

Augmentative and Alternative Communication

Nearly two million people in the US use AAC to communicate and many report experiencing negative attitudes and behaviors directed toward them (Beck et al., 2000; Hoag et al., 1994; Hyppa-Martin et al., 2016).

- May be due to a variety of factors including a lack of exposure to individuals who use AAC devices (Dubbs, 2024; Lilienfeld & Alant, 2002).
- Negative attitudes held by persons in the social environment may lead to limited opportunities and reduced social experiences (Dudek et al. 2006; Hyppa-Martin et al., 2016).

The Extant Evidence

McCarthy and Light (2005) conducted a systematic review of attitudes toward AAC nearly 20 years ago. This issue was recently addressed by Jansen and colleagues (2023). The extant scientific evidence regarding attitudes toward people who use AAC to communicate has commonly used survey methodology to assess listeners' attitudes (e.g., Achmadi et al., 2015; Bedrosian et al., 2003). In most studies, a video showed an individual using AAC to communicate. The video was viewed by participants, and participants were given a survey to measure attitudes (e.g., Achmadi et al., 2015; Bedrosian et al., 2003). For example, Bedrosian and colleagues (2003) had 96 participants view a video of an interaction between an individual who uses AAC and a sales clerk. Participants then completed a survey measuring their attitudes towards AAC. Similar methodology was used by most studies. A limitation of surveys is that they are measuring reported attitudes, not observed behaviors (Hyppa-Martin et. al., 2016).

Limitations of the Extant Evidence

Several problematic limitations have been noted in this extant evidence.

- nearly all participants were White or had unknown or unreported ethnic backgrounds
- most of the persons whose attitudes were measured were college students, which has socioeconomic, cultural, and developmental implications
- most of the attitudes toward AAC users that were measured in these studies were directed at school-age males who were actors portraying an AAC user, did not have an actual disability, and did not use AAC to communicate in “real-life.”
- Nearly all participants whose attitudes were measured did not actually interact with any AAC users.

It is not surprising that no real-life interactions were observed between the AAC users and the participants whose attitudes were being measured. Obviously, there are ethical and methodological implications that prevent having dozens of participants interact in real-life with people who have severe communication disabilities and use AAC to communicate.

Until methodology allows some interactions studies can only measure reported attitudes' rather than observed behaviors. Additionally, no studies were identified that attempted to improve attitudes directed toward the individuals who used AAC to communicate, though several authors have suggested the importance of pursuing interventions that are designed to improve attitudes toward persons who use AAC to communicate.

Fortunately, numerous studies have identified positive effects of virtual reality experiences on improving social attitudes regarding civic, political, and environmental attitudes (Nikolaou et al., 2022).

Virtual Reality

Virtual reality consists of using a head-mounted display and software to create an immersive, virtual experience (Lee, 2004). Nikoloau et al., (2022) examined whether VR influenced social attitudes more effectively than less immersive conditions, such as viewing a video or reading persuasive literature. The authors located social attitude research involving VR methodology from 39 studies and found that VR influenced social attitudes significantly more than non-immersive interventions. They summarized emerging challenges and opportunities for VR research.

Procedures using readily available VR equipment in intervention studies involving AAC has been well established (e.g., McGuigan & Davis; 2022). Rather than having participants view standard videos that depict AAC users, VR could create immersive, interactive, and realistic exposure to individuals who communicate using AAC and enhance the validity of the attitude measurements.

Secondly, using VR could allow virtual interactions with AAC users without having the methodological and ethical implications associated with involving real-life AAC users. Finally, previous researchers recommended that VR experiences be developed not only as a tool to measure attitudes, but as an intervention to actually improve attitudes toward people with disabilities (McGuigan & Davis, 2023).

Purpose

The present study had two purposes:

First, it systematically identified and described variables associated with improved attitudes toward AAC users in the previous 30 years. This is necessary because an intervention designed to improve attitudes should include stimuli that incorporates variables associated with more positive attitudes regarding AAC (e.g., message length, speech rate, synthetic speech intelligibility) but avoid variables that were associated with more negative attitudes (e.g., increased listening effort, incomplete information).

The second purpose of this study was to identify the common variables among VR intervention shown to positively affect social attitudes (e.g., exposure time, engagement with a message) and avoid variables of VR interventions that were undesirable (e.g., feelings of cybersickness).

