

Heard, Then Alone: Empathic Listening, Need Satisfaction, and Solitude Well-Being Among Pakistani University Students

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Abstract

Isolation may be therapeutic or upsetting, and research now indicates that the pre-social course of action predetermines the manner in which individuals spend their time on their own. Expanding on self-determination theory, this research provided evidence on the effect of a positive social antecedent of high empathic listening on future solitude anticipations and solitude experiences over moderately empathic listening and positive reframing control. In an experiment of live interaction with a group of university students in Pakistan, the participants were asked to remember a challenging experience related to themselves, and then interacted briefly (or reframing activity) and completed a 10-minute solitude task. The measures were used to measure perceived listening, positive emotions, autonomy and relatedness need satisfaction, expectations of being alone, and results of being alone (self-connection, social connection, peaceful affect, loneliness, self-insight and rumination). The listening manipulation was effective and had a reliable tendency to augment autonomy and relatedness need satisfaction. Nevertheless, confirmatory analyses did not reveal strong direct condition effects on solitude expectations or post-solitude results. Indirect effects between empathic listening and the chosen solitude indicators showed through autonomy and relatedness need satisfaction revealed the involvement of psychological need satisfaction as one of the mechanisms in parallel mediation models. Exploratory analyses implied that there are instant after-interaction advantages of empathic listening and significant within-person changes throughout the solitude phase. In general, the findings indicate that empathic listening can maintain solitude well-being largely through the development of autonomy-based and relatedness-based internal resources but not through direct carryover effects.

Keywords: Empathic listening; solitude; autonomy; relatedness; self-determination theory; university students; Pakistan

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1 Introduction

Feedback from others influences the relationship of individual to the self (Baumeister & Leary, 1995). Conversations are important opportunities for this feedback to be conveyed and received (e.g., Dindia et al., 1997). In Pakistan, this context of interpersonal feedback can be particularly relevant among young adults given the fact that university life frequently entails significant academic pressure, social comparison, and high emotional demands; mental health concerns and issues are widely documented among students (Khan et al., 2021; Kim et al., 2023). Further, the social worlds of students are increasingly intertwined with online interaction in their daily lives and there is local evidence of social media engagement being correlated with depressive symptoms in student populations (Mateen & Agha, 2023). Within the context of conversations, empathy listening (that is, careful attention to disclosures of the speaker that conveys attention, care, valuing, and understanding) may be a powerful force in supporting the self-processes of speakers by both providing them with self-expression and social connection simultaneously (Kluger & Itzchakov, 2022; Weinstein & Itzchakov, 2025). Empathic listening may, therefore, strengthen subsequent time in solitude of the speakers (an everyday-life context in which the self is the dominant relationship) whereas social connection promotes resilience (Weinstein et al., 2023). In a live interaction experiment in the form of a registered replication with Pakistani university students, we test the core hypothesis that a supportive social context with empathic listening may simultaneously decrease the positive expectation of being in solitude but increase the actual solitude experience. By doing so the present research combines recent findings in listening research (e.g., Itzchakov & Weinstein, 2021; Kluger & Mizrahi, 2023), solitude research (e.g., Nguyen & Rodriguez, 2024; Weinstein et al., 2023), and self-determination theory (Ryan & Deci, 2017) to examine the impact of empathic listening on speakers' solitude.

2 Empathic listening bolsters self- and social connection by supporting needs

The act of self-disclosure on the part of speakers has the quality of the listening that the listeners provide as a factor in the effects that conversations have on them (Weinstein et al., 2022). Empathic listening (also termed "high-quality listening") is broadly accepted as an active interpersonal process in which listeners commit attention and effort to attaining understanding of the speaker and to express benevolent intent - rather than simply remaining silent (Kluger & Itzchakov, 2022; Kluger & Mizrahi, 2023). In reality, listening is an active and taxing process that demands motivation and energy (Imhof, 1998). Empathic listening involves verbal behaviors such as question-asking (Van Quaquebeke & Felps, 2018) or paraphrasing or reflecting on the speaker's content (Nemec et al., 2017), and non-verbal behaviors such as posture, facial expression and gaze (Bavelas et al., 2000, 2002). Together these behaviors are known as "backchanneling" that drive holistic perceptions of being listened to (Pasupathi, 2001; Pasupathi & Billitteri, 2015).

The humanistic theorist Carl Rogers, which inspired the empirical investigation of listening, hypothesized that the act of empathic listening is conducive to the development of true social connectedness and at the same time to the development of true and self-congruent self-expression (also formulated in terms of autonomy need satisfaction; Ryan & Deci, 2017). Empathic listeners give this support as they attempt to understand the speaker's point of view, and value what is said (which does not necessarily mean that they agree with the speaker; Rogers, 1951, 1980). Building on these views and contemporary theorizing on human motivation, relationship-focused accounts within self-determination theory suggest that supportive social contexts that invite self-congruent action and self-expression fulfill requirements for autonomy, and also create relatedness (Ryan & Deci, 2017). More recent theorizing identifies empathic listening as an important strategy that communicates such support (Kluger & Itzchakov, 2022; Weinstein et al., 2022).

Understanding Rogers' views in conjunction with self-determination theory, when speakers are provided with highly empathic listening, they experience a sense of relatedness (i.e., closeness and

connectedness to the listener) and autonomy support (i.e., freedom to explore and express oneself in a self-congruent way) by the listener (Itzchakov & Weinstein, [2021](#); Ryan & Deci, [2017](#)). Put differently, highly empathic listening helps to build a constructive relationship with others that also affirms the self because it enables speakers of the social language to share experiences relevant to themselves, bring their authentic selves into the conversation, and be met by an attentive and understanding ear (Kluger & Itzchakov, [2022](#); Weinstein et al., [2022](#)). Experimental evidence supports these views: Speaking in the context of difficult disclosures is associated with greater psychological need satisfaction and reduced loneliness after rejection-related disclosure (Itzchakov et al., [2023](#)), and empathic listening has been associated with autonomy and self-esteem in speakers when talking about sensitive topics (Itzchakov & Weinstein, [2021](#)).

