

Activation of a secure base as a buffer against loneliness:

Does insecure attachment moderate the secure base activation effect?

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Abstract

This study examined the effect of a secure base activation on loneliness and looked at the moderating effect of anxious and avoidant attachment dimensions on this relationship. Participants (N=401) were randomly assigned to either a secure base condition (where they were asked to think of someone who was there for them in challenging times) or a secure base threat condition (where they were asked to think of someone who was not there for them in challenging times). The results showed a significant effect of the manipulation on loneliness but did not show a significant moderation effect of either anxious or avoidant attachment dimensions. Through exploratory analysis, a significant moderation effect of anxious attachment, but not avoidant attachment on wellbeing was found.

Keywords: Secure base activation, attachment styles, loneliness, wellbeing

Activation of a secure base as a buffer against loneliness:

Does insecure attachment moderate the secure base activation effect?

Loneliness, which can be defined as "an unpleasant experience that occurs when a person's network of social relations is deficient in some important way, either quantitatively or qualitatively" (Perlman, D., & Peplau, L.A. 2008), can be a serious health risk for people of all ages, and hence it is crucial to keep looking for ways in which we can help individuals feel less lonely. Indeed, loneliness is problematic for children and adults alike. For example, children that suffer from social isolation have significantly higher levels of cortisol and worse cognitive development compared to those who do not (Almeida et al., 2022). Similarly, adults that perceive themselves as isolated have higher risks of anxiety, low self-esteem (Cacioppo et al., 2006a), increase in depressive symptoms (Cacioppo et al., 2006b; Segrin, 1999; Heikkinen & Kauppinen, 2004; Wei et al., 2000), are more likely to score higher on suicidal ideation (Beutel et al., 2017) and more likely to eventually commit suicide

(Goldsmith et al., 2002). They are also likely to have impaired cognitive functioning (Gow et al., 2007) and are at higher risk for Alzheimer's Disease (Wilson et al., 2007).

In this thesis, we will examine one of the possible ways through which loneliness may be reduced, which is the activation of a secure base in participants (i.e., through reminding individuals of someone who was there for them in times of need; (Mikulincer et al., 2003)). Building on previous work of Kroker et al., 2022, we will specifically look at whether secure base activation decreases levels of loneliness in participants, and additionally explore for whom this manipulation seems to work best. More specifically, we focus on individuals' own attachment insecurity, because those more insecure are theoretically in stronger need of a secure base (Mikulincer et al., 2009) and hence for them secure base activation should be most beneficial. Below we outline the rationale for these hypotheses and for the experiment that was conducted to test these hypotheses.

The problem of loneliness and isolation

For many social species in the animal kingdom, being banished from their group is arguably one of the most serious types of punishment. After being left to survive on their own, death is often inevitable. Humans get called "social animals" for a good reason. Like many other group-dwelling animals, a Homo Sapiens needs others in order to function and flourish (De Laia Almeida et al., 2022). This is particularly visible when individuals lack social contact and understanding, or in other words, if they are physically or emotionally isolated and feel lonely (Hawkley & Cacioppo, 2010). Indeed, loneliness research has found negative effects of loneliness on health behaviors, mental health, short-term physical health, and even long-term functioning of the human body through changing gene expression, which is the process by which the encoded information in a gene is transformed into a function (Hawkley & Cacioppo, 2010). Similarly, many experiments have repeatedly shown that being excluded from a group can heighten pain sensitivity (Bernstein & Claypool, 2011) and cause

feelings comparable to those of intense physical pain (MacDonald & Leary, 2005). Overall, loneliness and isolation often have detrimental effects on individuals, as they go against human social nature.

Despite being a serious physical and mental health risk factor, loneliness continues to be a present issue worldwide, with some studies finding the general prevalence to be ranging from 1.8% for young adults to 24% for older adults (Surkalim et al., 2022). While being from different parts of the world can correlate with how lonely one feels, no matter what culture one comes from, the risk for loneliness will still be present (Surkalim et al., 2022). Even when living in a culture that promotes social contact through well-established norms, there is significant risk for emotional and perceived loneliness, while people coming from cultures with less strict social norms tend to score high on physical loneliness (Heu et al., 2020). In sum, preventing or reducing loneliness and isolation is a worthwhile aim for people all around the world. This raises the question of how this can be achieved.

Using attachment theory to reduce loneliness

In this thesis, we explore one possible way toward reducing loneliness based on attachment theory (Bowlby, 1982). In this theory, individuals develop either more secure or more insecure emotional bonds to others, based on their early experiences with their main caregiver, and this has important consequences for how they go about their social relationships later in life. For example, people develop beliefs about what one can expect from others in a relationship in terms of potential abandonment and lack of intimacy (Bowlby, 1982).

