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ORIGINAL ARTICLE

Do gestures and props help communication with older adults about prescription medicine?

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Abstract

One barrier to patients' compliance in following instructions to take prescription medication is their memory of those instructions. Effective communication can be challenging with older adults, since people can use ineffective strategies to compensate for older adults' presumed communication difficulties. The purpose of this study was to test whether older adults would benefit from gestures and/or props in hearing explanations of the appropriate use of prescription medication. Participants were 181 adults 65 years or older. They evaluated pharmacy students on their communication. Each participant watched video clips of pharmacy students explaining how to use fictional medications in three conditions: (1) speech only, (2) speech and gestures, and (3) speech and props. Participants were tested on their memory and rated the effectiveness of the communication of each pharmacy student. Participants showed no differences in memory across conditions. These findings do not support the use of gestures and/or props in effective communication with older adults.

Keywords: Comprehension; gestures; memory; older adults; props

Around the world, life expectancy has increased, resulting in a growing aging population (Global Aging Initiative, Center for Strategic & International Studies, 2017). As the over-65 demographic rapidly expands, ageism and negative age-related stereotypes are prevalent, like inevitable memory loss or difficulties with communication (Nelson, 2016). These stereotypes can have a negative effect, such as a self-fulfilling prophecy (Thornton, 2002). There is sometimes a grain of truth in some of the stereotypes. For example, some small challenges in communication can arise in old age through aging-related changes like sensory loss (Erber & Scherer, 1999) and mild cognitive impairment (Sobral, Araújo, & Sobral, 2018). However, some aspects of communication remain stable into old age, such as some components of pragmatics (Daniluk & Borkowska, 2020). And contrary to the stereotype, vocabulary continues to grow into old age (Verhaeghen, 2003).

Despite the dubious foundation for the stereotype that it is difficult to communicate with older adults, this stereotype affects how people approach communication with the elderly (Thimm, Rademacher, & Kruse, 1998). For example, one study showed that nurse practitioners working with elderly patients were hypervigilant in their communication (Kaakinen, Shapiro, & Gayle, 2001). Other studies have shown that older adults are sometimes addressed with elderspeak, including a slower speaking rate, simplified vocabulary, and exaggerated prosody (Kemper & Harden, 1999). Older adults often find these communication adjustments patronizing and disrespectful (Balsis & Carpenter, 2006; Edwards & Noller, 1993; Johnston & Womack, 2015; Lagacé, Tanguay, Lavallée, Laplante, & Robichaud, 2012; Thimm et al., 1998). Moreover, the compensatory strategies used to communicate with older adults are not always effective. For example, elderspeak often results in more comprehension errors, greater confusion, and more negative assessments of self for the older person (Kemper & Harden, 1999).

In the context of health care, effective communication is essential for positive health outcomes (Lagacé et al., 2012; Oliver & Gee, 2018; Ratna, 2019), including respectful and effective communication with elderly patients (Oliver & Gee, 2018). The purpose of the present study is to test whether gestures and/or props can aid communication for older adults.

We address this hypothesis in the context of pharmacy students' communication about prescription medication. Pharmacists (in addition to physicians) are trusted sources of information about prescription medication (Donohue, Huskamp, Wilson, & Weissman, 2009). The majority of seniors in North America take at least one prescription medication, and most of those take more than one prescription medication (Rotermann, Sanmartin, Hennessy, & Arthur, 2014; Wilson, Schoen, Neuman, Strollo, Rogers, Chang, & Safran, 2007). Medication is often not taken according to the prescription (Hammond & Lambert, 1994; Osterberg & Blaschke, 2005; Wilson et al., 2007). Inadequate communication on the part of the prescriber has been identified as one of the primary reasons that prescription medication is not taken as prescribed (Hammond & Lambert, 1994; Tarn, Heritage, Paterniti, Hays, Kravitz, & Wenger, 2006). Patients only remember 29–72% of what healthcare professionals tell them (Houts, Bachrach, Witmer, Tringali, Bucher, & Localio, 1998). There is room for improvement in presenting information about prescription medication in memorable ways.

Communication with gestures and props

Accompanying speech with either gestures or props might increase memory for information communicated through speech (Driskell & Radtke, 2003; Khatin-Zadeh, Eskandari, Yazdani-Fazlabadi, & Marmolejo-Ramos, 2022). Gestures are communicative hand and arm movements, and often accompany similar-meaning speech (Kelly, Manning, & Rodak, 2008). For example, if someone is demonstrating how to use an eyedropper to deliver medication to the eye, they could mime the action while speaking about it. Props refer to physical objects that are related to the accompanying communication (Mason-Baughman & Lander, 2012). For example, a person could use an empty eyedropper held close to the eye to demonstrate its appropriate use.

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There are a number of ways in which both gestures and props might enhance memory for the spoken message. Both gestures and props can provide a semantic representation of the information expressed in speech, only through a different modality (Cook, Yip, & Goldin-Meadow, 2012; Schubotz, Holler, Drijvers, & Özyürek, 2021). The reliance on the visual modality could lighten the cognitive load on working memory (Khatin-Zadeh et al., 2022; Wu, Müller, & Coulson, 2022), allowing people to better remember the spoken information. Another way in which both gestures and props can support memory is by drawing listeners' attention to important information (Alibali & Kita, 2010; Khatin-Zadeh et al., 2022; Wakefield, Novack, Congdon, Franconeri, & Goldin-Meadow, 2018).

