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Loneliness Versus Distress: A Comparison of Emotion Regulation Profiles

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(Received 11 February 2022; accepted 11 August 2022; first published online 14 September 2022)

Abstract

Loneliness, a negative emotion stemming from the perception of unmet social needs, is a major public health concern. Current interventions often target social domains but produce small effects and are not as effective as established emotion regulation (ER)-based interventions for general psychological distress (i.e., depression/anxiety). Given that loneliness and distress are types of negative affect, we aimed to compare them within an ER framework by examining the amount of variance ER strategies accounted for in loneliness versus distress, and comparing the ER strategy profiles characterising them. Participants ($N = 582$, $M_{\text{age}} = 22.31$, 77.66% female) completed self-report measures of loneliness, distress, and use of 12 cognitive (e.g., cognitive reappraisal) or behavioural (e.g., expressive suppression) ER strategies. Regression analyses revealed that ER explained comparable variance in these constructs. Latent profile analysis identified seven profiles differing in ER patterns, with no distinct loneliness or distress profile identified. Rather, similar patterns of ER characterised these two constructs, involving the greater use of generally maladaptive strategies and the lesser use of generally adaptive strategies. However, loneliness was additionally characterised by less use of strategies involving social connection/expression. Overall, our study supports the utility of ER for understanding loneliness. Established ER-based frameworks/interventions for distress may have transdiagnostic utility in targeting loneliness.

Keywords: loneliness; psychological distress; emotion regulation; latent profile analysis; transdiagnostic

Introduction

Loneliness, defined as a subjective unpleasant or distressing feeling of a lack of connection to other people, along with a desire for more, or more satisfying, social relationships (Badcock, Holt-Lunstad, Garcia, Bombaci, & Lim, 2022), is highly prevalent across the lifespan and is a significant threat to the health and quality of life of individuals (Holt-Lunstad, 2022; Lim, Eres, & Vasan, 2020a). Around 15–30% of adults report chronic (i.e., enduring) levels of loneliness, a presentation with profound negative impacts on a variety of key mental and physical health outcomes (e.g., depression, functional disability, cardiovascular disease; Park et al., 2020). Given its links to poor health and mortality, loneliness is now recognised as a major public health concern (Holt-Lunstad, 2022), and it is, therefore, important to develop more effective conceptualisations and treatment approaches to alleviate its effects.

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Loneliness Interventions

Many of the loneliness interventions designed to date have focused on increasing the quantity of people's social contacts (Masi, Chen, Hawkey, & Cacioppo, 2011). However, experiences of loneliness are not always contingent on experiences of social isolation (e.g., a person may feel lonely despite having social contacts), and thus, these social-based interventions have been largely unsuccessful in alleviating loneliness, yielding only small effect sizes (Masi et al., 2011).

In contrast, treatments within related domains of negative affect, such as general psychological distress (operationalised as a composite of depression and anxiety symptoms; Kessler et al., 2003), have highlighted the efficacy of interventions that promote emotion regulation (ER) skills, with strong effect sizes reported (Barlow, Curreri, & Woodard, 2021). Considering the conceptual proximity of loneliness to psychological distress, and that they are often comorbid (Richard et al., 2017), the benefits of ER interventions might extend to treatment for loneliness. Targeting the ER mechanisms that underpin this experience may be useful in conceptualising and treating loneliness. While loneliness and psychological distress are both types of negative affect, there is a conceptual and statistical distinction between them; by definition, loneliness uniquely stems from unmet social needs, whereas psychological distress is a more general type of negative affect attributable to a variety of sources (Cacioppo, Grippo, London, Goossens, & Cacioppo, 2015; Lovibond & Lovibond, 1995). Therefore, establishing the degree of similarity (or difference) between these affective phenomena in their emotion regulation mechanisms could help to determine whether a transdiagnostic approach may be relevant for loneliness and psychological distress, or if there is something unique and specific that needs to be altered for interventions to encapsulate loneliness.

Theoretical Considerations

Recently, Preece et al. (2021) proposed that an ER framework might hold promise for understanding and addressing loneliness, particularly as loneliness is a type of negative affective state. The basis for this proposal is grounded in Gross's (2015) *process model of ER*. The core tenets of this model are that emotions (i.e., loneliness or other negative emotions) unfold over time, that people can use different types of ER strategies to try to alter the trajectory of such emotions, and that some strategies are generally more effective than others (see Supplementary Figure S1 for a more detailed description of the process model). The utility of this model has been widely supported in the mental health field, where individuals with high levels of depression or anxiety have consistently been found to differ from healthy samples in the types of ER strategies they typically use (e.g., Aldao, Nolen-Hoeksema, & Schweizer, 2010).

