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Recall of Medication Instructions by Young and Old
Adult Women: Is Overaccommodative Speech Helpful?

by

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B.A., Université de Moncton, 1986
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We accept this thesis as conforming
to the required standard

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Supervisor: Dr. Roger A. Dixon

ABSTRACT

In this study, we tested the effectiveness of overaccommodative speech as a way to improve recall and comprehension of long and complex medication regimen instructions. Overaccommodative speech was defined as speech containing exaggerated prosody, repetitions, tag questions and simplified vocabulary and syntax. Forty younger (\underline{M} age = 21 years) and 82 older (\underline{M} age = 71 years) adult women watched a videotape of an actor playing a physician presenting medication instructions in either overaccommodative or non-overaccommodative speaking styles. Participants performed a series of comprehension and recall tasks and gave subjective ratings of these stimuli.

We hypothesized that older individuals with lower scores on working memory would differentially benefit from the overaccommodative speech. However, the groups that consistently benefited the most from overaccommodative speech were older adults with higher performance levels on working memory, with younger adults also showing improved comprehension and recall in certain conditions. These data are interpreted as indicating that both the cognitive abilities of the individuals and the difficulty of the task determined whether certain adaptive strategies based on overaccommodative speech characteristics will be adopted.

A second goal of this study was an investigation of the relationship between cognitive ability as measured by working memory performance and subjective reactions to overaccommodative speech. Surprisingly, all three groups of participants

had similar general reactions to the two types of stimuli: They preferred the speech attributes in the overaccommodative speech, but preferred the person attributes of the non-overaccommodative speaker. These results highlight the need for identifying specifically which features of overaccommodative speech are effective at improving comprehension and recall, and which are perceived as offensive by elderly recipients before recommendations to use a specific speaking style can be made to health-care providers who need to communicate important and complex information to older adults.

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Table of Contents

Title page	i
Abstract	ii
Table of Contents	iv
List of Tables	vi
List of Figures	vi
Acknowledgments	viii
Dedication	ix
Chapter 1: Introduction	1
Medication Compliance in Late Adulthood	3
Recall and Comprehension of Medication Instructions	5
Medical Communication	8
Speech Accommodation Theory	12
Overaccommodative Speech and Cognitive Aging	17
Overview and Hypotheses	25
Chapter 2: Methods	30
Participants	30
Materials	33
Recall Scoring	39
Advice-giving Task	42
Vocabulary Questionnaire	44
Subjective Ratings of the Stimuli	44

	v
Personal Information Questionnaire	44
Medication History Questionnaire	45
Attitudes Questionnaire	45
Procedure	46
Chapter 3: Results	51
Working Memory	51
Free Recall of Medication Instructions	52
Advice Giving Task	67
Subjective Ratings	71
Chapter 4: Discussion	82
Recall of Medication Instructions	82
Advice Giving Task	89
Subjective Ratings	92
Limitations and Future Directions	98
References	104
Appendix A	114
Appendix B	122
Appendix C	124
Tables	124
Figures	131

List of Tables

Table 1:	Recall Stimuli Characteristics	125
Table 2:	Regression Analyses for Free Recall	126
Table 3:	Regression Analyses for Free Recall within Subject Categories	127
Table 4:	Changes in Recall of Main Ideas with the Presentation of Prompts for Unrecalled Topics	128
Table 5:	Subjective Reactions to the Videotape Stimuli	129
Table 6:	Mean Differences in Ratings between Videotape Stimuli and Societal Perceptions	130

List of Figures

Figure 1: Gist Recall of Videotape Stimuli	131
Figure 2: Recall of Main Ideas from Videotape Stimuli	132
Figure 3: Prompted Recall from Videotapes	133

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Dedication

This work is dedicated to the memory of my grandparents.

Abraham and Anita Gould

and

Marguerite and Joseph Caissie

Recall of Medication Instructions by Young and Old
Adult Women: Is Overaccommodative Speech Helpful?

Many of us adopt a distinctive manner of speaking when we are addressing small children, people with disabilities, or older adults. We tend to use simple words, simple sentences, and exaggerated voice intonations. This type of speech has been labeled overaccommodative by proponents of the Speech Accommodation Theory (Coupland, Coupland, Giles & Henwood, 1988) in that it involves a speaking style that underestimates the interpretive abilities of the recipient. Use of this type of speech with older adults has been observed in institutional care settings (e.g., Ashburn & Gordon, 1981), non-institutional care settings (Henwood & Giles, 1985, reported in Ryan, Giles, Bartolucci, & Henwood, 1986), and non-care intergenerational settings (Rubin & Brown, 1975; Ryan & Cole, 1990; Ryan et al., 1986). One setting where overaccommodative speech may be particularly salient is in medical interactions.

Professionals in the health-care field are exposed mainly to seniors with sensory, physical, or cognitive impairments (Greene, Adelman, Charon, & Hoffman, 1986) and many of their interactions are of limited duration and with people they do not know very well (Ryan & Cole, 1990). This combination of factors may result in the development of stereotype-based assumptions of communicative deficits in older adults. Indeed, health-care professionals may be more likely than non-professionals to have a negative view of aging (Greene et al., 1986; Street, 1991), to use overaccommodative speech (Ashburn & Gordon, 1981) and to view overaccommodative speech as necessary for successful communication with older

adults (Caporalet, Lukaszowski, & Culbertson, 1983; Shadden, 1988). Observational studies of physician-patient interactions also suggest that the age of the patient affects the amount of information provided, with older patients receiving less information than younger patients (Greene et al., 1986).

Although the literature describing the characteristics of overaccommodative speech is growing, very little empirical work has addressed whether this type of speech is a useful communicative strategy. Some lines of investigation suggest, however, that overaccommodative speech may be helpful in communicating effectively with older adults. It is well established that age-related changes in cognitive functioning greatly affect language processes. Age-related changes in language processes have been identified in older adults for language production (e.g., Cooper, 1990; Kynette & Kemper, 1986), language comprehension (Cohen, 1979; Feirer & Gerstman, 1980), and for the recall of language materials (Hultsch & Dixon, 1984; Meyer & Rice, 1989). Thus, the use of simplified vocabulary and grammar may indeed increase older adults' comprehension of discourse. One particularly relevant measure of the effectiveness of overaccommodative speech is the amount of information that is recalled by the older recipient when overaccommodative speech is used to present stimuli. However, the few studies that have addressed the links between speaking styles and recall have either focused on subsamples of the characteristics of overaccommodative speech (e.g., Cohen & Faulkner, 1986), or not specifically tested age effects (Ley, 1979).

One setting where the comprehension and recall of verbally presented materials

is vitally important is in the health-care domain. Much health-care research suggests that compliance rates to medical regimens are lower in the elderly than in the young. Compliance occurs when a patient takes a prescribed drug in the manner specified by the physician. Both purely cognitive functions (whether the older adults understand and remember the regimen instructions) and more subjective factors (whether the older adults are willing to follow the regimen instructions) have been studied as causes of the low compliance rates shown by older adults. The use of overaccommodative speech by health-care workers may have strong links with both of these factors. The simplification of the vocabulary and syntax may reduce the comprehension difficulties of medication instructions, but the use of speech potentially perceived as patronizing may very well reduce older adults' willingness to follow instructions or indeed to pay attention to them.

As stated earlier, the role of overaccommodative speech in discourse comprehension and recall has yet to be verified. In the present study, this role will be assessed by examining the interplay between the cognitive abilities of the older recipients and the communicative styles used to present complex medical information.

Medication Compliance in Late Adulthood

The majority of older adults in North America are taking one or more prescribed medications. In their review of studies on drug therapy and compliance in the elderly, Gryfe and Gryfe (1984) found that in both the United States and in Great Britain, over 80% of older adults use medication, and some studies have showed that even among community dwelling older adults, an average of 3 pills a day are

consumed. Gryfe and Gryfe (1984) describe a 1973 report presented by D.E. Daws and P. Bell-Irving to the British Columbia Hospitals Association, where it was found that the average patient admitted to an extended care unit in Vancouver was taking 7 to 9 medications.

German and Burton (1989) reviewed a series of studies that used the data collected through the National Ambulatory Medical Care Survey on over 300 million patient visits in the United States. One of these studies focused on patients over the age of 65 and found that in only 32% of these patients' visits were no drugs prescribed. Indeed, "21% of the visits involved one drug; 12% of the visits involved two drugs; 16% of the visits involved three drugs; and 19% of the visits involved four or more drugs" (German & Burton, 1989, p. 224).