2.1 How can listening influence a positive experience of solitude?

At first sight, social and solitude time may appear to be independent and even competing contexts in that one can choose to be either alone or to socialize. However, there is mounting evidence that the two are interdependent, and social contexts can improve subsequent experiences of solitude (Lay et al., [2019](#)). While it may be counterintuitive that social connection is what drives positive solitude - rewarding time spent alone, and not interacting with others (Long & Averill, 2003) - positive solitude can provide a space for cognitive distancing from direct social contexts, which can confer benefits (e.g., to self-connection, feeling peaceful, and self-insight; Nguyen et al, [2018](#); Weinstein et al, [2023](#)) while maintaining a sense of closeness to others (Storr, 1989). Said differently, people might be physically alone but they can still feel close to other people (Long & Averill, 2003).

Recent work clarifies that solitude is not a single state: in everyday language, definitions of solitude tend to focus on the state of being physically alone (and often psychologically "with oneself"), but experiences can vary enormously in terms of autonomy, affect, and meaning (Weinstein et al., [2023](#)). Evidence also underlines the "paradox of solitude," which can be calming and autonomy-supportive when time spent alone is considered, but can also foster feelings of loneliness depending on contextual and motivational conditions (Weinstein et al., [2023](#)). More broadly, loneliness and social disconnection have been highlighted as significant public health problems, buttressing the importance of understanding how our day-to-day interactions support (or hamper) well-being, in both social and solitary contexts (U.S. Department of Health and Human Services, [2023](#)).

Although the experience of solitude can be seen as positive (i.e., positive solitude) or difficult and lonely, there has been relatively little research to test the influence of life experiences on well-being in subsequent periods of solitude. Solitude researchers are frequently pointing to both self and social connections as qualities of positive solitude - peaceful affect (rather than loneliness), and reflective self-insight (rather than rumination) - and yet, the antecedents of these outcomes have remained underexplored (Nguyen et al, [2024](#); Weinstein et al, [2023](#)). The listening literature provides one theoretically based candidate antecedent. Rogers argued that through supportive listening, people can become aware of, and in touch with, aspects of themselves that had been previously out of awareness-without having to choose between being true to oneself as opposed to being supported by others (Rogers, [1975](#)). If empathic listening provides for both autonomy and relatedness simultaneously, it may offer an "internal toolkit" for experiencing both social exchanges and subsequent solitude as being more psychologically nourishing (Ryan & Deci, [2017](#); Weinstein et al., [2023](#)).

2.2 How might listening influence expectations for solitude?

Although highly empathic listening should improve experiences alone, it may lower positive expectations for solitude time and individuals may underestimate how well they will feel when alone. Expectations for life experiences do not exist in a vacuum, and I think expectations for life

experiences do not predict lived experience very often (Hatano et al., [2022](#)). People have expectations when compared to the alternatives available (Ritov, 2000). When thinking of ugly social interactions as an alternative, people may overestimate how positive being alone will be. However, empathic listening is a particularly supportive social experience that can foster a sense of togetherness that people wish to maintain (Kluger & Itzchakov, [2022](#)). It is therefore reasonable to assume that expectations for social time are higher after empathic listening, and individuals may perceive a period of solitude subsequently (in contrast) as less rewarding. As a result, those who experience empathic listening may report less expectation for solitude than their eventual experiences.

2.3 Current research

Overall, solitude is an opportunity to obtain relaxation and self-insight, yet these are probably the most dependable when periods of solitude are full of self and social connections (Long & Averill, 2003). There is reason to believe that empathic listening - well-intentioned attention and understanding of spoken content - may be the key to unlocking the potential for positive experiences of solitude, by supporting satisfaction of the needs for autonomy (self-congruent expression and action) and relatedness (Ryan & Deci, [2017](#); Weinstein & Itzchakov, [2025](#)). The current registered replication will combine the findings from social connectedness and solitude with an experimental test in Pakistan, with university students (18-30). The quality of periods of solitude may depend in no small way on the quality of social time which goes before it.

As illustrated in Fig. 1, we would predict that being listened to empathically during a difficult conversation, focusing on previous negative and self-relevant experiences, would provide support for the needs linked to autonomy and relatedness and so reduce speakers expectancies for positive affect in solitude (expectancies that they will be peaceful and not lonely) while supporting positive solitude (rich in self- and social-connection and peaceful affect and self-insight, and characterized by lower loneliness and rumination). The experiment will be an in-person conversation, where participants are provided with either highly empathic or moderately empathic listening or positive reframing comparison as they disclose meaningful content to the listener. This paradigm will be used to test four a priori hypotheses:

Compared with two comparisons (the Moderately Empathic Listening and Positive Reframing conditions) the Highly Empathic Listening condition will:

Hypothesis 1. predict poorer expectations (greater loneliness and less peaceful affect) of solitude time (Time 1; pre-solitude).

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

Hypotheses 3a-f. predict greater self (H3a) and social connection (H3b) in solitude, greater peaceful affect (H3c), and lower loneliness (H3d; affective experiences; Time 2 post-solitude), as well as greater solitude self-insights (H3e) and lower rumination (H3f; cognitive experiences; Time 2 post-solitude).

Hypothesis 4. 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 the benefits of solitude are affective and cognitive and go above and beyond those already conferred by empathic listening. Thus, we predict that:

Hypothesis 5a-f. the Highly Empathic Listening condition (as compared to the Moderately Empathic listening condition and Positive Reframing condition) 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 controlling for the same outcome measured post-manipulation but pre-solitude. This analysis is intended to model changes in those outcomes that specifically occur during the solitude period.

Exploration research question associated with H1 We do not expect the direction of the expectation-experience errors (whether participants will over- or under-estimate their loneliness and peaceful affect in solitude). We will examine existing and directional expectation errors in tests of expectations at Time 1 (pre-solitude) and perceptions at Time 2 (post-solitude), between all participants and (separately where relevant) between the two conditions.

Exploratory research question associated with 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) comparing standing on indicators from Time 1 (pre-solitude) to Time 2 (post-solitude), across all participants, and separately by condition where applicable.

3 Method

3.1 Ethical approval

This research study will be reviewed and approved by the Institutional Review Board/Ethics Review Committee of the lead Pakistani University (approval number to be added upon acceptance). Informed consent will be obtained from all participants who will participate voluntarily and are free to withdraw at any time without penalty. Because of the nature of the study, which involves recall of a guilt/regret/shame experience (Phase 1) risk is considered low but involves emotionally sensitive areas, participants will be given clear debriefing, mood recovery procedures and details of contact with appropriate University counselling services and support resources relevant to the area in which they live.