There is extensive evidence that gestures can help memory among children and young adults (Kelly et al., 1999; Morford & Goldin-Meadow, 1992; Schubotz et al., 2021; Thompson, 1995). For example, Galati and Samuel (2011) found that when participants saw gestures, they had better recall of presented information after delays than when they did not see gestures. Similarly, So, Chen-Hui, and Wei-Shan (2012) found that both children and adults remembered more words from lists of words when the words were accompanied by representational gestures, that is, gestures that depict the referent through hand movement or shape. Furthermore, in that same study, So et al. (2012) found that adults' memory for words was also enhanced when the words in the word list were accompanied by beats, nonrepresentational, repetitive hand movements that often serve to highlight important information. In the context of health communication, Stevenson (2014) found that nonverbal communication was helpful when a pharmacist and a patient did not share a common language.

It seems likely that props may also enhance memory, although there is little direct evidence from communication with adults. Toddlers produce many object-related actions, such as showing objects to parents (Masur, 1982). Object-related actions are highly correlated to toddlers' receptive vocabulary development (Sansavini, Bello, Guarini, Savini, Stefanini, & Caselli, 2010), suggesting that they support memory for words. As gestures are often considered to be simulated action (Hostetter & Alibali, 2019), it would seem likely that both gestures and object-related actions would have similar underlying processing mechanisms. In support of this argument, one study found that 18-month-olds' imitation of gestures was correlated with imitation of object-related actions (Kim, Óturai, Király, & Knopf, 2015). Among adults, one study found that the processing of representational gestures relied on the same neurological reactions as processing other meaningful representations, like pictures (Wu & Coulson, 2005). Previous studies have found that when pharmacists use gestures and demonstrations or include pictograms on medications, the patient's understanding is improved (Stevenson, 2014; Monfort et al., 2010).

It is not clear that gestures help memory among older adults (Cocks et al., 2011; Engelkamp & Cohen, 1991). Thompson (1995) found that gestures did not help (or hinder) older adults' recall of spoken information. In addition, Ouwehand et al. (2015) used video-based instruction to teach participants a water-pouring task and found that gestures did not aid in learning for older adults. In contrast, Schubotz et al. (2021) found that older adults (like younger adults) could benefit from gestures in understanding words in noise, but that the enhancement of gestures was smaller for older adults than for younger adults. One common explanation of these age-related

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declines in the use of gesture in comprehension is age-related declines in working memory (Cocks et al., 2011; Ouwehand et al., 2015; Schubotz et al., 2021; Thompson, 1995). That is, with declines in working memory, older adults can no longer keep track of information from two separate modalities. In support of this argument, Schubotz et al. (2021) found that the difference between older adults and younger adults in the use of gestures in comprehension could partially be accounted for by differences in working memory capacity. If this reasoning is correct, we may find no advantage in memory when older adult participants are presented with spoken information accompanied by gestures. However, it is important to keep in mind that these previous studies were done with lab-based, experimental tasks, with little ecological validity. We hypothesized that gestures might enhance older adults' comprehension in familiar communication scenarios (listening to a pharmacist explain a medication), like the one used in the present study.

As for props, many researchers have recommended the use of props to improve communication with people with communication difficulties, such as children (Herdini, Suyitno, & Marwoto, 2019), adults with dementia (Martinec & Lera, 2018; Mason-Baughman & Lander, 2012), and elderly adults (Ratna, 2019). While some studies have shown that the use of props can increase interlocutors' confidence about communicating (Mason-Baughman & Lander, 2012), it is not clear that props always help the listener. Salmon (2001) reviewed the evidence for props helping communication with children and found that props did not always facilitate children's understanding. We have found no previous studies testing the effectiveness of props in communicating with older adults (cf. Monfort et al., 2010, who found the use of pictograms was an effective support for communication with older adults). If props function like gestures, then we expect to see the same facilitative effects as with gestures.

This study

The purpose of this study is to test whether gestures and/or props facilitate memory of information about prescription drugs among elderly adults (65 years or older). Participants were invited to evaluate pharmacy students on their communication skills before they begin their rotations. Each participant saw three different students explain a fictional medication in three conditions: (1) speech only, (2) speech and gestures, and (3) speech and props. We used novel medications to avoid the possibility that prior knowledge about a medication could influence the results, since most elderly adults take at least one prescription medication (Rotermann et al., 2014). We predicted that hearing information about prescription medication with either gestures or props would make that information more memorable, compared to speech alone.

In designing the scripts, we tried to make the presentation of the material as "natural" as possible in order to maximize the chances that the findings would generalize to other interactions and participants. As will be seen, this decision entailed a certain loss of experimental control, thereby raising questions that can only be addressed by future studies.

Before testing our predictions with elderly adults, we ran a pilot study with ten younger adults to test whether these conditions made a difference for younger

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adults' memory. The results showed some positive effects on memory in the gesture and props conditions (see Supplementary Material).

Method

Participants

In order to determine the appropriate number of participants for the main study, we did a power analysis in G*Power, using the medium effect size reported for younger adults in gesture comprehension (So et al., 2012). According to that analysis, we required 177 participants for a study powered at 90% (Faul, Erdfelder, Buchner, & Lang, 2009).

There were 181 participants included in the analyses of this study (70 females and 111 males). All were aged 65 or older ($M = 69.1$ years, $SD = 2.8$). Five people completed a survey but did not report their age; their data were excluded. Finally, the data analysis excluded participants who did not have a complete survey ($N = 17$). In this study, complete surveys were defined as surveys with at least eight responses to multiple-choice questions and at minimum an attempt at half of the written questions.

The participants were varied in terms of the highest level of education completed: 1 reported grade 8, 57 some high school courses (no degree), 42 high school or equivalent, 1 technical degree, 32 some college courses (no degree), 42 a bachelor's degree, 3 a master's degree, and 3 doctoral degrees. In terms of ethnicity, most participants identified as Euro-North American ($n = 150$), 22 as First Nations/Métis/Inuit, five as European, two as Hispanic, and two as Middle Eastern. Participants were recruited by posters across a Western Canadian university campus and were given an honorarium of $10 as a small token of appreciation for their participation.