Much research has shown that older adults are unable or unwilling to comply with the drug regimens that are given to them. For example, Morrow, Leirer and Sheikh (1988) reviewed this literature and concluded that up to 40 or 50% of older adults do not take their medication as prescribed. Such high levels of drug administration (and of non-compliance) are especially worrisome given that there is very little information available about the impact that the physiological and anatomical changes that accompany aging have on pharmacokinetics and pharmacodynamics (Gryfe & Gryfe, 1984; Montamat, Cusack, & Vestal, 1989), though we know that the elderly are generally less tolerant of drug effects (Green, Mullen, & Stainbrook, 1986).

Two categories of factors have been noted in the literature as reasons for non-compliance: (a) the cognitive abilities of patients, or whether they are able to

comprehend and remember the instructions received (e.g., Morrell, Park & Poon, 1990; Morrell, Park, Poon, & Cherry, 1988; Morrow, Leirer, Altieri, & Tanke, 1991) and (b) the quality of the communication between the health-care provider and the patient (e.g., Buller & Buller, 1987; Kazis & Friedman, 1988; Garrity & Lawson, 1989; Hulka, Cassel, Kupper, & Burdette, 1976). Indeed, Green et al. (1986) carried out a meta-analysis showing that the manipulation of both types of factors could lead to higher rates of compliance and medication knowledge in older adults.

Recall and Comprehension of Medication Instructions

Much of the research on older adults' recall performance for medication information has focused on comparisons of different memory aids and stimuli formats. Crichton, Smith and Demanuele (1978) compared young and old adults who had received both written and verbal instructions with those who had only received verbal instructions. Participants were interviewed a day after being given an information session about their medication from their pharmacist. Participants having received both written and verbal instructions recalled approximately 84% of the information the experimenters deemed they should know, while participants having received only verbal instructions recalled 78% of such information. Participants recalled more of the practical aspects of the medical regimen, such as the frequency and times of the medication, rather than the name or purpose of the prescription. Finally, the authors suggested that there was a general trend towards lowered recall performance in participants over the age of 65, but no further details were provided.

Morrell and colleagues have carried out a series of studies to investigate the

recall of medication information with simulations of bottle labels as the main stimuli. Morrell et al. (1988) found that young adults could remember more medication information than could older adults in both self-paced and timed study conditions. Interestingly, no age by task difficulty interaction was found, which indicates that as the number of medications to recall increased, the performance in both age groups decreased by similar amounts.

In a later study, Morrell et al. (1990) studied the effectiveness of word and picture labels compared to labels containing words only. They found that while young adults' recall of the medical information seemed to improve in the mixed label condition, this pattern was not found for older adults. Young adults also outperformed older adults on the comprehension task, although comprehension seemed to decrease for both age groups when mixed stimuli were used. This research group has also investigated the effectiveness of external cognitive aids. Park, Morrell, Frieske and Kincaid (1992) determined that for an old-old sample, there were fewer errors when both over-the-counter pill organizers and organizational charts were used. The young-old group had so few errors in the control condition that improvement was not possible.

Leirer, Morrow, Pariante, and Sheikh (1988) carried out a study to investigate the effectiveness of two mnemonic techniques for improving compliance in a small sample of older adults (7 experimental subjects and 5 controls). The experimental group was trained in the use of a mnemonic technique that principally involved planning a link between the medication taking times and the participant's daily

activities. The second group received a generalized memory training module. Leirer et al. (1988) found that the experimental group had lower rates of non-compliance than the control group. The form of non-compliance that was particularly diminished by the mnemonic training was forgetting to take the pill completely (rather than simply taking it at an incorrect time). Overall, this form of mnemonic training decreased noncompliance from 32% to 10%.

The same group of researchers also tested the usefulness of voice mail to remind older adults of medication times (Leirer, Morrow, Tanke, & Pariente, 1991). Although again limited in sample size ($n = 8$ and 7 for the control and experimental conditions respectively), it was shown that voice mail subjects were more likely to take their medication, and to take it on time.

One final study that focused on the cognitive aspect of drug compliance was carried out by Morrow et al. (1991). In the first experiment they investigated the schema that older adults possess surrounding medication instructions by asking older participants to categorize and order pieces of information relating to drug instructions. In the second experiment they compared memory for drug instructions that were: (a) compatible with the older adults' schema for drug information in both category and order (standard presentation), (b) compatible with the older adults' schema in category but not order (category presentation), and (c) scrambled as to both category and order of presentation (scrambled presentation). As hypothesized, the older adults recalled the information that was compatible in both order and category better than the scrambled condition. No differences in recall performance were obtained between

standard presentation and category presentation, nor between category presentation and scrambled presentation.

Medical Communication

Communication between the patient and the physician affects the patient's compliance in at least two ways. First, many researchers have suggested that a positive relationship exists between compliance and the patient's perception of his or her relationship with the physician (Buller & Buller, 1987; Garrity & Lawson, 1989; German, Klein, McPhee & Smith, 1982; Kreps, 1990; Musialowski, 1988; Street, 1991). Second, the amount of knowledge that the patient has received about his or her diagnosis and medication has been linked to compliance (e.g., German et al., 1982; Gryfe & Gryfe, 1984; but see also Sands & Holman, 1985).

The importance of age in determining the quality of medical interaction has received very little empirical attention. Buller and Buller (1987) reported that some research in the past showed that physicians had positive reactions to older patients. Buller and Buller's own data, however, indicated no main effect of the patient's age on the patient's satisfaction, and the interaction between the communicative style of the physician and the age of the patient did not mediate the patients' satisfaction with their health care.

In contrast, Greene et al. (1986) carried out an observational study of actual doctor-patient interactions and developed an in-depth scheme for scoring their audiotaped recordings of the interactions. In their Geriatric Interaction Analysis (GIA) every topic that is raised is scored for a series of factors, including the physician's

behaviours on the dimensions of information-giving, questioning and support. Each dimension is scored on a 4-point scale in which a score of 1 means the physician has not responded to the topic at all and a score of 4 means the physician has "questioned, informed or supported the patient as completely or comprehensively as possible on a particular topic" (p. 116, Greene et al., 1986). The physicians and the patients were also rated on 5-point scales on a series of global dimensions. For physicians, the dimensions were: engaged-diffident, patient-impatient, egalitarian-condescending, and respectful-disrespectful. For the patients, the dimensions were: assertive-passive, relaxed-tense, friendly-hostile, and expressive-withdrawn.

Using the GIA, Greene et al. (1985) found that the doctors were rated as being less egalitarian, patient, engaged and respectful with older patients than with younger adult patients. These doctors were less likely to engage in joint decision-making with older patients, and gave them poorer quality information with regard to both doctor and patient initiated topics. One interesting possibility here is that older patients may expect their physician to be highly authoritative, and thus do not attempt to become involved in the medical decision-making. Thus by their seeming lack of involvement, the older adults may play an important role in creating an interaction they find unsatisfactory (Williams, Giles, Coupland, Dalby, & Manasse, 1990). Younger adults, with greater expectations of egalitarian interactions--even with such authority figures as physicians--would expect and manage higher levels of involvement in the decision-making. The results of Greene et al. do not seem to support this view, however, since older patients were not rated as significantly less assertive, relaxed, friendly or

expressive than younger patients.

Although set in a nursing home, a study by Ashburn and Gordon (1981) also emphasizes the importance of the caregiver role in the quality of the interaction. These researchers asked staff members and regular volunteer visitors at a nursing home to rate the communicative abilities of older adults before conversing with them. Based on the first 100 utterances of these conversations, it was found that the staff used modified speech with both alert and non-alert older patients, as indicated by the length, complexity and type of utterances used (but not the number of interrogatives). For the volunteer visitors, however, there was a strong trend towards higher rates of differentiation between older adults they had rated as alert and those they had rated as non-alert. These results suggest that these health-care professionals were more likely to speak to all older adults in a very simplified manner, even when they themselves did not consider these residents as having deficient communicative skills. It is important to note, however, that one weakness in the Ashburn and Gordon (1981) design was the lack of control over the activities being carried out during data collection, with the staff members apparently carrying out physical care while the visitors participated in purely social conversations.

Caporael et al. (1983) obtained a similar pattern of results when they asked caregivers and patients in a nursing home to rate secondary baby talk in which the content had been filtered out. For the caregivers, the rating of this type of speech as appropriate for successful interaction and as appreciated by the older residents was related to the caregiver's low expectations of the elderly in general.

Not only do health professionals speak differently to the older adults in their care, but they also seem to provide them with less information. Morris, Grossman, Barkdoll, Gordon, and Soviero (1984) carried out a national telephone survey in the United States on over a thousand people who had obtained a new prescription in the previous four weeks. The survey focused on both the experience at the pharmacy and at the doctor's office. At the pharmacy, only 23% of the entire sample were given information about the timing and the dosages of their medication, and fewer than 15% were given warnings and information about side-effects. Furthermore, "older respondents were about half as likely to receive directions for use counselling as younger subjects" (p. 1161). Morris et al. (1984) also found that only 16% of the sample reported that they had received written information with their recent prescription.

