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Empathic listening satisfies speakers' psychological needs and well-being, but doesn't directly deepen solitude experiences: A registered report☆

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ABSTRACT

A live discussion experiment was designed to test the effects of highly empathic (vs. moderately empathic) listening on solitude experiences. Participants were assigned to three conditions in which they: 1) Discussed a negative personal experience with a confederate (ostensibly another participant) exhibiting highly empathic listening; 2) Discussed an experience with a confederate exhibiting moderately empathic listening; or, 3) Engaged in a positive reframing exercise. Building on previous listening theory (Weinstein et al., 2022) and research (Itzchakov & Weinstein, 2021; Itzchakov, Weinstein, et al., 2022). We then assessed the two posited mechanisms of autonomy and relatedness and tested the expectations to be in solitude. All participants were instructed to spend ten minutes alone, phones off, and distractions stored away. While highly empathic listening enhanced participants' (i.e. speakers) autonomy and relatedness need satisfaction compared to the other two conditions and predicted initial increases in self- and social-connection, it did not subsequently improve solitude experiences, with no direct effects found predicting self-connection, peaceful affect, loneliness, or self-insight. Indirect effects linked empathic listening to self-connection and self-insight through autonomy satisfaction. While empathic listening fosters immediate psychological need satisfaction in social contexts, deeper listening interventions may be necessary to improve subsequent solitude periods.

Feedback from others shapes individuals' relationship with the self (Baumeister & Leary, 1995). Conversations provide important opportunities for this feedback to be conveyed and received (e.g., Dindia et al., 1997). Within the context of conversations, *empathic listening,* defined as careful attention to the speaker's disclosures that conveys attention, care, valuing, and understanding (Kluger & Itzchakov, 2022; Kluger & Mizrahi, 2023), may be a powerful force in supporting speakers' self-processes by simultaneously providing them both self-expression and social connection. Empathic listening may, therefore, bolster speakers' subsequent time in solitude, an everyday life context in which the self is the dominant relationship, but social connection fosters resilience (Weinstein, Nguyen, & Hansen, 2023). In a planned live-interaction experiment, test the core hypothesis that a supportive social context characterized by empathic listening could simultaneously *reduce* positive expectations of being in solitude while *enhancing* the actual solitude experience. By doing so, the current research integrated recent findings in listening research (e.g., Kluger & Itzchakov, 2022; Yip & Fisher, 2022), solitude research (e.g., Thomas, 2023), and self-determination theory (Ryan & Deci, 2017) to examine the impact of empathic listening on speakers' solitude.

1. Empathic listening bolsters self- and social connection by supporting needs

When speakers self-disclose, the quality of listening they receive from their listeners influences the effects those conversations have on them (Weinstein et al., 2022). Empathic listening (also termed 'high-quality listening' in the literature) has three components: empathic listeners attend carefully to their speakers, convey their caring and valuing of the speakers, are non-judgmental, and show that they understand what has been said (Kluger & Itzchakov, 2022). A common misperception is that listening is a passive process that merely entails silence (Itzchakov, Reis, & Weinstein, 2022). In practice, listening is an active and effortful process that requires motivation and energy (Imhof, 1998). Empathic listening includes verbal behaviors such as question-asking (Van Quaquebeke & Felps, 2018), paraphrasing, or reflecting on the

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speaker's content (Nemec et al., 2017), and non-verbal behaviors such as body posture, facial expressions, and gaze (Bavelas et al., 2000, 2002). Together, these behaviors, referred to as "backchanneling," drive holistic perceptions of being listened to (Pasupathi, 2001; Pasupathi & Billitteri, 2015).

The humanistic theorist Carl Rogers, whose work inspired the empirical study of listening, posited that empathic listening supports genuine social connections while simultaneously fostering genuine and self-congruent self-expression (also formulated in terms of autonomy need satisfaction; Ryan & Deci, 2017). Empathic listeners provide this support as they try to understand the speaker's perspective and value things that are said (which does not necessarily entail an agreement with the speaker; (Rogers, 1951, 1980). As a result, speakers connect with their internal and self-congruent experiences and feel a sense of deep interpersonal connection (Rogers, 1959, Rogers, 1980).

Building on these views and empirical research on human motivation and relationships, Relationship Motivation Theory (Ryan & Deci, 2017) posits that supportive social contexts that encourage self-congruent action and self-expression satisfy autonomy need satisfaction directly and, inevitably, simultaneously foster relatedness. More recent theorizing has argued for a central and critical role of empathic listening as a key strategy that conveys such support (Weinstein, Nguyen, & Hansen, 2023). These literatures emphasize the potential power of highly empathic listening for promoting two of self-determination theory's psychological needs (i.e., autonomy and relatedness; Itzchakov, Reis, & Weinstein, 2022; Ryan & Deci, 2017). The third – competence – is thought to be relevant only in very specific listening contexts, such as when individuals hold conversations related to tasks or goals (Elliot & Thrash, 2002) or have goals for the conversation itself (Horowitz et al., 2001; Weinstein et al., 2022).

Understanding Rogers' views alongside those of relationship motivation theory, when speakers receive highly empathic listening, they feel related (i.e., close and connected to the listener) and autonomy-supported (i.e., free to explore and express themselves in a self-congruent way(Itzchakov, Weinstein, et al., 2022; Weinstein, Huo, & Itzchakov, 2021). Put differently, highly empathic listening fosters a constructive relationship with others that also affirms the self because it allows speakers to share their genuine self-relevant experiences, bring their authentic selves into the conversation, and be met by an attentive and understanding ear (Kluger & Itzchakov, 2022; Weinstein et al., 2022).

Previous experimental findings support these views by showing that during conversations in which speakers disclose difficult topics to high-quality (i.e., highly empathic) listeners, such as when sharing their prejudiced attitudes (Itzchakov et al., 2020) or when they discuss recollections of being rejected (Itzchakov, Weinstein, et al., 2022), speakers report benefits to both their autonomy (i.e., genuine and authentic self-expression) and relatedness (i.e., their sense of social connection; for an overview see Weinstein et al., 2022) in comparison to those speakers sharing those same views with a moderately good listener. Further, in experiments examining self-disclosure contexts in parent-child relationships, adolescents who anticipated parents' empathic listening reported greater autonomy and relatedness need satisfaction than those who anticipated lower listening quality (Weinstein, Nguyen, & Hansen, 2021). In addition, speakers who received highly empathic listening felt greater relatedness to their listeners (Itzchakov & Weinstein, 2021; Weinstein, Nguyen, & Hansen, 2021).

2. How can listening influence a positive experience of solitude?

At first glance, social and solitude time may seem to be independent and even competing contexts since one can choose to be either alone or to socialize. However, there is growing evidence that the two are interdependent and that social contexts can enhance subsequent solitude experiences (Lay, Pauly, Graf, Biesanz, & Hoppmann, 2019). While it may seem counterintuitive that social connection drives positive solitude – rewarding time spent alone and not interacting with others (Long & Averill, 2003; Palgi et al., 2021), positive solitude offers a space for cognitive distancing from direct social contexts, which in itself can confer benefits (e.g., to self-connection, feeling peaceful, and self-insight; Nguyen, Ryan, & Deci, 2018; Weinstein, Nguyen, & Hansen, 2023) while maintaining a sense of closeness to others (Storr, 1989). Said differently, people may be physically alone, but they can still feel close to others (Long & Averill, 2003). Studies demonstrating the importance of connection in solitude show that people enjoy time alone more when they have strong social bonds (Pauly et al., 2018) and less when they feel displaced within their culture (Lay et al., 2020). Such positive solitude has several characteristics, including fostering a sense of peacefulness or low-arousal positive affect such as a sense of peace and relaxation (Weinstein, Nguyen, & Hansen, 2021), an effect also known as deactivation (Nguyen et al., 2018). It can also foster productive and deep reflection that can lead to insights and is low in rumination. People in a state of positive solitude can use the time to think through ideas, feelings, and memories or even make plans for the future in a way that helps them understand more about themselves and what they need (France, 2014; Kull, 2009).

On the other hand, in the absence of positive social connections solitude becomes a more negative state and can be ruminative and lonely (Paul Ricco, 2020). For example, when individuals are ostracized, they pursue solitude as an escape but do not enjoy being alone (Ren et al., 2016). Thus, solitude may optimally involve some measure of *social connectedness* (i.e., relatedness), which is incurred prior to the solitude experience. Said another way, social connectedness may yield positive solitude.