Materials

We created three fictional medications: Esuypzil, Vacsozem, or Yimellus. We then created a script for each medication, detailing how it should be taken (Appendices A–C). For every medication, we created three modality conditions: (1) speech only, (2) speech and gestures, and (3) speech and props (e.g., inhaler, syringe, or eyedropper).

In the conditions with gestures, gestures were included where and how they seemed natural in communication, accompanying similar-meaning spoken information, as is often the case in everyday communication (Cienki, 2017; see the Appendices for descriptions of gestures). As a result of our focus on the naturalness of communication, representational and nonrepresentational gestures were included. Representational gestures refer to gestures that represent the meaning (either concretely or metaphorically) by hand movement or handshape, such as a shaking motion to instruct the patient to shake the medication, or a thumbs up for keeping blood pressure low. Nonrepresentational gestures referred to any communicative hand movements that did not represent, such as repetitive movements to emphasize or highlight. For example, in one condition, a nonrepresentational gesture accompanied the opening statement (i.e., the clasping

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of hands paired with "Okay, I ran your prescription . . . "). In the Appendices, we have put in bold font the representational gestures, including deictic gestures (gestures that indicate a particular referent, such as pointing), as representational gestures, following previous research (Özder, Özer, & Göksun, 2023). For the Esuypzil condition, there were a total of 29 gestures (66% representational); for Vacsozem, 34 gestures (65% representational); and for Yimellus, 40 gestures (55% representational). As can be seen in the Appendices, many of the representational gestures occurred with the instructions on how to use the medication. To the extent that representational gestures support memory, it is possible that we will see particularly strong effects of the gesture condition on memory for instructions. We will return to the possible ramifications of the choice of gestures in the discussion.

In the conditions with props, props were referenced or used where natural to explain something, like pulling back the syringe or pointing out the button on the inhaler. As for the gestures, the props were produced with similar-meaning speech (see Appendices). As we chose where and how to include gestures and props separately and where they seemed natural, they did not necessarily convey the same information, a limitation we return to in the discussion.

Three undergraduate psychology majors played the role of the pharmacy students. We originally tried to recruit pharmacy students to play the role of pharmacy students, but could not locate any who had the time to devote to this project. All of the students were female and opted to dress in black for the video clips. In a video clip lasting approximately two minutes, each student explained the proper procedure to take one medication, in three separate videos: (1) speech only, (2) speech and gestures, and (3) speech and props. Each participant saw a total of three videos of pharmacy students. Note that these videos have not been made publicly available as the students did not consent to public sharing; they only consented to the use of the videos for the study itself. Participants were randomly assigned to one of the six variations of medication/condition videos. Each of these six variations included all three medications and all three modality conditions. For example, one participant might have seen Esuypzil (speech only), Vacsozem (speech and gestures), and Yimellus (speech and props), while another participant might have seen Vacsozem (speech only), Yimellus (speech and gestures), and Esuypzil (speech and props).

To test the participants' memory for what the pharmacy student said, we asked two multiple-choice questions: one about the name of the disease and one about the name of the medication. We offered 10 choices for each of these questions, so chance performance was 10%.

Unlike in the pilot study, for the main study (with the older adults), we added three open-ended questions: to recall the symptoms of the disease, information about the dosage (e.g., how much, how often), and any additional instructions regarding the medication. In order to make the medications seem more realistic to the participants, the number of details that could be remembered differed by medication. For Esuypzil, there were two details about the symptoms, four details about dosage, and four additional instructions. For Vacsozem, there were two details about the symptoms, three details about dosage, and three additional instructions. For Yimellus, there were four details about the symptoms, three details about dosage, and five additional instructions. To account for these differences in possible scores, we calculated a ratio correct for each question.

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Finally, participants were asked to rate the communication of each pharmacy student on a scale of 1 (poor communicability) to 10 (excellent communicability).

Procedure

Participants completed the study through an online Qualtrics survey. After reading information about the study and consenting to participate, participants filled out a brief demographic information questionnaire. The participants were told ahead of time that they would be tested on their memory of what they saw. They watched one video and immediately answered the questions about that video. The same process was repeated for the other two videos. The order of the videos was counterbalanced across participants. Once they had viewed all three videos, they were asked which pharmacy student they preferred and why.

Data analysis

The questions about the names of the disease and the medication were scored as either correct or incorrect. We therefore compared the conditions on these questions with Generalized Linear Mixed Model (GLMM) analyses for a binomial family, with participant and pharmacy student as random effects. For the open-ended questions, for each participant, we calculated a ratio of correct out of the total number of details that could be remembered within that condition. We compared across conditions with GLMM for a Gaussian family, with participant and pharmacy student as random effects. Preliminary analyses showed no relationship between performance and either age or gender. These factors were not included in the remaining analyses presented in the results section.

Results

We predicted that gestures and/or props would support older adult participants' memory for what the pharmacy student said. Table 1 summarizes the results of remembering the name of the disease and the medication. As can be seen in this, participants scored significantly above chance in all conditions.

To test if there were differences by condition for memory of either the name of the disease or the name of the medication, we performed a GLMM with condition as a fixed effect; pharmacist and participant were included as random effects. For all the GLMM analyses presented here, the random slopes could not be calculated with participant as a random effect. We therefore present the analyses both with participants as a random effect and without. For the name of the disease, there was no significant effect of condition with participant as a random effect, $\chi^2\ (2) = 0.34$, $p = .85$, or with only pharmacist as a random effect, $\chi^2\ (2) = 0.26$, $p = .88$. For the name of the medication, there was no effect of condition with participant as a random effect, $\chi^2\ (2) = 0.97$, $p = .61$, or with only pharmacist as a random effect, $\chi^2\ (2) = 0.97$, $p = .62$.