Empirical Findings

To date, few studies have applied such a framework to the understanding of loneliness. Those that have, though, have shown promising results. Most existing studies of this type have looked specifically at two common ER strategies, cognitive reappraisal (i.e., changing the way one is thinking about a situation to change its emotional impact) and expressive suppression (i.e., inhibiting the behavioural expression of an emotion), finding in each case that the low use of cognitive reappraisal and the high use of expressive suppression is associated with loneliness (e.g., O'Day, Morrison, Goldin, Gross, & Heimberg, 2019; Verzeletti, Zammuner, Galli, & Agnoli, 2016). However, most prior work has failed to investigate the broader range of ER strategies available, which limits our understanding of the full ER profile associated with loneliness and how this compares to other specific negative emotional experiences (i.e., because people typically use a wide range of cognitive or behavioural strategies to regulate their emotions, with successful ER requiring flexible use of the right strategies at the right times; Gross, 2015).

One study that did examine a wider range of strategies was Kearns and Creaven (2017), who employed vignette-based ER measures to examine typically adaptive (i.e., being present, positive

reappraisal, emotion expression, positive mental time travel, situation modification, capitalising, attention reorientation, and behavioural display) and typically maladaptive (i.e., negative mental time travel, learned helplessness, fault finding, rumination, suppression, substance abuse, distraction, and acting out) cognitive and behavioural ER responses to positive and negative scenarios. Results showed that ER styles significantly predicted loneliness, explaining 13–18% of the variance in loneliness.

Preece *et al.* (2021) also conducted a study to map a fuller ER profile for loneliness. They gathered data on a wide variety of cognitive and behavioural ER strategies via psychometric questionnaires, finding in a regression analysis that ER patterns could account for around half (52.2%) of the variance in loneliness. A latent profile analysis, moreover, highlighted a distinct ER profile characterising high loneliness. Cognitively, loneliness was denoted by the low use of cognitive reappraisal and the high use of catastrophising, rumination, self-blaming, and blaming others. Behaviourally, loneliness was denoted by the high use of expressive suppression and behavioural withdrawal, and the low use of seeking social support. Broadly speaking, this is a pattern of ER that mirrors what has also been commonly linked to general psychological distress (i.e., the high use of maladaptive strategies like expressive suppression and the low use of adaptive strategies like cognitive reappraisal; Aldao *et al.*, 2010) and is consequently often targeted in established ER-based treatments of depression and anxiety (e.g., Barlow *et al.*, 2021).

While these are therefore promising findings, given the lack of data in the loneliness context, further replications are required to establish the generalisability and importance of this ER profile for loneliness. Moreover, since Kearns and Creaven (2017) and Preece *et al.* (2021) did not examine psychological distress in their studies, it remains unclear the extent to which the ER profile characterising loneliness might truly be similar or differentiated from the ER profile characterising general psychological distress (i.e., a crucial detail that may help inform the extent to which established ER-based interventions for distress could be applied or adapted to target loneliness).

The Present Study

The purpose of the present study was to comprehensively compare loneliness and general psychological distress within an ER framework. We examined (1) how much variance ER strategies accounted for in loneliness versus distress and (2) used latent profile analysis (LPA) to compare the ER strategy profiles characterising these two types of affective phenomena.

Method

Participants and Procedure

Our sample was 582 psychology students¹ from an Australian university who completed self-report measures of loneliness, distress, and ER as part of a larger online survey² exploring emotional functioning, well-being, mental health symptoms, and self-injury (the total survey was around 60 min in duration). Most participants were female (77.66%), with a mean age of 22.31 years ($SD = 6.19$, range = 17–56), and the majority of the sample was born in Australia (67.87%). Participants accessed the survey via Qualtrics software. Participants were recruited via the SONA system at Curtin University, an online system where students participate in research in exchange for course credit. Students in this study thus received course credit for participation.

¹An a priori statistical power analysis (G*Power 3.1) indicated that the minimum sample size required for our analyses was 135 participants.