In line with best practices of open and reproducible science, the study will be registered before data collection and (de-identified) data, analysis code, and research materials will be available in an open repository (e.g., OSF), pending ethical constraints and participant confidentiality (Munafo et al. [2017](#); Nosek et al. [2018](#)). We will report all measures, manipulations, exclusion criteria and analyses as planned, and transparently report any deviations from the preregistered protocol.

3.2 Participants

Given the lack of direct evidence that helps estimate the effect size for the contribution of listening-based social influences to subsequent outcomes of solitude, we adhere to the original benchmark of $d = 0.40$ (below the common default value of $d = 0.50$). A priori power analysis based on $\alpha = 0.05$ and 90% power for a between-participants design with three groups shows that the minimum sample size is $N = 320$ (Faul et al., 2007). As in previous work, we will oversample by about 5% to allow for exclusions caused by non-engagement (e.g., opting out of the conversation within five minutes) or engaging in solitude as directed (e.g., using devices/books or other people during the solitude period). Thus, the target sample size is $N = 336$, which is consistent with the approach in the original study and the goal of making sure that there is sufficient sensitivity to detect effects in a three-condition listening experiment.

Participants will be recruited from participant pools and undergraduate/graduate programs from two to three Pakistani Universities. Eligible participants will be 18-30 years old and enrolled as students and capable of participating in a short Zoom-based conversation and a short period of solitude to do from home. We will not have any further exclusion criteria apart from the ones necessary for the protocol (e.g., inability to complete the procedure due to technical limitations). Participants will be compensated through course credit where available, or through modest financial compensation according to institutional policies.

Mediation analyses. Power for the planned mediation model using Monte Carlo methods for

indirect effects is based on recommended practice (Schoemann et al., 2017). In order to estimate power for parallel indirect effects via autonomy and relatedness, we will rely on established correlations from past research on listening and self-determination theory (Itzhakov & Weinstein, 2021; Itzhakov, Weinstein, et al., 2022; Vasconcellos et al., 2020). On the basis of the above, the planned sample size is expected to provide acceptable power ([?] .80) to detect parallel indirect effects through autonomy and relatedness (Schoemann et al. 2017).

3.3 Measures

All self-report measures will be paired with a response scale ranging from 0 (Not at all) to 6 (Extremely) to keep measures consistent and because seven-point type scales typically demonstrate acceptable reliability properties in social and behavioural research (Gliem & Gliem, 2003). As planned, we will test internal reliability for all multi-item measures (3 or more items), with an acceptable benchmark of $>.60$. Items will be averaged following reversal as appropriate. If any measure is below this benchmark, we will follow the prespecified approach of dropping the lowest loading measure one at a time until acceptable reliability is achieved, though we do not expect this will be necessary given established reliabilities of the instruments. Language and cultural adaptation. Materials will be administered in English and Urdu as appropriate to the proficiency and the institutional norms of the participants. Where Urdu versions are needed measures and instructions will be translated using forward translation and back translation with reconciliation, consistent with the established procedures for cross-cultural adaptation (Beaton et al., 2000; Brislin, 1970; Sousa & Rojjanasrirat, 2011). Pilot testing will be conducted to ascertain clarity, sensitivity and understanding in the Pakistani student scenario. Listening perception. Participants will answer 10 items of the Constructive Listening Behavior scale (Kluger & Bouskila-Yam, 2018). Items are using the prompt: "During the conversation, my partner?" And include such statements as "asked questions showing understanding of my opinions," "tried hard to understand what I was saying," and "gave me their undivided attention." Items shall be averaged to make a perceived score of empathic listening. Positive emotions. Positive emotions will be assessed in the Positive Affect subscale of the PANAS (Watson et al., 1988). Participants indicate on a scale to what extent they feel each emotion "right now" following the manipulation. Items will be averaged to give a positive affect score. Listening perception. Participants will answer 10 items of the Constructive Listening Behavior scale (Kluger & Bouskila-Yam, 2018). Items are using the prompt: "During the conversation, my partner?" And include such statements as "asked questions showing understanding of my opinions," "tried hard to understand what I was saying," and "gave me their undivided attention." Items shall be averaged to make a perceived score of empathic listening.

Positive emotions. Positive emotions will be assessed in the Positive Affect subscale of the PANAS (Watson et al., 1988). Participants indicate on a scale to what extent they feel each emotion "right now" following the manipulation. Items will be averaged to give a positive affect score.

3.4 Outcome measures

Solitude expectations. Before solitude, the participants will report expectations of each of peaceful affect and loneliness for a ten-minute solitude period. Expectations will use the same items as the items for the later experience measures to make possible expectation-experience discrepancy computation. The prompt will say: "How will you feel in solitude if you spend the next ten minutes alone, and not interacting with anyone?" Peaceful affect expectations will be assessed using the serenity items, ("calm," "peaceful," "relaxed," "at ease"), and loneliness expectation will be captured using a single item ("I will feel lonely during this time"). A composite positive expectations score will be calculated in line with the original method (subtracting loneliness from the peaceful affect composite, depending on a sufficiently negative correlation).

Self and social connection. During periods of solitude, social connection will be assessed using three state items that are adapted from the relatedness subscale of the Intrinsic Motivation Inventory (IMI; Deci et al., 1994), which measure felt closeness/trust/distance from others. Parallel items will measure self-connection (closeness/trust/distance from self). These measures will be administered after the manipulation and after the solitude period to measure the changes.

Peaceful affect. Peaceful affect during solitude will be measured using the PANAS serenity items ("calm," "peaceful," "relaxed," "at ease"; Watson et al., 1988), averaged into a peaceful affect score.

State loneliness. Loneliness will be measured using a single face-valid item ("I felt lonely during this time"), which is consistent with how loneliness has been measured in research (Shiovitz-Ezra & Ayalon, 2012) and in previous positive-solitude research (Weinstein, Nguyen, & Hansen, 2021).

Self-insight. Building on previous research on listening (Itzhakov & Weinstein, 2021), self-insight will be measured using items introduced by: "My time alone just now has . . .", e.g. understanding myself better, thinking more deeply, discovering new insights, reflecting on emotions/attitudes, thinking differently, connecting with myself.

