

A scoping review of video modeling interventions to support community participation for autistic adolescents and adults

David McNaughton^{1,2}, Ciara Ousley¹, Karley Baker¹, Naima Bhana¹, Madison Cherry¹, & Becca Stroschein¹

¹Pennsylvania State University, ²RERC on AAC

INTRODUCTION

There are over 5.4 million autistic adults in the United States.[1] Individuals with autism spectrum disorders (ASD) are a heterogeneous population and demonstrate variability in the severity of defining characteristics, including difficulties in communication, as well as restricted, repetitive patterns of behavior, interests, or activities.[2] Many autistic individuals face significant challenges as they pursue desired outcomes in key aspects of community participation. Adults with ASD are less likely than peers without ASD to live independently, be employed, participate in community activities, or obtain access to goods and services.[3]

A variety of interventions have been identified to support participation and communication for autistic adolescents and adults, especially in the performance of needed life skills.[4] Traditionally these interventions have relied on trained personnel providing in-person instruction and coaching. More recently, highly portable technologies (e.g., smartphone, tablet technologies) have been introduced for viewing and listening to videos. With these new assistive technologies, the use of *video modeling* has received increased attention.[5,6] In a video modeling approach, an individual watches a video of a target behavior (e.g. greeting a co-worker), imitates the observed behavior, and thereby performs a valued skill.

Although video modeling appears to be a promising approach, it most frequently has been investigated in controlled academic settings.[7] There is, however, a growing but un-summarized body of research examining the use of video modeling with autistic adolescents and adults in community settings. Therefore, the following three questions will guide this scoping review: (a) What are the demographic characteristics of the adolescents and adults who have participated in video modeling interventions in community settings? (b) For what activities has video modeling been investigated? (c) What are the implications of these studies for autistic adults, caregivers, interventionists, and researchers?

METHOD

Systematic search procedures were employed in January 2021 using the electronic database, ProQuest. Search terms were comparable to the categories of video modeling, community-based activities, and autism spectrum disorder. Boolean operators (i.e., AND and OR) and stemmed terms (e.g., *autis**) were included within the search terms to maximize the number of articles yielded from the search. The electronic search yielded 272 peer-reviewed articles. Duplicates were removed ($n = 126$), and the remaining 146 articles were evaluated for inclusion.

Four research assistants were trained by the first author on five articles. Once the research assistants demonstrated 100% accuracy on five consecutive articles, they were released to apply inclusion criteria on the remaining articles. Inclusion criteria were: (a) at least one participant having the diagnosis of ASD, (b) the autistic participant being 14 years of age or older, (c) setting including a community-based activity, (d) intervention integrating video modeling, and (e) article written in English. Following the removal of articles that did not meet the inclusion criteria ($n=128$), 18 articles [5,8–25] remained. A fifth research assistant viewed relevant reviews from the search (e.g., meta-analyses) and found one additional study that qualified based upon the inclusion criteria. As such, 19 articles were included in the current review. The fifth research assistant also served as a reliability check for the inclusion criteria with 20% of the articles ($n=30$). Point-by-point inter-assessor agreement was calculated by dividing the total number of agreements of the total number of articles evaluated. Agreement for the initial search was 97%, and disagreements ($n=1$) were resolved through discussion.

RESULTS AND DISCUSSION

A total of 40 autistic individuals participated in the 19 studies included in this review. Severity of disability (e.g., intellectual disability, adaptive functioning, ASD) was reported (using a wide variety of measures) for 22 of the 40

participants. Eight of the participants were identified as having mild disabilities, eight as moderate, and six as severe. Although the review imposed no upper age-limit, the great majority were between the ages of 14 and 25. In fact, the oldest participant was 26 years old.[13] The focus on transition age individuals makes good sense, as the earlier transition services are provided, the better.[26] The absence of individuals age 27 and above is concerning, however, as ASD is a lifelong condition, and there are over 5.4 million adults with ASD in the United States alone.[1] Although there are increased mortality risks associated with ASD, the mean average age of death is over 65 years of age [27], and supports for participation and communication must be provided across the lifespan.