However, social connection may not be enough for experiencing positive solitude. Solitude may confer the greatest benefits when individuals come to it with an affirmed self – a sense that they know and connect with themselves, including their thoughts, feelings, values, and interests (Weinstein, Nguyen, & Hansen, 2023). A recent integration of quantitative and qualitative studies suggested that in its ideal form, solitude also provides an important opportunity to turn inwards and connect to the self because, in the absence of other people, interactions with the self remain present (Weinstein, Nguyen et al., 2021). Studies supporting this view have shown that individuals considered their most enjoyable experiences of solitude when they felt their most authentic or true selves (Nguyen et al., 2021). This affirmed self, which listening can build, feels more autonomy need satisfaction as well as feeling relatedness to others; in other words, both psychological needs – autonomy and relatedness – may result in more positive solitude experiences.

Although solitude can be perceived as beneficial (i.e., positive solitude), or difficult and lonely, there is little research to explore how life experiences foster or undermine well-being during solitude periods after those experiences. Compared to social processes, relatively little is known about what makes moments of solitude enjoyable and beneficial or painful and unhelpful (Coplan et al., 2021). Solitude researchers often point to both self and social connections as important qualities of solitude that are positive in other ways, for example feeling peaceful and not lonely, insightful and not ruminating, but these experiences within solitude and their antecedents require more empirical study (Weinstein, Nguyen, & Hansen, 2023).

The listening literature can help shed light on these discrepancies. Rogers theorized that experiencing social support for one's genuine experiences through empathic listening enables speakers to gain awareness of, and connect with, aspects of their selves that were outside their awareness. That is, speakers do not have to choose between their genuine self-expression and receiving social support; both are available to them (Rogers, 1975). This supportive social context may, therefore, be expected to satisfy the needs for both autonomy and relatedness and consequently make relating to others enjoyable but also make time alone rewarding. Together, these experiences should provide the ideal internal toolkit to feel connected to the self and others during social exchanges and time alone (Weinstein, Nguyen, & Hansen, 2023). Understanding

the literatures described above together makes it especially well-suited to provide individuals with the toolkit needed to benefit from solitude. If highly empathic listening aligns individuals with others and themselves, it should be a powerful catalyst for positive solitude experiences that result from an empowered self.

3. How might listening influence expectations for solitude?

Although highly empathic listening should improve experiences alone, it may reduce positive expectations for solitude time, leading individuals to *underestimate* how well they will feel when alone. Expectations for life's experiences do not live in a vacuum and they do not accurately predict what those experiences will be (Hatano, Ogulmus, Shigemasu, & Murayama, 2022). People form their expectations in direct comparison to the alternatives available (Ritov, 2000). In addition, solitude is often pursued as an escape from adverse social situations (Ren et al., 2021). When considering unattractive social interactions as an alternative, people may overestimate how positive their solitude will be.

However, empathic listening is an especially supportive social experience that fosters a sense of togetherness that individuals wish to last (Kluger & Itzchakov, 2022). It is, therefore, reasonable to assume that expectations for social time are higher following empathic listening and that individuals who are listened to well may be focused on extending the social situation. They may then see the solitude period – as a direct contrast – would bring less reward. As a result, individuals who experience empathic listening may report lower expectations than their more positive experiences.

4. Current research

Overall, solitude constitutes an opportunity to achieve relaxation and self-insights, but these benefits likely only occur during periods of solitude that are rich in self and social connections (Long & Averill, 2003). There is reason to believe that empathic listening, the provision (and corresponding perception) of well-intentioned attention and comprehension of spoken content (Itzchakov, Reis, & Weinstein, 2022), unlocks the potential for positive experiences of solitude by supporting the satisfaction of the needs for autonomy (the experience of self-congruent expression and action) and relatedness to others(Weinstein, Huo, & Itzchakov, 2021). This planned study will integrate insights from works on social connectedness and solitude with an experimental study that explores the impact of listening on the self in solitude. The quality of periods of solitude may depend in no small way on the quality of the social time that preceded it.

As shown in Fig. 1, we predict that empathic listening during a difficult conversation focused on previous negative and self-relevant experiences will support the needs for autonomy and relatedness and, therefore, reduce speakers' solitude expectations for positive affect in solitude (expectations that they will be peaceful and not lonely) but promote their positive solitude (that is rich in self- and social-connection, peaceful affect and self-insight, and characterized by lower loneliness and rumination). The planned experiment will involve an in-person conversation in which participants receive either highly empathic or moderately empathic listening or a positive reframing comparison as they disclose meaningful content to the listening partner. This paradigm will serve to test four a-priori hypotheses:

Compared to two comparisons – the Moderately Empathic Listening and Positive Reframing conditions – the Highly Empathic Listening condition will:

Hypothesis1. predict *poorer* expectations (greater loneliness and less peaceful affect) for solitude time (Time 1; pre-solitude).

Hypothesis2a and 2b. predict greater state autonomy need satisfaction (2a) and greater relatedness need satisfaction (2b; Time 1 pre-solitude).

Hypotheses3a-f. predict greater self (H3a) and social connection (H3b) in solitude, peaceful effect (H3c), and lower loneliness (H3d; affective experiences; Time 2 post-solitude), as well as solitude self-insights (H3e) and lower rumination (H3f; cognitive experiences; Time 2 post-solitude).

Hypothesis4. predict the specific solitude outcomes linked with condition in H3 indirectly through its simultaneous effects on autonomy need satisfaction and relatedness need satisfaction.

A more conservative model will test whether solitude has affective and cognitive benefits above and beyond those already conferred by empathic listening. Thus, we predict that:

Hypothesis5a-f. the Highly Empathic Listening condition (as compared to the Moderately Empathic listening and Positive Reframing conditions) will predict greater self (H5a) and social connection (H5b), greater peaceful affect (H5c), and lower loneliness (H5d), greater self-insights (H5e) and lower rumination (H5f) after the solitude period when controlling for the same outcome measured post-manipulation but pre-solitude. This analysis is designed to model changes in those outcomes that occur specifically during the solitude period.

Exploratory research question linked to H1. We do not have reason to anticipate the direction of expectation-experience errors (whether participants will over- or under-estimate their loneliness and peaceful affect solitude), we will explore the presence and direction of expectation errors through exploratory tests comparing expectations at Time 1 (pre-solitude) with perceptions at Time 2 (post-solitude) for all participants, or separately for each condition providing condition differences are apparent in H1 tests.

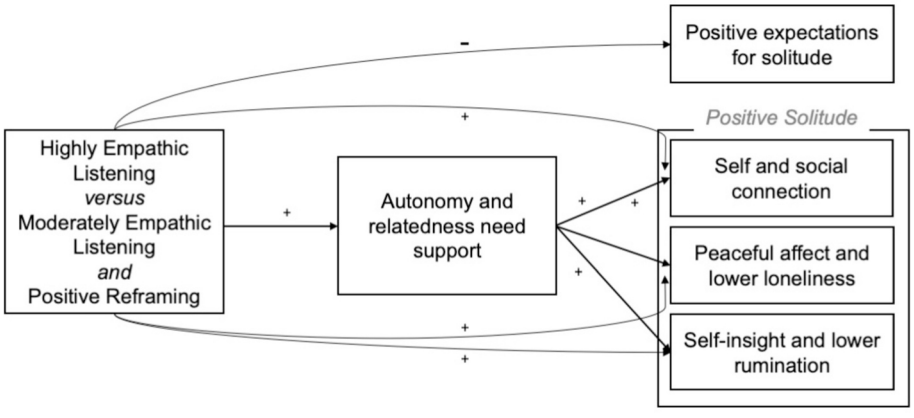

Fig. 1. Conceptual Model of Speaker Outcomes Guiding Hypotheses.

Exploratory research question linked to H5A-F. We will further explore the presence and direction of change in positive solitude indicators (self and social connection, peaceful affect, loneliness, self-insight, rumination) through exploratory tests comparing standing on indicators from Time 1 (pre-solitude) to Time 2 (post-solitude) for all participants, or separately for each condition providing condition differences are apparent in H5 tests.

5. Method

Ethical approval. This study has been approved by the School of Psychology and Clinical Language Sciences Ethical Review Board at the University of Reading (Num. 2023–060-NW). Participants provided informed consent, participated voluntarily, and were appropriately compensated for their time.

Open research practice. Raw data, code, materials, and time-stamped pre-registration are available for download on the Open Science Framework. The approved protocol was registered following Stage 1 in-principle acceptance but before starting data collection to comply with best practices. We reported all measures, manipulations, and exclusions in these studies. These materials can be accessed at https://osf.io/h32wy/?view_only=6ba9591870f14322ac81b97586146a4a (note, the link is anonymized for peer review).