²All administered measures have previously demonstrated good validity and reliability (e.g., Garnefski & Kraaij, 2006; Gross & John, 2003; Kraaij & Garnefski, 2019; Osman *et al.*, 2012; Russell, 1996). All administered measures had high reliability in our sample (i.e., $\alpha \geq .70$), except for the *rumination* subscale of the Cognitive Emotion Regulation Questionnaire-Short (CERQ-S) ($\alpha = .62$).

Materials

10-Item UCLA Loneliness Scale (UCLA-LS)

The 10-item UCLA-LS (Russell, 1996) is a measure of loneliness. Items are answered on a 4-point Likert scale, from 1 (never) to 4 (always), where half of the items are positively worded (e.g., ‘How often do you feel close to people?’). After reverse coding positively worded items, all items are summed into a total scale score as an overall marker of loneliness, with higher scores indicating higher levels of loneliness.

Depression Anxiety Stress Scale-21 (DASS-21)

The DASS-21 (Lovibond & Lovibond, 1995) is a 21-item measure of depression, anxiety, and stress symptoms. Items are answered on a 4-point Likert scale, ranging from 0 (did not apply to me at all) to 3 (applied to me very much or most of the time), with higher scores indicating more severe symptoms. Psychometric studies have indicated that the DASS-21 is best represented by summing all items into a total scale score as an overall marker of general psychological distress (e.g., Osman et al., 2012).

Emotion Regulation Questionnaire (ERQ)

The ERQ (Gross & John, 2003) is a 10-item measure of habitual use of two ER strategies: *cognitive reappraisal* (6 items, e.g., ‘I control my emotions by changing the way I think about the situation I’m in.’) and *expressive suppression* (4 items, e.g., ‘I keep my emotions to myself.’). Items are answered on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree), with higher scores indicating the higher use of that strategy.

Cognitive Emotion Regulation Questionnaire-Short (CERQ-S)

The CERQ-S (Garnefski & Kraaij, 2006) is an 18-item measure of habitual use of several cognitive strategies used to regulate emotions when experiencing unpleasant events. We used data from five of the CERQ-S subscales:³ *self-blame* (e.g., ‘I think that basically the cause must lie within myself’), *acceptance* (e.g., ‘I think that I have to accept the situation’), *rumination* (e.g., ‘I often think about how I feel about what I have experienced’), *catastrophising* (e.g., ‘I continually think how horrible the situation has been’), and *other-blame* (e.g., ‘I feel that basically the cause lies with others’). Items are answered on a 5-point Likert scale, ranging from 1 ([almost] never) to 5 ([almost] always), with higher scores indicating the greater use of that strategy.

Behavioral Emotion Regulation Questionnaire (BERQ)

The BERQ (Kraaij & Garnefski, 2019) is a 20-item measure of habitual use of five behavioural strategies used to regulate emotions when experiencing unpleasant events: *seeking distraction* (e.g., ‘I do other things to distract myself’), *withdrawal* (e.g., ‘I isolate myself’), *actively approaching* (e.g., ‘I get to work on it’), *seeking social support* (e.g., ‘I ask someone for advice’), and *ignoring* (e.g., ‘I block it out’). Items are answered on a 5-point Likert scale, ranging from 1 ([almost] never) to 5 ([almost] always), with higher scores indicating the greater use of that strategy.

Analytic Strategy

Hierarchical multiple regressions

Two hierarchical multiple regressions (using either loneliness or distress as the criterion variable) were conducted to examine how much variance ER strategy use accounted for in loneliness and distress, and whether there were particular ER strategies that were unique predictors of these affective

³The CERQ-S has four additional subscales that measure types of cognitive reappraisal. However, because cognitive reappraisal was already covered by the ERQ in our dataset (with higher reliability), these additional CERQ-S subscales were not included so as to minimise redundancy in the analyses.

phenomena. In the first step, age and gender were entered as predictors to control for potential demographic effects. In the second step, the ERQ, CERQ-S, and BERQ subscales were entered as predictors.

Latent profile analysis

To further examine the ER profiles that might characterise loneliness or distress, we conducted a LPA using the TidyLPA package in R (Rosenberg, Beymer, Anderson, Van Lissa, & Schmidt, 2019). LPA was used as this modelling technique identifies distinct profiles (i.e., subgroups) of people within a dataset that have similar patterns of scores across a set of variables. UCLA-LS, DASS-21, ERQ, CERQ-S, and BERQ scores were converted into z-scores and used as the variables in the LPA. The default LPA model type in TidyLPA was used (i.e., equal variances and covariances fixed to 0). Solutions with 1–10 profiles were estimated and compared.

