

USING COGNITIVE TASKS FOR NON-RESPONSIVE ASSESSMENT OF LONELINESS

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Abstract

Loneliness is the perceived feeling of lack of significant social relationships and has a significant impact on the wellbeing and physical health throughout lifespan. It has been suggested that the feeling of loneliness occupies the cognitive system by inducing hypervigilance to social-cues, as positive or negative facial expressions, thus impairing functions as attention and memory. However, to date, levels of loneliness are assessed solely using self-report questionnaires, which are sensitive to response bias and thus may yield biased assessments. The aim of this presentation is to review and discuss the efficacy of employing commonly used, non-responsive, cognitive tasks in order to assess loneliness. Specifically, this notion will be explored through the presentation of initial findings from a pilot study in which tasks of memory and attention were employed. Overall, the findings indicate that loneliness may be assessed to some extent using cognitive tasks. However, these tasks may be sensitive to some technological constraints, as type of computerized platform or the environment in which the test is taking place, as well as to some personal factors as technological literacy.

Keywords: Loneliness, attention, memory, perception.

1. Introduction and objectives

The socio-cognitive model of loneliness (Cacioppo and Hawkley, 2009) argues that perceived social isolation induces hypervigilance for social threats and diverges cognitive resources from memory and attention processes, thus resulting with increased attention to negative social cues and increased tendency to remember negative social events. Over the years, it was found that individuals with high levels of loneliness had more difficulty to control their attention in a dichotic listening task compared to not-lonely participants (Cacioppo et al., 2000); were more attuned to smiling faces—which signal social acceptance—than other facial expressions (DeWall et al., 2009); and showed poor memory performance in older age (Ayalon et al., 2016). The present study was designed to investigate whether levels of loneliness may be predicted using cognitive tasks. If loneliness may indeed be assessed using such tasks, non-responsive assessment methods may be developed in order to remotely monitor loneliness among populations at risk.

2. Method

2.1. Participants

As a part of a longitudinal study that was conducted during a COVID-19 lockdown in 2020, 110 participants aged 18-74 volunteered to participate in the study ($M_{age}=35.04$, $SD_{age}=13.75$; 78.1% women), by completing online Qualtrics™ surveys in seven assessment waves.

2.2. Assessments and procedure

Loneliness was assessed using the short form of the Social and Emotional Loneliness Scale for Adults (SELSA-S; DiTommaso et al., 2004), addressing familial, social, and romantic loneliness, on a 6-point Likert scale. At Waves 1 and 7, participants were presented with the full 15 items questionnaire, whereas at Waves 2-6 a shorter version was presented consisting of two items from each type of loneliness. The 15- and the 6-item versions showed good reliabilities throughout the assessment waves, with a minimum Cronbach's alpha of .82.

Visual search task. The task consisted of a set of 30 schematic faces (smileys) with a colored geometric shape for a nose, presented in a rectangular array of 300 X 350 pixels. Participants were instructed to "find and click on 3 red diamonds" among distractors faces with red and blue triangles and blue diamonds. Each participant completed two search conditions: The Negative-distractor condition comprised of 60% sad distractors, 20% happy distractors, and 10% neutral distractors, whereas the Positive-distractor condition comprised of 60% happy distractors, 20% sad distractors, and 10% neutral distractors. Reaction times (RTs) in the Negative- and Positive-distractor conditions were assessed.

Recognition memory task. The memory task consisted of 12 negative and 12 neutral Hebrew nouns. At study, 12 words (six of each valence) were randomly presented one at a time for 2 seconds each. At test, all 24 words were randomly presented in a table form. Half of the words were old (studied) and half were new (unstudied), and participants were to determine whether each word was or was not presented at study. Memory performance for each valence was calculated as $P(\text{hit}) - P(\text{FA})$.

3. Results

3.1. Visual search task

Multiple regression analyses of 488 daily reports revealed that, controlling for age and gender, romantic loneliness predicted longer RTs in both search conditions, whereas social loneliness solely predicted shorter RTs in the positive search condition. Familial loneliness did not predict search RTs.

3.2. Memory task

Multiple regression analyses of 64 participants completed the memory task, revealed that controlling for age and gender, overall levels of loneliness did not predict memory performance. However, loneliness interacted with Worry of COVID-19 to affect the memory for negative, but not neutral, words. Specifically, loneliness was associated with poor memory performance for negative words among those with high levels of worrying, but their memory was intact for neutral words.

4. Discussion and conclusions

The findings obtained in this study demonstrate that levels of loneliness were associated with visual search task and memory performances, probably due to the engagement of the attentional system. As predicted, loneliness was associated with increased search time and with poor memory performance. However, the association between loneliness and search performance differed as a function of type of loneliness, with romantic loneliness associated with overall slow search rate, whereas social loneliness associated with faster search rate but only among smiling distractors. As for memory, loneliness by itself was not associated with performance, and other emotional factors needed to be addressed for this association to emerged. Therefore, it seems that loneliness may be assessed to some extent using common cognitive tasks, but these tasks should be refined and tested in various conditions in order to produce estimations of loneliness.

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