5.1. Participants

Given the absence of previous studies on this topic, we had no benchmark for effect size. Therefore, we set a benchmark of $d = 0.40$, which was less than the frequent default of $d = 0.50$. Our a-priori power analysis suggested that this effect size at alpha = 0.05 and a power of 90 % in a between-participant design with three groups required a sample size of 320 participants (Faul et al., 2007). We planned to add 5 % for potential exclusions if participants 1) Failed to engage in the conversation by opting out within five minutes or 2) Did not engage in solitude during the required period, for example, by using technology or books to distract themselves during this time. Thus, the target sample size planned was $N = 336$. This sample size is the largest relative to any listening study that has involved an in-person conversation (Castro et al., 2016; Itzchakov et al., 2017; Itzchakov et al., 2018; Itzchakov et al., 2020; Itzchakov, Weinstein, et al., 2022). Thus, this study was conducted in two labs, namely, in the UK and Israel. Sensitivity analysis indicated that the smallest effect size this sample could detect was $d = 0.39$ (Faul et al., 2007).

In total, $N = 336$ participants were recruited; Of these $N = 285$ (84.8 %) passed our exclusion criteria ($n = 235$ were women, $n = 43$ were men, and $n = 6$ identified as another gender). These participants were aged $M = 22.54$ years ($SD = 4.48$, range = 18–48 years), and recruited, as planned through the participant pools at the investigators' universities. We set no other exclusion or inclusion criteria for taking part. Participants were compensated through course credit or financially.

Mediation analyses. We calculated the power of the planned sample size on the parallel indirect effects using 1000 power analysis replications and 20,000 Monte-Carlo draws per replication (Schoemann et al., 2017). We used the following correlations: r (listening manipulation-autonomy) = 0.60, r (listening manipulation-relatedness) = 0.70, r (listening manipulation-solitude outcomes) = 0.20, r (autonomy-relatedness) = 0.60 (Vasconcellos et al., 2020), r (autonomy/relatedness- solitude outcomes) = 0.30. The correlations between the listening manipulation relatedness and autonomy, as well as the correlations between autonomy and relatedness, are based on previous work (Itzchakov & Weinstein, 2021; Itzchakov, Weinstein, et al., 2022; Itzchakov, Weinstein, Leary, Saluk, & Amar, 2023; Itzchakov, Weinstein, Vinokur, & Yomtovian, 2023). The rest of the correlations are based on a conservative benchmark because they have not been assessed in previous research. The observed sample size has a power of above 80 % to detect parallel indirect effects through autonomy relatedness (Schoemann et al., 2017).

5.2. Measures

5.2.1. Overall treatment

All self-report measures were paired with a scale ranging from 0 (*Not at all*) to 6 (*Extremely*) for consistency across the study, and because 7-point type scales provide higher internal and test-retest reliability than do measures with fewer scale points (Gliem & Gliem, 2003). As planned, we first tested for internal reliability for all measures with three or more items and set $\alpha > 0.60$ as an acceptable benchmark. This was attained for all scales (as described below), and so we averaged all items after reversing items as appropriate. We planned that if $\alpha \leq 0.60$, we will remove the lowest-loading item, one at a time until we achieve an overall alpha above this cutoff point, but this was not necessary to do.

5.2.2. Manipulation checks

Listening perception. Participants completed the 10-item constructive listening behavior scale (Kluger & Bouskila-Yam, 2018). Items were paired with the prompt: "During the conversation, my partner…" and included items such as "asked questions that showed understanding of my opinions," "tried hard to understand what I was saying," and "gave me their undivided attention." Items were then averaged to produce a 'perceived empathic listening' score ($\alpha = 0.96$).

Positive emotions. Positive emotions were measured using the PA (positive affect) of the widely used positive and negative affect scale (PANAS; Watson et al., 1988). Items included "interested," "strong," and "excited." Participants rated the degree to which they felt each 'right now' after the manipulation. Items were then averaged for a single positive emotion score ($\alpha = 0.93$).

5.2.3. Proposed mediators

Autonomy and relatedness satisfaction. Satisfaction for the autonomy and relatedness needs were measured once after the manipulation with ten items (five each) of the basic psychological need satisfaction scale (La Guardia et al., 2000). To test the two needs in a conversation context, we adapted the prompt for conversations as in previous listening experiments focused on self-disclosures (Weinstein, Nguyen, & Hansen, 2021). Participants assigned to either of the listening conditions responded to the prompt: "When speaking with my conversation partner, I felt…". Those assigned to the Positive Reframing condition responded to the prompt: "When reframing my thoughts, I felt…". Five items measured autonomy need satisfaction with the prompt, "During the conversation, I felt…": "free to be who I am," "free to express my emotions," "that I was able to be 'me,'" "pressured to be a certain way", and "that my genuine experiences were NOT understood." Five items measured relatedness need satisfaction. Listening condition participants received the prompt, "During the conversation, I felt…" Positive Reframing participants received the prompt, "during my writing period, I felt…": "cared about," "closeness and intimacy," "distance from my conversation partner [for Positive Reframing: 'others']," "like I could trust my conversation partner [for Positive Reframing: 'others'],," and "want more interaction with my conversation partner [for Positive Reframing: 'others']." Reliabilities were acceptable for all scales (relatedness: $\alpha = 0.83$; autonomy: $\alpha = 0.77$).

5.2.4. Outcome measures

Solitude expectations. Participants were asked about their expectations of experiencing peaceful affect and loneliness if they spent ten minutes alone in solitude. Expectations were measured with the same items that were used to test solitude experiences of peaceful affect and loneliness (described below) so that discrepancies between expectations and experiences could be calculated. Specifically, participants were asked: "How will you feel in solitude if you spend the next ten minutes alone, and not interacting with anyone?" Peaceful affect was measured with: "During my time alone, I will feel…" "calm," "peaceful," "relaxed,"

and "at ease" (α = 0.95). Loneliness was similarly measured with the item: "I will feel lonely during this time." A peaceful affect score was computed by averaging the four items. The single-item loneliness measure was subtracted from the peaceful affect composite, as we had planned to do providing their correlation was negative and $r \geq -0.30$. The observed correlation was $r = -0.50$. This resulted in a 'positive expectations' score.

Self and social connection. We measured *social connection* with three items appropriate to adapting to state experiences and a broad gut feeling of connection, taken from the relatedness subscale of the Intrinsic Motivation Inventory (IMI; Deci et al., 1994). Items measuring social connection *during the period of solitude* were "I felt really distant from others," "I felt like I could really trust others," and "I felt close and connected to others." Three parallel items were used for *self-connection*: "I felt really distant from myself (r), "I felt like I could really trust my own perceptions," and "I felt close to myself." (Post listening: $\alpha_{\text{self-connection}} = 0.81$, $\alpha_{\text{social connection}} = 0.77$; post solitude: $\alpha_{\text{self-connection}} = 0.71$, $\alpha_{\text{social connection}} = 0.73$).

Peaceful affect. The PANAS serenity scale (Watson et al., 1988) was used to measure peaceful affect. Four items asked participants to rate items including "During my time alone, I felt…": "calm," "peaceful," "relaxed," and "at ease". Items were then averaged to compute a peaceful affect score (Post listening: α = 0.94; post solitude: α = 0.95).

State loneliness. State loneliness was measured with a one-item direct measure: "I felt lonely during this time." This is a common and face-valid way to assess the construct (Shiovitz-Ezra & Ayalon, 2012). Both affect measures (the one-item loneliness measure and peaceful affect above) have been studied in the context of positive solitude (Weinstein, Nguyen, & Hansen, 2021).

Self-insight. Building on Itzchakov and Weinstein (2021), participants were asked to indicate their responses to a prompt beginning: "My time alone just now has…": "helped me to understand myself better," "made me think more deeply about things," "helped me to discover new or different insights about myself," "helped me to reflect about my emotions or attitudes," "helped me think about things in a different way," and "helped me connect with myself." (Post listening: α = 0.94; post solitude: α = 0.94).

State rumination. We measured state rumination with the adapted (for state level) rumination subscale of the Rumination-Reflection Questionnaire (Trapnell & Campbell, 1999). Participants responded to the prompt: "During my time alone just now…" with items: "My attention was often focused on aspects of myself I wish I'd stop thinking about," "I seemed to be rehashing in my mind recent things I've said or done," "It was easy for me to put unwanted thoughts out of my mind," and "I tended to 'ruminate' or dwell over things that happen to me." (Post listening: α = 0.70; post solitude: α = 0.75).