The optimal number of profiles was judged according to Akogul and Erisoglu's (2017) analytic hierarchy process, which is automatically conducted in TidyLPA and assesses the best solution across a combination of five fit indices, namely, the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), Classification Likelihood Criterion (CLC), Kullback Information Criterion (KIC), and Appropriate Weight of Evidence Criterion (AWE). Lower fit index values indicate a better fitting solution. This analytic hierarchy approach is advantageous for judging the best solution, as it does not rely on a single fit index (thus resolving situations where different fit indexes might highlight different solutions as best). That said, in terms of individual fit index values, BIC has often been found to perform best, and so BIC values were also given particular consideration in our selection of the best LPA solution (Nylund, Asparouhov, & Muthén, 2007). Entropy was also examined (as an indication of classification certainty), with values of .80 or more indicating acceptably high classification certainty in a model (Preece *et al.*, 2021).

Results

Descriptive and reliability statistics for all measures are provided in Supplementary Table S1. All measure scores had acceptable or high reliability in our sample ($\alpha > .70$) except for the CERQ-S rumination subscale ($\alpha = .62$). The Pearson correlation matrix for all variables is provided in Supplementary Table S2. Loneliness and psychological distress were significantly correlated ($r = .50$).

Hierarchical Multiple Regression Analyses

Loneliness

Demographic variables accounted for only 0.1% of the variance in loneliness ($p = .738$). Adding the 12 ER strategies into the model accounted for a significant additional 44.70% of the variance in loneliness levels (final model: $F [14, 567] = 32.84, p < .001, R^2 = .45$, adjusted $R^2 = .43$). As displayed in Table 1, eight of the 12 ER strategies were significant unique predictors of loneliness. Cognitively, these were the high use of catastrophising, rumination, and self-blame, and the low use of cognitive reappraisal and acceptance. Behaviourally, these were the high use of expressive suppression and withdrawal, and the low use of seeking social support.

Distress

Demographic variables accounted for only 1.0% of the variance in distress ($p = .032$). Adding the 12 ER strategies into the model accounted for a significant additional 37.90% of the variance in distress levels (final model: $F [14, 567] = 26.00, p < .001, R^2 = .39$, adjusted $R^2 = .38$). As displayed in Table 1, the pattern of unique predictors was largely similar to that of the loneliness regression; five of the 12 ER strategies were significant unique predictors. Cognitively, these were the high use of catastrophising, rumination, and self-blame, and the low use of cognitive reappraisal. Behaviourally, these were increased use of withdrawal.

Table 1 Standardised Beta Coefficients for Regression Models Predicting Loneliness or Distress

	Loneliness	Psychological distress
Variable	β	β
Age	.01	.03
Gender	-.01	.03
ERQ cognitive reappraisal	-.18*	-.16*
ERQ expressive suppression	.21*	.08
CERQ-S self-blame	.09*	.09*
CERQ-S acceptance	-.08*	-.06
CERQ-S rumination	.12*	.13*
CERQ-S catastrophising	.11*	.15*
CERQ-S other-blame	.00	.04
BERQ seeking distraction	-.01	.02
BERQ withdrawal	.24*	.30*
BERQ actively approaching	-.01	-.04
BERQ seeking social support	-.24*	-.03
BERQ ignoring	-.05	.04

Note. * $p < .05$. Gender 0 = male, 1 = female.

In terms of overall variance accounted for by ER strategies in the two regression models, the 95% confidence intervals of the model R^2 values overlapped (loneliness 44.70% [95% CI 37.74–48.63] vs. distress 37.90% [95% CI 31.73–43.11]), thus indicating that a similar amount of variance was accounted for in loneliness and distress. These affective phenomena also shared five of the same ER strategies as unique predictors. There was a key difference, however, with loneliness having an additional three unique predictors (increased use of expressive suppression and decreased use of seeking social support and acceptance).

Latent Profile Analysis

A seven-profile solution was optimal according to the analytic hierarchy process and BIC (see Supplementary Table S3 for fit index values). This solution also had good classification accuracy (entropy = .80). The seven profiles within this model differed meaningfully from each other on their levels of loneliness, distress, and ER strategy use (see Figure 1). There did not appear to be a distinct loneliness profile and a distinct distress profile, with most profiles having either high, average, or low levels of *both* affective variables. Profiles 1 and 7 appeared to be of particular note, in terms of perhaps characterising most clearly the ER profile of high loneliness/distress or low loneliness/distress, respectively.