Whether these emotional bonds will be secure or insecure depends on multiple factors, of which an important one is the secure base. A secure base can be defined as one's confidence in the fact that in times of need, there will be a person they can turn to (Nisa et al., 2021). In one's childhood, the child's secure base is typically the main caregiver. This means

that the child feels secure in exploring the world around them, because they know they always have a base to come back to. Thus, the children that do experience having a secure base person are very likely to not only develop a secure attachment style but also to internalize the feeling of a secure base (Mikulincer, M., & Shaver, P. R., 2004). This translates to feeling secure within oneself, and always believing that someone will be there for us, without necessarily needing one specific person to rely on. On the other hand, if the secure base is not present in a child's life, an insecure base becomes internalized, and these people then often have insecure attachment styles (Cassidy & Berlin, 1994).

While the concepts of secure base and attachment style are clearly strongly intertwined, it is important to distinguish between them. As previously mentioned, a secure base is a feeling of security and the knowing that someone will always be there for us, in case we need it. While most people with a secure attachment style have internalized this feeling of a secure base, people with insecure attachment styles have not. However, since the feeling consists of trusting that others will be there for us, it is possible to induce this feeling even in individuals with an insecure attachment style. This can be done by for example making them think of a person who has recently been there for them in times of need, which we call secure base activation. Such secure base activation has previously been found to reduce loneliness (Kroker et al., 2022), a finding that we will seek to replicate in the study to come.

Furthermore, we explore whether such buffering effects of secure base activation are more beneficial to those more insecurely attached, as they are assumed to have a stronger need for a secure base. Indeed, attachment styles are internalized patterns of thought, emotions and behavior and hence will be difficult to change with a simple reminder of someone who is there for you in times of trouble. If individuals have developed a more insecure attachment style, they mostly have a negative and fearful way of viewing the world and relationships (Collins & Feeney, 2004). This is because they (a) have learnt that showing

their needs or emotions will cause others to be angry, thus it is better not to do this (*avoidant* attachment), and/or (b) were exposed to such inconsistency of emotional signals that they now constantly worry about others leaving them (*anxious* attachment). Such dysfunctional mechanisms prevent them from creating sufficient and healthy bonds later in life, and in fact put individuals at risk for loneliness. These frames of reference that one develops after repeated patterns of encounters with others are called "working models" (Bowlby, 1982).

Such a frame of reference, when more secure, will lead to individuals engaging in more healthy behaviors, including both behaviors towards oneself and towards others (Scharfe & Eldredge, 2001; Huntsinger & Luecken, 2004). They feel safe enough to explore and actively approach relationships (e.g., leaving those which are potentially harmful to them and investing in those which are beneficial). On the other hand, less securely attached individuals may not only spend less time with people they want to spend time with (because as opposed to securely attached individuals, they have developed strong defense mechanisms that keep them from exploring the world and the relationships), but also that these relationships are less fulfilling (i.e., lower quality), which in turn confirms their expectations of their social relationships as insecure (Collins & Feeney, 2004). Indeed, while secure attachment has been specifically found to be positively correlated with the number of people an individual is close to (Spence et al., 2022), the opposite is true for insecurely attached individuals (Akdogan, 2017). Another study's finding supports the theory that securely attached individuals are more likely to notice positive life events and categorize them as such, compared to insecurely attached individuals, who seem to process their perceptions more negatively (Mikulincer, 1998; Collins, 1996). This also leads to perceiving their relationships in a more negative way (Murray et al., 2000), while securely attached individuals were found to perceive a higher emotional and instrumental support from others (Florian et al., 1995).

