Research Paper

Ostracism breeds depression: Longitudinal associations between ostracism and depression over a three-year-period

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ABSTRACT

Background: Theoretical models in both clinical (Psychobiological Model of Social Rejection and Depression) as well as social psychology (Temporal Need Threat Model of Ostracism) have postulated that ostracism (i.e. being excluded and ignored by others) may foster the development of depressive symptomatology. However, stress generation models indicate that depression may also foster ostracism as depressed individuals might be considered as burdensome by others.

Methods: We investigated whether experienced ostracism predicted diagnosed clinical depression over time and vice versa within longitudinal panel data from a sample representative of the German adult population (the Socioeconomic panel) over a three years period.

Results: A cross-lagged panel analysis shows that experienced ostracism predicts self-reported diagnosed depression three years later. Vice versa, depression predicts ostracism three years later, too, although the results were less stable.

Limitations: While the results extend our understanding about the temporal order of ostracism and depression, temporal order is a precondition but not a proof of causation. Development of targeted interventions and treatments that aim to reduce social ostracism and research on their impact is needed to determine a causal effect of ostracism on depression.

Conclusions: We present empirical evidence from a representative adult sample showing that social ostracism as a potential risk factor. Findings advance knowledge about the development of depression and corroborate contemporary theorizing in the fields of clinical and social psychology.

1. Introduction

Depression is a multicausal phenomenon often due to a combination of several factors. Aside from genetic and neuro-biological risk factors that make individuals vulnerable to the development of a depressive disorder, the onset of clinical depression is also influenced by stressors tied to the environment of the affected individuals (Klengel and Binder, 2013). Research on potential environmental risk factors has especially focused on aspects that are directly tied to humans' fundamental need to belong (Hagerty and Williams, 1999). Particularly, positive interactions with others (i.e., social support) have been identified as a psycho-social resource that protects individuals from developing depression (Eisman et al., 2015), while negative interac-

tions with others are likely risk factors for the onset of depression (Hagerty and Williams, 1999). One maladaptive social phenomenon that has been theorized to evoke depression symptoms is ostracism (Slavich et al., 2010; Williams, 2009), the experience of being excluded and ignored by others. Here, we investigate whether ostracism experiences contribute to the onset of clinical depression as postulated by research in the field of clinical (Slavich et al., 2010) and social psychology (Williams, 2009). In line with stress-generation models of depression (Hammen, 1991; Liu and Alloy, 2010), we further test the reverse link, namely whether depression predicts future ostracism experiences. We test our hypotheses using longitudinal panel data from a nation-wide representative adult sample over a three-year period.

1.1. Ostracism as a risk factor for depression

As ostracism is a prevalent and ubiquitous phenomenon in individuals' everyday life (Rudert et al., 2020b), a plethora of research has investigated its various negative consequences (for an overview, see Blackhart et al., 2009; Williams, 2009). Theorists from both clinical and social psychology assume that social ostracism represents a risk factor for the development of depression symptoms. For instance, the Psychobiological Model of Social Rejection and Depression aims to explain why social rejection contributes to the onset and development of clinical depression (Slavich et al., 2010). According to this clinical model, social rejection threatens social self-preservation (i.e., the need to maintain belongingness to one's social group; Gruenewald et al., 2004) and consequently leads to negative self-referential cognitions such as feeling unlikeable. These negative cognitions then result in negative emotions such as shame as well as social withdrawal, that are core symptoms of clinical depression (Kemeny, 2009). This notion conceptually follows predictions from stress exposure models (e.g., Hammen, 2005), stating that environmental stressors (such as experiencing ostracism and rejection) increase the risk for developing depressive symptoms.

Assumptions of the Psychobiological Model conceptually align with those of the social-psychological Temporal Need Threat Model of Ostracism (Williams, 2009). The Temporal Need Threat Model postulates that social ostracism threatens the fundamental human needs for belongingness, control, meaningful existence, and self-esteem. *Acute ostracism*, that is an isolated ostracism experience, is experienced as painful (Eisenberger et al., 2003) and evokes negative emotions (Rudert and Greifeneder, 2016). *Chronic ostracism*, that is repeated experiences of ostracism, supposedly causes long-lasting depressive symptoms. More specifically, chronic ostracism depletes psychological resources, which eventually leads to feelings of helplessness, alienation, and worthlessness. Taken together, both the Psychobiological Model and the Temporal Need Threat Model hold that (chronic) ostracism poses an important risk factor for the development of depression.