Profile 1 ($n = 53$) had the highest levels of loneliness and distress. It was characterised by an increased use of those ER strategies generally considered maladaptive (i.e., withdrawal, self-blame, and catastrophising) and a decreased use of those strategies generally considered adaptive (i.e., cognitive reappraisal, seeking distraction, actively approaching, seeking social support, and acceptance). In contrast, *Profile 7* ($n = 83$) had the lowest levels of loneliness and distress. It was characterised by essentially the opposite ER pattern to Profile 1: increased use of those ER strategies generally considered adaptive (i.e., cognitive reappraisal, actively approaching, and seeking social support) and decreased use of those strategies generally considered maladaptive (i.e., expressive suppression, withdrawal, ignoring, self-blame, and catastrophising).

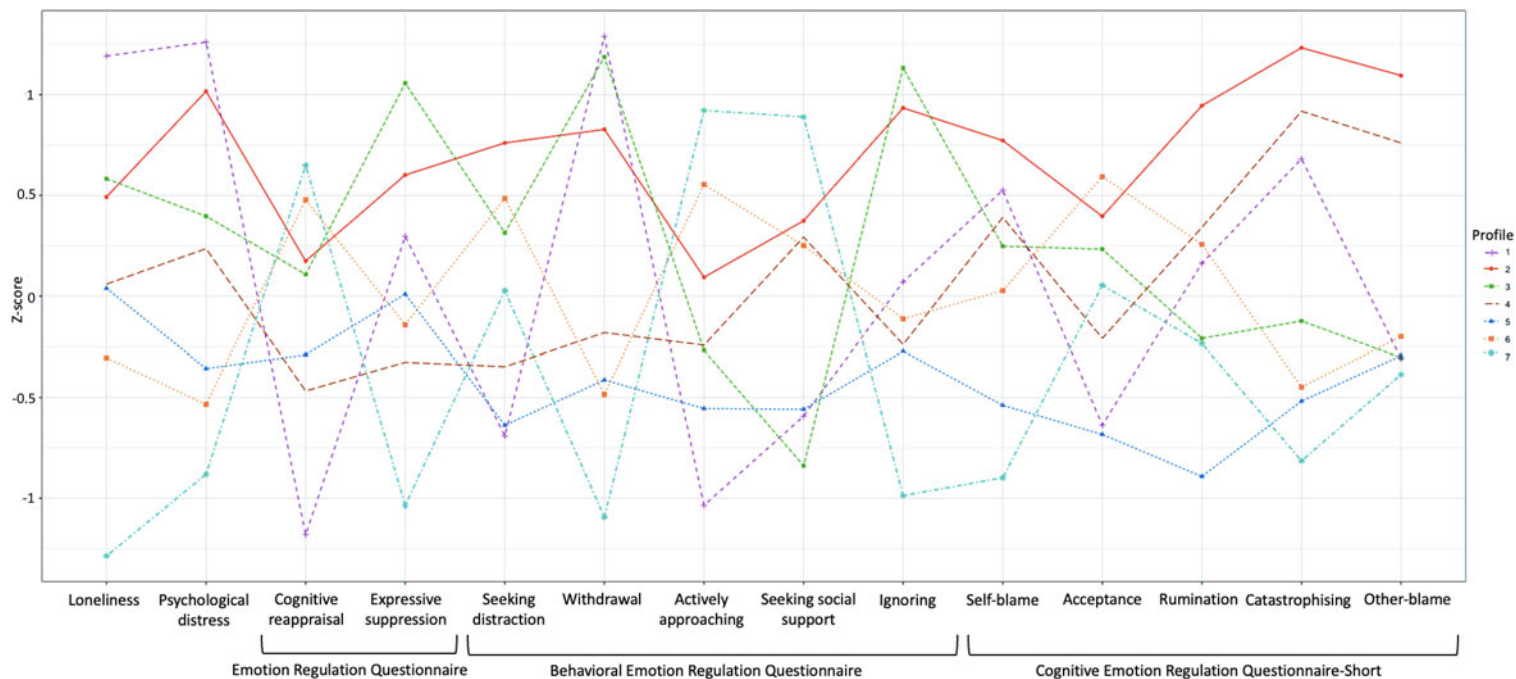


Figure 1. Latent profile analysis: 7-profile solution. *Note.* z-score of 0 = the average for the sample; z-score of 1 is 1 SD above mean; -1 is 1 SD below mean. A version of this figure with 95% error bars is provided in Supplementary Figure S2.