The current study and hypotheses

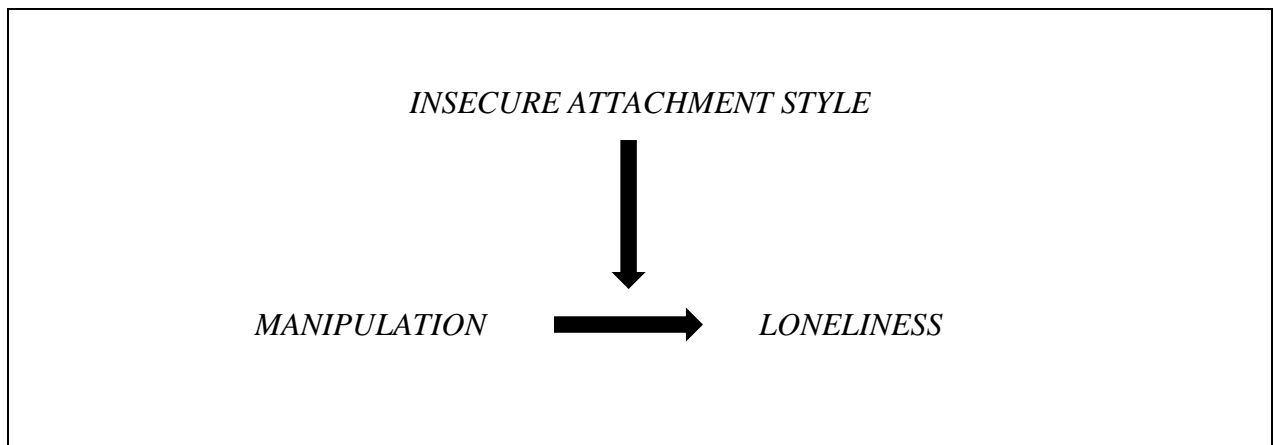
The current study will hence look at how a secure base activation can be helpful for reducing loneliness, especially for people with anxious and avoidant attachment (Figure 1) and explore how these two groups might differ in the level of benefit they get from this. Indeed, while for both types of insecure attachment a secure base activation may be beneficial (as both crave a secure base), the mechanisms by which it does so may differ. Hawkley and Cacioppo's (2010) explanation of the mechanisms by which individuals feel lonely, namely as "unconscious surveillance for social threat", and automatically expect unpleasant interactions with others is identical to that of anxiously attached people and is the opposite of how securely attached people function. Therefore, we can also predict that activating the secure base could be especially beneficial for those participants with the anxious type of insecure attachment, since it would target their dysfunctional thought processes. Since avoidantly attached people often exhibit a strong desire for independence and self-reliance and prefer to go through life's challenges by themselves rather than seek support from others, they can often be left feeling lonely.

Against this backdrop, we predict that activating a secure base in participants may be an effective way to reduce loneliness. Specifically, the current study tests whether secure base activation reduces loneliness (H1) and explores whether this may be most effective for those most in need of a secure base (i.e., those with less secure attachment in terms of higher attachment anxiety or avoidance (H2)). Testing these hypotheses builds on previous work that activated a secure base by reminding individuals of someone who has been there for them when they were going through a challenging life period. This activation of a secure base has been done in other previous research (e.g., Kroker et al., 2022; Nisa et al., 2021). Specifically, in their study with British participants during the COVID-19 pandemic, Kroker et al. (2022) found that activating a secure base reduced loneliness through reminding participants of someone who stood by them (vs. someone who did not stand by them) during

trying times of social isolation. In another study with international students in the Netherlands in the same context, this buffering effect of secure base activation was found only among those more on the insecure attachment dimension (Kroker et al., 2022).

Figure 1

Visualization of the moderation effect on the main effect



Methods

Participants, design and sample size

Using the crowdsourcing data collection service Prolific Academic, 401 individuals from the UK between the ages of 18-60 took part in the experiment. The design of the study was experimental, such that we randomly allocated participants to one of the two experimental conditions (secure vs insecure base activation). The questionnaire was available in English, so participants had to be able to understand English fluently in order to take part. Participation was voluntary, preceded by informed consent ensuring anonymity and safety of the participants, and compensated with 1.5£ that was received by the participants through Prolific Academic.

We incorporated attention checks in order to ensure data quality. In case of participants not passing those checks, they were excluded from the sample and replaced with

a new participant by Prolific Academic. Benefits of using Prolific Academic were obtaining many participants time-efficiently, as well as reaching access to a large pool of people.

The sample size for this study was determined on the basis of previous studies (Kroker et al., 2022) that investigated the effect of insecure base activation on loneliness (using sample sizes of 289 and 295 respectively) and budget considerations. To boost statistical power compared to these studies, the targeted sample size was 400. We received data from 420 participants overall, and after filtering out participants that were ineligible through quality and exclusion checks, our final dataset consisted of 401 participants. These were participants that either did not fill out most of the questionnaire, or ones that did not consent to the study but by a technical mistake appeared in the dataset.

Procedure

Similar to Kroker et al. (2022), participants filled out a 20-minute online survey. Prior to the start, informed consent was acquired. Participants were compensated for their time with £1,50 per 15 minutes. The questionnaire first asked about basic demographics information. Afterwards, the variables attachment dimension was measured, using an adapted version of an existing questionnaire. Participants were then randomly assigned to one of the two experimental conditions. They were either in the secure base activation condition, in which participants were asked to think about someone who was there for them during a difficult period, or in the insecure base activation condition, in which participants were asked to think about a person who was not there for them during a difficult period (see Appendix for full information). After the manipulation, participants were asked to complete a loneliness questionnaire and a well-being questionnaire. We included wellbeing in sync with the Kroker et al. (2022) studies, and because well-being may offer a more positive framing of how people are feeling (compared to the negative framing of the loneliness items). At the end of

the survey, a debriefing was presented, which included links relevant to the possible feeling of discomfort participants could have been experiencing after the study.