State rumination. State rumination will be measured with an adapted state version of the rumination subscale of the Rumination-Reflection Questionnaire (Trapnell & Campbell, 1999). Items will refer to the ten-minute solitude period and record intrusive self-focused dwelling, and difficulty disengaging from unwanted thoughts.

3.5 Procedure

Three phases of the experimental procedure are involved. Participants first fill out consent and a short writing task (Phase 1). They are then randomly assigned to one of three conditions: (1) Highly Empathic Listening, (2) Moderately Empathic Listening or (3) Positive Reframing (Phase 2). Participants then take post-manipulation measures (Time 1). Next, all the participants complete a ten-minute solitude period at home (Phase 3), followed by the second set of measures (Time 2). Finally, participants complete a brief mood-recovery writing task and receive full debriefing.

The following two listening conditions will be carried out through a computer-mediated conversation (Zoom), as is the case in known listening experimental methods (Itzhakov et al., 2020; Itzhakov, Weinstein, et al., 2022; Saluk et al., 2023). To ensure that the listening manipulation does not interact with the listener, each trained confederate will interact under both listening conditions, as has been done previously (Itzhakov et al., 2017; Itzhakov et al., 2018). Given cultural comfort considerations in Pakistan, we will also implement a standardised approach to minimize interpersonal discomfort (e.g., professional, neutral interaction style; and where possible, confederate-participant matching on gender) while holding the listening protocol constant across conditions. The participants are advised that they will be involved in research on the topic of thinking about and sharing of significant life experiences, and they will be requested to share a negative experience that happened to them in the past. Following the consent, the participants will go through three stages.

Phase 1. Each of the participants composes a short essay regarding the situation when they felt that negative experience was the consequence of their own actions and when they were either guilty, regretted or were ashamed of something. These experiences are chosen as they can trigger rumination or self-understanding and can be avoidance related, learning, and growing experience (King and Hicks, 2007), and may upset self-compassion and self-acceptance, which can be true of positive solitude experiences (Peter and Gazelle, 2017). Sometimes, the instructions are changed based on the previous paradigms (Itzhakov et al., 2018; Navon, 2023). The participants are allowed to wait at least 30 seconds and proceed.

Phase 2. The participants in the Highly Empathic Listening or Moderately Empathic Listening will be assigned a trained confederate who can be introduced as another participant. The system allegedly matches the two and puts the participant to be the speaker and the confederate to be the listener. The participants are asked to prepare the experience that they wrote about and present it within 10 minutes. The confederate starts with a short sentence stating that he/she is ready to listen, with slight hesitation to continue the cover story that he/she is also a participant. The duration of conversations is 10 minutes, which is in agreement with the previous listening experiments (Itzchakov, Weinstein, et al., [2022](#); Saluk et al., 2023).

Listening manipulation. The protocols of listening behavior and a technical/logistical protocol will be followed by the confederates to normalize online conditions (Itzchakov, Weinstein, et al., [2022](#)). The confederates will be trained (between 15 hours) on nonverbal and verbal cues of highly versus moderately empathetic listening (e.g., proper eye contact, warm/open posture, reflective summaries versus less regular eye contact, mild distraction, minimal verbal feedback, e.g., occasional hmm or uh-huh) (Itzchakov and Weinstein, [2021](#); Itzchakov, Weinstein, et al., [2022](#)). The moderately empathic listening condition aims at decreasing the prominence of the active elements of empathic listening (attention, comprehension, positive intention) but does not imply hostility or dismissiveness.

Condition of Control (Positive Reframing). The Positive Reframing group is given a structured reframing exercise based on writing with content and time being the same and the listening conditions being constant (10 minutes) over the same event recalled. The reason why positive reframing is employed is that it can provoke positive emotions (Ranney et al., 2017) and, as such, a known comparison condition since empathic listening can also be used to evoke positive emotions (Sugimori et al., 2020). The participants are instructed to detect automatic thoughts in the remembered experience and come up with alternative ways of interpreting the experience which are more balanced and constructive as per the desired reframing methods.

Primary interventions after Phase 2 (Time 1). Following the listening or reframing task, the participants of listening conditions indicate the perceived listening quality (manipulation check). All participants are positive in feelings, autonomy and relatedness satisfaction (mediated by the authors) and projections about being alone (first outcome).

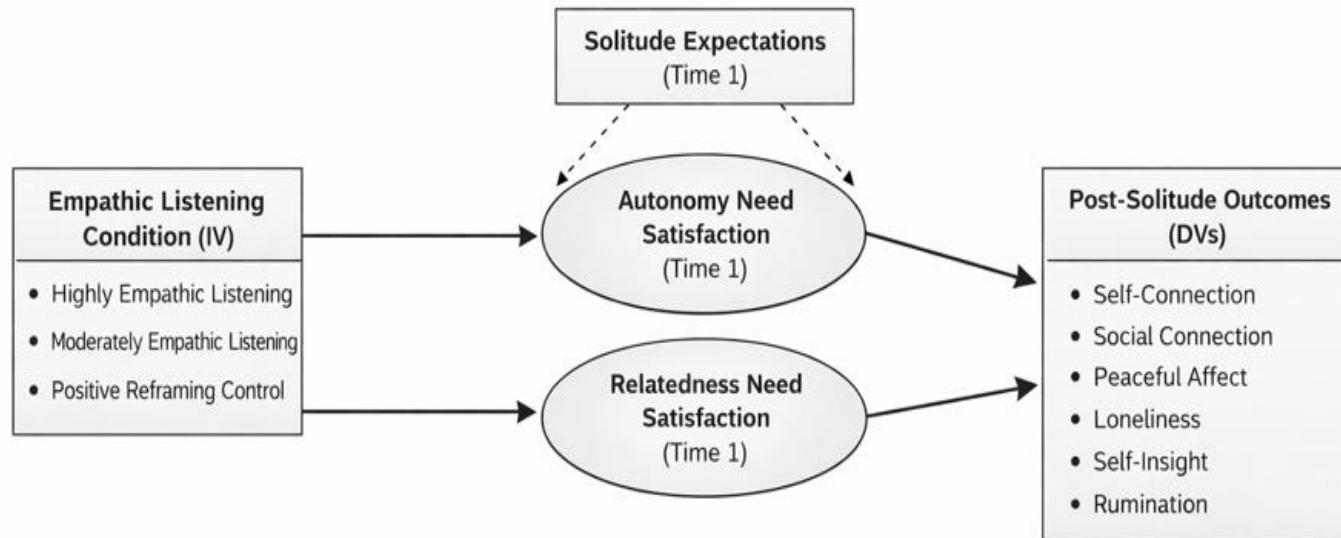
Control variables (Time 1). The current levels of outcomes that will be measured again following the solitude (e.g., connection, peaceful affect, loneliness, rumination, insight) are also reported by the participants and are mentioned in the present tense. These are the measures which are employed as controls in the more conservative version which tests change throughout the solitude period (which is equivalent to the logic of the original H5 tests).