Profile 2 ($n = 55$) was another profile with elevated levels of loneliness and distress like *Profile 1*, though with slightly lower loneliness and a different pattern of ER strategy use. *Profile 2* was characterised by high usage across nearly all the ER strategies, both those considered generally adaptive and those considered generally maladaptive.

The remaining four profiles (*Profile 3* [$n = 80$], *Profile 4* [$n = 91$], *Profile 5* [$n = 95$], and *Profile 6* [$n = 125$]) all had levels of loneliness, distress, and ER strategy use generally clustered around the sample average but with slight deviations in their ER pattern. *Profile 3* was characterised by the average use of cognitive strategies with increased use of behavioural strategies that are generally considered maladaptive (i.e., increased use of expressive suppression, withdrawal, ignoring, and decreased use of seeking social support). *Profile 4* was characterised by average usage across all the ER strategies with the elevated use of catastrophising and other-blame. *Profile 5* was characterised by average to below average usage across all ER strategies. Last, *Profile 6* followed a similar but less extreme pattern of ER strategy use to *Profile 7*.

Discussion

The aim of this study was to directly compare loneliness and general psychological distress within an ER framework. Overall, we found that the ER profile characterising loneliness and psychological distress was highly similar, with some notable distinctions.

Our regression findings were consistent with those of Preece et al. (2021), who also found that ER could account for around half the variance in loneliness. Crucially, our results extend this work, by highlighting that the amount of variance accounted for in loneliness is statistically equivalent to that accounted for in psychological distress. In terms of unique predictors within our regression models, cognitively, loneliness and distress were both similarly characterised by the low use of cognitive reappraisal and the high use of catastrophising, rumination, and self-blame. Behaviourally, both were characterised by the high use of withdrawal. The key differentiator between these two affective phenomena in our regressions was that only loneliness was additionally predicted by the high use of expressive suppression and the low use of acceptance and seeking of social support. Expressive suppression and seeking of social support are two strategies that are inherently social in nature (or avoidant of social connection in the case of expressive suppression; Gross & John, 2003), and thus, our data indicate that loneliness, in comparison to general psychological distress, may have an ER profile that relies more heavily on avoiding social connection. This might be influenced to some extent by the strong social stigma that surrounds loneliness (Kerr & Stanley, 2021). Coupled with the prominence of the behavioural withdrawal strategy within the loneliness profile, these findings support an interesting paradox noted by Preece et al. (2021); namely, that lonely individuals are, by definition, craving social connection (Lim, Holt-Lunstad, & Badcock, 2020b), yet at the same time they appear to respond to their emotions by actively distancing or withdrawing from others.

These findings align with popular theories of loneliness (Hawkey & Cacioppo, 2010), which emphasise that lonely people are likely to be cognitively hypervigilant for social threat (i.e., expecting social rejection) and therefore more avoidant of social connection (see also, reaffiliation motive model; Qualter et al., 2015). Such proposals are also consistent with our ER results in the cognitive domain, whereby the low use of cognitive reappraisal (i.e., typically an adaptive strategy) and the high use of catastrophising, rumination, and self-blame (i.e., typically maladaptive strategies in terms of links with poor long-term outcomes) denote cognitive patterns that are likely to perpetuate negative affective states and unhelpful cognitions (Aldao et al., 2010). Hence, our findings help to highlight the role that ER could play in the development and maintenance of these cycles of loneliness.

The results of the LPA demonstrate that many of these ER patterns are not exclusive to loneliness. Our LPA did not extract separate ER profiles for loneliness and distress, underscoring the high co-occurrence of loneliness and distress (Park et al., 2020), and the fact that loneliness and distress are more similar than different when it comes to their associated ER patterns. Both affective states are characterised by high usage of maladaptive strategies and low usage of adaptive strategies

(Aldao *et al.*, 2010). However, for some individuals, our data indicate that high loneliness and distress can still be present even when adaptive ER strategies are being used (i.e., LPA Profile 2). It may be that in these cases, adaptive strategy use is not sufficient to offset the concurrent use of maladaptive strategies, or that a range of strategies are being used somewhat indiscriminately (rather than tailored to appropriate contexts; Gross, 2015).