5.3. Procedure

5.3.1. Context

Fig. 2 depicts the phases of the experimental procedure. At the outset of the study, participants completed an agreement form. Afterward, they engaged in a writing task. They wrote a brief essay about a time when they felt guilty, regretful, or shamed (Phase 1 in Fig. 2). After writing the essay we randomly assigned participants to one of three experimental conditions: (1) Highly Empathic Listening, (2) Moderately Empathic Listening, or (3) Positive Reframing.

The two listening conditions followed a computer-mediated conversation via Zoom. In the two listening conditions, participants first received written instructions that guided them as they completed questionnaires and conducted video and audio tests that prepared them for a video conversation with a partner who joined them online. They then interacted with listener confederates after the system presumably 'paired them' with their conversation partners and assigned them to the "speaker" role. This procedure has been successfully implemented in previous listening experiments (Itzchakov et al., 2020; Itzchakov, Weinstein, et al., 2022; Saluk et al., 2023).

In the Positive Reframing condition, participants received written instructions that guided them as they completed surveys and engaged in the activity (see Phase 2 in Fig. 2). After the focal activity of each condition (conversation in the listening conditions and positive activity in the control condition), they received instructions that guided them to complete a series of post-manipulation questionnaires (Time 1 self-report measures are summarized in Fig. 2). After completing these questionnaires, participants in each condition spent 10 min in solitude (Phase 3 in Fig. 2) and completed the second set of post-manipulation questionnaires (Time 2 self-report measures in Fig. 2). In the next section, we elaborate on each phase.

Research materials were delivered in English or Hebrew (depending on the lab). As in previous studies (Itzchakov et al., 2017; Itzchakov et al., 2018), each confederate conversed with both listening conditions to avoid a situation where the listening manipulation was confounded with the listener (i.e. if some listeners were to conduct the Moderately Empathic Listening condition while others conducted the Highly Empathic Listening condition).

5.3.2. Experimental procedure and instructions for participants

Introduction. Participants were invited to participate in a study on 'thinking about and sharing life's important life experiences', where they were asked to remember an important negative life experience. After they completed the consent procedures, participants undertook three study phases.

Phase 1. At the start of the study, all participants were instructed to

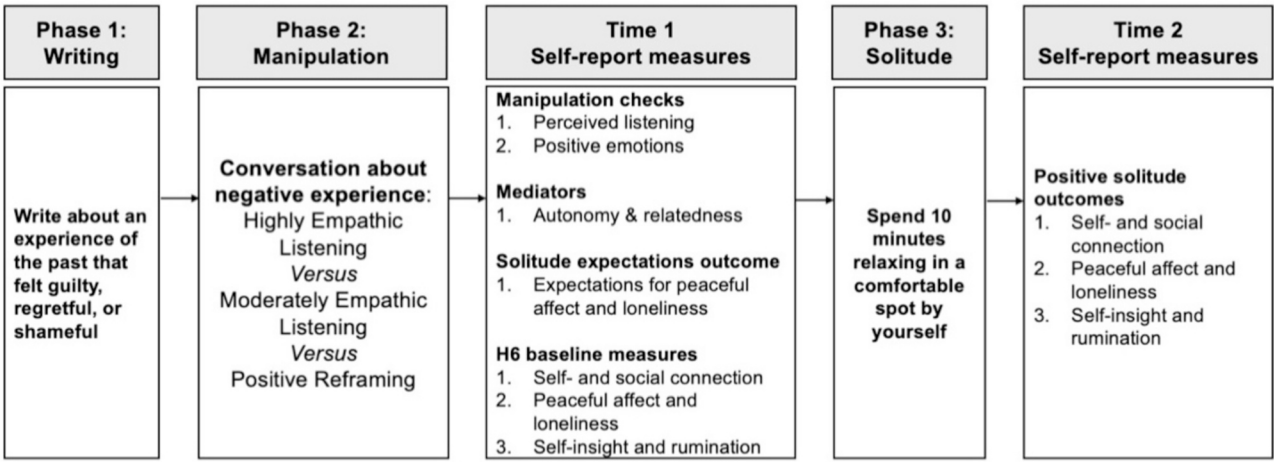

Fig. 2. Description of the phases of the experiment and measures.

write a brief essay about a life experience, a situation where they felt a negative event from the past, namely, one where they felt the negative experience came from their own actions and about which they felt guilt, regret, or shame. Such negative experiences were selected because they can elicit rumination or self-insights, avoidant behaviors, or otherwise learning and growth (King & Hicks, 2007) and may undermine people engaging in self-compassion and self-acceptance, important qualities in positive solitude ((Peter & Gazelle, 2017). These discussions have been shown to benefit more from highly empathic (i.e., high-quality) as compared to moderately empathic (i.e., moderate-quality) listening (Navon, 2023).

Instructions were adapted from Itzchakov et al. (2018) and Navon (2023): *Please spend a few moments thinking about an experience you have had that makes you feel guilty, regretful, or ashamed. We all have these experiences but experience them in different ways. Next, if randomly selected, you may be invited to discuss this emotion in a conversation, so please describe something you would be willing to explore with your conversation partner. Please write a bit about this experience in as much detail as you feel comfortable doing.* Participants were given a minimum of thirty seconds to complete this task before proceeding to Phase 2.

Phase 2. After completing Phase 1, participants assigned to the Highly Empathic or Moderately Empathic Listening conditions were paired via the program with a confederate listener who was ostensibly a second participant in the study. The system (supposedly, randomly) assigned the participant to the speaker role and the confederate to the listener role. To frame this task, those assigned to one of the two listening conditions were instructed, "The next part of the study will involve sharing experiences when talking to another person. You have been randomly assigned to be the SPEAKER. This means that you will share your own experiences, on which you wrote, over the next 10 minutes with your partner. Please wait while we connect you….".

During the second phase (i.e., the conversation), the confederate (i.e., listener) started by informing the participant that they were going to be listening to the experience that the participant described in the study. To make sure that participants thought the confederate was also a fellow participant, the confederates conveyed this information with certain feigned hesitancy. Conversations lasted 10 min following previous procedures (e.g., Itzchakov, Weinstein, et al., 2022; Saluk et al., 2023). Based on random assignment, the confederates listened using highly empathic or moderately empathic listening behaviors (described in Itzchakov & Weinstein, 2021).

Listening manipulation. The confederates followed a validated listening behavior protocol and a second protocol that ensured that the technical and logistic online conditions were fulfilled (Itzchakov, Weinstein, et al., 2022). Following procedures that were established during previous listening research (e.g., Itzchakov et al., 2020; Itzchakov, Weinstein, et al., 2022), the confederates received 15 h of listening training where they were instructed on conveying non-verbal and verbal indicators of highly empathic listening (for example, appropriate eye contact, warm and open body language, and the use of reflection and summaries) and moderately empathic listening (for example, using frequent but not consistent eye contact, an occasional distraction, and little verbal feedback beyond an occasional 'uh huh,' or 'hmmm'). The moderately empathic listening conversation was designed to reduce the salience of the active ingredients in empathic listening (attention, comprehension, and positive intention) without the listener conveying a hostile or dismissive attitude.

Control condition. Participants assigned to the Positive Reframing condition were directed to activities designed to help them recall their memory using a positive mindset. This approach was selected because it allows participants to continue thinking about the experience they recalled in Phase 1, holding the content (namely, the negative experience recalled) and timeframe (10 min) constant with the two listening conditions. Positive reframing has been shown to elicit more positive emotions (Ranney, Bruehlman-Senecal, & Ayduk, 2017), providing a control condition for this beneficial quality of empathic listening, which also benefits speakers, in part because it elicits positive emotions (Sugimori, Shimokawa, Aoyama, Kita, & Kusumi, 2020). We based the framework for our positive reframing exercise on a structured activity offered at https://positivepsychology.com. Participants were instructed on what positive reframing thoughts involved and were guided through an exercise to consider their automatic thoughts during their recalled experience and then, for each, replace those thoughts with more appropriate ones.

Initial measures following Phase 2. After the listening or reframing manipulation, participants who were in either of the two listening conditions reported on the listening quality they had received (the manipulation check). All participants reported their positive emotions, autonomy, and relatedness satisfaction (proposed mediators), and expectations for solitude (first outcome variable) using the above scales.