Similar results were observed on the open-ended questions. Figure 1 summarizes the ratio of correct symptoms, dosage, and additional instructions by condition. These questions were analyzed with GLMM with condition as a fixed effect and

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Table 1. Number of participants choosing correct/incorrect response by question and condition

	Condition	#Correct/incorrect	%Correct	Relative to chance[a]
Disease	Gestures	42/136	24%	.001
	Props	50/131	28%	< .00001
	Speech	56/125	31%	< .00001
Medication	Gestures	53/128	29%	< .00001
	Props	45/136	25%	.0003
	Speech	54/127	30%	< .00001

Note: Totals do not always add up to 181 because not all participants answered all questions.
[a]*p*-value on a Fisher's exact test compared to chance (i.e., 1 out of 10).

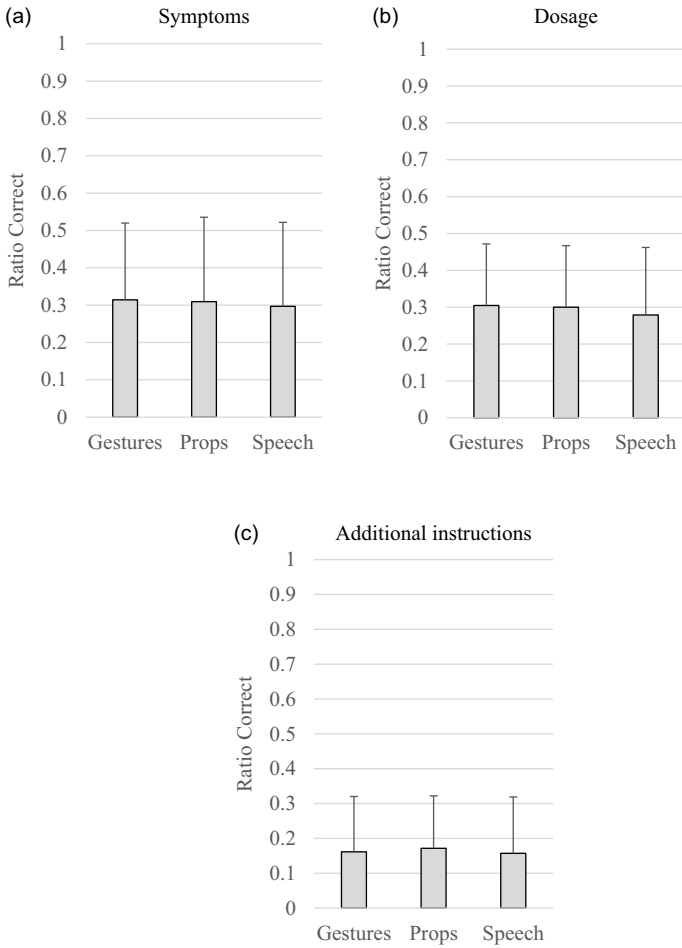

Figure 1. Average (SD) ratio correct by condition. (a) Symptoms. (b) Dosage. (c) Additional instructions.

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pharmacist and participant as random effects. As can be seen in Figure 1a, participants remembered approximately 30% of the symptoms correctly, with no significant difference by condition with participant as a random effect, χ^2 (2) = 4.66, p = .10, or without participant as a random effect, χ^2 (2) = 4.26, p = .12. As for dosage instructions, participants remembered approximately 30% of them correctly (see Figure 1b), with no difference by condition with participant as a random effect, χ^2 (2) = 2.39, p = .30, or without, χ^2 (2) = 1.65, p = .44. Participants remembered approximately 16% of the additional instructions correctly (Figure 1c), with no difference by condition with participant as a random effect, χ^2 (2) = 2.34, p = .31, or without, χ^2 (2) = 1.72, p = .42.

We had no predictions as to whether gestures and/or props would make a difference in participants' rating of the effectiveness of communication. The results showed little evidence that participants were sensitive to the use of gestures/props in making these ratings. Approximately equal numbers of participants identified the best communicator as the student they saw who used speech alone (n = 56), speech and gestures (n = 63), and speech and props (n = 59). Only five participants justified their choice of pharmacy student on the basis of using gestures, and none mentioned the props. Similarly, there was little evidence for differences between conditions on the question about how well each pharmacy student communicated. The conditions were compared with a repeated-measures ANOVA that revealed no significant main effect of condition, F (2, 356) = 2.15, p = .12, and η^2 = .012. The average rating on the 10-point scale for the Speech condition was 7.0 (SD = 1.5), for the Gesture condition 7.2 (SD = 1.4), and for Props 7.1 (SD = 1.5).

Discussion

This study tested whether using gestures and/or props when explaining the appropriate use of a fictional prescription medication would result in better memory among older adults than speech alone. Previous research has shown that gestures can facilitate memory of speech among younger adults (Thompson, 1995). However, most studies to date have not shown such a facilitative effect for older adults (Cocks et al., 2011; Ouwehand et al., 2015; Schubotz et al., 2021; Thompson, 1995). In the present study, we used a more ecologically valid communication context, pharmacy students explaining how to take a novel medication, than has been used in previous studies. We found no evidence that either gestures or props made a difference in older adults' memory for the information about the medication. Participants recalled between 16% and 30% (depending on the question) of the details presented to them in all conditions (amounts that correspond to those reported in previous studies; Houts et al., 1998).

