A key question in the psycholinguistics of reference is whether listeners use common ground during the earliest moments of referential interpretation (e.g., Keysar et al., 2000; Brown-Schmidt & Heller, 2018). To date, the balance of evidence suggests common ground rapidly guides real-time language processing in both children (e.g., Nadig & Sedivy, 2002; Nilsen & Graham, 2009) and younger adults (e.g., Brown-Schmidt et al., 2008; Hanna et al., 2008; Heller et al., 2009). Surprisingly, there is little research exploring common ground in older adults' comprehension, with most work focusing on language production (e.g., Healey & Grossman, 2016; Long et al., 2018). Nonetheless, older adults provide an intriguing test case. On the one hand, they are often described as drawing on context more heavily than younger adults (Pichora-Fuller, 2008). On the other hand, communicative perspective-taking is thought to depend on aspects of executive function such as inhibition and working memory (Brown-Schmidt, 2009; Cane et al., 2017; Nilsen & Graham, 2009; Symeonidou et al., 2016), in which older adults exhibit age-related declines (Hasher & Zacks, 1988; Wingfield et al., 1988). Older adults have also been described as having reduced attentional capacity (Craik & Byrd, 1982) and Theory of Mind (Moran, 2013), which could reduce the use of perspective information.

The present study used a referential communication task to examine if and to what extent older adults differ from younger adults in terms of the ability to use a speaker's perspective to guide referential interpretation. A group of 21 younger (\(M_{age} = 20.04\)) and 17 older adults (\(M_{age} = 71.88\)) followed instructions from a Director (lab member) to point to objects on a 40” display monitor. Each display depicted a 3-D shelving unit with objects in selected compartments. Some objects were hidden behind an occluded panel and thus were visible only to the participant. The Director viewed another display screen placed back-to-back with the participant's display screen, and the Director's screen showed the shelving panel from the opposite side. Before the main experiment began, participants were shown three example displays from their point of view as well as the Director's point of view. On critical trials, displays contained four objects (a target-competitor pair and two unrelated objects). We varied whether the target object (e.g., hat with blue feathers) was accompanied by a genuine competitor (e.g., hat with pink feathers) or a control object (e.g., stapler, see Figure 1). We also varied whether the competitor/control object was mutually visible (in common ground) or had a panel on the back side of its compartment, making it visible only to the listener (in privileged ground). Eye movements were recorded as participants followed spoken instructions from the Director (e.g., point to the hat with the blue feathers). Fixations to the target were explored using growth curve analysis in the ambiguous speech interval spanning from noun onset (e.g., hat) to the average onset of the disambiguator (e.g., blue). The results (see Figure 2) revealed greater increases in target fixation in the privileged ground condition than the common ground condition, reflecting listeners' use of the Director's perspective to differentiate the intended target from the competitor. However, this pattern was strongest in younger adults, as reflected in a reliable Age x Ground x Competitor Type interaction on the quadratic time term in the GCA analysis (\(p = .003\)). In fact, inspection of the fixation patterns shows little evidence that older adults used perspective information on-line.

What explains older listeners' difficulty in using common ground information? We believe the patterns are unlikely to arise from slower real-time information processing in older adults (e.g., as proposed by the cognitive slowing hypothesis, e.g., Salthouse, 2000). This is supported in part by the similar fixation profiles of older and younger in the control conditions, which indicate older adults had no difficulty "keeping up" with younger adults in terms of processing the speech signal. Instead, given the symmetry with the results of production studies, we suggest the results are better explained in terms of age-related declines in the mentalizing and cognitive control systems that support perspective-taking at a more general level.
Figure 1. Sample display for a critical trial, showing the four experimental conditions. (Instruction: *Point to the hat with the blue feathers.*)

Figure 2. Target fixations relative to the noun onset. The window of analysis is from 200 to 1000 ms.