1.2. Depression as a risk factor for ostracism

While ostracism might act as a risk factor for depression, the reverse link that depression leads to experiences of ostracism is similarly conceivable. Consistent theorizing has been posited, for instance, in so called stress-generation models. These models suggest that depressed individuals are not only reacting towards negative life events, but that they also often engage in dysfunctional behavior and cognitions that may lead to them experiencing more stressful events such as social rejection (Hammen, 1991; for an overview, see Liu and Alloy, 2010). In other words, stress-generation models emphasize that depressed individuals may contribute to their own distress through (1) their own behavior and (2) their cognitions about social situations. Regarding the behavioral pathway, depressed individuals express themselves more negatively (Baddeley et al., 2013) and often require more reassurance and support from their social environment, which might result in others perceiving the depressed individuals to be burdensome (Potthoff et al., 1995). In turn, those perceptions of burdensomeness might elicit negative responses towards the depressed individual, such as ostracism (Coyne, 1976; Platt et al., 2013; Wesselmann et al., 2013). Moreover, depressed individuals are less socially active and tend to withdraw from others (Cruwys et al., 2014; Nezlek et al., 2000), which might result in the (maybe unintended) impression in others that they do not desire social contact. Regarding the cognitive pathway, depressed individuals adopt more negative cognitive styles (Liu and Alloy, 2010) and tend to react more sensitive to social situations and rejection (Steger and Kashdan, 2009). As a result, they might interpret ambiguous social situations more frequently as instances of ostracism or rejection than non-depressed individuals (Liu et al., 2014) and could consequently also be more likely to experience ostracism.

In summary, against the backdrop of the existing literature there is reason to assume a bi-directional link between ostracism and depression. This bi-directionality may result in vicious cycles, with ostracized individuals developing depressive symptoms and reacting to their environment in dysfunctional ways that might result in even more ostracism as a consequence (Coyne, 1976).

1.3. Empirical findings on the ostracism-depression connection

To date, epidemiologic investigations mostly relied on cross-sectional designs and strongly support the notion that experienced ostracism is associated with depression (e.g., DeWall et al., 2012; Riva et al., 2016). Yet while suggestive, cross-sectional studies do not allow for conclusions about temporal order: Repeated ostracism may result in depression, but depressed individuals may also be ostracized more often. Moreover, in most studies both ostracism and depressive symptoms are assessed via self-report, rendering them vulnerable to assimilative carry-over effects (e.g., Schwarz and Bless, 1992) resulting from undue salience of one construct (e.g., ostracism) when assessing the other construct (e.g., depression).

Longitudinal studies that measure both ostracism and depressive symptoms at two or more measurement points offer a potential solution. Yet at present, there are only few longitudinal studies investigating associations between ostracism and depression, and those that do mainly focus on samples of children or adolescents (see also Platt et al., 2013). For instance, one longitudinal study with young adolescents (Nolan et al., 2003) showed that rejection prospectively predicted depression over a time span of two years, but not vice versa. Similar prospective effects have been found for the effects of peer rejection in adolescence (Zimmer-Gembeck et al., 2016) as well as for rejective parenting (Rowe et al., 2015). However, there is also evidence for the opposite line of causation: early depression symptoms are linked to later social problems with peers in adolescence (Kochel et al., 2012).

Moreover, the emphasis on rejection in adolescence within previous research leaves an important question open: Do these findings primarily hold for rejection in the sensitive period of adolescence, or do they generalize to ostracism over the lifespan? Adolescence represents a special period in ontogenesis during which individuals develop their social identity and social connectedness and acceptance are particularly central. Consequently, prior research has demonstrated that adolescents are both highly sensitive and highly reactive to threats and disruptions of their belongingness (Blakemore, 2018; Nikitin et al., 2014). Beyond adolescence, social connectedness remains a fundamental human need (e.g., Williams, 2009), but becomes less central. Thus, it remains an open question whether ostracism constitutes a risk factor for the development of depressive symptoms beyond adolescence.