Manipulation and Measures

Attachment (in)security (moderator). To measure attachment dimension of participants, a shortened version of the Experiences in Close Relationships Scale by Brennan et al. (1998) was used. It includes 12 items, such as "I want to get close to my partner, but I keep pulling back", measuring avoidant attachment, or "My desire to be very close sometimes scares people away", measuring anxious attachment. A 7-point Likert scale is used to mark down answers, going from "Strongly disagree" to "Strongly agree". Exploratory factor analysis (principal components analysis with oblique rotation) was run as a check for construct validity. Two correlated factors were expected, since the Close Relationships Scale measures both anxious and avoidant anxiety. After running factor analysis with all 12 items, the analysis suggested 3 factors. Further investigation showed that most items (11 out of 12) had loadings close to the ones that were expected, or in other words, belonged to either one of the theoretically expected scales. Item 10 ("I do not often worry about being abandoned") however, did not load for either of these factors, and was removed from the final statistical analysis. Reliability was good for both the avoidant dimension scale, consisting of items 1-6 ($\alpha = .76$), and the anxious dimension scale, consisting of items 7-12, excluding item 10 ($\alpha = .83$), leaving us with 2 scales to use in the analyses to come to test hypothesis 2 (i.e., attachment anxiety and avoidance).

Other moderators that were measured for, but were not used in this thesis, can be found in the appendix.

Manipulation and Manipulation Check. The manipulation consisted of two conditions: the secure base activation and the insecure base activation. In the secure base activation, the participants read a short text about emotionally difficult times (see appendix)

and then are asked to think back to such a time in their recent past and either think of someone who has been there for them (secure base activation condition) or who has not (insecure base activation condition) and how this felt. They are then asked to describe briefly who it was they were thinking about, and how it made them feel.

We then asked a manipulation check question. Specifically, we asked the participants to mark on a 5-point Likert scale to what extent was this person they thought of there for them.

Loneliness. To measure our main dependent variable, loneliness, the UCLA loneliness scale by Russel and colleagues (1978) was used. The scale includes 20 items, such as "I am unhappy doing so many things alone" or "I feel as if nobody really understands me", and its goal is to measure participants' level of subjective loneliness. Different from the original scale, but similar to Kroker and colleagues (2022), our study uses a 5-point Likert-type scale, on which participants were asked to indicate to what extent they agree or disagree with the 20 statements.

Factor analysis indicated that two factors were present. After a closer look, these factors did not clearly differ in their content, and since keeping the items in one scale did not make a difference for the statistical analysis in this thesis and the reliability of the full scale was found to be $\alpha=.96$, we decided to use all of the items as one scale.

Well-being. In line with Kroker et al. (2022), we measured well-being as a secondary dependent variable. Specifically, we used all 5 items of Diener's (1985) Satisfaction with life scale. The items include statements such as "The conditions of my life are excellent" and all aim to measure subjective satisfaction with life of participants. We used the original scale system with seven points, ranging from 1 (Strongly disagree) to 7(Strongly agree). Factor analysis indicated one factor, with reliability analysis showing $\alpha=.91$, leaving us with one scale.

Statistical Analysis

To transform measured items into analyzable scales, exploratory factor analysis was performed on all variables to check for construct validity and to see how many factors the items within each variable would load onto. Furthermore, a reliability check was performed, in which the value of 0.7 and higher of Cronbach's alpha was considered sufficient to consider the scales reliable. To check whether the manipulation worked as intended, an analysis of variance (ANOVA) was used to test whether there was a significant difference between the means on the manipulation check for those in the secure vs the insecure base activation conditions. For hypothesis testing, the main effect was tested through ANOVA with experimental condition as the fixed factor and loneliness as the outcome variable. The effect of the moderating variable was tested through the PROCESS macro in SPSS, in which both the significance and the direction of the possible interaction between the moderator (attachment insecurity) and experimental condition on loneliness was inspected. An additional exploratory analysis was run in which the effect of the manipulation on wellbeing was tested, and in which the interaction between the moderator (attachment dimension) and experimental condition on wellbeing was tested.

Results

Descriptives

Our sample consisted of 177 males (mean age: 25), 217 females (mean age: 25), 4 non-binary participants and 3 that preferred not to say their gender. In *Table 1*, the means, standard deviations and the correlations of all key measured variables are presented. On average, loneliness was low/moderate/high in this sample, and fairly strongly correlated positively with indicators of attachment insecurity. As can be expected, loneliness was also negatively related to wellbeing.