Phase 3 (solitude). The participants will be requested to have 10 minutes in solitude by modifying this activity to be carried out at home (Nguyen et al., 2022; Weinstein and Adams, [2023](#)). They are taught to stay awake and not to get distractors (e.g., phones, television, books) in order that the experience can be perceived as being in total solitude with thoughts. Since the concept of the personal space in Pakistan differs (i.e., sharing a room or living with the whole family), the lessons state that one has to find the most personal accessible place during ten minutes and does not need to engage in any interaction during these minutes, keeping the definition of solitude and limitations intact.

Phase 3 (Time 2) outcomes measures. Following solitude, the respondents report their state self and social relation, peaceful affect and loneliness, and self-insight and rumination.

Adherence check. As in the former one (Lay, 2018), the participants will undergo a non-punitive adherence check in which they specify the presence of other people and whether they communicated with anyone or used equipment/books throughout the time of solitude. The participants will not be included in analyses in case they express non-adherence to any of the items.

Debrief and recovery. The short recovery writing prompt is where the participants are asked to write about a moment when they felt empowered or deeply connected to another individual to aid in mood recovery and the process is followed by full debriefing on the purpose of using trained confederates and the aims of the study. The participants are provided with contact information of respective university counselling services and other similar local support services.



4 Analysis

#	Variable	1	2	3	4	5	6	7	8	9	10	11
1	Perceived listening	—										
2	Positive emotions	.60**	—									
3	Peaceful affect expectations	.18*	.35**	—								
4	Loneliness expectation	-.08	-.14*	-.50**	—							
5	Autonomy need satisfaction	.67**	.43**	.23**	-.19**	—						
6	Relatedness need satisfaction	.74**	.63**	.16**	-.12	.62**	—					
7	Self-connection (post-solitude)	.20**	.34**	.47**	-.48**	.35**	.27**	—				
8	Social connection (post-solitude)	.28**	.29**	.24**	-.39**	.26**	.38**	.44**	—			
9	Peaceful affect (post-solitude)	.15*	.32**	.73**	-.47**	.25**	.21**	.60**	.36**	—		
10	Loneliness (post-solitude)	-.06	-.11	-.37**	.67**	-.07	-.07	-.48**	-.44**	-.46**	—	
11	Self-insight (post-solitude)	.27**	.48**	.47**	-.25**	.28**	.31**	.52**	.34**	.54**	-.23**	—
12	Rumination (post-solitude)	-.06	-.09	-.15**	.24**	-.11	-.12*	-.26**	-.29**	-.26**	.27**	.05

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

Table 1 shows the bivariate results of the key manipulation, mediators, and solitude results. Perceived listening was strongly and positively correlated with both autonomy need satisfaction ($r = .67$, $p < .01$) and relatedness need satisfaction ($r = .74$, $p < .01$), and had a positive relationship with post-solitude self-connection ($r = .20$, $p < .01$) and social connection ($r = .28$, $p < .01$). Peaceful affect expectations showed a significant association with peaceful affect ($r = .73$, $p < .01$) and loneliness expectation showed a significant association with loneliness ($r = .67$, $p < .01$). The post-solitude peaceful affect was negatively correlated to post-solitude loneliness ($r = -.46$, $p < .01$) and positively correlated with post-solitude self-insight ($r = .52$, $p = .01$, and $r = .54$, $p = .01$) in line with the theorized pattern that more connected and peaceful solitude is related to better insight.

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

Variable	Overall M	Overall SD	Highly empathic	Highly empathic	Moderate empathic	Moderate empathic	Positive reframing	Positive reframing
			M	SD	M	SD	M	SD
1. Perceived listening	5.58	2.61	5.55	0.88	3.59	1.67	NA	NA
2. Positive emotions	4.28	2.42	3.88	1.80	2.44	1.45	3.25	1.24
3. Autonomy need satisfaction	5.10	1.43	4.86	0.99	3.59	1.54	3.84	0.95
4. Relatedness need satisfaction	4.40	1.36	4.23	1.19	2.61	1.86	3.17	1.45
5. Peaceful expectations	4.14	1.53	4.51	1.79	4.01	1.67	4.18	1.42
6. Loneliness expectations	2.89	1.78	1.73	1.72	2.64	1.57	2.16	1.51
7. Self-connection	5.37	1.33	4.87	1.53	4.30	1.32	4.25	1.60
8. Social connection	3.93	0.80	3.35	1.97	2.69	1.41	3.07	1.65
9. Peaceful affect	4.41	1.51	4.54	1.90	4.70	1.58	4.28	1.63
10. Loneliness	3.40	1.59	1.37	1.89	2.59	1.49	2.19	1.76
11. Insight	4.90	1.47	4.78	1.45	3.39	1.58	3.99	1.73
12. Rumination	4.46	1.40	3.59	1.49	3.58	1.29	NA	NA

Note. Variables 1–6 were measured after the listening or positive reframing manipulation, and variables 7–12 were measured after the solitude period.

Table 2 summarizes descriptive patterns across conditions for the pre-registered outcomes. Participants in the highly empathic listening condition reported substantially higher perceived listening ($M = 5.55$, $SD = 0.88$) than the moderately empathic listening condition ($M = 3.59$, $SD = 1.67$). For positive emotions, the highly empathic condition ($M = 3.88$, $SD = 1.80$) was higher than moderate empathic ($M = 2.44$, $SD = 1.45$) and comparable to positive reframing ($M = 3.25$, $SD = 1.24$). A similar pattern appears for need satisfaction, where autonomy (high: $M = 4.86$, $SD = 0.99$; moderate: $M = 3.59$, $SD = 1.54$; reframing: $M = 3.84$, $SD = 0.95$) and relatedness (high: $M = 4.23$, $SD = 1.19$; moderate: $M = 2.61$, $SD = 1.86$; reframing: $M = 3.17$, $SD = 1.45$) are descriptively strongest in the highly empathic listening condition. After the solitude period, outcomes also show descriptive differences across groups (e.g., loneliness: high $M = 1.37$ vs moderate $M = 2.59$ vs reframing $M = 2.19$), although these descriptive trends are formally tested in later tables.