Control variables (after the manipulation). Participants also reported on their current levels of the outcomes that were measured once again later in the study (e.g., mood, rumination, and reflection). At this point, those measures referenced 'right now' and used *present* tense. They were used as control variables to test H6, which states that benefits are conferred *during* the solitude period, and controls for post-manipulation standing on the same measure.

Phase 3. After the Conversation or Reframing Phase 2, we asked participants to spend 10 min alone, following procedures in Nguyen et al. (2022) adapted to the home environment and piloted successfully in a previous 'solitude framing' experimental study conducted by the group (Weinstein & Adams, 2023). They were asked to avoid using distractors such as phones or books to allow them to be in complete solitude with their thoughts (Weinstein et al., 2022). Specifically, they were instructed: *"For this next part of the study, you will not be interacting with anyone. Instead, your task is to spend the next ten minutes by yourself. For this period, you can relax in a comfortable spot (a cozy sofa, perhaps). During this time, please stay awake and not use objects that may sway your attention, such as any electronic devices or books. Please make sure nobody is around and do not interact with anybody."*

Outcome measures following Phase 3. Following time spent in solitude as a Time 2 measure, participants reported on their state: 1) self and social connection, 2) peaceful mood and loneliness, and 3) self-insight and rumination. These formed the outcome measures. Finally, as an adherence check, participants were given the following questions based on (Lay, 2018): "The answer to the following questions will not determine whether you are paid for your participation in the study. During the 10-minute period when you were asked to be by yourself: 1) "Were others around?" (responses: '*no (no one else was around)*' or '*yes (somebody/others were around)*'), and (b) "Did you interact with someone or use electronic devices (e.g., computer, phone, television) or books ('*Yes*' or '*No*'). Participants were excluded from all analyses if they answered yes to either of these questions.

Debrief and recovery. At the end of the study, participants were asked to write about a time in their lives when they "felt empowered or deeply connected to another person" to help mood recovery following the experimental paradigm. Participants were also fully debriefed on the study procedures and provided with contacts if they wished to talk further (e.g., the University's mental health support office, a local mental health charity, and Good Samaritans, a phone-based peer support network).

6. Results

6.1. Correlations

Correlations are reported in Table 1. In Table 2, we report each construct's mean and standard deviation.

6.2. Manipulation checks

We conducted two manipulation checks. First, we tested whether

Table 1
Correlations for Study Variables of Interest in Hypothesized Models.

	1	2	3	4	5	6	7	8	9	10	11
1. Perceived listening											
2. Positive emotions	0.60**										
3. Peaceful affect expectations	0.18*	0.35**									
4. Loneliness expectation	−0.08	−0.14*	−0.50**								
5. Autonomy need satisfaction	0.67**	0.43**	0.23**	−0.19**							
6. Relatedness need satisfaction	0.74**	0.63**	0.16**	−0.12	0.62**						
7. Self-connection post solitude	0.20**	0.34**	0.47**	−0.48**	0.35**	0.27**					
8. Social connection post solitude	0.28**	0.29**	0.24**	−0.39**	0.26**	0.38**	0.44**				
9. Peaceful affect post solitude	0.15*	0.32**	0.73**	−0.47**	0.25**	0.21**	0.60**	0.36**			
10. Loneliness post solitude	−0.06	−0.11	−0.37**	0.67**	−0.07	−0.07	−0.48**	−0.44**	−0.46**		
11. Insight post solitude	0.27**	0.48**	0.47**	−0.25**	0.28**	0.31**	0.52**	0.34**	0.54**	−0.23**	
12. Rumination post solitude	−0.06	−0.09	−0.15**	0.24**	−0.11	−0.12*	−0.26**	−0.29**	−0.26**	0.27**	0.05

Notes. $^{**}p < .01$; $^{*}p < .05$; Experimental condition was coded: 1 = Moderately empathic listening, 2 = Highly empathic listening.

Table 2
Means and Standard Deviations for Pre-Registered Study Outcomes.

	Overall		Highly empathic		Moderate empathic		Positive reframing	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
1. Perceived listening	4.58	1.61	5.55	0.68	3.59	1.67	NA	NA
2. Positive emotions	3.18	1.42	3.88	1.20	2.44	1.45	3.22	1.22
3. Autonomy need satisfaction	4.10	1.23	4.86	0.91	3.59	1.34	3.83	0.99
4. Relatedness need satisfaction	3.30	1.36	4.13	1.19	2.61	1.36	3.14	1.05
5. Peaceful expectations	4.14	1.43	4.31	1.49	4.01	1.47	4.11	1.32
6. Loneliness expectations	1.99	1.70	1.83	1.72	2.04	1.67	2.10	1.71
7. Self-connection	4.37	1.13	4.47	1.03	4.00	1.32	4.28	1.20
8. Social connection	2.93	0.70	3.15	1.37	2.69	1.21	3.06	1.27
9. Peaceful affect	4.21	1.41	4.34	1.40	4.10	1.50	4.20	1.33
10. Loneliness	2.10	1.39	1.97	1.39	2.19	1.44	2.15	1.36
11. Insight	3.90	1.37	4.08	1.35	3.69	1.51	3.93	1.23
12. Rumination	3.46	1.30	3.49	1.40	3.58	1.21	NA	NA

Notes. Variables 1–6 were measured after the listening or positive reframing manipulation. Variables 7–12 were measured after the solitude period.

those in the Highly Empathic Listening condition reported higher listening perception than those in the Moderately Empathic Listening condition. A test was conducted with a planned *t*-test comparing coded conditions. Findings showed a strong and significant condition effect, $t(191) = 10.73$, $p < .001$, $d = 1.54$, such that the moderately-empathic listening condition predicted lower perceived listening ($M = 3.59$, $SD = 1.67$) than did the highly-empathic listening condition ($M = 5.55$, $SD = 0.68$). Therefore, we can conclude the listening manipulation was successful.

Second, we conducted a manipulation check comparing moderately empathic listening to the two conditions designed to elicit positive emotions: Positive Reframing and Highly Empathic Listening conditions. Given that we had a directional expectation that the Moderately Empathic Listening condition would have lower positive emotions than either those who received highly empathic listening or those who positively reframed, a planned comparison tested the contrast of the Positive Reframing condition (coded +1) and the Highly Empathic Listening condition (coded +1) against the Moderately Empathic Listening condition (coded −2). Results showed that this manipulation, as well, was successful, $t(283) = 6.77$, $p < .001$, $d = 0.85$ ($M_{\text{moderate}} = 2.44$, $SD = 1.45$; $M_{\text{highly empathic/reframing}} = 3.56$, $SD = 1.25$).

6.3. Primary tests of hypotheses H1 – H5

The experimental design required a between-participant test with three groups. A $p < .05$ in a two-way test was used as the benchmark for determining significance. According to APA 7th guidelines, effect sizes should be reported, as well as exact *p*-values over <0.001. As we conducted multiple significance tests, false-positive results were possible. Therefore, we employed the Benjamini-Hochberg approach (Benjamini & Hochberg, 1995) and compared the obtained *p*-value to an adjusted *p*-value. This well-validated approach addresses the potential for false positives while maintaining statistical power, unlike other methods, such as the Bonferroni correction, that involve power loss and increased type-II error (Narum, 2006; Thissen et al., 2002). We set a significance level of $\alpha = 0.05$ for a false discovery rate.

Hypothesis 1, that the Highly Empathic Listening condition (as compared to the Moderately Empathic Listening and Positive Reframing conditions) would predict *less positive* solitude expectations (Time 1; post-listening), was tested using an analysis of variance (ANOVA) with the condition defined as a predictor and solitude expectations as an outcome following registered plans. Counter our expectations, findings showed no omnibus effect of condition predicting positive solitude expectations, $F(2, 279) = 1.04$, $p = .354$.

Given we had directional hypotheses concerning the relationship between highly empathic listening and two separate comparison conditions (and we did not anticipate the two comparisons would differ from one another on our primary outcomes), after interpreting the omnibus test, we conducted a planned comparison to test the contrast of the Highly Empathic Listening condition (coded +2) against both the Positive Reframing and Moderately Empathic Listening conditions (each coded −1). This contrast, as well, did not predict positive solitude expectations, $t(279) = 1.44$, $p = .152$, $d = 0.36$.