Communication skills were reported for 16 of the 40 participants. For these 16 individuals, 10 (63%) spoke using short sentences or more, while it was reported that speech did not meet the communication needs of six participants (37%). For these six individuals, three received support for communication as part of the video intervention, and three did not. It has been estimated that over 30% of individuals with ASD will experience difficulty with the use of speech throughout their lives.[28] Given the high percentage of autistic adolescents and adults who experience difficulty in communication and social interaction (with or without the use of speech), additional attention to supports for communication within video modeling interventions is needed.[11]

The targeted activities included supports for the individual's participation in independent living (n=3); job-training, employment and volunteer activities (n= 33); leisure activities (n=2); and obtaining goods and services (n=2). No study addressed the use of video modeling to support social interaction. The consideration of supports for a wide variety of employment and volunteer activities is a positive finding, as autistic individuals both desire and deserve choice in employment and volunteer activities. The small number of participants in studies investigating supports for independent living, leisure activities, the obtaining of goods and services, and social interaction is a concern, however, as these are all areas in which poor outcomes are reported for autistic adolescents and adults.[3]

The video modeling intervention was developed and delivered by a member of the research team in 10 studies (information was not available for seven studies). In two studies, the video modeling intervention was delivered by a parent [16] or co-worker.[13] Investigation of the performance of typical communication partners is critical to assess the feasibility of video modeling interventions in community settings.

All 19 studies reported positive outcomes for the 40 participants, although additional instructional supports (e.g., prompting) were sometimes needed. Social validity was reported for 17 of the 19 studies, including information from staff in seven studies, the participants with ASD in four studies, and information from both staff and participants in seven studies. While the widespread collection of information on social validity is welcome, greater attention to procedures to regularly include the views of autistic adolescents and adults is needed.

FUTURE DIRECTIONS

The results summarized here provide evidence that video modeling interventions have the potential to be an important assistive technology support for autistic adolescents and adults to enhance community participation. Future research should address the development and investigation of video modeling technologies that support both participation and communication in a wide variety of settings, and in pursuit of a wide variety of key goals of adult living. In addition, future research should address the development and use of video modeling interventions by typical communication support personnel (e.g., family members, support staff, co-workers) in order to better understand the supports and barriers to the widespread use of video modeling interventions.

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REFERENCES

- [1] Dietz PM, Rose CE, McArthur D, Maenner M. National and state estimates of adults with autism spectrum disorder. *J Autism Dev Disord*. 2020 Dec 1;50(12):4258–66.
- [2] American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 5th ed. Washington, DC: American Psychiatric Pub; 2013.
- [3] CDC. *Autism Spectrum Disorder in Teenagers & Adults* [Internet]. Centers for Disease Control and Prevention. 2020 [cited 2021 Mar 14]. Available from: <https://www.cdc.gov/ncbddd/autism/autism-spectrum-disorder-in-teenagers-adults.html>
- [4] Gilson CB, Carter EW, Biggs EE. Systematic review of instructional methods to teach employment skills to secondary students with intellectual and developmental disabilities. *Res Pract Pers Sev Disabil*. 2017 Jun;42(2):89–107.
- [5] Aldi C, Crigler A, Kates-McElrath K, Long B, Smith H, Rehak K, et al. Examining the effects of video modeling and prompts to teach activities of daily living skills. *Behav Anal Pract*. 2016 Dec;9(4):384–8.
- [6] Wynkoop KS, Cardon TA, Kruis NE, Hawkins PM. Teacher and video modeling: A survey of use and perspectives. *J Spec Educ Technol*. 2020 Dec 1;35(4):262–71.
- [7] Park J, Bouck E, Duenas A. The effect of video modeling and video prompting interventions on individuals with intellectual disability: A systematic literature review. *J Spec Educ Technol*. 2019 Mar 1;34(1):3–16.
- [8] Allen KD, Wallace DP, Greene DJ, Bowen SL, Burke RV. Community-based vocational instruction using videotaped modeling for young adults with autism spectrum disorders performing in air-inflated mascots. *Focus Autism Dev Disabil*. 2010 Sep;25(3):186–92.
- [9] Allen KD, Wallace DP, Renes D, Bowen SL, Burke RV. Use of video modeling to teach vocational skills to adolescents and young adults with autism spectrum disorders. *Educ Treat Child*. 2010 Aug;33(3):339–49.
- [10] Babb S, Gormley J, McNaughton D, Light J. Enhancing independent participation within vocational activities for an adolescent with ASD using AAC video visual scene displays. *J Spec Educ Technol*. 2019 Jun;34(2):120–32.
- [11] Babb S, McNaughton D, Light J, Caron J, Wydner K, Jung S. Using AAC video visual scene displays to increase participation and communication within a volunteer activity for adolescents with complex communication needs. *Augment Altern Commun AAC*. 2020 Mar;36(1):31–42.
- [12] Bassette L, Titus-Dieringer S, Zoder-Martell K, Cremeans M. The use of video-based instruction to promote independent performance of physical activity skills in students with developmental disabilities in a school and community setting. *Psychol Sch*. 2020 Sep;57(9):1439–56.
- [13] Bross LA, Travers JC, Wills HP, Huffman JM, Watson EK, Morningstar ME, et al. Effects of video modeling for young adults with autism in community employment settings. *Career Dev Transit Except Individ*. 2020 Nov;43(4):209–25.
- [14] Burckley E, Tincani M, Fisher AG. An iPad™-based picture and video activity schedule increases community shopping skills of a young adult with autism spectrum disorder and intellectual disability. *Dev Neurorehabilitation*. 2015 Apr;18(2):131–6.
- [15] Carlile KA, DeBar RM, Reeve SA, Reeve KF, Meyer LS. Teaching help-seeking when lost to individuals with autism spectrum disorder. *J Appl Behav Anal*. 2018;51(2):191–206.

