An Ecological Momentary Assessment Study to investigate individuals' reactions to perceived social exclusion

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Abstract

Most psychological research on social exclusion mainly focused on maximizing internal validity (e.g., controlling for confounding variables). However, maximizing external validity to produce generalizable knowledge about real-world experiences becomes increasingly essential. In the present study (N=89), we adopted an ecological momentary assessment (EMA) design to track exclusionary experiences and their impact on psychological distress over 15 consecutive days. We tested the mediating effects of positive and negative emotions on the link between daily exclusionary experiences and psychological distress, examining the moderating role of experiential avoidance (EA). Results confirmed a large effect of social exclusion on distress mediated by positive and negative emotions. However, EA did not moderate the exclusion-distress link but was, unexpectedly, found to moderate the exclusion-positive emotions relationship. Specifically, this relationship was stronger for low (vs. high) levels of EA, indicating that adopting EA in response to perceived exclusion may provide a protective function from blunted positive emotions. The present study suggests the usefulness of investigating the occurrence and reactions to the daily experiences of social exclusion, going beyond the sole reliance on experimental manipulations, especially to explore the role of individual differences in working towards a more integrated theoretical model of exclusion.

Keywords: Social Exclusion; Ecological Momentary Assessment; Experiential Avoidance; Personality, Coping.

Introduction

Social exclusion has been broadly defined as the experience of being kept apart from others physically (e.g., social isolation) or emotionally (e.g., being ignored or told one is not wanted; Riva & Eck, 2016). Exposure to social exclusion experiences can occur multiple times throughout the day in various contexts (e.g., ignored by family members, work colleagues, or social media posts receive no comments or likes; Nezlek et al., 2012; Rudert et al., 2020). According to the Temporal Need Threat Model of Ostracism (Williams, 2009), individuals experience immediate psychological distress with an increase in negative emotions (and decrease in positive ones) and threats of satisfaction of fundamental needs (i.e., belonging, control, self-esteem, and meaningful existence). Since its introduction, hundreds of experimental studies have replicated these findings through the Cyberball paradigm (e.g., Williams et al., 2000; Hartgerink et al., 2015). Following this short-term reaction, Williams (2009) argues that how a person copes with their ostracism depends on how they appraise the meaning, context, and importance of the experience (i.e., the reflective stage). Moreover, at this stage, individual differences are purported to influence how quickly people cope with their ostracism experience. Indeed, several moderators of the short-term effects of ostracism have been reported, including social anxiety (Zadro et al., 2006), fear of social pain (Riva et al., 2014), attachment style (Yaakobi & Williams, 2016), cultural values (Yaakobi, 2021), and a tendency to ruminate (Wesselmann et al., 2013). Although people might experience prolonged and repeated episodes of exclusion (entering the so-called resignation stage; Williams, 2009; see also Riva et al., 2017), when such experiences remain short-term, their adverse effects do not typically persist for long (Williams, 2009).

Over the last 20 years, numerous experimental studies on ostracism and rejection with high internal validity have been conducted. However, research that points to external validity and

considers the unfolding of exclusion in real life is lacking**.** Given that much work in the social exclusion literature has examined potential moderating effects of individual differences in the laboratory, methods are needed to allow for tests of such moderation effects that are externally valid and generalizable. The present study aims to address this knowledge gap using the Ecological Momentary Assessment (EMA) paradigm to examine real-world experiences of social exclusion and possible moderators of its consequences rather than artificially induced exclusionary events in the laboratory.

Experiential Avoidance

One moderator of the shorter-term effects of social exclusion that has received recent empirical attention is experiential avoidance (EA). EA is one of the key processes in the overarching construct of psychological inflexibility within the Acceptance and Commitment Therapy (ACT) model of behavior change (Hayes et al., 2006, 2012). EA is described as efforts to alter the frequency or form of unwanted thoughts, memories, and bodily sensations, even when it leads to a personal detriment. In the short term, avoiding the experience of uncomfortable and distressing private events might be adaptive. This might happen, for instance, when someone attempts to suppress their thoughts and feelings when ghosted, rather than over-reacting to such feelings (e.g., accusing the other person of ostracism, ignoring them in retaliation; see Pancani et al., 2021). However, the chronic use of EA when dealing with daily stressors (e.g., social exclusion) is purported to exacerbate psychological distress (e.g., Hayes et al., 1996). Indeed, research has shown that attempts to suppress unwanted thoughts (i.e., one type of EA strategy) can lead to paradoxical effects whereby the frequency and intensity of the thought increase (e.g., Wenzlaff & Wegner, 2000). It is worth noting here that some ostracism researchers posit that individuals with avoidant attachment styles report less psychological distress following social exclusion because they employ suppression and denial mechanisms to protect themselves (e.g., Shaver & Mikulincer, 2013; Yaakobi, 2022; Yaakobi