Table 1

Descriptive Statistics and Correlations

	1	2	3	4	5
1 Loneliness		.456**	.498**	.585**	-.542**
M=2.30					
SD=.88					
2 Anxious			.334**	.806**	-.277**
Attachment					
M=3.78					
SD=1.23					
3 Avoidant				.827**	-.405**
Attachment					
M=2.60					
SD=1.08					
4					-.419**
Attachment*					
M=3.13					
SD=.93					
5 Wellbeing					
M=4.21					
SD=1.41					

*. Attachment= the dimension of attachment overall, which goes from insecure to secure

** . Correlation is significant at the 0.01 level (1-tailed).

Manipulation Check

First, it was checked whether the manipulation worked as intended through running an ANOVA in which the aim was to look at whether the manipulation affected the manipulation check in the expected direction. It was found that the manipulation indeed

worked as planned, with the ANOVA showing the results of $t(399) = 13.059, p < .001$. In the secure base condition, on average participants' scores were significantly lower ($M = 4.523, SD = .797$) than in the insecure condition ($M = 3.158, SD = 1.244$).

Testing Hypothesis 1

The hypothesized effect of the manipulation on loneliness was also tested with ANOVA. The effect was statistically significant, with $t(399) = -2.173, p = .015$, with the mean of loneliness for the secure base activation condition being $M = 2.202$ and $SD = .844$ and the mean of loneliness for insecure base activation condition being $M = 2.391$ and $SD = .897$. This means that secure (vs insecure) base activation reduced loneliness.

Testing Hypothesis 2

The moderation effect was analyzed with PROCESS (Macro Model 1). More specifically, the effect of anxious attachment dimension and the effect of avoidant attachment dimension on the relationship between the manipulation and loneliness were examined in separate model tests. This moderation effect of anxious attachment dimension was not significant, with $b = .075, SE = .063, p = .24$. The moderation effect of avoidant attachment dimension was also not significant with $b = .008, SE = .071, p = .910$. Thus, we do not find support for Hypothesis 2, as the main effect of secure base activation on loneliness was not moderated by attachment insecurity.

Wellbeing

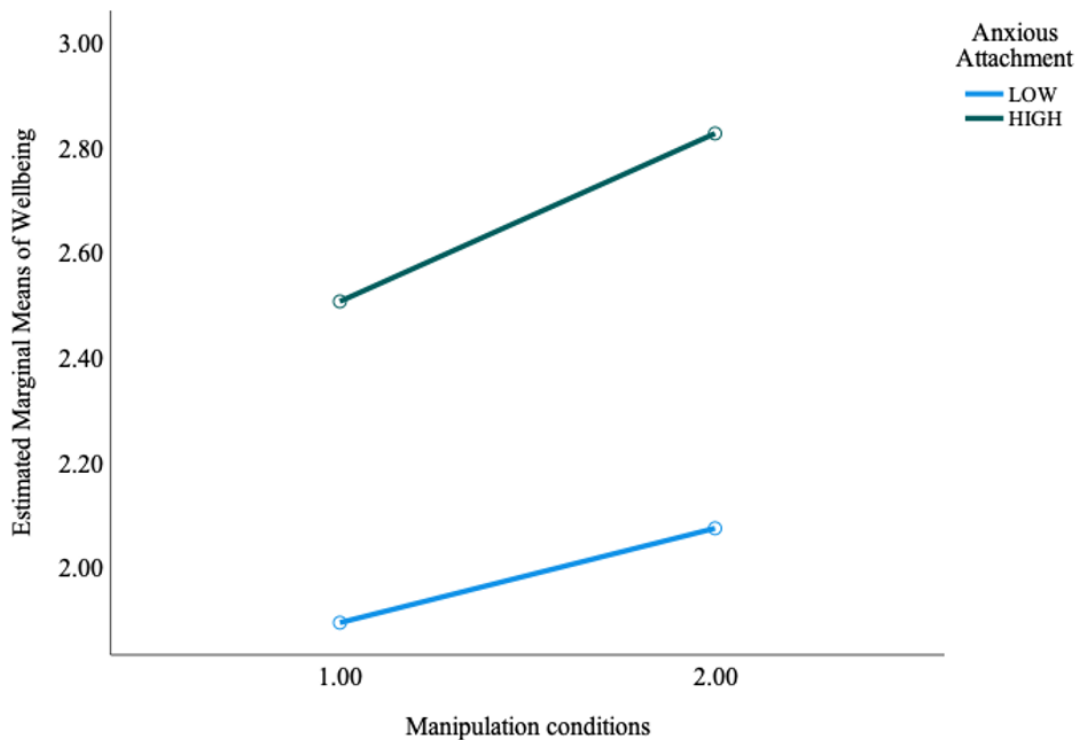
Additionally, we explored the effect of the manipulation on wellbeing. Results showed no statistically significant result for the main effect, with $t(399) = 1.496, p = .068$. We then explored whether secure base activation may increase wellbeing for those more insecurely attached. Analysis was thus performed on the moderating effect of anxious attachment dimension and avoidant attachment dimension on the relationship between the manipulation and wellbeing. Interestingly, we found that the moderation effect of avoidant

attachment was not significant ($b = .011$, $SE = .121$, $p = .93$), but the moderation effect of anxious attachment was significant with $b = -.232$, $SE = .110$, $p = .036$.