1.4. Research question

The dearth of longitudinal evidence for adult samples is surprising given the prevalence of ostracism and strong theoretical claims regarding the connection between ostracism and depression. At this point, it is unclear whether social ostracism is an important risk factor for the development of clinical depression only during adolescence, or whether it is a risk factor for depression symptoms in humans over their whole life span. Furthermore, it remains an open question whether depressed individuals experience ostracism more frequently due to their affective disorder. Against this background, we investigate longitudinal associations between ostracism and self-reported diagnosed depression within a representative sample of the German adult population at two measurement points. In line with predictions from the Psychobiological Model of Social Rejection and Depression as well as the Temporal Need Threat Model of Ostracism we assume that ostracism predicts depression three years later. In addition, consistent with stress generation models, we further also analyzed whether prior depression predicts ostracism three years later.

2. Method

We used data from the Socio-Economic Panel (SOEP), a longitudinal data panel representative for the adult German population (Goebel et al., 2018) to address our research question. The SOEP data is subject to data protection laws of the Federal Republic of Germany and thus cannot be made public. However, free access is granted to all scientists who sign a contract with the German Institute for Economic Research (DIW Berlin; https://www.diw.de/en/diw_02.c.222829.en/access.html). Our complete analysis scripts are provided at https://osf.io/tuzg5/. The IRB of the University of Koblenz-Landau approved the assessment and analysis of data on ostracism and its negative affective consequences (IRB # 0002-16-1). The present contribution contains analysis of secondary data only, which is collected by the German Institute for Economic Research (www.diw.de) in full compliance with ethical standards for the treatment of human participants.

2.1. Participants

We conducted our analyses within the 2015 and 2018 SOEP-IS waves. In total, 2959 adults participated in the survey study; $n(2015) = 2745$ (52.9% female; $M_{age} = 53.44$, $SD = 18.26$, Range = 18–97); $n(2018) = 2215$ (53.8% female; $M_{age} = 55.48$, $SD = 18.52$, Range = 18–98). 2001 participants provided data at both measurement points (drop-out between 2015 and 2018 = 27.1%). Dropout analyses revealed that the participants who had participated at the first but not the second measurement point, compared to those participants who had participated at both measurement points, differed neither in experienced ostracism, $t(2743) = 0.10$, $p = .920$, nor in self-reported diagnosed depression, $\chi^2(1) = .41$, $p = .521$.

2.2. Measures

In the SOEP survey, *self-reported depression diagnosis* is assessed as a single-choice item (yes/no), presented within a questionnaire that asks participants to indicate all (chronic) illnesses they had been diagnosed with by a physician within the last two years. As the SOEP does not contain any other depression measure, this measure cannot be cross-validated within the SOEP data set. However, previous research has shown that self-reported diagnosis of depression is a valid method to estimate the presence of actual clinical depression as it strongly corresponds with other measures such as structured clinical interviews that are typically used to diagnose depression (Herva et al., 2006; Sanchez-Villegas et al., 2008).

Experience of ostracism was measured with the Ostracism Short Scale (OSS; Rudert et al., 2020a; Rudert et al., 2020b), a four-item scale that assesses the subjective frequency of having experienced ostracism during the last two months (e.g., *"Others ignore me"*, 7-point Likert scale, *1 = never, 7 = always*). Ostracism was assessed prior to depression both in 2015 and in 2018, thus eliminating the risk of assimilative carry-over effects from depression to ostracism. We conducted confirmatory factor analyses with a robust maximum likelihood estimator (MLR) for both measurement points to investigate whether a single-factor solution is a suitable measurement model to characterize the scale. Both factor analyses reached a good fit; $\chi^2(2) < 6.76$, $p > .034$, RMSEA < .03, CFI > .99, TLI > .98. All factor loadings exceeded values of $\lambda = .64$ and reached mean scores of $\lambda = .78$ resulting in high internal consistency of the scale (McDonald's $\omega_{T1,T2} = .86$). We also investigated the equivalence of the measurement model over both measurement points by conducting measurement invariance tests (Putnick and Bornstein, 2016). The same factor structure was applicable to both measurement points (configural invariance), indicated by a good model fit; $\chi^2(15) = 29.58$, $p = .014$, RMSEA = .02, CFI > .99, TLI = .99. Next, we tested whether factor loadings were equal between measurement points (metric invariance) by comparing the base model of configural invariance to a more restrained model with equalized factor loadings (Steenkamp and Baumgartner, 1998). We

detected no violation of metric invariance as deviations between model fit indices (CFI, TLI, and RMSEA) did not exceed the critical value of .01 (Putnick and Bornstein, 2016). The same was true when comparing the metric invariance model with a model that was characterized by constrained item intercepts (scalar invariance). As scalar invariance is considered the most important prerequisite for interpreting longitudinal trends (Putnick and Bornstein, 2016), we conclude that the Ostracism Short Scale is suitable for investigating temporal trends and associations.