&Wlliams, 2016;). However, importantly, while the mechanism might appear similar on the surface, EA from an ACT perspective is not linked to putative attachment styles but is a contextual emotion regulation behavior shaped via a history of negative reinforcement.

Some researchers have explored whether EA is a moderator of the emotional effects of ostracism. For instance, Waldeck et al. (2020) found that participants who were ostracized in Cyberball coped with their ostracism more quickly in the short term when low (vs. high) in EA. Furthermore, Tyndall et al. (2018) found that EA appeared to moderate the relationship between perceived ostracism and psychological distress in the long term. Thus, at high EA levels (i.e., more inflexible), there was a significant positive relationship between ostracism and distress, which was not significant at low levels. As such, people appeared to recover more quickly from their ostracism when lower in EA. Such findings are promising as reducing reliance on EA as a coping strategy is a key target within ACT's model of behavior change and offers a potential route for effective intervention for those who suffer exclusion daily. Indeed, emerging literature suggests that even brief exposure to acceptance and mindfulness-based interventions can help people cope more readily with their ostracism experience (e.g., Hochard et al., 2021). Although the above results are encouraging, little is known about the role of EA in coping with episodes of exclusion in the short term, and research needs to examine it in a more ecological context when dealing with the psychological distress resulting from daily experiences of social exclusion.

The present research

The present study focused on the association between perceived social exclusion and psychological distress in everyday life, testing possible mediating effects of positive and negative emotions. Moreover, we explored whether the participants' tendency to avoid uncomfortable and distressing internal experiences could moderate the relationships among social exclusion, emotions, and psychological distress. As noted above, as an innovative factor, we adopted an Ecological Momentary Assessment design (EMA; for an overview, see: Shiffman et al., 2008) that allows the

collecting of real-time data repeatedly over time and in natural environments. Thus, compared with cross-sectional designs, these advantages make the EMA methodology more reliable for investigating the relationship between psychological dimensions that can rapidly change over time, such as social exclusion and psychological distress.

As reported in several studies (Chung, 2018; Riva et al., 2017), we hypothesized a positive relationship between perceived social exclusion and psychological distress. Following Williams (2009), we also hypothesized that affective reactions mediate this link. Specifically, a higher perception of social exclusion would decrease positive emotions and increase negative ones, which would lead to higher psychological distress. Indeed, the immediate (reflexive) emotional response is posited to precede the subsequent reflective stage (Williams, 2009). Further, as experiential avoidance (EA) strategies include attempts to avoid or reduce the intensity of emotional responses to stress (Hayes et al., 2012), we hypothesized that EA would moderate the exclusion-distress relationship. Specifically, having low levels of EA should act as a buffer against the distress associated with ostracism (e.g., Tyndall et al., 2018). As such, we have positioned EA as a *response-focused* rather than an antecedent emotion regulation strategy in this study (see Gross, 1998), meaning that it can intervene when the individual reflects on the meaning of the perceived exclusionary episode (i.e.,, William's reflective stage).

Method

Sample Size

We planned to conduct a multilevel moderated mediation with random slopes in which we estimated the relationship between perceived social exclusion and psychological distress being mediated by negative and positive emotions. Moreover, we estimated the moderating effect of experiential avoidance (i.e., a between-subject variable) on all the relationships estimated in the mediation model. Given the complexity of the model, we based our sample size calculation on prior simulation studies conducted on EMA methodology and multilevel modeling. Zirkel et al. (2015)

suggested collecting at least 35 observations per participant; Kreft and de Leeuw (1998) recommended the 30/30 rule (i.e., 30 participants with 30 observations each), whereas Hox (1998) proposed the 50/20 rule to achieve a good power. Moreover, Maas and Hox (2005) ran a simulation study on moderation in multilevel models showing that substantial biases in the estimates related to the level-two (i.e., between-subject) variables occur only for 30 level-two units or less. Thus, we planned to recruit at least 60 participants asking them to complete up to 45 EMA questionnaires.