We therefore explored the pattern of interaction on this variable. As can be seen in Figure 2, simple slope analysis suggested that secure (vs insecure) base activation increased wellbeing for those higher in attachment anxiety, but not for those lower in attachment anxiety.

Figure 2

Moderation effect of anxious attachment on the effect of the manipulation on wellbeing



Discussion

Does secure base activation buffer against loneliness, and does it do so particularly for those more insecurely attached? The findings of our experiment supported our main hypothesis, as the effect of the manipulation on loneliness was statistically significant and the effect was in the predicted direction (i.e., secure versus insecure base activation reduced loneliness). This replicates the findings of previous work by Kroker and colleagues (2022).

The second hypothesis was not supported, since both moderating effects of anxious attachment and avoidant attachment were not significant. Hence, the secure base manipulation reduced loneliness among securely and insecurely attached individuals in this sample. Exploratory analyses, however, revealed a significant moderation effect for anxious attachment on the relationship between the manipulation and wellbeing (our secondary outcome variable). Although not predicted explicitly, the pattern of interaction was in line with predictions for H2: Participants that scored higher on anxious attachment reported a significantly higher wellbeing after the manipulation if they were in the secure (vs insecure) base condition. For participants who scored low on anxiety attachment, the manipulation did not affect their well-being. Below, we discuss the interpretation and implications of these findings.

Theoretical and practical implications

As loneliness is a serious risk factor for both mental and physical health (Hawkey & Cacioppo, 2010), researching ways in which can help people feel less lonely is crucial. In terms of research on loneliness, this study adds evidence for the idea that loneliness can, indeed, be reduced (somewhat), even with such a simple manipulation as the one we used. Additionally, it is possible to conclude from our study that the manipulation is an effective way to decrease the feelings of loneliness no matter one's attachment style, at least given the sample and context we used. This is good news in both a scientific and practical sense, as future interventions may be based on the idea of secure base activation.

Our findings have implications for theory and research on attachment (Ainsworth et al., 2015; Bowlby, 1969; Cassidy & Shaver, 2018; Mikulincer & Shaver, 2008). Our data underlines the importance of a secure base, particularly its (external) activation (Mikulincer et al., 2001). It shows that feeling like we have a secure base – i.e., someone who will be there for us in times of need – can decrease our feelings of loneliness.

Our results further show that especially when being on the anxious attachment dimension, manipulations such as the one in our study might work the most to increase wellbeing, at least in the context of thinking about a secure base in challenging times.

Furthermore, our findings were also in line with the idea that attachment insecurity relates to loneliness and wellbeing (Akdogan, 2017). Indeed, both insecure dimension and avoidant dimension seem to be strong predictors of loneliness, while scoring high on the avoidant attachment dimension correlated with feeling lonely slightly more than having an anxious one did. We hypothesize that this might be because of the working models of those avoidantly attached. These individuals believe that they are undeserving of others' support and love (Bartholomew, 1990), which often leads to them wanting less contact and closeness in relationships (Slotter & Luchies, 2014). Hence, they are often left feeling lonely and isolated. While this difference exists, and we believe it is a useful finding (more in Implications), overall, both of the insecure attachment dimensions were correlated with loneliness significantly, supporting the idea that the wellbeing of especially those who are on the insecure dimension can increase after secure base activation: They are more in need of a secure base, and feel good about this temporary relief. Despite this, we did not find an effect on loneliness. One of the possible explanations could be that while it did make the participants feel more uplifted, or content (wellbeing), the manipulation wasn't strong enough to be effective for specifically those with insecure attachment in decreasing loneliness.

There are also practical implications of this study. The main one is the potential of the secure base version of the manipulation to be applied in a therapeutic setting. Since it is a non-invasive method that does not require any preparation, it could potentially be a very effective tool in making clients feel (somewhat) less lonely. The simple nature of the manipulation makes it possible to use it in all kinds of therapy settings, from individual to

partner therapy to group therapy. While this study looked at the effect the manipulation had after one time on a participant, it would be interesting to see the effects of such manipulation if it was repeated multiple times, over a longer time span. Finding out which exact form and length of the manipulation is most effective could be especially useful for practitioners, who could hence know which form is likely to bring the best results for their clients.

If doing this once, in the minimalistic way we did it in this study, already showed significant effects, we believe that a more intensive and long-term application could prove to be an effective strategy in reducing loneliness through activating a secure base.

Similarly, another useful application of our results could be using the secure base manipulation to increase wellbeing for those who have anxious attachment style. Since we know that for those with this attachment dimension, wellbeing significantly increased after the manipulation, therapists could use already-existing attachment style questionnaires to identify those in most need of a secure base, and this would allow them to predict for whom it would make sense to use the manipulation on, on for whom not. However, more research is of course needed to corroborate these explorative but intriguing findings.