2.3. Analytic strategy

First, we calculated zero-order correlations between both measured constructs at both measurement points. We calculated φ to estimate the zero-order correlation of depression measured in 2015 with depression measured in 2018. All zero-order correlations with ostracism were calculated using the latent ostracism factors as described above. Next, we conducted a latent cross-lagged panel analysis to dissect true temporal effects of experienced ostracism on depression and vice versa from cross-sectional associations while controlling for the constructs' relative stability. Depression was entered as a manifest variable. As depression was indicated by a single dichotomous item (diagnosed depression; yes/no), we used the weighted least squares means and variance adjusted estimator (WLSMV; Muthen et al., 1997). The WLSMV estimator allows for a robust estimation of model parameters (i.e., path coefficients) and model fit for structural equation models that include both latent constructs (here: ostracism) and categorical variables (here: depression). For ostracism experiences, we estimated latent factors for both measurement points; allowing for residual correlations between content-identical indicator variables measured at different time points. Experienced ostracism in 2015 was then used to predict both the experienced ostracism in 2018 (construct stability) as well as self-reported diagnosed depression in 2018 (temporal effect of ostracism). Similarly, self-reported diagnosed depression measured in 2015 was used to predict self-reported diagnosed depression in 2018 (construct stability) and experienced ostracism in 2018 (temporal effect of depression). We also allowed for undirected paths between the constructs within each measurement point (cross-sectional associations). We applied the Full Information Maximum Likelihood (FIML) method to handle missing data when estimating the structural equation model.

The fit of the computed model was evaluated through a combination of misfit (RMSEA) and fit indices (CFI, TLI). Our interpretation of these indices relies on established rules of thumb for cut-off values (Schermelleh-Engel et al., 2003). We distinguished between an acceptable (RMSEA ≤ .08, CFI ≥ .95, TLI ≥ .95) and a good model fit (RMSEA ≤ .05, CFI ≥ .97, TLI ≥ .95).