Participants and Procedure

Eighty-nine participants (52 females; Age: $M = 26.82$, $SD = 7.44$) were enrolled with a snowball sampling method for the present study. Participants were presented with an initial online questionnaire on Qualtrics (2021). Then, the researcher helped participants install an application to manage EMA studies, *Time2Rate* (*BLIND REFERENCE*), on their smartphones. In our design, *Time2Rate* sent notifications to each participant three times a day for 15 consecutive days. We adopted a time-based sampling method in which assessment time systematically varied from day to day to cover most waking hours. When tapping on the notification, *TimeToRate* presented the participants with the brief EMA questionnaire. If participants missed the notification, they received three reminders (one every 30 minutes). If the last reminder was missed, no other opportunities to complete that specific EMA questionnaire were given.

Measures

Initial Questionnaire. The questionnaire measured age, gender, and experiential avoidance, which was assessed using the *Brief Experiential Avoidance Questionnaire (BEAQ*; Gámez et al., 2014). Participants responded using a 6-point Likert scale from 1 (strongly disagree) to 6 (strongly agree), $\alpha = .76$. Sample items include, “The key to a good life is never feeling any pain” and “I would give up a lot not to feel bad.” Higher scores indicate greater levels of experiential avoidance.

EMA Questionnaire. Each EMA questionnaire included a single question asking participants how they felt *at that moment*. Following the question, six *ad hoc* items (three for each construct)

were developed to measure perceived social exclusion and psychological distress on a 5-point Likert scale, from 1 (not at all) to 5 (extremely). Specifically, "I feel ignored," "I feel rejected," and "I feel socially excluded" (α = .88) were used to assess the main components of social exclusion (Riva & Eck, 2016). "I feel depressed," "I feel anxious," and "I feel stressed out" (α = .73) were used to assess the main components of psychological distress (i.e., depression, anxiety, stress; Lovibond & Lovibond, 1995). Emotions were measured on the same Likert scale, using two items for positive ("happy" and "calm;" r = .58) and negative ("angry" and "sad;" r = .51) valence.

Results

The 89 participants completed a total of 3,283 EMA questionnaires, ranging from 5 to 45 (M = 36.89, SD = 11.04). Twelve participants had less than 20 repeated measures, 17 participants less than 30, and 20 participants less than 35, violating the recommendations of Hox (1998), Kreft and de Leeuw (1998), and Zirkel et al. (2015), respectively. However, given that these recommendations represent rules of thumb to follow in planning the data collection (not exclusion criteria) and a major focus of our study was the effect of a between-subject variable, we prioritized level-two units, keeping the number of participants as large as possible to achieve good power.

Mplus, version 7 (Muthén & Muthén, 2012), was used to run a multilevel moderated mediation analysis with random slopes. Specifically, at level 1 (i.e., within-subject), we regressed psychological distress on perceived social exclusion, positive emotions, and negative emotions, estimating random slopes. Moreover, we estimated the random slope of the effect of perceived social exclusion on positive and negative emotions and the correlation between the latter two variables. At level 2 (i.e., between-subject), we estimated (a) the fixed effects of all the regression coefficients estimated at level 1, (b) the fixed intercept of the three dependent variables, (c) all the possible covariances between the coefficients mentioned in the previous two points, (d) the cross-level interactions between experiential avoidance and the random intercepts and slopes, and (e) the

effect of gender (0 = female, 1 = male) and age on each random intercept and slope to control for their possible influence. All the predictors were mean-centered.

The fixed slopes of the model (AIC = 17750.5, sample-size adjusted BIC = 17963.6) are displayed in Figure 1, and the effects of the between-subject predictors are reported in Table 1. The direct effect of social exclusion on psychological distress was not significant (p = .517). However, this effect was significantly mediated by both positive, b = .152, 95% C.I. [.093, .211], p < .001, and negative emotions, b = .050, 95% C.I. [.004, .097], p = .035. In other words, higher perceived social exclusion led to higher psychological distress through both a decrease in positive emotions and an increase in negative ones. Moreover, the mediation effect passing through positive emotions was stronger than the negative one, Δb = .102, 95% C.I. [.034, .169], p = .003.