Hypothesis 2a and 2b, that the Highly Empathic Listening condition (as compared to the Moderately Empathic Listening and Positive Reframing conditions) would predict greater state autonomy need satisfaction (2a) and greater relatedness need satisfaction (2b); Time 1 post-listening), was evaluated similarly to Hypothesis 1. Specifically, we registered to conduct a planned comparison contrasting the Highly Empathic Listening condition (coded +2) to each of the comparison conditions (each coded −1). Omnibus effects were significant, $F_{\text{autonomy}}(2, 282) = 36.51$, $p < .001$, and $F_{\text{relatedness}}(2, 282) = 39.19$, $p < .001$. The planned comparison further predicted both psychological need satisfactions: Autonomy, $t(282) = 8.40$, $p < .001$, $d = 2.10$; Relatedness,

$t(282) = 8.28$, $p < .001$, $d = 2.07$. The highly empathic listening condition predicted greater standing on both psychological needs than did the comparison conditions.

Hypothesis 3a-f stated that the Highly Empathic Listening condition (as compared to the Moderately Empathic Listening and Positive Reframing conditions) would predict greater self (H3a) and social connection (H3b), peaceful affect (H3c) and lower loneliness (H3d), and self-insight (H3e) and lower rumination (H3f) after the solitude period. These expectations were tested using the same approach as in H1 and H2 tests. Specifically, we conducted omnibus tests but also planned a-priori to conduct a planned comparison contrasting the Highly Empathic Listening condition (coded +2) against both the Positive Reframing and Moderately Empathic Listening conditions (each coded −1). No condition effects were found predicting these experiences.

Hypothesis 4 stated that the Highly Empathic Listening condition (as compared to the Moderately Empathic Listening and Positive Reframing conditions) would predict outcomes indirectly through its simultaneous effects on autonomy need satisfaction (assuming H2a would be statistically significant) and relatedness need satisfaction (assuming H2b would be statistically significant). To test this hypothesis, we conducted a parallel mediation analysis using Model 4 in PROCESS (Hayes, 2017) with 5000 bootstrapped samples (Preacher & Hayes, 2008). We conducted six separate parallel mediation analyses, one for each dependent variable: social connection in solitude, self-connection in solitude, peaceful affect, lower loneliness, self-insight, and lower rumination. The independent variable was always the experimental condition (coded +2 for Highly Empathic Listening; −1 for Moderately Empathic Listening and Positive Reframing), and the mediators were relatedness and autonomy. For each mediation model, we compared the two indirect effects to test whether they differed significantly from each other.

Hypothesis 5. A more conservative model was planned to test whether solitude had affective and cognitive benefits above and beyond the benefits already conferred by highly empathic listening. We had predicted (*Hypothesis 5a-f*) that Highly Empathic Listening (as compared to Moderately Empathic Listening and Positive Reframing) would predict more self (H5a) and social connection (H5b), peaceful affect (H5c) and lower loneliness (H5d), greater self-insight (H5e) and lower rumination (H5f) *post-solitude*, *controlling* for the respective indicator measured *directly after the manipulation*. Analysis of covariance tests is presented in Table 5 and shows no effects of condition on post-solitude outcomes, replicating the analogous tests without these additional controls (Table 3 above).

6.4. Controlling for family-wise error

Following our preregistration, we conducted a Benjamini-Hochberg (BH) analysis to control for multiple comparisons. The lowest BH-adjusted p-value was lower than 0.0001, while the highest was 0.944. We focused on the BH-adjusted *p*-values for listening perception, autonomy, and relatedness, as these were the only significant main effects out of the 16 tested. The BH-adjusted *p*-values for these three effects were all equal to or below 0.0016, maintaining their significance at $\alpha = 0.05$. Thus, controlling for family-wise error did not alter the significance of our results.

Table 3
Planned Analyses Predicting Study Outcomes After Listening.

	Omnibus			Planned comparison		
	F	*p*	*Cohen's f*	*t*	*p*	*d*
1. Self-connection	0.68	0.506	0.05	1.16	0.246	0.28
2. Social connection	3.39	0.035	0.11	1.64	0.102	0.42
3. Peaceful affect	0.71	0.492	0.05	1.08	0.279	0.27
4. Loneliness	0.68	0.506	0.05	−1.16	0.248	−0.29
5. Self-insight	1.98	0.140	0.09	1.54	0.125	0.38
6. Rumination	1.03	0.359	0.06	0.24	0.812	0.06

6.5. Model assessment

Finally, because our model included multiple dependent variables, we examined the fit between the entire theoretical model and the data using Structural Equation Modeling with AMOS software. We tested for model fit using the most frequently used indices and the recommended benchmarks. Specifically, χ^2/degrees of freedom <5 (Hu & Bentler, 1999). Note: *the usefulness of a chi-square test in itself is limited due to its sensitivity to sample size. As the sample size increases, the probability of obtaining a statistically significant chi-square also increases, leading to a false indication of a mismatch between the model and data.* Second, we examined the comparative fit index (CFI). A CFI of above 0.90 is considered a good fit. However, we used the more conservative approach of CFI < 0.95. The third fit index is the Root Mean Square Error of Approximation (RMSEA), which is a parsimony-adjusted index (Kline, 2015). The most conservative threshold for good results is when the RMSEA is less than 0.05. As the RMSEA was greater than 0.05, we used the less conservative but more frequently used threshold of RMSEA <0.08 (Kline, 2015). Finally, we examined the Standardized Root Mean Square Residual (SRMR). This measure calculates the square root of the difference between the residuals of the sample covariance matrix and the hypothesized model. The common threshold for a good SRMR is when it is equal to or less than 0.08. Following recommendations by Kline (2015), we covaried residual errors when $|r| \geq 0.10$.

As more than one fit index indicated a poor model fit, we tested a more parsimonious model by averaging the dependent variables, which correlated at 0.60 and above with each other. We examined a model of the main and indirect effects that were supported. Therefore, we submitted autonomy and relatedness need satisfaction at Time 1 as mediators of the effects of the listening manipulation on the following Time 2 variables: self-insight, peaceful affect, social connection, and self-connection As can be seen in Table 4, autonomy, but not relatedness, served as a mediator of the listening manipulations' effect on peaceful affect, whereas relatedness, but not autonomy, served as a mediator of the listening manipulations' effects on social connection. Both autonomy and relatedness served as mediators of the effect on self-insight. In addition, as indicated in our preregistration we let residual errors that were correlated at $|r| \geq 0.10$ to covary (see Fig. 3).

The results of the structural equation model indicated a good fit between the model and the data. First, the ratio χ^2/df was 1.167 which is smaller than the threshold of 5. Second, the CFI was =0.998, also above the threshold (0.95). RMSEA also indicated a good fit with a score of 0.024 and 95 %*CI* [0.00, 0.08], $p = .716$, smaller than the threshold of 0.05. Finally, the SRMR was 0.029, also below its threshold of 0.08.

6.6. Exploratory research questions

We had planned to conduct two sets of exploratory research questions with repeated measures ANOVAs including Time 1 (pre-solitude) measures and Time 2 (post-solitude) measures as a within-subjects factor in all cases, and predictor as a between-subjects factor providing condition effects had been identified predicting the relevant in tests for H1 (predicting expectations versus experience of peaceful mood and loneliness) and H5 (predicting current standing on all positive solitude indicators at Time 1 (pre-solitude) versus Time 2 (post-solitude). However, H1 and H5 were not supported.

Instead, we took a different route to better understand the nature of the listening effects and the solitude experience. First, we examined the direct effects of the listening manipulation on our outcomes at Time 1 (pre-solitude). While these findings did not speak to the effects of listening on solitude, they were useful for understanding the potential benefits of empathic listening during a difficult conversation. Findings (presented in Table 6) showed that the highly empathic listening condition predicted the most self-connection, social connection, peaceful

Table 4
Planned Indirect Effects Linking Condition to Study Outcomes After Solitude Through Autonomy and Relatedness Need Satisfaction.

Dependent variable	Autonomy (B-C)		Relatedness (B-C)		Indirect effect Autonomy (A-B-C)			Indirect effect Relatedness (A-B-C)			Direct effect (A-C)	
	t	*p*	*t*	*p*	*b*	*Low 95 % CI*	*High 95 % CI*	*b*	*Low 95 % CI*	*High 95 % CI*	*t*	*p*
1. Self-connection	4.55	<0.001	1.85	0.066	**0.12**	**0.06**	**0.18**	0.05	−0.00	0.10	−2.20	0.029
2. Social connection	1.07	0.284	5.17	<0.001	0.03	−0.02	0.09	**0.15**	**0.08**	**0.22**	−1.52	0.131
3. Peaceful affect	2.98	0.003	1.45	0.147	**0.10**	**0.03**	**0.17**	0.05	−0.02	0.12	−1.27	0.206
4. State loneliness	−0.47	0.641	−0.45	0.652	−0.02	−0.09	0.05	−0.02	−0.08	0.05	−0.55	0.586
5. Self-insight	2.29	0.023	3.41	0.001	**0.07**	**0.004**	**0.15**	**0.11**	**0.03**	**0.19**	−1.44	0.150
6. Rumination	−1.01	0.314	−1.58	0.116	−0.03	−0.09	0.03	−0.05	−0.10	0.12	1.50	0.135

Note. Indirect effects in bold were statistically significant.