3. Results

The average frequency of experienced ostracism was relatively low (2015: $M = 1.75$, $SD = .77$; 2018: $M = 1.57$, $SD = 0.69$), corresponding to previous studies investigating the experience of ostracism (e.g., Ferris et al., 2008). Nevertheless, only a minority of the participants (2015: 29%; 2018: 39%) indicated that they never felt ostracized within the previous two months (i.e., had a mean ostracism score of 1.00 on the 7-point scale). For self-reported diagnosed depression, the prevalence was 5.4% in 2015 and 5.0% in 2018. The zero-order correlations indicated medium stability for both depression ($\varphi = .41$, $p < .001$, 95% CI [.37, .45]) and ostracism ($r = .45$, $p < .001$, 95% CI [.40, .51]) over the three years. Moreover, there were significant correlations between ostracism and depression within and between all measurement points (see *Table 1*). The latent cross-lagged panel model fitted the data well, $\chi^2(27) = 116.31$, $p < .001$, CFI = .99, TLI = .98, RMSEA = .03. All path coefficients are depicted in *Figure 1*. As hypothesized, ostracism in 2015 predicted depression in 2018, $\beta = .14$, $p = .001$, 95% CI [.08, .25]. Depression in 2015 also predicted ostracism in 2018, $\beta = .05$, $p = .014$, 95% CI [.02, .07].
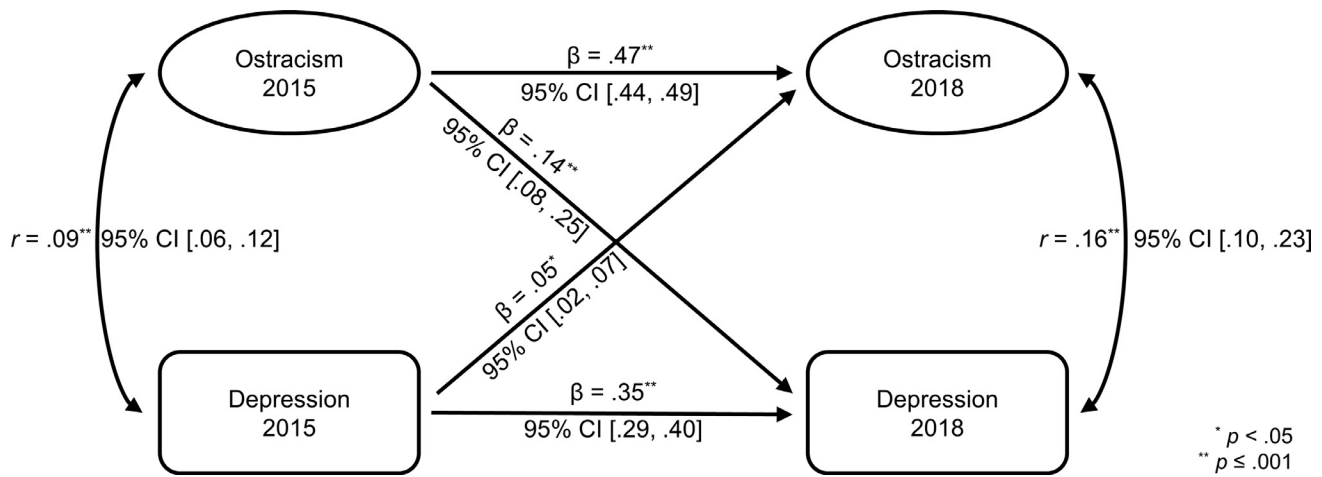
Fig. 1. Standardized path coefficients derived from the cross-lagged panel model linking ostracism and depression over a three-year time span. Neither the loadings of the items indicating the ostracism factors ($\lambda = 0.65$–0.88; all $p < .001$) nor residual correlations between items ($r = 0.00$–0.23; $p < .001$ for two correlations) are depicted for better comprehensibility.

Table 1
Zero-order correlations.

Scale	(1)	(2)	(3)	(4)
(1) Ostracism in 2015				
(2) Ostracism in 2018	.45**			
(3) Depression in 2015	.16**	.16**		
(4) Depression in 2018	.17**	.23**	.41**	

** $p < .01$

Ostracism was modeled as a latent factor indicated by the items of the Ostracism Short Scale for the estimation of the zero-order correlations.

The single ostracism items were highly skewed with participants mostly using the first two scale points (1 = *never*; 2 = *rarely*) when indicating their ostracism experiences (on average, 85.94% of the individual responses per item fall into these two categories). Thus, it appeared commendable to complement the above pre-planned analyses with an exploratory analysis, in which we treated the ostracism items as categorical rather than as continuous variables (each scale point is treated as a distinct category). The resulting model fit was slightly better than the original model fit, $\chi^2(27) = 44.75$, $p = .017$, CFI = .99, TLI = .99, RMSEA = .02. While the path linking ostracism in 2015 to depression in 2018 proved stable, $\beta = .15$, $p = .001$, 95% CI [.08, .23], the path linking depression in 2015 to ostracism in 2018 did not, $\beta = .04$, $p = .061$, 95% CI [.005, .08].

4. Discussion

Theories from both clinical and social psychology hold that ostracism constitutes a severe risk factor for the development of depression throughout the lifespan (Slavich et al., 2010; Williams, 2009). Despite these prominent claims, longitudinal research on ostracism as a risk factor for depression is scarce, and the available evidence focused on adolescence as a critical life phase for peer rejection (Platt et al., 2013). The present contribution extends the existing body of research by longitudinally investigating the temporal links between ostracism experiences and reports of diagnosed clinical depression within a representative adult sample of the German population. Results show that experiencing ostracism predicts self-reported diagnosed depression three years later. Moreover, consistent with theories arguing for vicious cycles of ostracism and depression (Coyne, 1976) as well as models on stress-

generation (Hammen, 1991; Liu and Alloy, 2010), the reverse link from depression to ostracism three years later was also documented, though it proved less stable and depended on the chosen model estimation.