These results are consistent with the argument that gestures do not help older adults' memory (Cocks et al., 2011; Ouwehand et al., 2015; Thompson, 1995). These results also challenge the claim that props necessarily support communication with elderly patients (Ratna, 2019). If so, then a likely reason that gestures/props help younger adults and do not help older adults is through working memory capacity (Schubotz et al., 2021). As working memory capacity declines with typical aging, particularly on timed tasks (Bartsch, Loaiza, & Oberauer, 2019), older adults may not be able to keep track of information from two modalities. Indeed, some previous

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studies have shown that when processing speech accompanied by gestures, older adults focus either on auditory information (Cocks et al., 2011; Thompson, 1995) or on gestures (Schubotz et al., 2021). To test this explanation, future studies should include measures of individual participants' working memory capacity.

Naturally, it is always possible that there was something about the materials for this study that did not adequately test the hypothesis that gestures/props support memory. For example, some researchers have argued that it is the representational nature of gestures (in a different modality from speech) that supports enhanced comprehension (Kelly et al., 1999; Wu & Coulson, 2005). In the present study, as we were focused on including gestures where and how they seemed natural in communication, we included representational and nonrepresentational gestures in the gesture condition. Other research has shown that nonrepresentational gestures can support memory, too (Li, Wang, Mayer, & Liu, 2019; Ravizza, 2003; So et al., 2012). Future research is needed to identify the exact properties of gestures that support understanding and memory. By designing a study with tighter controls over the types of gestures, researchers can gain insights into whether there are particular kinds of gestures that enhance memory among older adults. In a similar vein, future studies can more carefully control the information presented with gestures and props, ensuring that the information is the same across conditions. Similarly, future studies can design probe questions that correspond (or not) with information presented with gestures/props to test whether there is particular information that is remembered better when paired with gestures/props. Future research could similarly test whether using props differently than in the present study could result in different results. In other words, it is important to test under what conditions props help communication (in analogy with results with children; see review in Salmon, 2001). For example, since aging particularly affects working memory on timed tasks (Bartsch et al., 2019), it is possible that gestures and/or props could enhance memory for spoken information if the speech is slowed down.

There were other limitations to this study that can only be addressed in future studies. In the present study, we assumed that participants had understood what the pharmacist said. In support of that assumption, the participants' accuracy appeared relatively similar to that of the younger adults in the pilot study (see Supplemental Material). Nevertheless, future studies can be designed to test for the effects of gestures at various stages of communication, including understanding, encoding, and recall. For example, researchers could invite participants to repeat what the pharmacist said with accompanying gestures and/or actions. It is possible that the repetition of the movements could reinforce the meaning among older adults with declining working memory skills. Moreover, we did not collect information on whether participants were experiencing any general cognitive decline. Future studies can do so. Another limitation of this study is that we only tested one-way effects of communication. In other words, the participants were in a position of passively listening and trying to remember what they had heard. In real-life settings, elderly patients would have the chance to ask questions or request repetition if they had not understood what a healthcare provider had said. The two-way nature of communication plays an essential role in patients' understanding and willingness to comply with their healthcare providers' instructions and suggestions (Schommer & Wiederholt, 1995; Schöpf, von Hirschhausen, Farin, & Maun, 2018). In addition,

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other aspects of nonverbal communication (like touch) can play important roles (Caris-Verhallen, De Gruijter, Kerkstra, & Bensing, 1999).

Conclusion

In conclusion, this study found no evidence that either gestures or props help older adults remember information about a novel prescription medication. These results add to the growing evidence that gestures and props do not necessarily help older adults' memory for spoken information (Cocks et al., 2011; Ouwehand et al., 2015; Thompson, 1995). Effective communication is essential for compliance in taking prescription medications (Wilson et al., 2007). Moreover, all patients, including older adults, should be able to expect respectful communication on behalf of their healthcare providers (Oliver & Gee, 2018). The challenge of finding effective and respectful ways of communication with older adults remains open.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S0142716425100088.

Competing interests. The authors declare no competing interests.

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Appendix A

In this appendix and the following ones, the representational gestures in Conditions 2 are in bold.

Script for medical condition: Toogititis (two-gee-titis)

Description: Long-term medical condition in which the blood pressure in the arteries is persistently elevated. It can lead to a heart attack, stroke, and other arterial diseases. Risk factors include excess salt, excess body weight, smoking, and alcohol. Treated by **Esuypzil (essoip-zil)**: oral suspension, starting dosage is 500 mg or 1000 mg a day as a single or divided dose. Dosage is increased or decreased according to blood pressure response.

Condition 1: Speech Only
Condition 2: Gestures
Condition 3: Props

1. Hello, my name is X, and I am a pharmacy student at the University of Alberta. Today, I will be practicing my patient interaction skills with a provided script.

   I will be taking care of you today. Okay I ran your prescription. As your doctor would hopefully have told you, you are in the early stages of toogititis which is a long-term condition. While this condition is incurable, I can help you to keep it controlled so that it isn't too much of a problem in your day-to-day life. Untreated, the blood pressure in your arteries would continue to elevate and worsen over time. So to prevent that we are going to put you on a drug called esuypzil. This will work to prevent complications of toogititis such as heart attack and stroke by keeping your blood pressure stable. Esuypzil is an oral suspension medication which means you'll have to measure your dose each time. I will give you a syringe for that and you just have to make sure to shake the bottle well before drawing up the liquid. Based on your age and weight I want you to start with 6 mL a day for the first 4 months. When you come in for your refill we can discuss increasing the dosage, but I think 6 mL will be plenty while you adjust. You can also take it as a divided dose if you prefer, but I recommend a single dose as it is important to take it at the same time every day. Most people prefer to take it in the morning with their breakfast, but taking it with food is not necessary. Otherwise, I also want you to try to consume less salt and alcohol. Additionally, some patients have found increased positive results by avoiding dairy products. I will check in with you in 2 months. If you have any questions or concerns before then feel free to come by or contact me by phone at 555-0504 (zero not o).

