example, a person may score as low on a measure of distress, but this does not necessarily mean they will score high on wellbeing (or that they are flourishing). Similarly, although people may be low in psychological inflexibility (e.g., not habitually adopting EA in response to perceived ostracism), this does not necessarily mean they are actively being psychologically flexible (e.g., paying mindful attention to thoughts and feelings). Given the foregoing more recent emphasis on the overarching construct (i.e., flexibility or inflexibility) rather than individual

components (Rolffs et al., 2018), we have assessed both psychological flexibility and psychological inflexibility in the present study.

Present Study

The present study aimed to explore whether psychological flexibility and psychological inflexibility moderate the relationship between perceived ostracism and paranoid thoughts (social reference; social persecution; see Freeman et al., 2005). It is important to note that the focus of the present study is on *perceived*, rather than actual ostracism. Indeed, as we are interested in the longer-term effects of ostracism it will arguably be more appropriate to capture perceived ostracism, given that some people may be exposed to actual ostracism but not interpret such events as being ignored (Waldeck, 2017). This study is important as it aimed to identify if ostracism is a salient stressor in the context of paranoia, which may be beneficial in guiding future interventions for affected individuals. We proposed (Hypothesis 1) that there would be a significant positive relationship between perceived ostracism and paranoid thoughts (both social reference and social persecution). Moreover, the perceived ostracism-paranoid thought relationships would be moderated by psychological flexibility and psychological inflexibility such that the relationship would be weaker for individuals with higher levels of psychological flexibility and lower levels of psychological inflexibility (Hypothesis 2).

Method

Participants and Procedure

A total of 334 participants took part in the study. However, 19 participants failed an attention check item[1] (i.e., not choosing 'strongly disagree' when prompted to do so).

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[1] The sole attention check item was chosen to be embedded within the R-GPTS (Freeman et al., 2021)

Therefore, a final opportunity sample of 315 participants was invited to participate via a variety of online platforms (e.g., www.reddit.com/samplesize; findparticipants.com), participated on JISC Online Surveys software, and were entered in a monetary prize draw as compensation led by the first author. Online sampling was chosen as the increased anonymity may reduce potential underreporting of sensitive topics such as paranoid thoughts (e.g., Pitman et al., 2015). Complete socio-demographic information about the sample is reported in Table 1.[2] Participants were required to read an information sheet and then consent to the study. They were then presented with the survey measures and finally read the debrief sheet. Ethical clearance was obtained from the lead authors' Institutional Ethics Committee before the collection of data.

Measures

The Cronbach's alpha figures for our sample for each measure in the present study are presented in Table 2.

Perceived Ostracism. We used a modified version of the 10-item Workplace Ostracism Scale (WOS; Ferris et al., 2008) on a scale from 1 (never) to 7 (always). Participants responded to statements about everyday ostracism episodes that occurred within the last six months without being restricted to a specific context (i.e., "others ignored you" as opposed to "others ignored you *at work*" originally included in the WOS). The modified WOS has been used as a measure of general perceived ostracism in social exclusion research (e.g., Waldeck et al., 2020).

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[2] Sociodemographic factors such as age and sex are known to moderate the distress associated with ostracism (e.g., Hitlan et al., 2006; Sebastien et al., 2010). We tested a path analysis model including these factors and there were no substantive differences in the results.

Psychological flexibility and Psychological Inflexibility. We used the 24-item Multidimensional Psychological Flexibility Inventory (Short-form; Rolffs et al., 2018) to measure psychological flexibility (12-item scale) and psychological inflexibility (12-item scale). Participants answered using a 6-point Likert scale from 1 (never true) to 6 (always true). Sample items include, "I opened myself to all of my feelings, the good and the bad" (flexibility) and "I tried to distract myself when I felt unpleasant emotions" (inflexibility). The MPFI has demonstrated good reliability and validity in non-clinical samples (e.g., Seidler et al., 2020; Stabbe et al., 2019).

Paranoid thoughts. We used the Revised Green et al. Paranoid Thoughts Scale (R-GPTS; Freeman et al., 2021) on a scale from 0 (not at all) to 4 (totally). Two subscales were used, social reference and social persecution (persecution). Sample items include, "people definitely laughed at me behind my back (social reference)" and "people have been hostile towards me on purpose (persecution)". The R-GPTS has demonstrated excellent psychometric properties and is considered a superior measure to the original GPTS (Freeman et al., 2021). Moreover, the R-GPTS is reliable in both clinical and non-clinical samples (Freeman et al., 2021).

