NRI:INT Design and Development of a Social Robot to Gather Ecological Momentary Stress Data from Teens



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http://depts.washington.edu/melab/projects/project-emar/

Project EMAR (Ecological Momentary Assessment Robot) is an interdisciplinary project to design, develop and deploy an engaging and customizable social robot to gather ecologically valid, teen stress and mood data, while delivering a micro-intervention.



Participatory Methods for Data Collection

Using a **participatory** approach to **human-centered** design, we engaged teens as co-designers to develop project principles and social robot requirements.



National Science Foundation award: SES-1734100



Project Impact

10 studies conducted so far.Partnerships with 11 local area high schools. Engaged with 360+ teens.



Design and Interaction Studies in the Wild



Design Challenge involved 7 schools and 81 teens (14-18) who learned human-centered design and prototyped their own social robots to measure and address teen stress. Teens presented their robot designs at a public showcase to receive feedback from experts. Finding: The incredibly diverse designs and behaviors demonstrated the need for a customizable robot platform.

Virtual Reality utilized teens 42 teens (14-17) as co-designers to build an asymmetric VR game wherein teens collaborate to design a social robot & explore teen-robot interactions. Finding: Teens shared positive emotions toward each during design & desired a hugging robot interaction.





Exploring Teens as Robot Operators, Users & Witnesses in the Wild Involved 62 teens (14-18) to determine robot verbal and physical behaviors using two types of robot platforms. Finding: robot movement was interpreted as more authentic that verbal responses. Teens desired empathetic responses.

Sharing stress with a robot: What would a

robot say? Involved 36 undergraduates (19-22). Explored mechanical, by proxy, and emotional robot disclosure. Finding: increased perceived stress predicted reduced human disclosure, user satisfaction, robot likability, and future robot use.





Sharing Stressors with a Robot: What Platform Do Adolescents Prefer? 71 teens (14-19) each shared stress stories with EMAR in a physical, computer, and virtual reality settings. Findings: Robot interactions were stress reducing. Most teens preferred the virtual reality setting, even though the physical robot was most stress reducing.

The Effect of Interaction & Design Participation on Teenagers' Attitudes towards Social Robots 136 teens (ages 15-18) interacted with various social robot prototypes in school settings. Findings:

Teens are optimistic about the technology, but need transparency to trust a robot with their data. Robot interactions significantly reduced their negative attitudes toward robots.

Next Steps

We are on the right track to design a culturally appropriate and engaging social robot to gather stress data from teens while administering a micro intervention. Future studies:

(1) Private versus Public interaction study(2) Teen Design Lab website as a method of data collection

(3) Impact of a longitudinal deployment.



EMAR Blog