Limitations and Directions for Future Research

One of the main limitations of this study is that we did not have a control group. This means that we cannot be entirely sure whether the secure base activation decreased loneliness significantly, or whether the secure base threat increased loneliness, or whether both were true. It is a limitation because if it is only true that the secure base threat decreased loneliness, but not that the secure base reminder increased it, then the secure base reminder manipulation cannot be considered effective. This could thus be addressed in future research, in which a control group would be present.

Another limitation is that the instructions of the manipulation could have been more specific and clearer. The instructions did not specify, for example, for how long you should

think about the person in question, nor did it specify how much time you should spend on writing about the person. These are factors that could very possibly influence the effects of the manipulation. While our manipulation did have a significant effect, we believe by making it clearer, even more participants' level of loneliness would be lower after the manipulation, or in other words, the effect size would be larger.

Another limitation that became clear after the participants finished filling in the questionnaires was the lack of any existing time restraint. While the expected time to take the study was around 15 minutes, some participants took 5 minutes and others finished the study after 15 hours. Both scenarios might be troublesome, the first one could mean that the participants barely thought about the manipulation, and possibly did not even read the full introduction to the manipulation. The second, on the other hand, means that at some point the participants left the study and came back to it later. If this was between the manipulation and the loneliness or wellbeing measures, this could significantly change the effect of the manipulation, or possibly completely diminish it. While we did find a significant main effect, giving the participants a time frame to fill in the study could increase the effect size, and possibly show clearer differences in the effect the manipulation has on people on different attachment dimensions.

The age range of our sample can be considered a limitation, since it doesn't allow us to see the effect this manipulation could potentially have on older generations, who, compared to the younger population, tend to be lonelier overall (Yang & Victor, 2011). Previous studies have found that the average attachment style of an older population does tend to differ to that of a younger one, especially in terms of anxious attachment, which older people tend to experience less (Segal et al., 2009). Based on the findings of Kafetsios and colleagues (2006), for avoidant older people, they felt less lonely, and their mental health was better when their perception of support from others was high. Since our manipulation is a

reminder of someone who supports you, we believe this could be especially beneficial for those avoidantly attached from an older population.

Future research could thus aim to improve the manipulation. This could be done, as suggested, to make maximize the effect of it by making it longer and possibly more specific to each of the attachment dimensions of the participants, thus also limiting unwanted variance in the effect the manipulation has.

This study used just one variant of activating the secure base, but it would be interesting to explore ways in which the manipulation could be made even more effective (i.e., how the effect size could be increased) by combining techniques that have been previously used by others. For instance, the manipulations used in a study by Mikulincer and Colleagues (2003), in which they (1) activated the secure base by making the participants think back on a situation in which they encountered a problem they could not solve on their own, but which other people then helped them solve, or (2) presented the participants with images showing a secure base schema representation, such as a person in distress being helped by a partner. Future research could thus compare the effects of these, including our manipulation, and additionally look at the effect of these when alternated and used in a long-term treatment.

While loneliness was the main dependent variable in our study, our exploratory analysis did show a significant effect of the manipulation on wellbeing, for those on the anxious attachment dimension. Further research could explore this moderation effect in more depth, perhaps with a larger scale measuring well-being. It could also look more into the effect of the secure base activation on wellbeing compared to loneliness, because while both of these have positive buffering effects, they could be used to achieve different goals in treatment (i.e., increasing the general wellbeing or specifically decreasing loneliness).

Conclusion

In this study, the main aim was to find an effective way to decrease feelings of loneliness in participants, specifically through the activation of a secure base. This activation was based on attachment theory's concept of a secure base (Bowlby, 1982), which was operationalized by asking people to think about someone who stood by them in times of trouble. The main finding of this study is that secure base activation can be an effective tool in decreasing loneliness in individuals, perhaps even independent of their attachment style. Furthermore, secure base activation increased wellbeing among those who scored high on anxious attachment style, suggesting promising avenues toward decreasing loneliness and increasing wellbeing.

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Appendices

Manipulation: secure

An emotionally difficult period in someone's life is a time of going through adversity and dealing with emotional struggles. It makes people feel vulnerable and strained and impacts daily life. An example would be the social isolation during Covid-19.

Take a minute to think back to a recent emotionally difficult period in your life, in which you felt this way.

Please think about a specific relationship or multiple relationships (e.g., family, friends, best friend, partner) that was important to you and also there for you in this difficult time. Think about how you were able to maintain this relationship despite the challenges in this period. How did you feel, knowing that this person was someone you could rely on and that would stand by you?