To explore whether the two mediation paths were responsible for the non-significant direct effect of social exclusion on psychological distress, we ran a multilevel model estimating only the latter effect, controlling for the influence of age and gender. The results showed that social exclusion had a significant and positive effect on psychological distress, b = .269, 95% C.I. [.141, .396], p < .001, confirming the full mediation of emotions.

In the main model, experiential avoidance showed only one significant effect: the cross-level interaction with the random slope estimated between perceived social exclusion and positive emotions. Higher perception of social exclusion predicted a significant decrease in positive emotions for each level of experiential avoidance tested. However, for individuals low in experiential avoidance (-1 *SD*), the effect of perceived social exclusion on positive emotions was stronger, b = -.493, 95% C.I. [-.635, .351], p < .001, than what was observed in individuals high in experiential avoidance (+1 *SD*), b = -.355, 95% C.I. [-.521, -.188], p < .001.

Due to the above cross-level interaction, experiential avoidance significantly moderated the indirect effect passing through positive emotions. The mediation was significant and positive for each level of experiential avoidance, but the indirect effect weakened as experiential avoidance

increased. Indeed, for individuals low in experiential avoidance (-1 *SD*), the indirect effect of perceived social exclusion on psychological distress was stronger, $b = .179$, 95% C.I. [.114, .244], $p < .001$, than what was observed in individuals high in experiential avoidance (+1 *SD*), $b = .126$, 95% C.I. [.061, .190], $p < .001$.

Concerning the sociodemographic characteristics, age did not show any significant effect. Conversely, gender predicted the random intercepts of psychological distress and positive emotions, as well as the random slopes linking perceived social exclusion to psychological distress and negative emotions. Specifically, the average level of psychological distress was higher for females, $M = 2.249$, 95% C.I. [2.118, 2.379], $p < .001$, than males, $M = 1.999$, 95% C.I. [1.880, 2.118], $p < .001$, whereas positive emotions were significantly lower than the sample mean for females, $M = -0.201$, 95% C.I. [-0.380, -0.022], $p = .028$, and not significantly different from it for males, $M = 0.176$, 95% C.I. [-0.002, 0.354], $p = .053$. The relationship between perceived social exclusion and psychological distress was not significant for females, $b = .037$, 95% C.I. [-.076, .150], $p = .517$, and positive and significant for males, $b = .231$, 95% C.I. [.145, .316], $p < .001$. Conversely, the relationship between perceived social exclusion and negative emotions was significant and positive irrespectively from gender, but weaker for females, $b = .459$, 95% C.I. [.328, .589], $p < .001$, than males, $b = .678$, 95% C.I. [.513, .843], $p < .001$. Finally, positive and negative emotions correlated negatively at both level 1, $r = -.213$, 95% C.I. [-.249, -.178], $p < .001$, and level 2, $r = -.089$, 95% C.I. [-.152, -.026], $p = .006$.

Discussion

The literature on social exclusion has typically investigated the consequences of this phenomenon from an experimental standpoint, manipulating individuals' perceived ostracism and rejection, or using retrospective surveys. Although these methods have significantly increased the knowledge of the phenomenon, less is known about real-life, daily experiences of exclusion.

Recently, Bernstein et al. (2021) made an effort in this direction, adopting an EMA methodology and finding that daily life exclusion worsened mood and threatened basic needs. However, the present study is the first to investigate whether individual differences moderated the immediate processes following daily exclusion using an EMA design, a methodology characterized by high ecological validity. Consistent with previous research (e.g., Riva et al., 2017; Waldeck et al., 2017), perceived exclusion was positively associated with psychological distress. However, we detected that positive and negative emotions fully mediated the exclusion-distress relationship. This finding supports literature reporting links between ostracism and affect (e.g., Howard et al., 2020; Spoelma et al., 2021; Williams, 2009). Indeed, according to Williams (2009), there is an immediate emotional impact following the detection of exclusion. Our data shows that such an immediate reaction accounts for the psychological distress resulting from the perception of exclusion.

However, in contrast to our predictions, EA was not found to be a moderator of the exclusion-distress relationship. This was surprising given that EA has been shown to moderate the distress associated with ostracism (Tyndall et al., 2018), at least in the long-term. As such, the benefits of psychological flexibility (i.e., low levels of EA) may not be as evident following daily exclusion.