Analysis Plan

To test our hypotheses, we ran a path analysis using Mplus, version 7 (Muthén & Muthén, 2015). Specifically, we estimated the influence of perceived ostracism on the two components of paranoid thoughts (i.e., ideas of social reference and persecution), investigating whether these relationships were moderated by psychological flexibility and inflexibility. In other words, the two outcomes (i.e., ideas of social reference and persecution) were regressed on perceived ostracism, psychological flexibility, psychological inflexibility, and the two-way interaction terms between perceived ostracism and psychological flexibility

and inflexibility. In addition, we estimated the correlation between the residual of the two components of paranoid thoughts. Before computing the interaction terms, perceived ostracism, psychological flexibility, and psychological inflexibility were mean-centered (Aiken et al., 1991). Significant moderation effects were further explored by conducting a simple slope analysis, looking at the effect of perceived ostracism on the outcome at the moderator's low (-1SD) and high (+1SD) levels.

The model tested is just identified, meaning that the number of the estimated parameter was equal to the data points, resulting in 0 degrees of freedom; thus, the model's fit indices could not be computed. Standardized estimation, 95% confidence interval, and the associated p-value were reported for each parameter.

Results

Means, standard deviations, and bivariate correlations are among the key variables presented in Table 2. As indicated, perceived ostracism and psychological inflexibility had significant positive correlations with social reference and persecution, respectively. By contrast, psychological flexibility had significant negative relationships with social reference and persecution.

The results of the path analysis are displayed in Figure 1. Concerning the ideas of social reference, we observed significant main effects of perceived ostracism, $\beta = .63$, 95% CI [.55, .71], $p < .001$, and psychological inflexibility, $\beta = .22$, 95% CI [.13, .31], $p < .001$, but not psychological flexibility, $\beta = -.05$, 95% CI [-.13, .04], $p = .26$. As for the main effects, psychological flexibility did not moderate the relationship between perceived ostracism and ideas of social reference, $\beta = -.03$, 95% CI [-.12, .05], $p = .44$, whereas psychological

inflexibility did, β = -.09, 95% CI [-.181, -.003], p = .043.[3] Specifically, the simple slope

analysis (displayed in Figure 2) revealed that the relationship between perceived ostracism

and social reference was significant and positive at both low, b = 0.45, 95% CI [0.36, 0.55], p

< .001, and high, b = 0.34, 95% CI [0.28, 0.40], p < .001, levels of psychological inflexibility,

but the effect was significantly weaker in the latter case, Δb = .11, 95% CI [0.003, 0.222], p =

.043.

Concerning persecutory thoughts, we observed a significant and positive main effect

of perceived ostracism, β = .77, 95% CI [.70, .84], p < .001, but psychological flexibility, β =

-.03, 95% CI [-.11, .06], p = .53, and inflexibility, β = .02, 95% CI [-.06, .11], p = .62, were

not associated with the outcome. Similarly, psychological flexibility, β = -.02, 95% CI [-.10,

.06], p = .56, and inflexibility, β = -.04, 95% CI [-.12, .05], p = .36, did not moderate the

relationship between perceived ostracism and paranoid thoughts.

Overall, the predictors explained a large amount of variance of both social reference

(R^2 = .55) and persecution (R^2 = .59). The correlation between the residuals of the two

outcomes was strong, r = .53, 95% CI [.45, .61], p < .001.

Discussion

The goal of the present study was to examine the link between perceived ostracism

and paranoid thoughts (social reference, persecution) and test if psychological flexibility and

psychological inflexibility were potential moderators of these relationships. To our

knowledge, our study is the first to observe a direct link between perceived ostracism and

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[3] As the relationships between perceived ostracism and paranoid thoughts were so strong we ran an additional model testing the reverse effects (i.e., paranoid thoughts predicting perceived ostracism). It was found that psychological inflexibility and psychological flexibility were not significant moderators in this model.

paranoid thoughts in a non-clinical sample. This finding is consistent with previous research suggesting that perceived ostracism can lead to negative psychological outcomes (e.g. Zhang & Chi, 2017; Waldeck et al., 2020). Further, our findings partially support those of Poon et al. (2020) who detected a link between ostracism and belief in conspiracy theories. Indeed, perceiving that one is being exposed to such painful social stressors (e.g., feeling ignored repeatedly) may lead to greater vulnerability and a tendency to be hyper-vigilant to detect potential threats in the environment (Poon et al., 2020).