Method

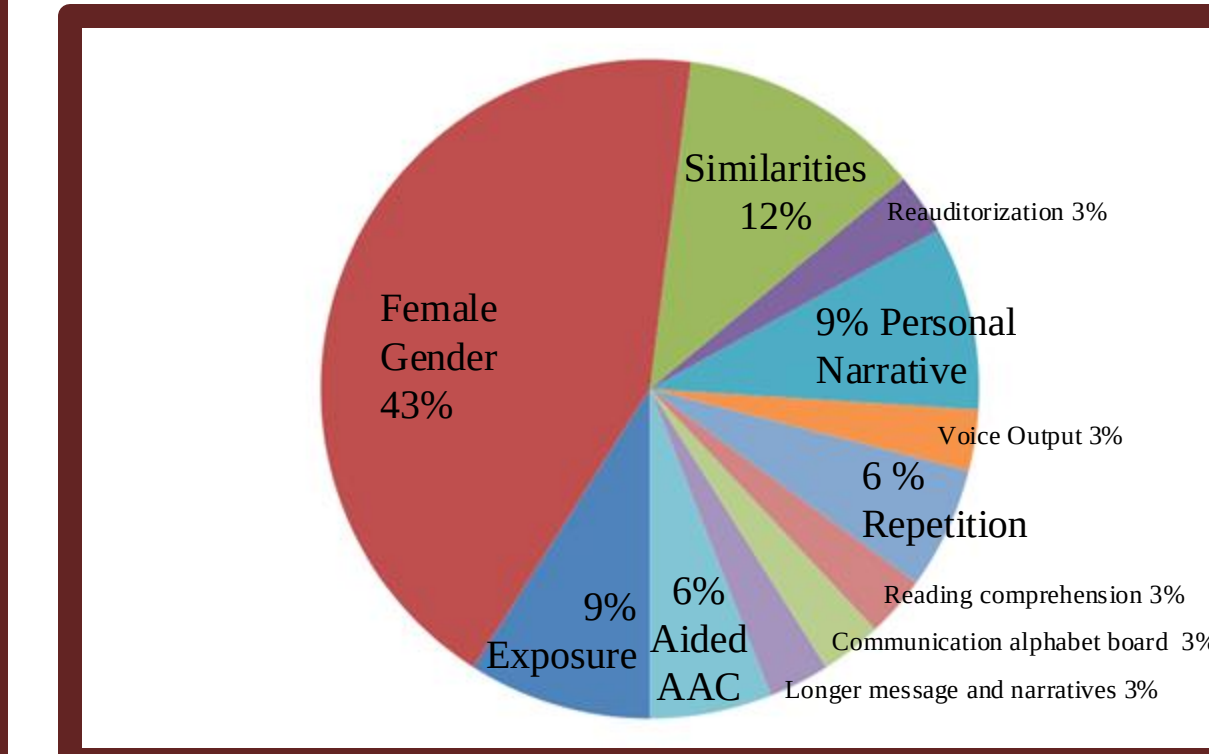
To accomplish these purposes, a systematic review was conducted.

Systematic reviews provide high levels of scientific evidence and a comprehensive summary on a topic of clinical interest using methodology that avoids bias and is replicable.

1. Five electronic databases known to index pertinent topics were searched using keywords related to virtual reality, attitudes, and augmentative and alternative communication and followed the PRISMA preferred systematic review procedures.
2. Following initial database searches, inclusion and exclusion criteria were applied and inter-rater reliability was monitored.
3. Articles yielded were added to those identified by the previous systematic reviews conducted by Jansen et al. (2003), McCarthy and Light (2005), and Nikoloau et al., (2022).
4. Data on pertinent variables were extracted and coded.

