Giving voice to human-robot intersubjectivity in loneliness contexts

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Purpose As loneliness becomes a prominent concern among the aging population (Holt-Lunstad et al., 2017), social robots have been suggested as a potential aid (Robinson et al., 2013; Montalvo et al., 2019). Third order social presence is a measure of the correlation between a person's subjective experience of an interaction and their perception of their partner's (human or robot) (Biocca & Harms, 2002). When paired with individuals in human-human interaction (HHI), lonely individuals will judge the interaction more negatively than non-lonely individuals (Montalvo et al., 2019). Similarly, when paired with a robot in human-robot interaction (HRI), lonely individuals will rate HHI and HRI third order social presence significantly more negatively than non-lonely individuals (Montalvo et al., 2019). Subjectivity regarding social interaction may be similar between HRI and HHI in lonely individuals. Fully exploring the third order social presence experience can provide specific recommendations of which aspects of HRI design need to be improved in lonely users. **Method** Three studies explored social presence in lonely vs. non-lonely individuals. In Study 1, participants interacted with virtual and embodied intelligent personal assistants. In Study 2, participants interacted with JIBO, a social robot (see Figure 1). In Study 3, participants completed surveys on which qualities of HRI were important in order to perceive social presence. In all studies, participants completed the UCLA Loneliness Scale (Russell, 1996), Lubbens Social Network Scale (Lubben et al., 2006), and Networked Minds Social Presence Inventory (Biocca & Harms, 2002). **Results and Discussion** Significant differences exist in design and robotic behavior preferences between lonely and non-lonely individuals. Additionally, lonely individuals were twice as likely (67%) than non-lonely individuals in accepting a social robot as a social companion. As with previous studies, lonely and socially isolated individuals had lower social presence than non-lonely individuals. The strongest significant difference was in third order social presence, indicating that lonely adults make the same negative attributions of robots, as they do of people.

References

Holt-Lunstad, J., Robles, T.F. & Sbarra, D.A. (2017). Advancing social connection as a public health priority in the United States. American Psychologist, 72(6), 517-530. https://doi.org/10.1037/amp0000103

Robinson, H., MacDonald, B., Kerse, N. & Broadbent, E. (2013). The psychosocial effects of a com-panion robot: a randomized controlled trial. Journal of the American Medical Directors Association, 14(9), 661-667. https://doi.org/10.1016/j.jamda.2013.02.007

Montalvo, F., Alves, G.M., Sasser, J.A., Payne, C.A., McConnell, D.S. & Smither, J.A. (2019). The presence of social engagement affects perceived social presence. Poster presented at the American Psychological Association 2019 Annual Convention, Chicago, Illinois.

Biocca, F. & Harms, C. (2002). Defining and measuring social presence: Contribution to the networked minds theory and measure. Proceedings of PRESENCE, 2002, 1-36.

Russell, D.W. (1996). UCLA loneliness scale (Version 3): Reliability, validity, and factor structure. Jour-nal of personality assessment, 66(1), 20-40.

Lubben, J., Blozik, E., Gillmann, G., Iliffe, S., von Renteln Kruse, W., Beck, J.C., & Stuck, A.E. (2006). Performance of an abbreviated version of the Lubben Social Network Scale among three European com-munity-dwelling older adult populations. The Gerontologist, 46(4), 503-513. https://doi.org/10.1093/geront/46.4.503

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Figure 1. Jibo