We also unexpectedly noticed that EA was a moderator of the link between perceived exclusion and positive emotions. Therefore, people appeared to be somewhat *partially protected* from the distress associated with exclusion due to *less of a negative impact* on their positive emotions (e.g., maintaining one's enjoyment in activities) if higher in EA (vs. low). As such, attempts to avoid the initial pain of ostracism (e.g., thought suppression, distraction) seem to benefit how people maintain their positive mood in coping with their exclusion. Indeed, there is evidence to suggest that short-term avoidance strategies (e.g., distraction) can help people endure painful events (e.g., Brown et al., 2022). Moreover, as people are hard-wired to detect ostracism quickly (Williams, 2009), an adaptive response arguably would be to attempt to down-regulate the negative

impact (i.e., adopt EA strategies). This unexpected result might derive from the robust ecological validity of the EMA methodology, that could have uncovered new real-life effects that experimental approaches might conceal. However, further research is needed to explore the mechanism in which high levels of EA provide some protective function in the short-term. Still, in the long-term, the reverse effect might occur (i.e., psychological inflexibility maintains distress from exclusion). Such a mechanism would appear to fits with some perspectives from the psychological inflexibility model, which discusses whether and when EA is harmful in the moment (Levin et al., 2018).

It was also found that men (vs. women) appeared to be more distressed due to their perceived exclusion. Although such findings are partially consistent with some studies (e.g., Hitlan et al., 2006), the literature is still mixed regarding potential sex differences in responses to social exclusion (e.g., Benenson et al., 2003; Waldeck et al., 2017).

Limitations and Future Directions

Some limitations reduce our ability to make firm conclusions. First, as noted above, 12 participants had less than 20 repeated measures. A low number of measurements might negatively impact data reliability, affecting the estimation of random slopes and reducing power (e.g., Zirkel et al., 2015); thus, caution is warranted in interpreting our data as some assumptions were violated. Although post-hoc power analysis might seem an easy solution, such technique is strongly discouraged by statisticians (e.g., Gelman, 2019; Levine & Ensom, 2001). Indeed, post-hoc power is unrelated to *a priori* power and it only represents an alternative way to express *p*-values (Hoenig & Heisey, 2001; Lakens, 2022). Second, our sample consisted of young individuals, and females were overrepresented. Future studies might consider a more heterogeneous sample, especially in terms of age, to investigate the replicability of our findings. For instance, extant studies have shown that older adults are particularly vulnerable to rejection and ostracism (Hawkley et al., 2011). Our EMA design might provide crucial information about how to help them cope with exclusion. Third, as the moderation effect was small in magnitude and resulted from an exploratory analysis, the

results may be subject to Type 1 errors. Moreover, considering possible power issues deriving from not excluding participants with too few measurements, the results might be subject to Type 2 errors. We recommend that future researchers examine the replicability of these findings using EMA and various methodologies (e.g., longitudinal, experimental) and use qualitative approaches to explore how people with different personality traits experience (and cope) with exclusion.

Conclusion

Daily encounters of social exclusion can be distressing experiences. We provide further evidence on this topic by employing an EMA methodology, finding that positive and negative emotions fully mediate the link between social exclusion and psychological distress. Our adoption of EMA design in this research domain represents a methodological advance insofar as the internal validity of numerous laboratory investigations of social exclusion has been shown. Still, ecologically valid methods are necessary to further our understanding of the real-world effects of perceived ostracism (see also Bernstein et al., 2021). Therefore, we argue that the EMA design might have revealed effects (i.e., the moderating role of EA) that could not be observed using other methods. Indeed, we found new evidence that adopting experiential avoidance strategies may ironically provide a partial buffer in coping with the initial impact of exclusionary events by maintaining positive emotions. These results extend existing literature showing that EA can moderate distress from ostracism; however, future research is needed to replicate further and explore these effects.