2. Hello (wave once), my name is X, and I am a pharmacy student at the University of Alberta. Today, I will be practicing my patient interaction skills with a provided script.

   I will be taking care of you today. Okay (clasp hands) I ran your prescription. As your doctor would hopefully have (open palms) told you, you are in the early stages of toogititis which is a long-term condition. While this condition is incurable (outreached hand), I (**self point** with index finger) can help you to keep it controlled so that it isn't (**shake head**) too much of a problem in your day to day (**chopping motion moving forward switching between hands two chops**) life. Untreated (outward motion), your blood pressure in your arteries would continue to elevate and worsen over time. So to prevent (**chopping block**) that we are going to put you on a drug called esuypzil. This will work to prevent complications (rolling of hands 2 rolls) of toogititis such as heart attack and stroke (count on fingers, thumb first) by keeping your blood pressure stable (both thumbs up). Esuypzil is an oral (**point to mouth**) suspension medication which means you'll have to measure your dose each time. I (**self point**) will give you a syringe (**needle squeeze; thumb on top, pointer and middle on bottom**) for that and you just have to make sure to shake (**shake 2 motions**) the bottle well before drawing up the liquid. Based on your (**outreach**) age and weight I want you to start with 6 mL a day for the first 4 (**4 fingers**) months. When you come (**come**

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motion w both hands) in for your refill we can discuss (**back and forth motion 2 hands**) increasing the dosage, but I think 6 mL will be plenty (**holding a large object**) while you adjust. You can also take it as a divided (**parting the sea**) dose if you prefer, but I (**self point**) recommend a single dose as it is important to take it at the same time every day. Most (open both hands) people prefer to take it in the morning with their breakfast, but taking it with food is not (**shake head**) necessary. Otherwise, I also want you to try to consume less (**shrinking w fingers**) salt and alcohol. Additionally (clasp), some patients have found increased positive results by avoiding dairy products. I will check in with you in 2 (**two fingers**) months. If you have any questions or concerns before then feel free to come by or contact me by phone (**phone**) at 555-0504.

3. Hello, my name is X, and I am a pharmacy student at the University of Alberta. Today, I will be practicing my patient interaction skills with a provided script.

   I will be taking care of you today. Okay I ran your prescription. As your doctor would hopefully have told you, you are in the early stages of toogititis which is a long-term condition. While this condition is incurable, I can help you to keep it controlled so that it isn't too much of a problem in your day-to-day life. Untreated, the blood pressure in your arteries would continue to elevate and worsen over time. So to prevent that we are going to put you on a drug called esuypzil. This will work to prevent complications of toogititis such as heart attack and stroke by keeping your blood pressure stable. Esuypzil is an oral suspension medication which means you'll have to measure your dose each time. I will give you a syringe (syringe) for that and you just have to make sure to shake the bottle well before drawing up (pump syringe once) the liquid. Based on your age and weight I want you to start with 6 mL a day (show amount on syringe) for the first 4 months. When you come in for your refill we can discuss increasing the dosage, but I think 6mL will be plenty while you adjust. You can also take it as a divided dose if you prefer, but I recommend a single dose as it is important to take it at the same time every day. Most people prefer to take it in the morning with their breakfast, but taking it with food is not necessary. Otherwise, I also want you to try to consume less salt and alcohol. Additionally, some patients have found increased positive results by avoiding dairy products. I will check in with you in 2 months. If you have any questions or concerns before then feel free to come by or contact me by phone (phone holding up showing back, without case) at 555-0504.

Appendix B

Script for medical condition: Luungodoria (luun-goo-door-e-ya)

Description: Long-term, progressive disease of the lungs that primarily causes shortness of breath due to over-inflation of the alveoli. It can lead to a collapsed lung, heart problems, and large holes in the lungs. Risk factors include age, smoking, exposure to smoke, fumes, dust, or pollution. Treated by **Vacsozem (VAK-so-zem)**: delivered through an inhaler directly to the lungs, to help open up the airways and minimize episodes of breathlessness.

Condition 1: Speech Only
Condition 2: Gestures
Condition 3: Props

1. Hello, my name is X, and I am a pharmacy student at the University of Alberta. Today, I will be practicing my patient interaction skills with a provided script.

   I will be taking care of you today. Okay. So it looks like we are changing you over to vacsozem to treat your luungodoria. My records say that you have been on puleomin (poo-le-O-min) for nearly two decades. I want to assure you that I have seen many patients switch to vacsozem easily and with a lot of success. That being said, the characterizing shortness of breath of luungodoria could reappear in this time of transition. It is unlikely but if it does happen you should get in touch with a medical professional so they can assess you. As you know, if untreated, luungodoria can lead to serious problems such as a collapsed lung or holes in the

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lungs. While you switch over to your new medication you do not need to change any of your habits, but I will just remind you of some general rules of thumb which should already be a part of your routine. You should avoid environments with smoke, fumes, or dust. Additionally, if you are a smoker I urge you to quit as it has detrimental effects on your lungs and makes them weaker and more susceptible to luungodoria. With this new medication, you will be using an inhaler. You will begin by shaking the compressed container with the medication in it to ensure the med hasn't settled. Then you will bring the end to your mouth. Next, you will press on the button, while holding the tube to your face, and press 2–3 times to release the medication, inhaling deeply each time. This will ensure none of the medication is lost to the environment. The dosage is the same as your previous inhaler: once daily and then as needed. If you are in an environment where you are finding it hard to breathe you should use your inhaler. I will check in with you when you come to refill your prescription in a few months but if you have any questions or concerns in the meantime please either stop by or call the pharmacy at 555-0504.