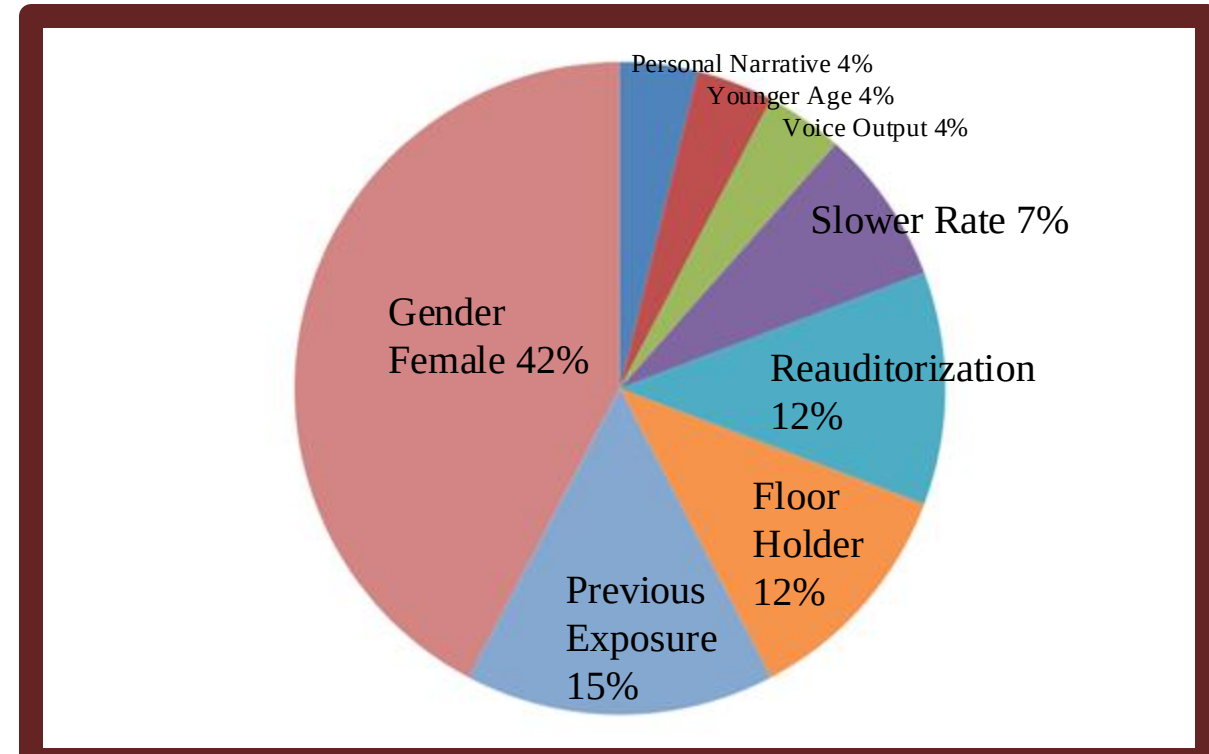
Results

Figure 1.
Variables Associated with Positive Attitudes Toward AAC and AAC Users



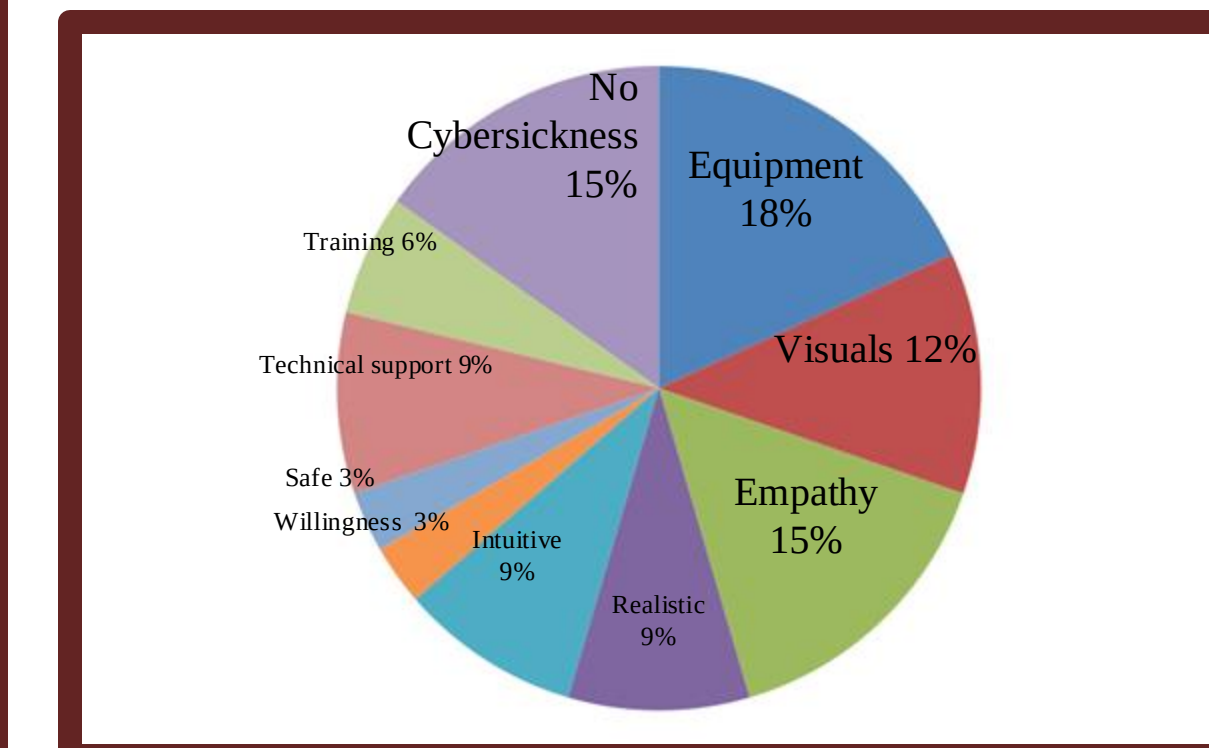
Note. Among the 32 studies that met inclusion criteria, 28 studies identified variables that had a positive effect on respondents' reported attitudes toward AAC and AAC users. These 28 studies identified 11 individual variables. These included female gender, similarities, reading personal narratives, partner reaudiotization, good reading comprehension, exposure to disabilities being the most common.