In accordance with the TNTM (Williams, 2009), one potential explanation of our findings could be that people who feel chronically ostracised lose motivation or capacity to reappraise their ostracism over time which leads to them becoming resigned (and accepting) their distressing (paranoid) thoughts. Moreover, it may also be the case that such individuals seek out evidence to maintain these threat beliefs and disregard evidence to the contrary (Freeman et al., 2002). It is important to note, however, that our study does not directly measure the processes suggested within the TNTM. As such, further research is needed to elucidate the mechanisms in which perceived ostracism leads to paranoid thoughts over time. We recommend future researchers explore the role of factors such as attribution (Yaakobi, 2022) following perceived ostracism to more closely map onto the TNTM whilst utilizing more longitudinal designs (e.g., experience sampling methods).

Our findings are also partially consistent with research demonstrating that perceiving ostracism may lead to an increase in paranoid thoughts in clinical and at-risk for psychosis samples (see Lincoln et al., 2021). A clinical implication may be that in understanding the impact of paranoid thinking an important contextual factor is a person's perceived ostracism in their social context, and their personal history, functions and safety-seeking behaviours linked with this (that may be targets for intervention, e.g., Freeman, 2016). Efforts at addressing these distressing concerns may not necessarily be focused on the individual,

instead there may be family, group and community-level changes that could be more impactful, by increasing inclusion, integration, (e.g., Baumann et al., 2019), targeting potential social stresses associated with elevated psychosis (e.g., Fett et al., 2019). Considering the prevalence of non-clinical paranoia and psychotic like experiences a public health approach aiming to prevent psychosis and other mental health disorders by increasing community inclusion and integration may be more impactful (Ajnakina et al., 2019), than a "downstream" approach of helping individuals impacted by perceived ostracism.

Contrary to expectations, it was found that psychological flexibility was not a moderator of the effects of ostracism on paranoid thoughts. This was surprising given the prior evidence suggesting that improving levels of psychological flexibility can lead to reductions in paranoid thoughts (e.g., Davies et al., 2021; Shawyer et al., 2017; Tyrberg et al., 2017). However, it must be acknowledged here that previous studies typically measured reductions in psychological inflexibility as evidence for increases in psychological flexibility. We observed that psychological inflexibility was a moderator of the link between ostracism and social reference. However, regardless of one's level of inflexibility (high or low), an increase in perceived ostracism was associated with an increase in these paranoid thoughts. The moderation effect was detected due to the high baseline levels of paranoia for those with high levels of psychological inflexibility. Indeed, such high baseline levels of negative psychological outcomes are common in ostracism research for those who are psychologically inflexible (e.g., Tyndall et al., 2018; Waldeck et al., 2017). These findings to some extent demonstrate the *power* of perceived ostracism as a stressor (and as a predictor) of paranoid thoughts and suggest that attempts to improve psychological flexibility for those who suffer such experiences may not prevent a reduction in such stressful thoughts. However, further research is needed to examine the potential mechanisms of change (e.g., acceptance, defusion) whereby ostracised individuals may work towards changing their relationship with

their paranoid thoughts before making any conclusions about the importance of psychological flexibility.

It is important to note that our study has some limitations that should be noted. Firstly, we adopted a cross-sectional correlational design so we cannot infer any direct cause-and-effect relationships. Indeed, we detected a strong relationship between ostracism and paranoid thoughts, which supports the suggestion of bi-directionality between the two constructs. As such, we suggest future researchers consider examining the link between perceived ostracism and the onset of paranoid thoughts more closely by adopting longitudinal designs (e.g., utilizing cross-lagged designs; see Kirchner et al., 2022). Secondly, all data collected was self-report which increases the risk of common method bias. Future researchers may consider a triangulation approach (e.g., by including observer ratings of expressed paranoid ideation if in a clinical setting).