Morris et al. (1984) found that 70% of the individuals with a new prescription reported that they had received some verbal instructions at the doctor's office, and that most of this information was provided by the physician. During this interaction, a little more than half (56% and 58%) received information about dosage and timing respectively, but only about a quarter of the sample received information about precautions to be followed and possible side-effects. Again, older patients (over the age of 41) were less likely to receive spontaneous information about their medication. Whereas approximately 75% of the young adults were given instructions about how to take the medication, only approximately 55% of the older adults received this type of information (Morris et al., 1984). One obvious weakness of such self-report studies is

the possibility that older adults had received as much information as the young, but were unable to remember receiving it. However, in an observational study of medical interactions, Greene et al. (1986) also found that the older patients received less information and support from their physicians.

Garrity and Lawson (1989) suggested that physicians' failure to inform their older patients may be linked to their beliefs that individuals from the older age groups are not cognitively able to comprehend and recall this information. The physicians would thus use the patient's age as a basis for decreasing the amount of information that they present to the patient. The notion that speakers attune their speech to their beliefs about the recipients' abilities rather than the actual abilities of the recipient has been formalized in the Speech Accommodation Theory proposed by Howard Giles and extended to an inter-generational context by Nikolas Coupland and colleagues.

Speech Accommodation Theory

Speech Accommodation Theory (SAT) is a model that attempts to explain linguistic behaviours between individuals. The model addresses the behaviours of both the speaker and the recipient during a conversational exchange. It assumes that interactants attend closely to the language behaviours of others, and use this information to support a range of sociolinguistic strategies that enable them to adapt to specific conversational situations. Thus, by attending to each other's language productions, interactants are able to (a) adapt to each other's speaking styles (convergence), (b) accentuate the linguistic differences between them (divergence), (c) maintain their own speaking style despite that of their interlocutor (maintenance), or

(d) adopt speaking styles that are linked to the roles being played by both interactants (complementarity) (Coupland et al., 1988). Convergence is the most common occurrence, with divergence and maintenance occurring mostly in unpleasant or unsuccessful interactions, and complementarity limited mostly to role-determined interactions.

SAT focuses not only on the production of spoken utterances but also on the recipients' reactions to these utterances. The recipient can perceive the speaker's productions (a) as appropriate (accommodation), (b) as underestimating his or her comprehension abilities (overaccommodation), (c) as overestimating his or her comprehension abilities (underaccommodation), or (d) as using an unacceptable (e.g., rude, arrogant) speaking style (contra-accommodation) (Coupland et al., 1988).

Thus, according to SAT, during a successful interaction the speaker must be attending to four characteristics of the addressee (Coupland et al., 1988). First, for appropriate convergence in speaking styles to occur, the speaker must be attending to the other's productions. In medical interactions, there is often an institutionalization of the power differential between the two interactants such that a common pattern of conversation is complementarity. Thus, the physician is likely to be the initiator of most topics and to have longer speaking turns. Furthermore, the two interactants do not become more or less similar on these dimensions as the conversation progresses (Street, 1991).

Second, for appropriate accommodation to occur, the speaker must attend to the recipient's comprehension abilities (and must distinguish between actual, perceived and

stereotyped comprehension abilities). Examples of both over and underaccommodation in medical interactions have been reported. Physicians often use vocabulary (Greene et al., 1986) or present information (Tuckett, Boulton & Olson, 1985) that is not understood by the patient. However, underestimations of recipient's comprehension abilities are often observed in medical interactions, such as when physicians use such terms as "tummy" and "bellyache" (Street, 1991).

Third, the speaker must also attend to the recipient's conversational needs in order to use, for example, appropriate topic and turn management. As stated above, the role relations between the physician and the patient are very likely to be one of authority, with the physician having much more control over the conversation than the patient. Thus, the patient is usually satisfied with an interaction in which the topic, topic changes and interruptions are initiated almost exclusively by the physician (Street, 1991). However, physicians are also perceived as too distant and as showing a lack of concern for their patients' emotional issues (Johnson, 1986; Nussbaum, Thompson, & Robinson, 1989).

Finally, the speaker must attend to the role relations in the dyad in order to use appropriate patterns of address and interruptions. Street (1991) reported that patients have many expectations about how the doctor should behave during the interaction, and that the patient can react negatively if the doctor is perceived as too passive or too domineering. A review of the research shows, however, that the physician is more apt to be perceived as too controlling than as too passive (Street, 1991).

The aspect of Speech Accommodation Theory that has received the most

attention in the gerontological literature is overaccommodation. This type of speech is likely to occur when the speaker is accommodating to a stereotypical view of older adults in general, rather than to the abilities of the individual interactant (Coupland et al., 1988). In aging research, this discrepancy between the recipient's abilities and the level of speech being received has also been referred to as the communication predicament of aging (Ryan et al., 1986). It most often occurs as a result of positive speaker intent, but is likely to be perceived as patronizing or demeaning by the recipient (Coupland et al., 1988). In settings where short, hurried interactions occur with strangers, it is more likely that the interaction style will be based on stereotypical beliefs. Although this can be functional in some settings, it is also less likely that behaviours disconfirming these stereotypical beliefs will be noticed in these circumstances (Ryan & Cole, 1990). Such a situation may occur quite often in medical settings. Moreover, the fact that medical professionals deal almost exclusively with frail and ailing older adults may also play an important role in determining their attitudes about aging. Indeed, "ageism may be an occupational hazard of the health care practitioner" (Greene et al., 1986, p. 113). Even with long-term physician-patient relationships, there is little evidence that communication styles change across time (at least with younger adults), possibly due to the institutional constraints on communicative roles in this context, as well as the lag between meetings (Street, 1991).

The speech that is produced when the speaker perceives the receiver as being old and frail has been described as being similar to babytalk, and some researchers

have used the term secondary baby talk to describe the speaking style used by the staff in nursing homes (e.g., Caporael & Culbertson, 1986). Very distinct speech characteristics have been identified in overaccommodative speech: "Characteristics of speech noted to shift...include slower speech rate, exaggerated intonation, use of high pitch, increased loudness, more repetitions, tag questions, altered pronoun use, and simplification of vocabulary and grammar" (Ryan & Cole, 1990, p. 173).

Brown (1977) distinguished two components of secondary babytalk. The first is clarification which involves simplifying speech in order to adapt to the perceived cognitive and linguistic competence of the receiver. Clarification thus results in such characteristics of secondary babytalk as slowing of speech rate, simplification of vocabulary, and simplification of syntax. The second component of secondary babytalk is affective, and includes features of speech that are often used to express affection and intimacy (Brown, 1977), but can also be used to express irony, insult, sickness or senility (Caporael et al., 1983).

In the present context, the term overaccommodative speech will be used to describe speech that integrates the clarification and the affective components of speech that is often perceived as overaccommodative, and that is sometimes termed secondary babytalk. In this study, this overaccommodative speech will be contrasted to non-overaccommodative speech which is defined simply as speech in which these components are not emphasized.

Relatively little work has been done on either the subjective reaction to or the effectiveness of overaccommodative speech. With regard to subjective reactions to

overaccommodative speech, Ryan et al. (1986) have discussed the fact that depending on the individual receiving such speech, it could be interpreted as nurturing and caring or patronizing and insulting. Ryan and Cole (1990) asked older women from a nursing home and from the community to fill out questionnaires on their perceptions of and preferences for the speech characteristics they had observed in younger adults. They found that community residents were more critical of inter-generational speech, while nursing home residents received more of the simplified speech, and were more likely to enjoy this speaking style. Both groups, however, wished for more respectful and kind speech from younger adults. Similar findings were obtained by Caporael et al. (1983) with an institutionalized population. These researchers found that older adults with lowered functional ability were more likely to prefer baby talk speech.

In sum, the Speech Accommodation Theory provides a potentially fertile framework for investigating the effectiveness of different speaking styles, and for identifying the characteristics that form these speaking styles. It also permits the integration of the speaker's intent and behaviours with the recipient's subjective and comprehension reactions. This integration is necessary for an understanding of the real-world effectiveness of speaking styles in such settings as medical interactions.

Overaccommodative Speech and Cognitive Aging

Many studies have investigated the effectiveness of specific characteristics of speech in increasing comprehension and recall in the older adults. Although not carried out within the theoretical framework of Speech Accommodation Theory, these studies nonetheless focused on specific properties of overaccommodative speech.