Figure 2.
Variables Associated With Positive Behaviors Toward AAC and AAC Users



Note. Among the 32 studies that met inclusion criteria, 17 studies identified variables that had a positive effect on respondents' reported behaviors toward AAC and AAC users. These 17 studies identified 8 individual variables. Female gender, previous exposure to AAC or persons with disabilities, use of a floor holder phrase, and reaudiotization were the most common.

Figure 3.
Variables Associated With More Positive Virtual Reality Experiences



Note. Among the 49 articles assessed for effects of VR, 31 studies identified variables that had a positive effect on respondents' reported experience with VR. These 31 studies identified 10 individual variables. Equipment, avoiding cybersickness/dizziness, empathy, visuals and realistic were the most common.

SLPs are often the professionals who lead AAC interventions. SLPs want to promote interventions that will provide positive experiences, high acceptability, and social inclusion for clients who use AAC to communicate.

Discussion

As stated in our session abstract, to date empirical efforts rarely sought to improve attitudes toward AAC users. Our findings can be used to inform next steps in the development of VR interventions to improve attitudes toward AAC and the individuals who use AAC to communicate. Meanwhile, the results of this systematic review can inform current clinical practices of SLPs who seek to create the most positive social inclusion experiences for their clients who communicate using AAC.

It is likely that the variables identified in this systematic review also contribute to more positive attitudes toward AAC and the individuals who use it in real-life settings. SLPs who wish to support social inclusion for their clients who use AAC may consider interventions such as sharing personal narratives about individuals who have disabilities and or use AAC to communicate. These narratives could highlight the similarities between the individual who uses AAC and the individuals who are the recipients of the narrative information. In addition, the use of floor holder phrases and rate management strategies were associated with positive behaviors being directed toward persons who use AAC to communicate.

Selected References

- Achmadi, D., van der Meer, L., Sigafos, J., Lancioni, G. E., O'Reilly, M. F., Lang, R., Schlosser, R. W., Hodis, F., Green, V. A., Sutherland, D., McLay, L., & Marschik, P. B. (2015). Undergraduates' perceptions of three augmentative and alternative communication modes. *Developmental Neurorehabilitation*, 18(1), 22-25. <https://doi.org/10.3109/17513758.2014.962767>
- Beck, A., Fritz, H., Keller, A., & Dennis, M. (2000). Attitudes of school-aged children toward their peers who use augmentative and alternative communication. *Augmentative and Alternative Communication*, 16(1), 13-26. <https://doi.org/10.1080/07434610012331278874>
- Dudek, K., Beck, A. R., & Thompson, J. R. (2005). The Influence of AAC Device Type, Dynamic vs. Static Screen, on Peer Attitudes. *Journal of Special Education Technology*, 21(1), 17-27. <https://doi.org/10.1177/016264340602100102>
- Hyppa-Martin, J., Collins, D., Chen, M., Amundson, C., Timinski, K., & Mizuko, M. (2016). Comparing First Graders' Attitudes and Preferences Toward a Peer Using an iPad ® -Based Speech-Generating Device and a Non-Electronic AAC System. *Augmentative and Alternative Communication*, 32(2), 94-104. Lee, K. M. (2004). Presence, explicated. *Communication Theory*, 14(1), 27-50. <https://doi.org/10.1111/j.1468-2885.2004.tb00302.x>
- Jansen, P. (2024). The Representation of Low and Middle Income Countries in the Extant Evidence Guiding Attitudes Towards AAC [Unpublished thesis paper]. Communication Sciences and Disorders, University of Minnesota Duluth.
- Lilienfeld, M., & Alant, E. (2002). Attitudes of children toward an unfamiliar peer using an AAC device with and without voice output. *Augmentative and Alternative Communication*, 18(2), 91-101. <https://doi.org/10.1080/07434610212331281191>
- McCarthy, J., & Light, J. (2005). Attitudes toward Individuals Who Use Augmentative and Alternative Communication: Research Review. *Augmentative and Alternative Communication*, 21(1), 41-55. <https://doi.org/10.1080/07434610410001699753>
- McGuigan, K. (n.d.). Virtual Reality & Physiological Measurements: Advancing Science to Enhance Attitudes Toward Persons Who Communicate Using AAC.
- Nikolaou, A., Schwabe, A., & Boomgard, H. (2022). Changing social attitudes with virtual reality: a systematic review and meta-analysis. *Annals of the International Communication Association*, 46(1), 30-61. <https://doi.org/10.1080/23808985.2022.2064324>