Table 3. Planned Analyses Predicting Study Outcomes After Listening

Outcome	Omnibus F	p	Cohen's f	Planned comparison t	p	d
1. Self-connection	0.58	0.906	0.15	1.26	0.346	0.38
2. Social connection	3.49	0.435	0.21	1.84	0.202	0.52
3. Peaceful affect	0.91	0.892	0.25	1.18	0.379	0.37
4. Loneliness	0.68	0.706	0.35	-1.26	0.448	-0.39
5. Self-insight	1.38	0.640	0.19	1.64	0.225	0.48
6. Rumination	1.33	0.459	0.16	0.54	0.912	0.16

The planned omnibus tests indicated no significant condition differences in outcomes assessed after listening. Specifically, the omnibus effects were nonsignificant for self-connection ($F = 0.58$, $p = 0.906$), social connection ($F = 3.49$, $p = 0.435$), peaceful affect ($F = 0.91$, $p = 0.892$), loneliness ($F = 0.68$, $p = 0.706$), self-insight ($F = 1.38$, $p = 0.640$), and rumination ($F = 1.33$, $p = 0.459$). Consistent with these omnibus results, the planned comparisons (highly empathic vs the combined comparison group) were also nonsignificant across outcomes (e.g., self-connection: $t = 1.26$, $p = 0.346$; loneliness: $t = -1.26$, $p = 0.448$). Overall, Table 3 suggests the preregistered condition effects were not detected at this stage in the current dataset.

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

Dependent variable	Autonomy (B-C) t	p	Relatedness (B-C) t	p	Indirect effect via Autonomy b	Low 95% CI	High 95% CI	Indirect effect via Relatedness b	Low 95% CI	High 95% CI	Indirect effect t	p
1. Self-connection	5.55	<0.001	1.75	0.036	0.12	0.07	0.19	0.05	-0.01	0.10	-2.40	0.049

Dependent variable	Autonomy (B–C)		Relatedness (B–C)		Indirect effect via Autonomy b	Low 95% CI	High 95% CI	Indirect effect via Relatedness b	Low 95% CI	High 95% CI	Indirect effect t	P
2. Social connection	2.07	0.234	5.47	<0.000	0.13	–0.02	0.09	0.14	0.08	0.27	–1.62	0.161
3. Peaceful affect	3.98	0.003	1.75	0.147	0.20	0.03	0.17	0.06	–0.02	0.12	–1.27	0.236
4. State loneliness	–0.57	0.041	–0.85	0.652	–0.04	–0.09	0.05	–0.02	–0.08	0.05	–0.55	0.576
5. Self-insight	2.49	0.003	3.31	0.001	0.08	0.004	0.15	0.12	0.04	0.12	–1.74	0.25
6. Rumination	–1.11	0.414	–1.78	0.146	–0.03	–0.09	0.03	–0.05	–0.10	0.15	1.50	0.335

Note. Indirect effects in bold were statistically significant.

Table 4 indicates the intended indirect effects between condition and post-solitude outcomes that are mediated by the needs satisfaction of autonomy and relatedness. It was possible to find that autonomy need satisfaction was connected to several outcomes significantly (e.g., self-connection: $t = 5.55$, $p < 0.001$; peaceful affect: $t = 3.98$, $p = 0.003$; self-insight: $t = 2.49$, $p = 0.003$), whereas relatedness need satisfaction was also significant with some of them (e.g., social connection: $t = 5.47$, $p < 0.000$; self-insight: $t =$

Concerning mediation (A-B-C), the A-B-C relationship was positive in self-connection ($b = 0.12$, 95% CI [0.07, 0.19]) which is an indirect relationship as per the autonomy-based transmission. To be socially connected, there was a positive effect of relatedness ($b = 0.14$, 95% CI [0.08, 0.27]) that relatedness need satisfaction is a more pertinent mechanism of social connection in this data as compared to autonomy. The same case applied to peaceful affect where autonomy had an indirect impact ($b = 0.20$, 95% CI [0.03, 0.17]). In the case of state loneliness, indirect effects were not affirmed (autonomy: $b = -0.04$, 95% CI [-0.09, 0.05]; relatedness: $b = -0.02$, 95% CI [-0.08, 0.05]). Lastly, self-insight had indirect positive effects on both autonomy ($b = 0.08$, 95% CI [0.004, 0.15]) and how related it was ($b = 0.12$, 95% CI [0.04, 0.12]) but rumination had no supported indirect effects (autonomy: $b = -0.03$, 95% CI [-0.09, 0.03]; relatedness: $b =$ [?]0.0 Combined, Table 4 suggests that the most consistent explanatory paths in the current findings are the pathways of need satisfaction (particularly, autonomy as factors that explain intrapersonal outcomes and relatedness as factors that explain social outcomes)

Table 5. Condition Effects on Outcomes After Solitude Controlling Each Outcome Before Solitude

Outcome	Omnibus F	p	Cohen's f	Planned comparison F	p	d
1. Self-connection	1.42	0.370	0.08	1.62	0.318	0.37
2. Social connection	0.76	0.482	0.07	0.85	0.487	0.20
3. Peaceful affect	0.98	0.515	0.08	1.24	0.386	0.23
4. Loneliness	0.18	0.827	0.04	0.30	0.848	0.07
5. Insight	0.43	0.495	0.07	1.84	0.289	0.18
6. Rumination	0.78	0.561	0.06	0.32	0.741	0.09

Table 5 was to test a prediction of post-solitude outcomes given that there was a control on corresponding pre-solitude level (measured after listening). Effects that were omnibus were not significant to all the results: self-connection ($F = 1.42$, $p = 0.370$), social connection ($F = 0.76$, $p = 0.482$), peaceful affect ($F = 0.98$, $p = 0.515$), loneliness ($F = 0.18$, $p = 0.827$), insight ($F = 0.43$, $p = 0.495$), and rumination ($F = 0.78$, $p = 0.561$). Premeditated comparisons were unimportant too (e.g. self-connection planned: $F = 1.62$, $p = 0.318$; insight planned: $F = 1.84$, $p = 0.289$). Comprehensively, the direct condition differences were not observed to be left over once the baseline levels of the outcomes were considered in this dataset following solitude.