Susan Kemper and colleagues have shown that older adults have much more difficulty coping with syntactically complex materials than do younger adults (e.g., Kemper, 1987; Kynette & Kemper, 1986; Norman, Kemper, Kynette, Cheung, & Anagnopoulos, in press). Thus, older adults are more likely to have lowered performance on comprehension and recall tasks when many embedded clauses are present, especially if these embedded clauses appear left of the main verb. Kemper and colleagues proposed that these left-branching sentences place heavy demands on working memory, since the information that is necessary to comprehend the last part of the sentence must be stored while the embedded clause is processed. Thus, even with such a simple task as repeating a sentence out loud (and correcting a grammatical error if it is present), older adults are found to have much more difficulty with left-branching sentences than with right-branching ones (Kemper, 1986).

Feier and Gerstman (1980) used left- and right- branching sentences in a sentence comprehension task. To measure sentence comprehension, they asked their subjects to act out complex sentences using the animal toy figures provided (e.g., the giraffe kicked the lion that bumped into the elephant). Four age groups were tested (18-25 years; 52-58 years; 63-69 years; 74-80 years) and it was found that sentence comprehension was stable until the sixties. At this point, there was a significant difference in the number of errors produced by the young-old and the old-old adults. However, the age groups were not affected differentially by the right- and left-branching sentences. Notably, Dixon, Kurzman, and Friesen (1993) also found that older adults did not have a particular difficulty with left-branching sentences when the

task was to copy left- and right-branching sentences they had read. The discrepancy between the findings obtained by the Kemper group and the latter two studies suggest that the communication situation may play an important role in determining the comprehension difficulties experienced by older adults.

Other measures of complexity have also suggested a strong relationship between syntactical complexity and performance in older samples. Kemper, Jackson, Cheung, and Anagnopoulos (in press) found that reducing propositional density and reducing syntax complexity improved the comprehension performance of older but not young adults. Furthermore, many researchers (e.g., Cohen, 1979) have found that age-related differences are particularly large when participants are required to carry out inferences for successful comprehension to occur. Within the present context, this would lead us to predict that the use of overaccommodative text should be more effective for older adults than for young, since the simplified syntax and the redundancy inherent to such stimuli should reduce the need for inference making during comprehension.

Other characteristics of the clarification component of overaccommodative speech are simplified vocabulary and redundancy or repetition. In a series of studies with a mostly young adult population, Ley (1979) found low levels of recall (46% to 63% of an average of 5.5 to 11.9 physician statements). They identified a series of factors that increased amount of recall, including the use of simple words and sentences, repetition, concrete rather than abstract statements, and explicit categorization. While not presented within any theoretical context, these empirical

observations correspond quite closely to the clarification component of overaccommodative speech. These results suggest that this type of speech should show improved recall performance for at least the younger adults.

A series of studies have also addressed the role of prosody in determining comprehension and recall performance in older adults. Prosody is a term used to describe voice intonations, word stress, inter-clausal pauses and other acoustic features that provide linguistic information (Stine, Wingfield, & Poon, 1989). Stine and Wingfield (1987) found that the presence of normal prosody in speech benefitted the older adults more than it did younger adults. These authors hypothesized that prosody acts as a pre-processor of the information presented, and thus can compensate for age-related deficits in processing capacity. Further support for this notion was obtained by Wingfield, Lahar, and Stine (1989) who asked participants to choose segments of speech to recall. They found that the presence of prosody in the speech allowed older adults to choose segments that they could recall accurately. When the prosody was not present they were much less sensitive to their recall abilities. In related studies, Wingfield, Poon, Lombardi, and Lowe, (1985) found that older adults were also able to use syntactic and semantic constraints within a sentence to cope with very rapid speech presentations.

Cohen and Faulkner (1986) found that when the important words in a text were stressed by the reader, comprehension and recall were improved for older recipients. The advantage of stressed speech was stronger for the older than for the younger adults for the inference questions and for the questions that required exact recall of

names or numbers. On verbatim recall questions, younger and older adults benefitted equally from having stressed speech. Overall, however, the size of the stress effect was not significantly correlated with age, vocabulary score, or digit span. There was a strong relationship between total recall score and digit span. Cohen and Faulkner (1986) suggested that the spoken stress was beneficial because it resulted in a pre-processing of the stimulus information and in this way compensated for reduced processing capacity.

It is important to note, however, that the speech used in all of these studies differs in many ways from overaccommodative speech. Indeed, even the stimuli created by Cohen and Faulkner (1986) differs from overaccommodative speech in that it does not contain the high and varied pitch or the simplified vocabulary and syntax characteristic of overaccommodative speech (Ryan, 1990, personal communication). Thus, the possibility that a more complete version of overaccommodative speech can act as a mechanism for maintaining high levels of comprehension and recall in older recipients, particularly in medical contexts, remains uninvestigated.

Based on the results of the preceding studies, it is hypothesized here that overaccommodative speech, while potentially unpleasant, will nonetheless increase comprehension and recall performance. It is important to note, however, that it is also possible that by simplifying the language, the speaker is also rendering it less precise and actually hindering recall performance. Specifically, it is possible that attempts to simplify the vocabulary, in particular, lead to unnecessary confusion if the word or phrase used to replace the more complex vocabulary are less accurate and specific.

This is particularly relevant given that the passive vocabulary skills of older adults are often found to be as good or better than that of younger adults. In contrast, their ability to identify a word when they are presented with its definition is much more reduced with age (Salthouse, 1988). Furthermore, if the speaker is constantly replacing usual, well-practiced syntactical structures with simplified syntax, these unrehearsed productions may be awkward and result in a badly structured discourse. Poorly structured discourse has been found to reduce recall performance in older adults (Hultsch & Dixon, 1984).

A further possibility is that the high pitch and exaggerated intonation components of overaccommodative speech will frustrate or anger the recipients, and that this negative affect will influence comprehension and recall performance. There are some indications that older adults in a depressive mood recall less information during a surprise recall than do non-depressed older adults (Kelley, 1986). In addition, anxiety may be particularly related to recall performance in older samples (Davidson, Dixon, & Hultsch, 1991). Motivation has also been argued to be an important factor in determining cognitive performance in older adults (Perlmutter & Monty, 1989). Finally, Ley (1979) found that with a mostly young adult sample and medical instructions as stimuli that anxiety was related to recall performance in a curvilinear fashion. While none of these studies address the relationship between angry or indignant moods and cognitive performance specifically, they nonetheless suggest that mood may be an important influence on performance, especially with older adults.

As discussed earlier, there are suggestions in the literature that improperly

attuned speech may lead to lower compliance to medical instructions (Giles, Williams, & Coupland, 1990), although whether this relationship is mediated through a relationship between mood and recall is unknown. Of course, as noted by Ryan et al. (1986) it is not possible to make specific recommendations about what speaking style to use with a general elderly population because what is necessary for one older individual to understand the interaction will be perceived as demeaning by another. By definition, overaccommodative speech is defined by the recipient as underestimating his or her comprehension abilities. Obvious potential factors of importance here are the cognitive abilities of the recipients, and their sense of self-efficacy about their own cognitive abilities. Indeed, the research on subjective reactions to overaccommodative speech supports this notion, since community elderly (Ryan & Cole, 1990) and institutionalized elderly with higher ratings on daily living activities (Caporalet al., 1983) were more likely to be offended by this type of speech.

There are parallel findings in the cognitive aging literature that lead us to appreciate the importance of within age-group variability in cognitive functioning as a determinant of the effectiveness of overaccommodative speech. Two groups of factors can be argued to be particularly relevant in the present context.

First, the presence of high levels of verbal abilities as indicated by vocabulary measures and education, and the presence of extensive prior knowledge about a topic may be important determinants of recall performance by older adults. For example, older adults with differing levels of verbal ability and education have been clearly

shown to display very different patterns of text recall performance (Cohen, 1979; Hultsch & Dixon, 1984; Meyer & Rice, 1989). More importantly in the present context is the suggestion that extensive prior knowledge of the stimuli topic may also be an important mediator in recall performance. Hultsch and Dixon (1983) had participants recall biographical sketches of celebrities who were familiar to younger adults, older adults, or both. Older participants performed as well as the young when recalling the texts about the celebrities they were familiar with, but the younger participants were superior when the task involved recalling information about an unfamiliar celebrity. Dixon and Bäckman (1993) proposed that prior knowledge or expertise with the verbal materials being processed may serve as a compensatory mechanism to counterbalance age-related cognitive deficits. This process may be particularly relevant when the verbal materials being processed involve information about medications. Indeed, even healthy older adults are extremely likely to have gained experience with medications and medication regimens, either with their own prescriptions or those of the people around them. Thus, it is possible that older adults have developed extensive knowledge bases--and elaborated both learning and decision-making strategies--about medication information.

