Aging and Social Robots: How Overspecification Affects Real-Time Language Processing

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Abstract

Despite the rise in communicative technologies for healthy aging, little research has focused on how effectively older adults process language spoken by artificial agents. We explore whether a robot's redundant (but potentially helpful) descriptions facilitate real-time comprehension in younger and older listeners. Gaze was recorded as participants heard instructions like "Tap on the [purple/closed] umbrella" for a display containing eight unique objects. We manipulated the description (no-adjective, color-adjective, state-adjective) and the visual context, specifically whether there was another object bearing the property denoted by the adjective (purple/closed notebook). Relative to the no-adjective condition, redundant color adjectives speeded comprehension when they uniquely identified targets, whereas (less-salient) state adjectives always impeded comprehension. No age-related differences were observed. Paralleling human-human studies, language processing in human-robot communication is facilitated when salient information narrows visual search. Together, these findings help inform the future design of communicative technologies.