Then, please describe briefly below who it was you were thinking about, and how this made you feel.

Manipulation: insecure

An emotionally difficult period in someone's life is a time of going through adversity and dealing with emotional struggles. It makes people feel vulnerable and strained and impacts daily life. An example would be the social isolation during Covid-19.

Take a minute to think back to a recent emotionally difficult period in your life, in which you felt this way.

Please think about a specific relationship or multiple relationships (e.g., family, friends, best friend, partner) that was important to you but was NOT there for you in this difficult time. Think about how you were able to maintain this relationship despite the challenges in this period. How did you feel, knowing that this person was someone you could rely on and that would stand by you?

Then, please describe briefly below who it was you were thinking about, and how this made you feel.

Other moderators (not used for this thesis)

The Big Five Inventory (BFI; Goldberg, 1993) is a self-report measure that assesses the five dimensions of personality, based on the five-trait taxonomy by OP John. It includes five subscale, each measuring one personality trait. The sole subscale of interest in the present study is the extraversion subscale. It assesses an individual's level of extraversion, which refers to sociability and seeking gratification from social situations. It includes 8 items and is scored on a 5-point scale (from "strongly disagree" = 1 to "strongly agree" = 5). This measure offers good psychometric properties and reliability with a Cronbach's alpha of 0.76 (Zamorano et al, 2014).

Prosocialness scale for adults (Caprara et al., 2005)

To measure prosocialness, Caprara's prosocialness scale for adults was used in shortened form. The full scale consists of 16 items, such as "I try to console those who are sad" and "I am empathetic with those who are in need" that are scored on a five-point Likert scale with answers from never/almost never true to always/almost always true. For this study it was decided to only incorporate 6 of these items which had the highest distinction rate between people in high and low prosocialness.

Existential Isolation scale (Pinel et al., 2017)

To measure Existential Isolation, the 6-item Existential Isolation Scale was used (Pinel et al., 2017). For each item participants had to indicate their agreement with the statement from point 1 (strongly disagree) to point 7 (strongly agree). Examples of the statements are "People do not often share my perspective" and "People around me tend to react to things in our environment the same way I do." The latter is an example of a reverse coded item. The scale is considered as reasonable internal reliability ($\alpha = 0.84$).

Brief COPE scale (Carver, 1997)

For the measurement of avoidant coping the subscale of avoidant coping from the brief COPE is used. This scale consists of twenty-eight questions, but since only the avoidant coping subscale is relevant only this subscale is used, and it consists of eight questions. With each statement people can indicate to what extent they apply to the statement. The four-point scale goes from 1 'I haven't been doing this at all' to 4 'I've been doing this a lot'. The mean of the scale is 1.64 and this will be used to categorize participants in groups of 'people who score low on avoidant coping' and 'people who score high on avoidant coping'. Cronbach's Alpha 0.72.

Attachment dimension measure

The statements below concern **how you generally feel in emotionally intimate relationships**.

We are interested in **how you experienced a specific relationship** either in the present or the past.

If you have **not been in a relationship** yet, please think about a **close friendship** of yours from the past or the present.

Please **indicate the extent to which** you agree or disagree with each statement:

I want to get close to my partner, but I keep pulling back.

I am nervous when partners get too close to me.

I try to avoid getting too close to my partner.

I usually discuss my problems and concerns with my partner.

It helps to turn to my romantic partner in times of need.

I turn to my partner for many things, including comfort and reassurance.

I worry that romantic partners won't care about me as much as I care about them.

My desire to be very close sometimes scares people away.

I need a lot of reassurance that I am loved by my partner.

I do not often worry about being abandoned.

I find that my partners don't want to get as close as I would like.

I get frustrated if romantic partners are not available when I need them.

Loneliness measure

We would like to ask you to read the following sentences carefully and to indicate, to which extent you might agree or disagree with them at the moment:

I am unhappy doing so many things alone.

I have nobody to talk to

I cannot tolerate being so alone.

I lack companionship.

I feel as if nobody really understands me.

I find myself waiting for people to call or write me.

There is no one I can turn to

I am no longer close to anyone.

My interests and ideas are not shared by those around me.

I feel left out.

I feel completely alone.

I am unable to reach out and communicate with those around me.

My social relationships are superficial.

I feel starved for company.

No one really knows me.

I feel isolated from others.

I am unhappy being so withdrawn.

It is difficult for me to make friends.

I feel shut out and excluded by others.

People are around me but not with me.

Wellbeing measure

Below are five statements that you may agree or disagree with. Using the 1 to 7 scale below, indicate your agreement at this moment with each item by selecting the appropriate number.

Please be open and honest in your responding:

In most ways my life is close to my ideal

The conditions of my life are excellent.

I am satisfied with my life.

So far, I have gotten the important things I want in life.

If I could live my life over, I would change almost nothing.