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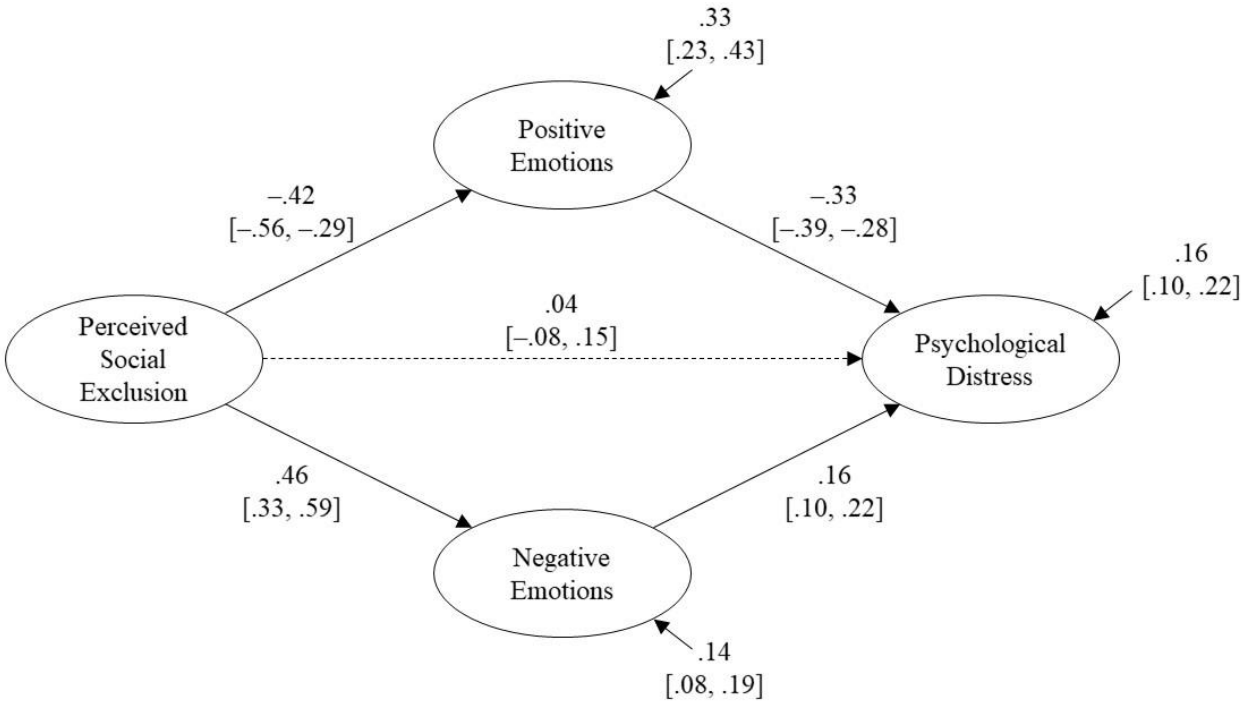
Table 1 – Effects of the between-subject predictors on random intercepts and slopes.

	b	95% C.I.	*p*-value
Fixed intercept: Psychological Distress			
Age	–.002	–.014, .010	.736
Gender	–.250	–.424, –.075	.005
Experiential avoidance	.127	–.028, .281	.108
Fixed intercept: Positive Emotions			
Age	.009	–.007, .025	.278
Gender	.377	.127, .626	.003
Experiential avoidance	–.111	–.314, .092	.285
Fixed intercept: Negative Emotions			
Age	.009	–.004, .022	.158
Gender	–.093	–.247, .061	.237
Experiential avoidance	.055	–.080, .191	.424
Fixed slope: Social Exclusion → Psychologial Distress			
Age	.000	–.013, .011	.995
Gender	.193	.059, .327	.005
Experiential avoidance	–.001	–.113, .112	.991
Fixed slope: Social Exclusion → Positive Emotions			
Age	.001	–.012, .013	.933
Gender	–.117	–.319, .085	.255
Experiential avoidance	.142	.009, .276	.037
Fixed slope: Social Exclusion → Negative Emotions			
Age	–.008	–.018, .002	.115
Gender	.219	.020, .419	.031
Experiential avoidance	–.093	–.226, .039	.167
Fixed slope: Positive Emotions → Psychologial Distress			
Age	.003	–.004, .010	.447
Gender	.034	–.048, .117	.415
Experiential avoidance	.019	–.055, .093	.618
Fixed slope: Negative Emotions → Psychologial Distress			
Age	.003	–.005, .011	.479
Gender	.088	–.015, .192	.095
Experiential avoidance	.076	–.049, .201	.233

Figure 1 – The diagram of the model: fixed slopes coefficients and 95% confidence intervals (in parentheses) are reported.



Note. Solid lines represent significant effects at level $p < .001$, dotted lines represent non-significant effects.