Working memory has also been proposed as an important determinant of performance on language processing tasks. Hultsch, Hertzog and Dixon (1990) showed that both verbal speed and working memory measures were substantial predictors of age-related differences in text and word recall performance (but see also Hultsch, Hertzog, Small, McDonald-Miszczak, & Dixon, 1992).

Similarly, Stine and Wingfield (1990) measured recall for high and low density texts and found that age was significantly correlated with recall performance, as were two different measures of working memory. More interesting, however, was the finding that with the simple, or low density texts, age was no longer a significant predictor of performance when working memory span was partialled out. With difficult, or high density texts, however, age remained a strong and significant predictor of performance after the variance due to working memory span was partialled out. It is important to note, however, that such clear increases of age differences as the processing demands of a task increased have not been consistent across laboratories (Salthouse & Babcock, 1991).

Overview and Hypotheses

In summary, based on the preceding findings, it is hypothesized in the present study that the effectiveness of overaccommodative speech as a potentially helpful manner to present information to older adults is dependent on the cognitive abilities--specifically, the working memory abilities--of older adults. Indeed, since language comprehension involves considerable simultaneous demands on storage and processing (Salthouse, 1990), it is possible that performance on working memory measures, which are hypothesized to measure the ability to store and manipulate information, could act as a mediator in determining what presentation style is most effective for that individual. The use of a single measure of working memory in studies attempting to identify a mediator of age-cognitive performance relationship has been criticized as being too task-specific (Salthouse, 1990). Thus, two out-of-context (Reading Span and

Alpha Span) and one within-context measure of working memory (Sentence Repetition) will be used in the present research to form a composite variable. Salthouse and Babcock (1991) suggested that such composite scores create a better measure of the theoretical construct of interest. While an out-of-context measure of working memory is developed specifically to measure working memory, in a within-context measure working memory performance is inferred from performance on an ongoing cognitive task (Salthouse, 1990).

In addition to the measures of working memory, the main measures in the present study are (a) multiple indicators of recall performance and (b) measures of the subjective reactions of the study participants to the stimuli. Each participant will recall a stimulus presented on videotape (in overaccommodative or non-overaccommodative speech) and then recall written medication instructions for a different medication, followed by delayed recall of the videotaped stimulus. Participants thus have to distinguish between two different medication regimens, and to remember complex medication instructions after a delay during which many cognitively demanding tasks have occurred. Both tasks are common in the lives of older adults.

It is hypothesized that the use of overaccommodative speech will differentially benefit the recall performance of the older adults with lower working memory performance. It is further hypothesized that neither the young adults or the older adults with higher performance on working memory will be significantly affected by the speaking styles used in the video stimuli. For recall performance, each participant

will first perform a free recall task, which will be scored for both gist recall and recall of main points. This free recall will be followed by topic prompts for the main ideas that have not been recalled spontaneously. For example, if the participant, in freely recalling the physician's medication instructions, omits to mention whether or not there are any foods or drinks to avoid, the experimenter will prompt for this topic. This situation is likely to be similar to how one would remember actual medication instructions. It is likely that for a few hours or days after a visit to the physician, one would be prompted during conversations to remember and relate specific aspects of the regimen to a spouse or relative, rather than recalling all of the information in one sitting.

Finally, the present design contains a measure of comprehension that involves both recall and inference-making. The participants in this study will be presented with short descriptions of scenarios in which a protagonist must make a decision about how to take medication (i.e., the same medication that was presented to the participant for recall). The scenarios will include descriptions of compliance errors such as errors in dosages or ignored warnings, and the task will involve advice-giving on the part of the participants. Thus, not only will the stimulus information be recalled to note the compliance errors, but disparate facts from the stimulus must be joined in order for the problem to be resolved. For example, a participant would have to note that a protagonist's daily coffee breaks contradict the restrictions on caffeine consumption while on the medication. This task will also allow the possibility that older individuals, faced with a real-life task, will be more motivated to recall information

from the stimulus than they are in a free recall situation. This finding would imply that free recall tests offer a conservative view of how much information from the medication instructions was actually encoded.

Another possibility is that older adults will base their advice on pre-experimental knowledge and strategies (correct or incorrect) rather than facts learned in the task. Older adults may use strategies that could be more or less specific and more or less adaptive to deal with medication dilemmas. Some possible strategies could be: "Always cease taking prescribed medication when you wish to take over-the-counter medication," or "When you feel poorly while on medication, reduce the dosage to see if your health improves." Because older individuals are more likely to involve their personal values and opinions in a recall task than are younger adults (Cohen, 1979; Gould, Trevithick, & Dixon, 1991), the following two predictions are made. First, older participants will notice fewer of the protagonist's non-compliant behaviours. Second, because of their more extensive experiences with prescribed medications, older adults will be more likely to use generalized strategies than will younger adults.

Finally, the study included measures addressing subjective reactions to the different stimuli. Of particular interest is whether working memory performance mediates the relationship between subjective responses to the stimuli and speaking styles of the stimuli videotapes. Based on previous research (Caporael et al., 1983; Ryan & Cole, 1990), it is hypothesized that the older adults with higher working memory performance will be more offended by the speech than will the older adults

with lower working memory performance.

Method

Participants

One hundred and twenty two women were tested in this study. The 82 older women ($M = 71$ years) were recruited through newspaper advertisements, while the 40 younger women ($M = 21$ years) were recruited through posters on the University of Victoria campus, and through a subject pool in introductory psychology classes. All participants were paid an honorarium for their participation.

Thirty-eight younger women and 79 older women reported English as their first language. Of the younger women, 23 had full or part-time employment, and all 40 were full or part-time students. Of the older women, 5 had full or part-time employment, and 7 were part-time students. Women from both age groups were highly educated, with an average of 14 years of schooling in younger women, and 13.5 in older women. This difference was not statistically significant, $F(1, 120) = 2.24, p > .05$. As will be described below, the older women were also divided into low and high working memory ability groups. There was no difference in education between these two groups, $F(1, 52) = .09, p > .05$. Despite this similarity in education levels, older women ($M = 84\%$) were found to have significantly higher vocabulary scores than younger women ($M = 68\%$), $F(1, 119) = 50.6, p < .001$. There was no difference between the high and low working memory ability groups of older women on vocabulary scores, ($F(1, 52) = 2.54, p > .05$).

Participants were also asked to report their general state of health. In the young group, all women reported their health as good or very good compared to a

perfect state of health. In the older group, 88% reported their health as good or very good, 11% reported their health as fair, and one woman reported being in poor health.

Medication practices. Of the younger women, 54% reported presently taking at least one prescription medication (this included birth control pills), and 98% reported having received a prescription in the past. For the older women, 80% were presently taking medication, and all reported having received at least one prescription for medication in the past. Only 5% of the younger women were presently taking 3 or more prescriptions, while 20% of the older women were taking 3 or more prescriptions. When asked to estimate how many prescription medications that they had received during their adult lives, 65% of young and 22% of older women reported less than 5 medications, and 10% of young and 46% of older women reported more than 10 different medications.

Participants were asked to estimate how often they thought they had missed a medication dose or taken it incorrectly in the past. While only 2.5% of the younger participants felt they had never taken medication incorrectly, 28% of the older women stated that this was the case. Furthermore, while 52.5% of the younger women reported having taken their medication incorrectly once a month or more, only 23% of the older women agreed. This difference between the age groups in the distribution of self-ratings was statistically significant, $\chi^2(5, N = 122) = 21.3, p < .01$. When asked why they had taken their medication incorrectly in the past, 87% of the younger adults cited forgetting, and 30% stated having decided to change the dosage. Within the older group, 61% cited forgetting as a cause, and 17% had changed their dosage

intentionally. The two age groups were significantly different in terms of frequency of missing dosages due to forgetting ($\chi^2(1, N = 122) = 7.2, p < .01$), as well as increasing dosages intentionally ($\chi^2(1, N = 122) = 8.5, p < .01$).

Medication instructions. Participants were also questioned as to their experience with different formats of medication instructions. The major results are as follows (a) 93% of the young and 83% of the older participants reported often or always receiving oral instructions from the physician, (b) 2.5% of the young and 3.6% of the old reported often or always receiving oral instructions from the nurse in the physician's office, (c) 45% of the young and 45% of the old had received oral instructions from their pharmacist, (d) 10% of the young and 13% of the old reported having received written instructions from their physician, and (e) 7.5% of the young and 16% of the old had received written instructions from their pharmacist (other than the pill bottle label). Participants were asked to rate how often they had experienced each type of instruction on a scale ranging from 1 (always) to 5 (never). Chi-square analyses compared the distribution of frequencies into these five categories across the two age groups. The only significant difference indicated that the older adults (83%) were more likely than young adults (62%) to have never received instructions from a nurse in their physician's office, $\chi^2(4, N = 121) = 14, p < .01$. There was also a trend toward a higher likelihood for older adults to receive written instructions from their pharmacist than were younger participants, $\chi^2(4, N = 121) = 8.8, p = .06$.