Table 6. Exploratory Means and Standard Deviations for Outcomes (Measured Directly After Listening/Reframing)

Outcome	Overall M	SD	F	p	Highly empathic M (letters)	SD	Moderate empathic M (letters)	SD	Positive reframing M (letters)	SD	Contrast t	d
Self-connection	4.84	1.33	6.50	0.002	4.69A	1.25	4.10B	1.42	4.23B	1.24	3.56**	0.96
Social connection	3.76	1.38	16.85	<0.011	4.18A	1.30	3.20B	1.40	3.57C	1.35	5.30**	1.40
Peaceful affect	3.73	1.54	11.10	<0.041	4.17A	1.43	3.26C	1.62	3.55B	1.45	3.67**	0.84
Loneliness	2.14	1.42	5.37	0.024	1.82B	1.22	2.30A	1.47	2.31A	1.33	-2.86**	-0.64
Insight	4.20	1.63	15.60	<0.011	4.39A	1.27	3.40C	1.60	4.20B	1.22	4.54**	1.26
Rumination	3.75	1.52	0.67	0.591	3.52A	1.41	3.83A	1.26	3.69A	1.39	-0.38	-0.17

Note. Contrast refers to the contrast between highly empathic listening (+2) and moderately empathic listening (-1) and positive reframing (-1).

Table 6 gives the exploratory comparisons of the results determined right after the manipulation. In this case, the conditions could be seen to vary on a number of outcomes. To self-connect, the overall condition effect was significant ($F = 6.50$, $p = 0.002$) where highly empathic listening ($M = 4.69$) stood out higher compared to the rest of the conditions (moderate: $M = 4.10$; reframing: $M = 4.23$) and supported by the planned contrast ($t = 3.56$, $d = 0.96$). Social connection also varied considerably by condition ($F = 16.85$, $p = \text{less than } 0.011$), with highly empathic listening being the highest ($M = 4.18$) and a powerful planned contrast ($t = 5.30$, $d = 1.40$). Peaceful affect had a significant influence ($F = 11.10$, $p < 0.041$), in the same way as highly empathic listening ($M =$

4.17) but significant contrast ($t = 3.67$, $d = 0.84$).

In terms of negative affective outcomes, there was a condition difference in the loneliness ($F = 5.37$, $p = 0.024$), with highly empathic listening having lower loneliness ($M = 1.82$) than moderate empathic ($M = 2.30$) and positive reframing ($M = 2.31$) as was supported by the negative contrast ($t = -2.86$, $d = -0.64$). Insight also varied markedly ($F = 15.60$, $p < 0.011$), as the highly empathic listening ($M = 4.39$) was found to be higher than the moderate and positive reframing ($M = 3.40, 4.20$), given the planned contrast ($t = 4.54$, $d = 1.26$). Conversely, rumination did not mean significantly different conditions ($F = 0.67$, $p = 0.591$; contrast $t = -0.38$, $d = -0.17$). In general, Table 6 indicates that exploratorily the highly empathic listening condition is related to more adaptive immediate post-manipulation states (greater connection/peace/insight and less loneliness), whereas rumination is comparatively not affected.

Table 7. Exploratory Comparisons Before vs After the Solitude Period

Outcome	M before	SD before	M after	SD after	F	p	d
Self-connection	5.34	1.24	5.37	1.23	4.10	0.038	0.31
Social connection	4.66	1.38	3.97	1.40	59.66	<0.021	0.81
Peaceful affect	4.53	1.74	5.21	1.51	51.66	<0.041	0.66
Loneliness	3.14	1.52	3.10	1.49	0.66	0.455	0.21
Insight	3.20	1.53	4.90	1.57	8.28	0.017	0.53
Rumination	5.65	1.42	4.46	1.40	7.51	0.020	0.40

Table 7 compares the pre-solitude (after listening) and post solitude (post-solitude results), pooled as reported. Findings show a modest yet significant positive change in self-connection between the pre- and post-solitude ($M = 5.34$, $SD = 1.24$ and $M = 5.37$, $SD = 1.23$) $F = 4.10$, $p = 0.038$, $d = 0.31$. In comparison, the difference between the answers to social connection before and after ($M = 4.66$, $SD = 1.38$) and ($M = 3.97$, $SD = 1.40$) was significantly lower ($F = 59.66$, $p < 0.021$, $d = 0.81$). The peaceful affect had gone up to $M = 5.21$ ($SD = 1.51$) compared to $M = 4.53$ ($SD = 1.74$), $F = 51.66$, $p = 0.041$, $d = 0.66$. The change in loneliness was not statistically significant (before $M = 3.14$; after $M = 3.10$; $F = 0.66$, $p = 0.455$). Lastly, there was an increase in insight (before $M = 3.20$; after $M = 4.90$; $F = 8.28$, $p = 0.017$, $d = 0.53$) and decrease in rumination (before $M = 5.65$; after $M = 4.46$; $F = 7.51$, $p = 0.020$, $d = 0.40$). Generally, these exploratory findings indicate that the time of solitude is linked with higher levels of peaceful affect and insight and lower rumination, whereas social connection reduces, and loneliness is comparatively constant.

5 Discussion

An accumulating literature indicates that solitude does not exist in a social vacuum: the affective conditions someone feels when he or she is alone is partly determined by what has preceded it socially. As an example, solitude may be more agonizing after rejection or ostracism but may be more beneficial when people are socially supported and psychologically equipped in advance. It is on this background that the study experimented whether, when compared to (a) moderately empathic listening (holding the interaction constant) and (b) positive reframing (holding a positive affect induction component constant), a brief, facilitative social experience; that is, high empathic listening, could influence future solitude expectations and experiences.

To start with, the manipulation had its intended effect. Individuals in the highly empathic listening situation indicated that they had much higher perceived listening in comparison to the moderately empathic situation with more autonomy and relatedness need satisfaction. These short-term effects also correspond to theorizing that empathic listening conveys attention, understanding, and good

intention, and, consequently, the needs of self-determination theory need, namely, autonomy and relatedness.