4.1. Theoretical and practical implication

Our empirical results support the theoretical postulate of the Psychobiological Model of Social Rejection and Depression that experiences of ostracism could over time result in clinical depression (Slavich et al., 2010). Additionally, our research contributes to social psychological research on ostracism. To date, most investigations on ostracism focus on short-lived effects within the first minutes past the ostracism episode (Hartgerink et al., 2015; Williams, 2009). Here, we present additional evidence for long-term consequences of chronic ostracism on psychological functioning, which strongly align with the tenets of overarching social-psychological theories such as the Temporal Need Threat Model of Ostracism (Williams, 2009). Overall, this contribution shows how research on social ostracism and clinical depression intersect, possibly leading to a more comprehensive perspective on the interplay of social interactions and psychological health.

As a notable strength and different from prior research, we investigate the relationship between ostracism and depression in a broad nation-wide representative adult sample of the German population. The large sample allows for robust and generalizable conclusions. Going beyond earlier research, the results show that temporal trends linking ostracism to depression are not limited to the developmental stage of adolescence. Even though adolescence may be a particularly sensitive life phase (Blakemore, 2018; Nikitin et al., 2014), the impact of social ostracism remains relevant in later life stages. Neglecting social ostracism as a potential risk factor for clinical depression in adulthood could hinder improvement of depressive patients and maybe even increase their risk of suffering from further depressive episodes.

From a more practical point of view, practitioners working in the health, educational, and organizational sector, but also policy and decision makers may be well served to raise awareness about the detrimental effects of ostracism, and to initiate efforts that prevent enduring ostracism (Rudert and Greifeneder, 2017; Williams and Nida, 2014). Practitioners working directly with depressed patients might want to pay special attention to the vicious cycle connecting ostracism and depression. Depending on whether the problem derives mainly from cognitive biases or actual dismissive treatment by others, interventions may focus either on addressing and resolving misconceptions about ostracism (e.g. as in cognitive therapy, Beck, 1979; Ellis and Grieger, 1986), or on

providing resources for individuals to deal with ostracism in the respective context, such as unconditional social support (Grav et al., 2012) in combination with social skill trainings (Segrin, 2000). For instance, the Cognitive Behavioral Analysis System of Psychotherapy (Keller et al., 2000; McCullough Jr, 2003) for chronically depressed individuals could help to break vicious cycles by addressing feelings and potential causes of ostracism at the same time.

4.2. Methodological considerations

Ostracism was measured as a subjective self-assessment, consistent with the tenet that it is individual's subjective construal (and not the objective reality) that determines reactions to ostracism (Rudert and Greifeneder, 2016). Importantly, these subjective construals can reflect both actual ostracism and misperceptions, and depressed individuals may be more sensitive or prone for either (see Downey et al., 2004; Liu et al., 2014 on rejection sensitivity). Note that experimental induction of short-time, actual ostracism in the laboratory points in a similar direction as the present results, with ostracism strongly affecting participants' well-being and mood (Williams, 2009).

Notably, our depression measure was a self-reported diagnosis made by a physician instead of participants' self-assessment that is often relied on in cross-sectional studies (e.g., DeWall et al., 2012). Prior research has cross-validated self-reports of diagnoses and documented that self-reported diagnoses are highly correlated with other depression measures such as structured clinical interviews (Herva et al., 2006; Sanchez-Villegas et al., 2008). Hence, with the necessary level of caution, the available self-report measure in the SOEP may be considered a valid method to assess the presence of depression, granting a unique opportunity to understand the causes and consequences of depression within nation-wide panel data. Consistent with the assumption of a valid measure, the prevalence of self-reported diagnosed depression in the SOEP is comparable with data on self-reported diagnosed depression from the representative DEGS1 survey (Busch et al., 2013) conducted by the Robert Koch Institute (federal governmental research institute for disease prevention in Germany), namely a 12-month point prevalence of 6.0% (SOEP: 5.4–5.0%). Interestingly, the frequency of depressive symptoms measured via a cut-off criterion in self-administered questionnaires was slightly higher in the DEGS1 (8,1%). This may suggest that in the SOEP-sample, too, slightly more participants suffered from an undiagnosed depression.