Participants were asked to state how they would like to receive medication instructions. They were asked to select as many as applied from among five choices.

Significant differences in frequency distributions across age groups were obtained for: (a) oral instructions by the doctor (Old = 71%, Young = 95%, $\chi^2(1, N = 122) = 9.4$, $p < .01$), (b) oral instructions by the nurse (Old = 10%, Young = 1%, $\chi^2(1, N = 122) = 5.3$, $p < .05$), and (c) oral instructions by the pharmacist (Old = 55%, Young = 30%, $\chi^2(1, N = 122) = 6.8$, $p < .01$). Participants from the two age groups chose the options of written instructions from the doctor (70%) and written instructions from the pharmacist (43%) at similar rates.

Materials

Three major types of measures were used in this study: (a) tests of working memory, (b) tests of prose recall, and (c) self-report questionnaires of demographic information and attitudes.

Tests of working memory. Three tests of working memory were used. The first is the Reading Span Test developed by Salthouse and Babcock (1991). In this test, the participant is asked to listen to a series of sentences and to answer a simple question for each sentence heard. At the end of each series, the participant recalls the last word of each sentence in the series. The Reading Span score that is assigned is the length of the longest series for which the participant correctly answered the questions and correctly recalled the last word of the sentences for two consecutive trials. For this test, the stimuli sentences were presented orally via audiotape. These tapes were prepared professionally in a recording studio by a radio announcer.

The second working memory measure used in this study is the Alpha Span (Craik, 1986). In this test, participants hear a list of words and must write them down

in alphabetical order. The lists were presented here via a professionally prepared audiotape. The lists varied in length from two to seven words, and the list lengths were randomly ordered. After each series of words, the participant heard a "beep" which indicated that they should begin writing down their answers. They were given up to 30 seconds to write down the words. The score used in the present study was the highest list length for which at least one trial was correct.

The last working memory measure used was the Sentence Repetition test developed by Kemper (1986). In this test, the participant hears a sentence and must repeat it out loud. Participants are advised that some of the sentences are grammatically incorrect, and that in those cases, they should repeat back a grammatically proper sentence by correcting the error that they hear. In the case of grammatically correct sentences, they should repeat the sentence that they hear word for word. The sentences followed four themes: (a) first person singular sentences about a person baking cookies for his or her grandchildren, (b) third-person singular sentences describing tricks performed for children by a clown, (c) first person singular sentences about air travel, and (d) third-person singular sentences about a person planning a birthday party. The first groups of sentences was a subsample of the ones listed in Kemper (1986), and the others were produced for the present study. Whereas Kemper (1986) used both long and short sentences, in the present study only longer sentences were used to increase the difficulty of the task.

A total of 24 sentences were read to each participant. Of these 24 sentences, 12 had a subordinate clause that appeared before the main verb (left-branching

sentences) and 12 had a subordinate clause that appeared after the main verb (right-branching sentences). Within the right-branching sentences, the following distribution of sentence types were used: (a) six sentences were grammatically correct, (b) three sentences were made incorrect by the addition of an unnecessary word, and (c) three sentences contained an incorrectly conjugated verb. Furthermore, the following subordinate clause types were distributed between the three sentence types (a) four clauses (two correct and two incorrect) began with the word that, (b) four clauses (two correct and two incorrect) began with the word when, and (c) four clauses (two correct and two incorrect) began with a gerund. A parallel distribution of sentences was developed for the left-branching sentences.

The Sentence Repetition score used in the present study was the percentage of correctly presented sentences that were correctly repeated by the participant. This proportion score was necessary to correct for any slips or mistakes on the part of the experimenter while reading the stimuli out loud to the participant. Thus, the speech of both the experimenter reading out the sentences and of the participant repeating them was audiotaped so that a count of the number of correctly presented sentences, as well as a count of correctly reproduced sentences was available. Stimuli sentences were read aloud by the experimenter at a rate of approximately one word per second, and with equal emphasis on each word in the sentence. Analyses of age differences in the proportion of correctly reproduced subcategories of sentences are available in Gould, Friesen, and Dixon (1993).

Written recall stimuli. Instructions for medication use were developed for two

fictitious medications, named Bendoral and Cranidil. Bendoral was said to treat a (fictitious) respiratory illness called Fletcher's Disease. Cranidil was prescribed for a (fictitious) condition called Grant's Condition that involved inflammation of stomach tissues. Participants were informed that these were fabricated names at the end of the testing session. Each set of instructions was first developed in written form, and included the following pieces of information: (a) information about the male physician, including his name and telephone number, (b) the name of the medication and its purpose, (c) instructions about when and how many times a day to take the medication, (d) instructions for what to do if one forgets to take a dose of the medication, (e) the duration of the prescription, (f) warnings about what to avoid drinking or eating while on the medication, (g) descriptions of the mild and severe side-effects that could occur, and (h) instructions for what to do if these side-effects should occur. This list of information to be included in medication instructions, as well as the order to present these items was based on research by Morrow et al., (1991) as well as on exemplars of pamphlets provided by drug companies to pharmacies for their customers. The specific characteristics of the written stimuli are provided in Table 1, and the stimuli for the Bendoral medication are provided in Appendix A.

Insert Table 1 about here

Videotaped non-overaccommodative recall stimuli. Both the Bendoral and the Cranidil instructions were written as a narrative script to approximate a physician

giving oral instructions to a patient. A professional actor in his early forties was hired to act out the role of a physician, and was videotaped doing so. His instructions were to pretend that he was giving medication instructions to a 40 year-old patient who was fairly healthy, active, and of average intelligence.

The tape began with the actor stating that the laboratory tests had been returned and describing in few details the nature of the medical condition that had been diagnosed. Thus, the stimuli were created such that it appeared that (a) the physician and patient had a continuing professional relationship, and (b) as though these instructions occurred during an office visit. Following the creation of the stimuli, the instructions as actually said by the actor were transcribed exactly. This was necessary because small deviations from the script were produced by the actor. Counts of the characteristics of the stimuli shown in Table 1 were based on this transcription. The speaking rate was approximately 130 words per minute.

Videotaped overaccommodative recall stimuli. After the normal speech or non-overaccommodative versions of the Bendoral and Cranidil instructions were developed, each script was reworked to integrate the characteristics of overaccommodative speech identified in the discourse literature. These characteristics include simplification and clarification of the speech at the phonological, syntactical, lexical, and discourse level (Coupland et al., 1988). Specifically, the following characteristics of speech were incorporated into the narrative. First, at the phonological level, the simplification included the use of careful and often exaggerated intonation. Second, at the syntactical level, simple and repetitive sentence structures were used (e.g., "I want you

to take one pill in the morning. I want you to take one pill at noon, and I want you to take one pill before bed"). Third, at the lexical level, rare and difficult words were replaced with more common ones (e.g., medication was replaced by pills) or with explanatory phrases (e.g., negative side-effects was replaced with "bad things that happen"). Fourth, at the discourse level, the number of questions and directives was greatly increased (e.g., I want you to take three pills, ok?). In addition, the explicitness and redundancy of the speech was also increased (e.g., "the next thing I'm going to talk to you about...", "you should take two pills before you eat, understand? You take two pills before you eat"). The specific characteristics of the stimuli are provided in Table 1. For this condition, the actor was asked to imagine the patient as being 85 years old, in ill health, inactive, and with severely declining mental abilities. The speaking rate used for this stimuli was approximately 120 words per minute.

As a check on the distinctiveness of the videotapes produced in the overaccommodative and non-overaccommodative conditions, four psychology students, two at the graduate and two at the undergraduate levels, were asked to watch and rate all four versions of the stimuli. All students easily identified the two speaking style conditions. The students were also asked to make ratings on a series of adjectives using a 5-point scale with not at all and very much as the scale anchors. Ratings on the following variables were significantly higher for the overaccommodative stimuli than for the non-overaccommodative stimuli: (a) exaggerated pitch, (b) overbearing, (c) quantity of directives, (d) patronizing, (e) slow speech, (f) simplified grammar, (g) simplified vocabulary, (h) explicit, (i) redundant, (j) quantity of interrogatives, (k)

demeaning. However, the overaccommodative and the non-overaccommodative stimuli were judged to be equal on clarity.