2. Hello (wave), my name is X, and I am a pharmacy student at the University of Alberta. Today, I will be practicing my patient interaction skills with a provided script.

   I will be taking care of you today. Okay (clasp). So it looks like we are changing (**flip flop with both hands open**) you over to vacsozem to treat your luungodoria. My records say that you have been on puleomin for nearly two (**two**) decades. I (**hand on chest**) want to assure you that I have seen many (opening palms) patients switch (**flip flop – two hands**) to vacsozem easily (nodding) and with a lot of success (thumbs up). That being said (outreach), the characterizing shortness of breath (**breathing motion/move right hand up and down**) of luungodoria could reappear in this time of transition. It is unlikely but if it does happen you should get in touch with a medical professional so they can assess you. As you know, if untreated, luungodoria can lead to serious problems such as a collapsed (**move right hand across the other horizontally**) lung or holes (**dot with right pointer in opposite palm**) in the lungs. While you switch (**flip flop**) over to your new medication you do not (**shake head**) need to change any of your habits, but I will just remind you of some general (outreach) rules of thumb which should (nod) already be a part of your routine. You should avoid (**talk to the hand**) environments with (start here – count on fingers starting with thumb) smoke, fumes, or dust. Additionally (outreach) if you are a smoker I urge you to quit (**chop – right-hand chop on left palm**) as it has detrimental effects on your lungs (**hand to chest area**) and makes them weaker and more susceptible to luungodoria. With this new medication, you will be using an inhaler. You will begin by shaking (**shaking motion**) the compressed container with the medication in it to ensure the med hasn't settled. Then you will bring the end to your mouth (**palm over mouth**). Next, you will press on the button (**button pressing motion**), while holding the tube to your face (**move hands toward face**), and press 2–3 (light head motion) times to release the medication, inhaling (**exaggerated inhale**) deeply each time. This will ensure none of the medication is lost to the environment (**motion past shoulder**). The dosage is the same as your previous inhaler: once (**one**) daily and then as needed. If you are in an environment where you are finding it hard (palm on chest) to breathe you should use your inhaler (**hold hands to mouth in inhaler fashion**). I will check in with you when you come (**"come" motion**) to refill your prescription in a few months but if you have any questions or concerns in the meantime please either stop by or call by phone (**phone**) at the pharmacy at 555-0504.

3. Hello, my name is X, and I am a pharmacy student at the University of Alberta. Today, I will be practicing my patient interaction skills with a provided script.

   I will be taking care of you today. Okay. So it looks like we are changing you over to vacsozem to treat your luungodoria. My records say that you have been on puleomin for nearly two decades. I want to assure you that I have seen many patients switch to vacsozem easily and with a lot of success. That being said, the characterizing shortness of breath of luungodoria could reappear in this time of transition. It is unlikely but if it does happen you should get in touch with a medical professional so they can assess you. As you know, if untreated luungodoria can lead to serious problems such as a collapsed lung or holes in the lungs. While you switch over to your new medication you do not need to change any of your habits, but I will just remind you of some

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general rules of thumb which should already be a part of your routine. You should avoid environments with smoke, fumes, or dust. Additionally, if you are a smoker I urge you to quit as it has detrimental effects on your lungs and makes them weaker and more susceptible to luungodoria. With this new medication, you will be using an inhaler. This (hold inhaler) is the type of inhaler you will use. You will begin by shaking (shake the container) the compressed container (point) with the medication in it to ensure the med hasn't settled. Then you will bring this side (point) to your mouth. Next, you will press on the button (point), while holding the tube to your face (move to face), and press 2–3 times to release the mediation, inhaling deeply each time. This will ensure none of the medication is lost to the environment. The dosage is the same as your previous inhaler: once daily and then as needed. If you are in an environment where you are finding it hard to breathe you should use your inhaler. I will check in with you when you come to refill your prescription in a few months but if you have any questions or concerns in the meantime please either stop by or call the pharmacy at 555-0504.

Appendix C

Script for medical condition: Resaicoma (ree-sai-coma)

Description: Eye condition that damages the optic nerve, which is vital for good vision. Symptoms include vision loss, eye pain, mid-dilated pupil, redness of the eye, and nausea. Increased pressure in the eye, family history, and high blood pressure are all risk factors associated with Resaicoma. Treated by **Yimellus**: administered through eye drops. Wash your hands first, and to avoid contamination, do not touch the dropper tip or let it touch your eye or any other surface. Decreases aqueous humor production. Use this medication once per day, every day, even if feeling well.

Condition 1: Speech Only
Condition 2: Gestures
Condition 3: Props

1. Hello, my name is X, and I am a pharmacy student at the University of Alberta. Today, I will be practicing my patient interaction skills with a provided script.