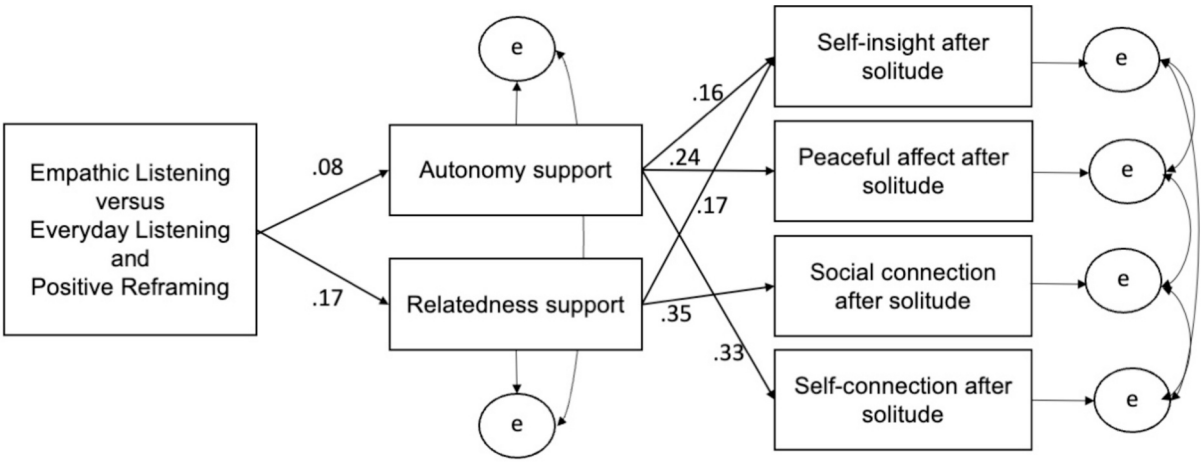

Fig. 3. A structural equation model of the highly empathic listening versus moderately empathic listening manipulation on study outcomes.
Notes. Numbers represent standardized coefficients. Condition is defined as a contrast between the listening condition as compared to the moderately empathic condition (1 = highly empathic listening, 2 = moderately empathic listening). Autonomy and relatedness support were measured at Time 1, before solitude. Dependent variables in the model were measured at Time 2, after the solitude period.

Table 5
Planned Condition Effects on Study Outcomes After Solitude Controlling For Each Outcome Tested Before Solitude (After Listening).

	Omnibus			Planned comparison		
	F	*p*	*Cohen's f*	*F*	*p*	*d*
1. Self-connection	1.32	0.270	0.07	1.52	0.218	0.27
2. Social connection	0.96	0.382	0.06	0.75	0.387	0.10
3. Peaceful affect	0.88	0.415	0.06	1.14	0.286	0.13
4. Loneliness	0.08	0.927	0.02	0.10	0.748	0.04
5. Insight	0.93	0.395	0.06	1.74	0.189	0.16
6. Rumination	0.78	0.461	0.05	0.22	0.641	0.06

affect, insight, but surprisingly, also rumination. It also predicted lower loneliness than both the positive reframing and moderately empathic listening group. Interestingly, although moderately empathic listening predicted more social connection than the completely non-social condition of positive reframing, it did not differ on levels of self-connection or loneliness.

Second, our primary analyses were designed to explore the power of listening on solitude moments, but we were curious about the power of solitude following listening. Specifically, we sought to examine the extent to which the time spent in solitude would hold certain benefits or costs, averaging across conditions. Results presented in Table 7 suggested both benefits and costs. First, we observed significant increases in self-connection and peaceful affect during the solitude period. Second, expectedly, participants reported drops in social connection. However, they also reported drops in self-insight and rumination following the

Table 6
Exploratory Means and Standard Deviations for Pre-Registered Study Outcomes.

	Overall				Highly empathic		Moderate empathic		Positive reframing		Contrast*	
	M	*SD*	*F*	*p*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*t*	*d*
Self-connection	4.24	1.23	6.30	0.002	4.59_A	1.15	4.00_B	1.32	4.13_B	1.14	3.46**	0.86
Social connection	3.56	1.28	15.85	<0.001	4.08_A	1.20	3.10_B	1.30	3.47_C	1.15	5.20**	1.30
Peaceful affect	3.63	1.44	10.10	<0.001	4.07_A	1.33	3.16_C	1.52	3.65_B	1.35	3.77**	0.94
Loneliness	2.04	1.32	4.37	0.014	1.72_B	1.12	2.20_A	1.37	2.21_A	1.43	−2.96**	−0.74
Insight	4.10	1.33	14.60	<0.001	4.59_A	1.17	3.60_C	1.50	4.10_B	1.12	4.64**	1.16
Rumination	3.65	1.22	0.37	0.691	3.62_A	1.31	3.73_A	1.16	3.59_A	1.19	−0.28	−0.07

Note. Outcomes were measured directly after the listening or reframing manipulation. *Contrast refers to the contrast – similar to the planned comparison – between highly empathic listening (+2) and moderately empathic listening (−1) as well as positive reframing (−1). Letters A and B also contain data about.

Table 7
Exploratory Comparisons of Before and After Solitude Period.

	Direct Comparison of Means Across Time Points				Change Across Solitude Period		
	M_{before}	SD_{before}	M_{after}	SD_{after}	F	p	d
Self-connection	4.24	1.23	4.37	1.13	4.00	0.047	0.21
Social connection	3.56	1.28	2.97	1.30	58.66	<0.001	0.91
Peaceful affect	3.63	1.44	4.21	1.41	50.66	<0.001	0.86
Loneliness	2.04	1.32	2.10	1.39	0.61	0.435	0.11
Insight	4.10	1.33	3.90	1.37	7.28	0.007	0.33
Rumination	3.65	1.22	3.46	1.30	6.71	0.010	0.30

solitude period, indicating that conversations were more conducive to both adaptive and maladaptive reflections than time spent alone.

7. General discussion

Research suggests that time spent in solitude is influenced by the social environments preceding this time alone; solitude can be more painful after moments of rejection or when feeling isolated (Ren et al., 2016; 2020), but it could also be constructive when people receive deep support for their self and social connection that gives them the internal resources for benefiting from solitude time. To test this possibility, we planned an experiment that examined the causal effects of highly empathic listening on a subsequent solitude period, and compared this *supportive* social experience (Weinstein et al., 2022) with two less supportive comparison groups: namely, moderately empathic listening that held the nature of the interaction constant, and a positive reframing comparison that held the positive affect induction component of the listening manipulation constant.

Our primary registered findings concerned both expectations for, and experiences of, solitude. We did not find support for those hypotheses: There was no evidence that receiving highly empathic listening shaped speakers' expectations for solitude, nor was there evidence that highly empathic listening sustained people during their time alone, leading to more self- and social connection, peaceful affect, and insight, and to lower loneliness and lower rumination. The absence of effects appears to stand in contrast with previous studies suggesting that people enjoy time alone more when they have strong social bonds (Pauly et al., 2018) and that negative social experiences undermine solitude well-being (Lay et al., 2020). Both of these directional effects suggest that feeling listened to well, an experience that is deeply socially connecting (Kluger & Itzchakov, 2022), should have facilitated a sense of well-being during subsequent solitude.

Yet, there are several possibilities as to why we did not observe these benefits. The first is that whereas previous research (Lay et al., 2020; Ren et al., 2016) focused on social connection or isolation within lasting relationships and social networks, whereas in the current study, we relied on a live, but relatively short, conversation with a stranger, an approach which may have resulted in more transient benefits. Second, and equally likely, the solitude periods tested in this study were designed to be naturalistic by asking participants to hold them within the home rather than in-lab, but they were still mandated as part of the study and were short-lasting. Such solitude moments may have not reflected typical occurrences of everyday solitude, which is more richly motivated – mandated through external constraints or health restrictions, or chosen and pursued for its value, and often long-lasting – with periods beyond the 10 min used in this study (Nguyen et al., 2021).