4.3. Limitations and Future Research

Despite its validity, a potential downside of the self-reported diagnosis measure is that a dichotomous diagnosis comes with a strong variance reduction compared to a more continuous assessment of symptom severity. Another downside is that we cannot distinguish between different types of depressive disorders (e.g., major depression or bipolar disorder). On the other hand, as a potential strength of the measure, a self-reported medical *diagnosis* is likely less situationally dependent than the self-assessment of depressive symptoms. Moreover, as depression has a high comorbidity with other physical diseases as well as mental disorders (Moussavi et al., 2007; Rohde et al., 1991), reliance on a physician's assessment offers a certain amount of control for differential diagnoses. Ideally, future studies should aim to make use of multiple depression measures (e.g., self-reported diagnosis, established depression scales, structured clinic interviews), to benefit from their respective strengths and weaknesses.

When interpreting the associations between reported ostracism and diagnosed depression, it is important to keep in mind that ostracism and depression measures refer to time spans that overlap only partly. For the depression measure, participants indicate whether they had a history of depression during the last two years; the ostracism scale, in contrast, focuses on the last two months. Given this partial non-overlap *within measurement points*, the cross-sectional results at *one* specific measurement

point are not necessarily informative about whether participants with diagnosed depression were suffering under a depressive episode at the time of the assessment of ostracism. However, this partial non-overlap is less concerning for the interpretation of the observed longitudinal trends (cross-paths), which relied on data from the 2015 and 2018 waves. This is due to two reasons: First, the longitudinal cross-paths in cross-lagged panel models indicate actual change between the measurement points such as a shift from no diagnosed depression in 2014/15 to a diagnosis in 2017/18. Second, the points of reference are non-overlapping *between* measurement points. This means that the measurement of ostracism for two months in 2018 as well as of depression during the time-span between 2017 and 2018 both reflect later stages in participants' life than the measurements of both constructs at the first measurement point. Thus, we can clearly say that experiencing ostracism in 2015 predicted a shift from no history of depression to a diagnosed depression in the time span between 2017 and 2018.

However, it should be noted that the partial non-overlap within measurement points may render the *interpretation* of some of the prospective effects more difficult. As we cannot say whether participants were suffering from depression at the time of measurement or sometime during the previous two years, it is not possible to distinguish between effects that are due to the *(current) experience of depression* versus a *recent history of depression.* Thus, one explanation for the longitudinal cross-path of diagnosed depression in 2015 on ostracism in 2018 could be that depressed individuals experience more ostracism over time (consistent with stress-generation frameworks). Alternatively, a previous history of depression documented in 2015 might suffice to facilitate future ostracism experiences in 2018. To clarify whether a history of depression or the current experience of depression is the determining factor, additional studies might compare ostracism experiences of individuals with a currently diagnosed depression, individuals with no current diagnosis but a history of depression, and participants who never received a diagnosis. Additional qualitative interview studies with depressed individuals could also be helpful in further understanding the interplay of ostracism and depression during a depressive episode.

The presented longitudinal associations enhance our understanding about the underlying temporal order regarding ostracism and depression. It should be noted, though, that temporal order is merely a precondition and not a proof of causation and that we cannot rule out that both ostracism and depression might be affected by third variables. However, given that the suggested causal predictions were grounded in theory from both clinical and social psychology, it appears fruitful to consider the possibility that the longitudinal associations indeed reflect causality for the ostracism-depression link. To further underscore such a conclusion, the development of targeted interventions and treatments that aim to reduce social ostracism is needed. Further research could then investigate the impact of such interventions on patients' depressive symptoms. This approach may benefit from considering a variety of interventions, given that social ostracism (just as depression) is a multi-causal phenomenon that can be due to controllable as well as uncontrollable reasons and originate from both the social environment of the ostracized individuals and their own actions as well as perceptions.

5. Conclusion

While theorists have claimed that ostracism could have a negative impact on long-term psychosocial functioning and eventually result in depression, empirical evidence on such temporal trends is scarce for the adult samples. Our findings provide important insights and implicate that continued ostracism experiences should not be taken lightly. Over time, the hurt deriving from experiences of being ostracized can fester and eventually transform into depression. Our research provides critical knowledge for medical and health practitioners regarding the importance of ostracism experiences as a risk factor for the development of persisting clinical depression.

Author statement

Authors SCR and RG wrote the application to include the Ostracism Short Scale into the Socio-economic panel. Author SJ undertook the statistical analysis, Authors SCR and SJ wrote the first draft of the manuscript. All authors contributed to and have approved the final manuscript.

Declaration of Competing Interest

The authors report no conflict of interests.

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