Implications

Taken together, we think our results have several important implications for loneliness theory and clinical practice. The role of ER is well established in contemporary theories of general psychological distress (i.e., depression/anxiety), with problematic ER patterns routinely targeted and addressed in established treatment protocols (e.g., Barlow *et al.*, 2021). Crucially, our data highlight that ER seems just as important, at least statistically, for explaining loneliness, and moreover, that ER patterns are highly similar across loneliness and distress. As such, our findings support the applicability of ER models to the conceptualisation of loneliness (Gross, 2015) and suggest that established ER-based interventions for distress might be usefully applied in the treatment of loneliness. Indeed, given the high rates of co-morbidity between loneliness and distress, a focus on common ER targets might represent an efficient transdiagnostic intervention for many individuals. Such interventions could, for instance, involve cognitive behaviour approaches (e.g., Barlow *et al.*, 2021) aimed at increasing the use of cognitive reappraisal, acceptance, and seeking of social support, and decreasing the use of rumination, self-blaming, expressive suppression, and behavioural withdrawal, while trying to develop and maintain meaningful social relationships.

Limitations and Future Directions

Several limitations of our study should be noted that will require further research. Our data were cross-sectional and collected entirely via self-report questionnaires. Future longitudinal work (ideally incorporating observer-rated and/or lab-based measures) would therefore help to delineate the directionality of observed associations between ER, loneliness, and distress. We also did not examine markers of objective social isolation, or behavioural avoidance associated with social anxiety specifically (i.e., loneliness and social anxiety can be reciprocal over time; Lim, Rodebaugh, Zyphur, & Gleeson, 2016); nor did we examine known correlates of loneliness such as physical health status or relationship status (Lim *et al.*, 2020a; Milicev *et al.*, 2022). Future work might benefit from including or controlling for such constructs. Our sample was also entirely comprised of university students from a single Western country, who were mainly female and young adults. Young adults are of particular interest to the loneliness field (as data consistently show a peak in loneliness in the 18–25-year-old age group; Lim *et al.*, 2020b), but the nature of our sample nonetheless limits the generalisability of our findings. Future work should also examine the extent to which similar findings might apply in other cultural groups.

Conclusions

Our data suggest that ER may be as relevant to understanding loneliness as it is to understanding general psychological distress. ER-based treatment approaches that have demonstrated success in the treatment of distress might therefore represent a promising treatment pathway to trial for loneliness.

Supplementary Material. The supplementary material for this article can be found at <https://doi.org/10.1017/bec.2022.18>.

Funding. This research received no specific grant from any funding agency, commercial, or not-for-profit sectors.

Ethical Standards. Ethics approval for this project was provided by the Curtin University Human Research Ethics Committee. All participants provided informed consent for their data to be used.

Conflicts of Interest. None declared.