   I'm going to take a few minutes to go over your medication. Your physician has prescribed Yimellus eye drops to treat an eye condition called Reesaicoma. This condition damages the optic nerve, which carries visual information to the brain, by causing higher-than-normal pressure inside the eye. Yimellus eye drops work by decreasing aqueous humour production and therefore decreasing pressure in the eye. These drops will also help with the eye pain, eye redness, and nausea you have been experiencing. You have most likely developed Resaicoma because of your history of high blood pressure. However, because we caught this early, treatment using Yimellus will greatly reduce your risk of vision loss. Make sure to shake the bottle vigorously to ensure the solution is mixed before administering the eye drops. To avoid contamination, wash your hands, do not touch the dropper tip, or let it touch your eye or any other surface. Remove the dropper from the bottle carefully, tip your head so that your eyes are facing the ceiling, and then squeeze the dropper gently so that three drops of the medication go into each eye. After doing so, look downward, gently close your eyes, and place one finger at the corner of your eye so that the medication doesn't drain out. Do this for 1 to 2 minutes. If you wear contact lenses, wait at least 15 minutes before replacing them. You can use the eye drops once in the morning and once in the evening. For storage, I recommend keeping your eye drops in the fridge, as this will help to prevent the medication from degrading or breaking down. It is also important that you use your Yimellus eye drops every day, even on days when your vision is clear and there is no pain or redness. You may experience temporary blurred vision, temporary burning/stinging/itching, eye redness, watery eyes, or a headache. These effects should go away after your eyes adjust to the solution, however, if any persist or worsen, please contact your physician immediately, as Yimellus may not be the right medication for you. If you have any questions or concerns regarding your new medication, please do not hesitate to contact the pharmacy.

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2. Hello (wave), my name is X, and I am a pharmacy student at the University of Alberta. Today, I will be practicing my patient interaction skills with a provided script.

   I'm going to take a few minutes to go over (**circular rolling once with hands**) your medication. Your physician has prescribed (palms together) Yimellus eye drops to treat an eye condition called (hand flick outwards) Reesaicoma. This condition (bounce hands palms up) damages the optic nerve, which carries visual information to the (**point at head**) brain, by causing (**high level with hand**) higher-than-normal pressure inside the eye. Yimellus eye drops work by (**lower level with hand**) decreasing aqueous humour production and therefore (bring hands together) decreasing pressure in the eye. These drops will also help with the (count off on fingers) eye pain, eye redness, and nausea you have been experiencing. You have most likely developed Resaicoma because of (**reach hand out**) your history of high blood pressure. However (open hands), because we caught this early, treatment using Yimellus will (hands far apart and bring together) greatly reduce your risk of vision loss. Make sure to (**shake fist**) shake the bottle vigorously to ensure the solution is (**intertwine fingers**) mixed before administering the eye drops. To avoid contamination, (**rub hands together**) wash your hands, (move both hands out to form X) do not touch the dropper tip, or let it touch your eye (**point to eye**) or any other surface (and then move hand across, in "finished" or "all done" gesture). Remove the dropper from the bottle carefully, (**push chin up with fingers**) tip head so that your eyes are facing the (**point up, don't bring down**) ceiling, and then (**pinch**) squeeze the dropper gently so that (**hold up 3 fingers**) three drops of the medication go into (**point to both eyes**) each eye. After doing so, (**tilt head down with fingers**) look downward, gently close your eyes, and (**hold up finger then place in corner**) place one finger at the corner of your eye so that the medication doesn't drain out. Do this for (**show 1 and 2 with fingers**) 1 to 2 minutes. If you wear contact lenses, (stop gesture) wait at least 15 minutes before (**circle motion over face**) replacing them. You can use the eye drops (**as if holding box, once to the left then once to the right**) once in the morning and once in the evening. For storage, I recommend keeping your eye drops in the (hand flick) fridge, as this will help to prevent the medication from (touch fingertips together) degrading or breaking down. It is also important that you use your Yimellus eye drops (**slice 2×**) every day, even on days when your vision is clear and there is (move both hands out to form X) no pain or redness. You may experience (count off on fingers) temporary blurred vision, temporary burning/stinging/itching, eye redness, watery eyes, or a headache. These effects should go away after your (**circular motion in front of eyes**) eyes adjust to the solution, however, if any (slice once and slice to the side) persist or worsen, please (**phone**) contact your physician immediately, as Yimellus may (move both hands out to form X) not be the right medication for you. If you have any (bounce hands) questions or concerns regarding your new medication, please do not hesitate to (**phone**) contact the pharmacy.

3. Hello, my name is X, and I am a pharmacy student at the University of Alberta. Today, I will be practicing my patient interaction skills with a provided script.

   I'm going to take a few minutes to go over your medication. Your physician has prescribed Yimellus eye drops (lift eye drops) to treat an eye condition called Resaicoma. This condition damages the optic nerve, which carries visual information to the brain, by causing higher-than-normal pressure inside the eye. Yimellus eye drops work by decreasing aqueous humour production and therefore decreasing pressure in the eye. These drops will also help with the eye pain, eye redness, and nausea you have been experiencing. You have most likely developed Resaicoma because of your history of high blood pressure. However, because we caught this early, treatment using Yimellus will greatly reduce your risk of vision loss. Make sure to shake the bottle vigorously to ensure the solution is mixed before administering the eye drops (shake bottle of eye drops). To avoid contamination, wash your hands, do not touch the dropper tip (pointing out the tip), or let it touch your eye or any other surface. Remove the dropper from the bottle carefully, tip your head so that your eyes are facing the ceiling, and then squeeze the dropper gently so that three drops of the medication go into each eye (demonstrate using the prop one eye). After doing so, look downward, gently close your eyes, and place one finger at the corner of your eye so that the medication doesn't drain out. Do this for 1 to 2 minutes. If you

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wear contact lenses, wait at least 15 minutes before replacing them. You can use the eye drops once in the morning and once in the evening. It is also important that you use your Yimellus eye drops every day, even on days when your vision is clear and there is no pain or redness. For storage, I recommend keeping your eye drops in the fridge, as this will help to prevent the medication from degrading or breaking down. You may experience temporary blurred vision, temporary burning/stinging/itching, eye redness, watery eyes, or a headache. These effects should go away after your eyes adjust to the solution, however, if any persist or worsen, please contact your physician immediately, as Yimellus may not be the right medication for you. If you have any questions or concerns regarding your new medication, please do not hesitate to contact the pharmacy.

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