Although solitude is not *restricted* to these qualities (i.e., brief or meaningful; Nguyen et al., 2021), the particular form it took in the current research may have changed the potential of empathic listening to affect well-being during this time alone. For example, individuals at risk for loneliness and mental health problems because they are in extensive, isolating solitude due to restricted mobility (Pantelaki et al., 2021) or because of self-quarantining (Gregory et al., 2024), may benefit greatly from having access to conversations during which they are deeply listened. This study does not discount such possibilities, and future research examining these possibilities may be important for building public health programs that support isolated individuals and tackle global loneliness (Lim et al., 2023).

In addition, although we found no evidence of direct listening effects on solitude experiences, confirmatory analyses showed significant indirect effects of the listening manipulation predicting post-solitude through its immediate benefits on relatedness and autonomy need satisfaction. As had been observed in previous research creating contexts of highly empathic (i.e., high-quality) listening (Itzchakov, Reis, & Weinstein, 2022; Itzchakov & Weinstein, 2021; Weinstein, Nguyen, & Hansen, 2021), participants in this study who had been listened to well-reported feeling more self-congruent action and self-expression (autonomy need satisfaction) and relatedness or closeness to their conversation partners. The strong effects of the listening manipulation on psychological need satisfaction also support conceptual arguments that empathic listening plays a critical role in conveying autonomy (Weinstein, Nguyen, & Hansen, 2023), and indirectly, relationship motivation theory, which argues that supporting autonomy satisfies both relatedness and autonomy (Deci & Ryan, 2014).

In turn, both psychological need satisfactions (autonomy and relatedness) predicted certain indicators of well-being even after the solitude period and indirectly linked the experimental conditions to those outcomes. Therefore, although the listening manipulation, in and of itself, may not have changed the feeling of solitude, the internal experience of feeling connected to the speaker and the freedom of self-expression that listening afforded may have carried its benefits across spans of alone time. Indeed, in our models testing both psychological autonomy and relatedness as simultaneous mediators, we found that autonomy need satisfaction independently predicted greater peaceful affect and self-connection after solitude, as well as experiences that time alone was conducive to self-insight, to knowledge gained about oneself, including one's thoughts, feelings, and experiences. Those benefits are in line with the potential of solitude to open the door to feelings of calm and constructive self-reflection (France, 2014; Kull, 2009; Nguyen et al., 2018; Storr, 1989; Weinstein, Nguyen, & Hansen, 2023), and they suggest that entering solitude with a feeling of self-congruence and freedom to self-express may help those alone to turn inwards and connect to the self, a view that has been previously proposed (Weinstein, Nguyen et al., 2021) but not yet tested.

Interestingly, in contrast to autonomy need satisfaction, feeling related to one's conversation partner did not conduce peaceful affect in solitude. These findings in parallel align with views that calm feelings reported within solitude more closely stem from the richness of the relationship with the self (Weinstein et al., 2022), whereas constructive social interactions yield high-energy positive emotions such as excitement (Vogel et al., 2017). Through its capacity to support both psychological needs (Weinstein, Nguyen, & Hansen, 2023), it may be that listening can facilitate calm, or potentially excitement and fun, depending on situations in which individuals find themselves after the listening interaction. Future research manipulating listening within rich social and solitude contexts could speak to the potential and limitations of listening for supporting high-arousal (e.g., happiness, excitement) and low-arousal (e.g., peaceful) positive emotions.

Along with our confirmatory analyses, we conducted two separate sets of exploratory analyses that were not planned. In the first of these, we found that the highly empathic listening condition predicted the most self-connection, social connection, peaceful affect, and self-insight, but surprisingly, also rumination. These findings have important theoretical implications for the listening literature. Namely, although the effect of listening on speakers' self-insight as well as the effect of social connection, and loneliness, replicate previous work (e.g., Itzchakov et al., 2020; Weinstein, Huo, & Itzchakov, 2021), the main effects on

speakers' self-connection and rumination are relatively novel. Concerning self-connection, our results align with the theorizing of Carl Rogers. According to Rogers, when a listener fully engages with the speaker, providing an atmosphere of unconditional positive regard, empathy, and congruence, the experience creates a safe space for the speaker to explore and express their true feelings and thoughts. This deep, nonjudgmental listening encourages the speaker to connect with their own emotions and experiences more authentically, leading to greater self-awareness and personal growth (Rogers, 1951, 1975, 1980). To our knowledge, this study is the first to directly test, and find tentative (unplanned) support for, the view that highly empathic listening increases speakers' self-connection.

The main effect on speakers' rumination is also novel and surprising within the listening literature. Previous work found that experiencing high-quality listening increases reflective self-awareness (Itzchakov et al., 2018). Self-reflection is a constructive and purposeful examination of one's thoughts and behaviors, aimed at gaining insight and fostering personal growth (Trapnell & Campbell, 1999). In contrast, ruminative self-awareness, involves a repetitive and negative focus on one's thoughts, feelings, and experiences, often leading to increased anxiety and distress, and is negatively associated with reflective self-awareness (Trapnell & Campbell, 1999). A possible explanation for the listening-induced self-rumination observed in this study is the focus on a negative topic, unlike previous studies that involved more neutral or positive topics. When speakers receive high-quality listening and engage in deep, elaborate thinking about a negative topic, they may be more prone to ruminative thinking. In contrast, speakers engage in reflective thinking when the topic is neutral or positive. It would be interesting to test whether the valence of the topic (negative vs. positive) influences whether speakers self-reflect in a reflective or ruminative manner.

A second set of analyses explored changes to well-being indicators across the 10-min solitude period, across conditions, to explore whether this time held benefits or costs to well-being. For example, in some previous research, solitude predominantly results in well-being costs over short periods (Rodriguez et al., 2020), whereas other work has shown mixed effects in daily diary studies (Weinstein, Vuorre, et al., 2023). Here, we observed increases in both self-connection and peaceful affect during the solitude period, speaking once again to the potential for solitude to bring individuals closer to themselves by reducing distractions from social influences (Weinstein et al., 2022), and also finding evidence in support for the deactivation effect (Nguyen et al., 2018), that the well-being power of solitude lies in its calming effects. Changes in cognitive processes were more mixed, and merit future inquiry. Specifically, time spent in solitude, on the whole, resulted in *drops* in self-insight and rumination, simultaneously countering arguments that solitude can bring opportunity for constructive self-reflection (Weinstein, Nguyen, & Hansen, 2023) and also countering evidence that solitude results in ruminative thought that can render it stressful and depressing (Hoppmann et al., 2021). Here, though, the short period of time participants spent in solitude, and the exploratory nature of these analyses, preclude conclusions about how these cognitive processes occur during extended alone time.

The conclusions we draw above should be understood in light of the study. The current study relied on a brief conversation with a stranger, and while this approach resulted in the condition having a strong effect on perceptions of listening, and on the capacity of the listener to satisfy the needs of the speaker, the context cannot readily translate to real-world relationships, such as those with parents, romantic partners, friends, or therapists, and likely yielded more transient benefits. In addition, we designed a relatively naturalistic solitude period by asking participants to be alone at home rather than in-lab or in front of the computer, a deviation from solitude lab paradigms that results in questionable external validity (Weinstein & Adams, 2025), but still this brief period of time could not match the best, or worst, of solitude periods. As such, the ability of the current study to speak to the power, and lack of power, of listening within those everyday solitude periods is limited, and future research building on the findings here is important for a well-rounded understanding of the topic.

Despite these limitations, the current study was the first to directly examine constructive social antecedents to solitude or to explore the self-connecting potential of listening, which is more traditionally connected with social, versus self, outcomes. Our confirmatory results suggested that brief conversations may not directly shape subsequent solitudinal experiences. They also suggested that highly empathic listening within those conversations can satisfy basic psychological needs for autonomy and relatedness, and through doing so support self-insight, a sense of calm and self-connection, and lasting social connection, during time alone. These results, and other exploratory analyses conducted in this paper, merit future investigation. Highly empathic listening may hold great potential to support well-being, and solitude can increase or undermine well-being under, respectively, ideal, and non-optimal, circumstances. Solitude is no stranger to most of us, and extended solitude, or isolation, is a threat to well-being for some. Social interactions that can affirm the self in a social world may be key to creating lasting well-being.

CRediT authorship contribution statement

Netta Weinstein: Writing – review & editing, Writing – original draft, Visualization, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Guy Itzchakov:** Writing – review & editing, Writing – original draft, Visualization, Supervision, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

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