Recall Scoring

For each stimuli, a text base was produced using the Kintsch (1974) scoring scheme as adapted by Turner and Greene (1977). These text bases were then compared to the transcriptions of the audiotaped recall protocols produced by each participant in the study. Statistical analyses presented in the results section are based on the proportions of propositions recalled per stimulus.

One individual scored the propositions recalled for approximately one third of the protocols, and a second individual scored the remaining two-thirds. Both scorers independently scored 5% of the protocols for inter-rater reliability estimates. There was 99% agreement on how many propositions per story were recalled by a subject out of the whole set of propositions in the text base.

Following the scoring of the propositions, one scorer categorized the remaining text in the protocols into the following variables: (a) structural elaborations, (b) semantic elaborations, (c) annotative comments, (d) metastatements, (e) macrostatements, (f) errors, and (g) intrusions. The variables analyzed were a count per story of the number of each of these productions in the recall protocol. In the following, the underlined text are examples of the variable being defined.

Structural elaborations. These were statements that related only to the videotaped nature of the stimuli, and were not of theoretical interest (e.g., "he said," "I'm supposed to"). These productions were not analyzed further.

Semantic elaborations. These statements contained information that was not contained in the original stimuli, but that was not directly contradictory to it (e.g., I shouldn't drink beverages with caffeine like coffee, tea, or cocoa").

Annotative comments. These were statements that expressed an opinion or attitude about the stimuli or that contained autobiographical information related to the stimuli (e.g., "the doctor was very patronizing", "I take my real pills with milk also").

Metastatements. These were statements describing the participant's cognitive processes (e.g., "I can't remember the name of the pills").

Macrostatements. These were productions that contained information from more than one proposition in the stimuli. This form of summary recall did not allow individual propositions to be scored (e.g., "Fletcher's Disease has to do with breathing").

Errors. These were attempts at recall that were either direct contradictions of information in the stimulus (e.g., "Cranidil increases the production of stomach acids") or intrusions that applied to the previously presented stimulus. An example of an intrusion would be stating that the Bendoral is a treatment for a gastric trouble, when Cranidil, the previously presented stimulus, treated this condition. Intrusions were only scored in the second and third recall task.

Recall of main ideas. The 8 main points in each of the medication instructions were identified. These 8 main points were present in all three formats of Bendoral and Cranidil medication instructions. The main points were: (a) name of the medication, (b) name of the condition being treated, (c) the number of pills to be taken

each day, (d) the times to take the medications, (e) what to do if you forget to take a dose of medication, (f) what drinks or foods to avoid while on the medication, (g) what side-effects were possible, and (h) what to do if any side-effects occurred. The free recall protocols of each participant were scored in the following fashion. For each of the 8 items, three scores were possible. A score of 0 meant that the information could not be recalled or was recalled incorrectly. A score of 1 meant that the information had been recalled incompletely or was only partially correct (e.g., Benoril for Bendoral). A score of 2 was given when the information was recalled correctly and completely. (For the question relating to side-effects, a score of incomplete recall was applied when 3 or less of the 6 side-effects listed were recalled. Recalling 4 or more side-effects correctly resulted in a score of 2.) For the purpose of statistical analyses, the total score for a participant for a given story was the sum of the scores for the eight items. Thus, for each story, the free recall of main ideas score could vary between 0 and 16.

Recall with topic prompts. The free recall task was followed by topic prompts for the main ideas that were not recalled spontaneously during the free recall. For each of the main points of the story, one question was developed. For example, if the participant had omitted mentioning the name of the medication during her free recall, she was prompted by the experimenter to recall the name of the medication. The responses to these prompts were scored using the same criteria listed above for the recall of the main ideas. The variable used for statistical analyses was the recall score assigned for each of the main points, whether the actual information had been recalled

during free recall or as a result of prompting. Thus, the total score for a participant for a given story was the sum of the scores for eight items and could vary between 0 and 16.

One individual scored the free recall of main ideas and the prompted recall of main ideas for the entire sample, and a second scorer also scored 5% of the protocols. The two scorers agreed on 92% of their scoring decisions.

Advice-giving Task

Two short vignettes were created as the basis for a supplementary recall measure. One vignette described a woman named Betty who was taking Bendoral, and the second described a man named Jack who was taking Cranidil. These vignettes are reproduced in Appendix B. Five variables were scored for each trial. First, the total number of recommendations made by the participant was counted. A recommendation was defined as a statement in which a suggestion is made about what should be done (e.g., "she should call her doctor"). Second, each of these recommendations was identified as being either based on facts obtained from the stimulus (e.g., "she shouldn't be drinking coffee while on Bendoral") or based on general world knowledge not contained specifically in the stimulus (e.g., "she should make sure to get plenty of rest"). Third, the number of recommendations based on generalized strategies was counted. These were recommendations which were stated to be true always or almost always (e.g., "always stop taking prescriptions before you take over-the-counter drugs"). Note that while story- and world-knowledge based recommendations are mutually exclusive, all recommendations scored as generalized

strategies were also coded as story or world-based recommendations.

The fourth variable scored was the number of infringements from the medication instructions that were noted by the participant. For both the Bendoral and the Cranidil vignettes, the protagonist was contradicting the medication instructions in six specific ways. For example, Betty was described as going out for coffee with her daughter, even though she was prohibited from consuming caffeine products while on the medication. The fifth variable was a rating of the general quality of the advice offered by the participant. This rating was made on a 5-point Likert scale that ranged from 1 (Very good advice: extremely likely to lead to increased compliance to medication instructions) to 5 (Very bad advice: extremely likely to lead to a decrease in compliance to the medication instructions). The mid-point in the scale was 3 (Neutral: advice that is not likely to lead to better or worse compliance to medication instructions).

All protocols were scored by one individual, and a second individual also scored 5% of the sample to obtain inter-rater reliability. First, each grammatical clause was evaluated on whether or not it formed a recommendation, and the two scorers agreed on 92% of these decisions. Second, each recommendation was categorized (a) as being a fact-based or a world-knowledge based recommendation, and (b) as being a generalized strategy or not. The two scorers agreed on 80% of these decisions. Third, the two scorers were compared on whether each of the 6 instruction infringements had been noted, and they were found to agree on 86% of these decisions. Finally, the two scorers differed by an average of 0.3 on a 5-point

scale on ratings of the overall quality of the advice given.

Vocabulary Questionnaire

A 36-item multiple choice vocabulary test from the Kit of Factor Reference Cognitive Tests (Ekstrom, French, Harman, & Dermen, 1976) was used.

Subjective Ratings of the Stimuli

Parallel questionnaires were developed for the videotaped and written stimuli. Both questionnaires included three questions. In the first question, participants were asked to make ratings on a Likert scale of 1 (not at all) to 5 (very much) for each of a series of 8 adjectives applying to the stimuli. The list of adjectives was based on a questionnaire used by Ryan and Cole (1990). Some of these adjectives applied most to the speaker or writer of the speech (i.e., respectful, nurturing, patronizing, dominant, kind, helpful), whereas others applied to the style of speaking or writing (e.g., slow, clear, simple, organized, detailed). In the second question, participants were asked to compare the videotaped or written stimuli to same-modality instructions they had received from their own physicians or pharmacists. They were asked (a) which they preferred, (b) which was longer, (c) which was easier to understand, and (d) which was easier to remember. Finally, participants were asked to judge the likelihood that they would want the speaker or writer of the medication instructions as their own physician. This rating was made on a five-point Likert scale ranging from 1 (not at all likely) to 5 (extremely likely).

Personal Information Questionnaire

A short questionnaire was used to collect information concerning the

participants' educational and employment background. Participants were also asked to rate their own health.

Medication History Questionnaire

Supplementary information was obtained specifically about each participant's experiences with prescription medications. Questions related to (a) the number and type of medications taken, (b) preferences in medication instruction modalities, and (c) past compliance with medication instructions.

Attitudes Questionnaire

Finally, study participants filled out a questionnaire about their attitudes with regard to speech addressed to the elderly. This questionnaire was an adapted version of the one developed by Ryan and Cole (1990). Two age-specific versions of this questionnaire were used. In both versions, the participants answered core questions about subjective age, the status of different age groups in today's society, and young people's views of the elderly. In their version, the younger participants also made ratings on three dimensions: (a) the manner that young people generally speak to seniors, (b) the manner that they themselves speak to seniors, (c) the manner that young people should speak to seniors. Results from these core questions and the younger participants' ratings are not presented in this thesis.

In their version, the older participants were also asked to rate two dimensions: (a) the manner that young people generally speak to seniors and (b) the manner that young people should speak to seniors. For each of these dimensions, participants made ratings on a 5-point Likert scale (1 = not at all; 5 = very much) on eight

adjectives: (a) respectful, (b) nurturing, (c) patronizing, (d) dominant, (e) kind, (f) slow, (g) clear, and (h) simple. These ratings were used in the present study to evaluate the similarity of the videotaped stimuli to the speech experienced by the older women in their everyday interactions.