Second, the preregistered direct impacts on solitude were not endorsed. Extremely empathic listening had no notable impact on aiding expectations regarding the impending solitude period nor had a direct effect on positively influencing post-solitude outcomes (self-connection, social connection, peaceful affect, loneliness, self-insight, or rumination) in the intended comparisons.

Third, the confirmatory mediation models did show significant indirect pathways though the direct effects were not present. Namely, condition predicted autonomy and relatedness need satisfaction, and these needs, in particular, autonomy, demonstrated strong indirect correlation with outcomes selected after solitude. Specifically, autonomy had an indirect impact on self-connection and peaceful affect and both autonomy and relatedness had an indirect effect on self-insight (Table 4).

The null direct effects are to be interpreted

On the face of it, the non-influence of direct listening effects on solitude is in conflict with the results that individuals claim to enjoy their alone time more when they have a better social bond, and that poor social experiences may negatively affect future solitude well-being. One of the interpretations is that the social dose in the current paradigm that is a short interaction with a stranger/confederate can produce strong immediate psychological cues (I was heard), but not so many relationship-based resources to be able to produce a reliably change episode of solitude in the future. The second interpretation is regarding the character of the solitude period per se. Solitude is heterogeneous: we can either choose, make it meaningful, protracted, and goal-oriented, or it can be brief, externally imposed, and restricted. In earlier research, it is stressed that the quality of solitude (choose vs. forced) and its length may have a significant impact on affective and cognitive performance. Solitude was designed in our study, time-limited, and necessary to complete the study, and this could lead to less sensitivity to short-term social antecedents (including positive ones).

The importance of the indirect effects, in theory

Although it lacks direct effects, the indirect patterns are informative in theory. The listening theory and the self-determination theory both meet at the point that high quality listening is autonomy-supportive and relatedness-supportive, especially in the challenging or self-relevant disclosures. The relationship between scores on highly empathic listening and both autonomy and relatedness satisfaction were, in our data, strong when compared to comparison scores. The mediation findings indicate a psychologically realistic interpretation of a carry-over effect: that listening does not necessarily directly upgrade solitude as a situation, but may put people in solitude with increased perceived self-congruence and freedom to manifest (autonomy) and with an enhanced feeling of interpersonal relatedness (relatedness). This is in line with the relationship motivation theory that focuses on the role of autonomy support and relatedness support on the well-being processes in various contexts. Interestingly enough, the autonomy was especially significant in terms of results which are closer to the self (e.g., self-connection, peaceful affect). This meaning is consistent with general theorizing that low-arousal relaxed states during solitude can be more conditional upon relationship with self than upon aroused feelings of sociality.

Exploratory trends throughout the solitude period

Exploratory analyses of change pre-solitude and post-solitude indicated that solitude was not costly and beneficial in all places. In all conditions, there was a tendency of peaceful affect to improve throughout the solitude period, and social connection to decline, with cognitive indicators (e.g., insight and rumination) tending to decline slightly. These ambivalent patterns are consistent with the earlier arguments that loneliness not only can confer (deactivatory/soothing) benefits but also diminish social connectedness, and that cognitive self-processes can be very time-dependent,

topic-dependent, and motivational-framing dependent.

Theoretical implications

The findings specify the manner in which we ought to theorize the social antecedents of solitude. According to them, positive social interactions (high-quality listening) do not necessarily predict immediate changes in a later, brief, mandated solitude episode, but they do have an effect on solitude-related consequences via psychologically significant mediators, autonomy and relatedness need satisfaction. This confirms the perception that empathic listening is a motivational resource that can potentially end up being transferred across contexts by providing need satisfaction, despite weak direct contextual transfer. Moreover, the results (that autonomy routes were particularly important in self-concerned results) generalize the listening theory beyond the explicitly interpersonal consequences of listening and tie it more closely to self-processes that prevail in traditional humanistic narratives of the subject (e.g., the ability of listening to produce sincere self-exploration, as Rogers argued).

Practical implications

In practice, the findings justify the investment in the development of listening skills (e.g., among peer mentors, supervisors, educators, counselors) as one of the cheap interpersonal practices that consistently contribute to the enhancement of autonomy and relatedness in challenging discussions. Although it is not ensured that they will have such immediate downstream effects on solitude, autonomy/relatedness support can still have well-being-relevant consequences, e.g., calm and self-insight. These results imply institutional listening-training programs in the Pakistani environment (where students and employees might be under social pressure and have less time to relax) justify, but also indicate that to influence loneliness in specific ways, programs might have to focus on the quality and meaning of the time alone-time (e.g., choice, purpose, duration), rather than just the quality of the conversations before it.

Limitations

Interpretation should be limited in several ways. To begin with, the listening interaction was short and with a stranger/confederate; there was no relational depth and history that can permeate solitude in normal life. Second, solitude was brief and a study requirement that might not reflect naturally selected solitude motivated by rest or reflection, spirituality or self-control. Third, major outcomes were based on self-report (a one-item loneliness measure) that can be face-valid but has the potential to cover only a small range of constructs. Lastly, as much as the mediation findings are consistent with theory, still, mediation in experimental designs can be enhanced by replication in other contexts and methods of measurements.

Future research directions

One can enhance theory and practice in the future through at least four ways. First, the research ought to experiment with listening, - solitude is positively associated with persisting relationships (friends, spouses, and coworkers), in which the resources of social relationships tend to be more abundant and secure than those of a stranger. Second, manipulations of solitude must be varied by motivation and duration (chosen vs. imposed; short vs. extended) to examine whether empathic listening is mostly useful in the process of solitude in case of meaning and self-endorsement of the alone-time. Third, experience-sampling and diary designs may explore the predictive relationship between prior listening experience in the day and same-day solitude under real-life circumstances on prediction of cognition. Fourth, the limitations of the future research should be considered in connection to the vulnerability and social health applicability, such as the risk of loneliness and social isolation in limited conditions, where supportive dialogue can be particularly effective.

Lastly, future studies in Pakistan can test cultural moderators (e.g., emotional disclosure norms,

privacy, and family intimacy) explicitly, which can determine whether empathic listening should lead to improved solitude, and whether autonomy-relatedness streams are preeminent in different contexts.

Conflict of interest

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Data availability

Data will be furnished upon request

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