- [16] Cruz-Torres E, Duffy ML, Brady MP, Bennett KD, Goldstein P. Promoting daily living skills for adolescents with autism spectrum disorder via parent delivery of video prompting. *J Autism Dev Disord*. 2020 Jan;50(1):212–23.
- [17] Cullen JM, Simmons-Reed EA, Weaver L. Using 21st century video prompting technology to facilitate the independence of individuals with intellectual and developmental disabilities. *Psychol Sch*. 2017 Nov;54(9):965–78.
- [18] Cullen JM, Alber-Morgan SR, Simmons-Reed EA, Izzo MV. Effects of self-directed video prompting using iPads on the vocational task completion of young adults with intellectual and developmental disabilities. *J Vocat Rehabil*. 2017;46(3):361–75.
- [19] English DL, Gounden S, Dagher RE, Chan SF, Furlonger BE, Anderson A, et al. Effects of video modeling with video feedback on vocational skills of adults with autism spectrum disorder. *Dev Neurorehabilitation*. 2017 Nov;20(8):511–24.
- [20] Kellems RO, Morningstar ME. Using video modeling delivered through iPods to teach vocational tasks to young adults with autism spectrum disorders. *Career Dev Transit Except Individ*. 2012 Dec;35(3):155–67.
- [21] Lee GT, Pu Y, Xu S, Lee MW, Feng H. Training car wash skills to Chinese adolescents with intellectual disability and autism spectrum disorder in the community. *J Spec Educ*. 2020 May;54(1):16–28.
- [22] Mechling LC, Pridgen LS, Cronin BA. Computer-based video instruction to teach students with intellectual disabilities to verbally respond to questions and make purchases in fast food restaurants. *Educ Train Dev Disabil*. 2005 Mar;40(1):47–59.
- [23] Rausa VC, Moore DW, Anderson A. Use of video modelling to teach complex and meaningful job skills to an adult with autism spectrum disorder. *Dev Neurorehabilitation*. 2016 Jul;19(4):267–74.
- [24] Van Laarhoven T, Laarhoven-Myers V. The effectiveness of using a pocket PC as a video modeling and feedback device for individuals with developmental disabilities in vocational settings. *Assist Technol Outcomes Benefits*. 2007;4(1):28–45.
- [25] Van Laarhoven T, Winiarski L, Blood E, Chan JM. Maintaining vocational skills of individuals with autism and developmental disabilities through video modeling. *Educ Train Autism Dev Disabil*. 2012 Dec;47(4):447–61.
- [26] Cimera RE, Burgess S, Wiley A. Does providing transition services early enable students with ASD to achieve better vocational outcomes as adults? *Res Pract Pers Sev Disabil*. 2013 Jun 1;38(2):88–93.
- [27] Bishop-Fitzpatrick L, Movaghar A, Greenberg JS, Page D, DaWalt LS, Brilliant MH, et al. Using machine learning to identify patterns of lifetime health problems in decedents with autism spectrum disorder. *Autism Res*. 2018;11(8):1120–8.
- [28] Tager-Flusberg H, Kasari C. Minimally verbal school-aged children with autism spectrum disorder: The neglected end of the spectrum. *Autism Res Off J Int Soc Autism Res [Internet]*. 2013 Dec [cited 2021 Mar 15];6(6). Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3869868/>