References

- Akogul S and Erisoglu M (2017). An approach for determining the number of clusters in a model-based cluster analysis. *Entropy*, **19**, 452.
- Aldao A, Nolen-Hoeksema S and Schweizer S (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review*, **30**, 217–237.
- Badcock JC, Holt-Lunstad J, Garcia E, Bombaci P and Lim MH (2022). *Position statement: Addressing social isolation and loneliness and the power of human connection*. Global Initiative on Loneliness and Connection (GILC). Retrieved from: <https://www.gilc.global/general-6>.
- Barlow DH, Curren AJ and Woodard LS (2021). Neuroticism and disorders of emotion: A new synthesis. *Current Directions in Psychological Science*, **30**, 410–417.
- Cacioppo S, Grippo AJ, London S, Goossens L and Cacioppo JT (2015). Loneliness: Clinical import and interventions. *Perspectives on Psychological Science*, **10**, 238–249.
- Garnefski N and Kraaij V (2006). Cognitive emotion regulation questionnaire – development of a short 18-item version (CERQ-short). *Personality and Individual Differences*, **41**, 1045–1053.
- Gross JJ (2015). Emotion regulation: Current status and future prospects. *Psychological Inquiry*, **26**, 1–26.
- Gross JJ and John OP (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, **85**, 348.
- Hawkey LC and Cacioppo JT (2010). Loneliness matters: A theoretical and empirical review of consequences and mechanisms. *Annals of Behavioral Medicine*, **40**, 218–227.
- Holt-Lunstad J (2022). Social connection as a public health issue: The evidence and a systemic framework for prioritizing the ‘social’ in social determinants of health. *Annual Review of Public Health*, **43**, 193–213.
- Kearns SM and Creaven AM (2017). Individual differences in positive and negative emotion regulation: Which strategies explain variability in loneliness? *Personality and Mental Health*, **11**, 64–74.
- Kerr NA and Stanley TB (2021). Revisiting the social stigma of loneliness. *Personality and Individual Differences*, **171**, 110482.
- Kessler RC, Barker PR, Colpe LJ, Epstein JF, Gfroerer JC, Hiripi E, ..., Zaslavsky AM (2003). Screening for serious mental illness in the general population. *Archives of General Psychiatry*, **60**, 184–189.
- Kraaij V and Garnefski N (2019). The behavioral emotion regulation questionnaire: Development, psychometric properties and relationships with emotional problems and the cognitive emotion regulation questionnaire. *Personality and Individual Differences*, **137**, 56–61.
- Lim MH, Rodebaugh TL, Zyphur MJ and Gleeson JF (2016). Loneliness over time: The crucial role of social anxiety. *Journal of Abnormal Psychology*, **125**, 620.
- Lim MH, Eres R and Vasan S (2020a). Understanding loneliness in the twenty-first century: An update on correlates, risk factors, and potential solutions. *Social Psychiatry and Psychiatric Epidemiology*, **55**, 793–810.
- Lim MH, Holt-Lunstad J and Badcock JC (2020b). Loneliness: Contemporary insights into causes, correlates, and consequences. *Social Psychiatry and Psychiatric Epidemiology*, **55**, 789–791.
- Lovibond PF and Lovibond SH (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, **33**, 335–343.
- Masi CM, Chen HY, Hawkey LC and Cacioppo JT (2011). A meta-analysis of interventions to reduce loneliness. *Personality and Social Psychology Review*, **15**, 219–266.
- Milicev J, Qualter P, Goodfellow C, Inchley J, Simpson SA, Leyland AH, ..., Long E (2022). The prospective relationship between loneliness, life satisfaction and psychological distress before and during the COVID-19 pandemic in the UK. *Journal of Public Health*, **1**, 1–15.
- Nylund KL, Asparouhov T and Muthén BO (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling: A Multidisciplinary Journal*, **14**, 535–569.
- O’Day EB, Morrison AS, Goldin PR, Gross JJ and Heimberg RG (2019). Social anxiety, loneliness, and the moderating role of emotion regulation. *Journal of Social and Clinical Psychology*, **38**, 751–773.
- Osman A, Wong JL, Bagge CL, Freedenthal S, Gutierrez PM and Lozano G (2012). The Depression Anxiety Stress Scales-21 (DASS-21): Further examination of dimensions, scale reliability, and correlates. *Journal of Clinical Psychology*, **68**, 1322–1338.
- Park C, Majeed A, Gill H, Tamura J, Ho RC, Mansur RB, ..., McIntyre RS (2020). The effect of loneliness on distinct health outcomes: A comprehensive review and meta-analysis. *Psychiatry Research*, **294**, 113514.
- Preece DA, Goldenberg A, Becerra R, Boyes M, Hasking P and Gross JJ (2021). Loneliness and emotion regulation. *Personality and Individual Differences*, **180**, 110974.
- Qualter P, Vanhalst J, Harris R, Van Roekel E, Lodder G, Bangee M, ..., Verhagen M (2015). Loneliness across the life span. *Perspectives on Psychological Science*, **10**, 250–264.

- Richard A, Rohrmann S, Vandeleur CL, Schmid M, Barth J and Eichholzer M** (2017). Loneliness is adversely associated with physical and mental health and lifestyle factors: Results from a Swiss national survey. *PLoS One*, **12**, Article e0181442, 1–18.
- Rosenberg JM, Beymer PN, Anderson DJ, Van Lissa CJ and Schmidt JA** (2019). tidyLPA: An R package to easily carry out latent profile analysis (LPA) using open-source or commercial software. *Journal of Open Source Software*, **3**, 978.
- Russell DW** (1996). UCLA loneliness scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment*, **66**, 20–40.
- Verzeletti C, Zammuner VL, Galli C and Agnoli S** (2016). Emotion regulation strategies and psychosocial well-being in adolescence. *Cogent Psychology*, **3**, 1199294.