Thirdly, the sample in this dataset was from predominantly white, educated, industrialized, rich, and democratic (WEIRD) cultures. Therefore, our results may not be generalizable cross-culturally. It is recommended that future researchers recruit larger samples and conduct invariance testing on non-WEIRD cultures. Indeed, little is currently known as to the mechanisms behind cross-cultural differences in perceived ostracism (Uskul & Over, 2017), although attachment orientation has been shown to be a potential mediator where such differences are observed (e.g., Yaakobi & Williams, 2016). Finally, there were potential confounding and/or moderating variables that were not accounted for in this study (e.g., not controlling for participants with mental health diagnoses such as psychosis; not controlling for rejection sensitivity levels or adverse childhood events [e.g., emotional neglect], attribution style, etc.). For example, the reactivity of a person (i.e., what they are likely to do in situations where they feel ostracized) may be a part of a maintenance pathway that needs to be tested. Indeed, rejection-sensitive individuals more readily expect to be

rejected and may react aggressively in self-defense (Gao et al., 2021), which in turn may create *a self-fulfilling prophecy* leading to actual rejection and an increase in related social persecutory thoughts. We recommend that future researchers consider controlling for rejection sensitivity or potentially including it in a path analytic model as a precipitating factor for the perception of ostracism.

   Conclusion

   The present study provides preliminary evidence that perceived ostracism is strongly positively related to paranoid thoughts (social reference, persecution). However, psychological flexibility and psychological inflexibility did not have much of an effect on the link between perceived ostracism and paranoia. As such, this demonstrates that ostracism is a particularly *powerful* social stressor that may lead to painful (and particularly threatening) thoughts about others. Further research is needed to understand the mechanism by which ostracism leads to the onset of paranoid thoughts. These findings may also have potential implications for those at-risk for psychosis such that interventions may focus on promoting inclusion and integration, as opposed to focusing on the individual's perception of ostracism alone, may prove fruitful.

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Table 1 – Descriptive statistics about participants' socio-demographic characteristics.

	N (%)
Age	M = 31.53 (SD = 12.95)
Gender	
Female	N = 215 (68.3%)
Male	N = 90 (28.6%)
Other	N = 10 (3.1%)
Nationality	
American	N = 130 (41.4%)
British	N = 112 (35.7%)
Canadian	N = 23 (7.3%)
Australian	N = 9 (2.9%)
Irish	N = 6 (1.9%)
Other	N = 34 (10.8%)
Country of residence	
USA	N = 138 (43.8%)
UK	N = 119 (37.8%)
Canada	N = 23 (7.3%)
Australia	N = 8 (2.6%)
Ireland	N = 3 (1.0%)
Other	N = 20 (6.5%)
Missing	N = 3 (1.0%)
Occupational status	
Employed	N = 181 (57.5%)
Student	N = 78 (24.7%)
Unemployed	N = 41 (13.0%)
Not disclosed	N = 15 (4.8%)
Job area	
Health and Social Care	N = 56 (17.8%)
Computer	N = 35 (11.1%)
Education	N = 34 (10.8%)
Self-employment	N = 28 (8.9%)
Sales	N = 18 (5.7%)
Office and Admin Support	N = 17 (5.4%)
Engineering	N = 14 (4.4%)
Government	N = 14 (4.4%)
Financial	N = 13 (4.1%)
Manufacturing	N = 11 (3.5%)
Arts and Entertainment Media	N = 8 (2.5%)
Other	N = 54 (17.3%)
Missing	N = 13 (4.1%)

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Table 2 – Cronbach's alpha (*α*), mean (*M*), standard deviation (*SD*), and Pearson

Correlations among the measures used in the study.

	α	*M* (*SD*)	1	2	3	4	5
			Correlations				
(1) Ostracism	.938	25.17 (11.30)					
(2) Psych. Flexibility	.883	43.67 (9.96)	-.16				
(3) Psych. Inflexibility	.872	37.81 (10.15)	.46	-.17			
(4) Social Reference	.863	10.59 (7.15)	.70	-.21	.51		
(5) Persecution	.941	9.78 (9.74)	.77	-.16	.37	.78	

Note. All the correlation coefficients were significant at level $p < .01$.

Figure Captions

Figure 1 – The diagram of the path analysis: standardized parameters are reported.

Figure 2 – Simple slope analysis of the moderating effect of psychological

inflexibility on the relationship between perceived ostracism and paranoid thoughts about

social reference.