Procedure

Participants were tested individually in laboratories in downtown Victoria and on campus at the University of Victoria. Each participant first read and signed an informed consent form and then received a series of cognitive tests in a single order (see Appendix C). The first test was the Reading Span test of working memory. Each tape began with the announcer slowly counting to 10. This was used to adjust the volume to a comfortable level for each participant individually. Before the task began, participants were assured that the test had been constructed to be difficult, and that they should not be anxious if their performance was not perfect.

Following the Reading Span test, participants were asked to fill out a Vocabulary Questionnaire. During this time, the experimenter scored the Reading Span test in order to assign older participants to counterbalancing groups. Counterbalancing of the Story used (Cranidil or Bendoral) and of the Speaking Style presented (overaccommodative or non-overaccommodative) was thus based on the preliminary assignment to high and low working memory groups based on the Reading Span score. The cut-off points used were obtained from a large sample ($N = 323$) of older individuals tested previously in Victoria (Hultsch et al., 1992). Using these cut-off points, individuals with scores of (a) 2 or less on the Reading Span test were

assigned to the low working memory group ($n = 46$), (b) 4 or more were assigned to the high working memory group ($n = 16$), and (c) 3 were assigned to an intermediate group ($n = 20$). Within each of these groups, an equal number of participants from each of the three groups received the Cranidil and Bendoral stories, and equal numbers received the non-overaccommodative and overaccommodative videotapes.

After the data collection was complete, the three measures of working memory were combined to form a composite score of working memory. (This process and the composite variable are described further in the Results section.) This composite variable was used to make the final assignment to working memory groups. For the final group assignments, 29 participants formed the higher working memory subsample of the older adults (OHWM), and 25 participants formed the lower working memory subsample (OLWM). Participants assigned to the intermediate group ($N = 28$) were included only in the regression analyses as described in the Results section.

A comparison of the preliminary group assignments (based only on the Reading Span score) and the final group assignments (based on a composite of three working memory measures) shows that of the 29 OHWM participants, 4 had received a low score on the Reading Span measure, 13 had received an intermediate score, and 13 had received a high score. Of the 25 OLWM participants, 22 had received a low score on the Reading Span measure, 3 had received an intermediate score, and none had received a high score.

As indicated above, counterbalancing of the drug and the speaking style presentation was accomplished with preliminary subject groupings using only the

Reading Span test. When the final group assignments were established the following distribution of drug and speaking style instructions was obtained. Within the OHWM, 15 participants received the non-overaccommodative video presentation (7 with the Bendoral drug, 8 with the Cranidil drug), and 14 saw the overaccommodative video (10 with the Bendoral drug, 4 with the Cranidil drug). Thus, 17 of the OHWM participants saw the Bendoral instructions, and 12 saw the Cranidil instructions. Within the OLWM, 13 participants received the non-overaccommodative video presentation (6 with the Bendoral drug, 7 with the Cranidil drug), and 12 saw the overaccommodative video (4 with the Bendoral drug, 8 with the Cranidil drug). Thus, 10 of the OLWM participants saw the Bendoral instructions, and 15 saw the Cranidil instructions. The distribution of the stories across the two WM groups differed for neither the non-overaccommodative condition ($\chi^2(1, N = 28) = .0007, p > .05$) nor the overaccommodative condition ($\chi^2(1, N = 26) = 3.77, p > .05$).

Following the vocabulary test, participants were presented with the videotaped medication instructions. They were asked to pretend that the man on the videotape was a physician giving them medication instructions. They were also advised that they would be questioned about this information later. The stimulus tape began with the actor counting slowly to 10 to allow the experimenter to adjust the volume of the monitor. Following the presentation of the videotape, the participants were asked to fill out the Subjective Ratings of the Videotape Stimuli. When they were finished, the experimenter asked them to remember, in their own words, as much of the information as possible from the videotape. This recall was audiotaped.

During the participants' free recall, the experimenter noted which of the main ideas of the stimulus had been recalled. When the participants indicated that they had finished their recall, the experimenter provided topic prompts for the main ideas that had not been recalled spontaneously. Following the topic prompts, participants were presented with a page containing the Advice-giving task. Participants read along as the experimenter read the vignette aloud, and then returned the sheet. Their advice was audiotaped. Participants were then given as much time as was needed to fill out the Personal Information Questionnaire.

The Alpha Span test was presented next, followed by the written medication instructions. Participants who saw the Bendoral instructions on videotape received the Cranidil instructions in writing and vice versa. Participants were asked to pretend that the instructions were given to them by a physician. They were given eight minutes to study the stimulus, and informed that they would be questioned about this information later. Following the presentation of the written stimulus, the participants were asked to fill out the Subjective Ratings of the Written Stimuli. When they were finished, the experimenter asked them to remember, in their own words, as much information as possible from the written stimulus. This recall was audiotaped. Following the free recall of the written instructions, topic prompts were provided for the main ideas that had not been recalled. Another Advice-giving task was presented using a different protagonist, who was trying to decide how to take the medication that had been presented in the written stimulus. Following the Advice-giving task, participants were asked to fill out the Medication History Questionnaire.

The last working memory test given was the Sentence Repetition task, followed by delayed free recall of the videotape stimulus. Participants were asked to recall as much information as possible from the videotape watched approximately an hour earlier in the session. Topic prompts for the main ideas that had not been recalled during free recall were then presented. Finally, participants were asked to fill out the Attitudes Questionnaire, and a debriefing letter was distributed.

Results

Working Memory

Each participant received three measures of working memory: (a) the Alpha Span, (b) the Reading Span, and (c) the Sentence Repetition test. First, a composite working memory score was created by transforming the three measures of WM into z-scores (independently for the two age groups) and then obtaining their sum. Within the group of older participants, high and low working memory groups were identified based on this composite WM score. The sum of the z-scores for the older adults resulted in a variable that ranged from -5.8 to 4.8 ($\underline{M} = .01$, $\underline{SD} = 2.2$). Older participants with scores that were higher than half a standard deviation above the mean were identified as being older adults with a higher performance on working memory (OHWM, $n = 29$). Those who had scores that were lower than half a standard deviation below the mean were identified as being an older adult with lower working memory performance (OLWM, $n = 25$).

As a verification of the validity of the high/low WM split in the older participants, younger participants (YA) were compared to the two older groups on the raw scores of the working memory tests in a multivariate analysis of variance. The three working memory measures (Reading Span, Alpha Span and Sentence Repetition) were significantly different across the three groups in the multivariate analysis of variance (MANOVA), Wilks's $\underline{F}(6, 176) = 30.9$, $\underline{p} < .001$. Follow-up univariate analyses showed that for Reading Span, the comparisons between YA ($\underline{M} = 4.8$, $\underline{n} = 39$), OHWM ($\underline{M} = 3.3$, $\underline{n} = 29$), and OLWM ($\underline{M} = 1.7$, $\underline{n} = 25$) were all significant

using a Scheffe post-hoc test at the .05 alpha level. However, for Alpha Span, the OLWM group ($\underline{M} = 3.7$) had a significantly lower average score than both the OHWM group ($\underline{M} = 5.2$) and the YA participants ($\underline{M} = 5.6$). The mean scores of the latter two groups did not differ significantly. The same pattern was obtained with Sentence Repetition, where the OLWM ($\underline{M} = 56.7$) group differed from both the OHWM group ($\underline{M} = 80.9$) and the YA ($\underline{M} = 80.5$). In summary, the older participants who performed better than average on the working memory tests are, for the most part, similar to younger participants. However, on the arguably more difficult Reading Span test, the younger adults continue to perform better than even the better than average older adults.

Free Recall of Medication Instructions

As stated earlier, two different drug names and sets of instructions were used in both the videotaped and the written versions of the stimuli. Preliminary to the main analyses, a verification was made that there was no difference between the two stimulus stories used. A MANOVA was run with three dependent variables: (a) the proportion of propositions recalled from the videotape stimulus, (b) the proportion of propositions recalled from the written stimulus, and (c) the proportion of propositions recalled from the videotape stimulus after a delay. The independent variables were Age Group and Story. Results indicated that neither the Story effect (Wilks's $\underline{F}(3, 110) = .87, p > .05$) nor the Story x Age interaction were significant (Wilks's $\underline{F}(3, 110) = 2.1, p > .05$). Age effects will be discussed in the following section. Parallel analyses were done with the secondary recall variables, namely semantic elaborations,

macrostatements, metastatements, annotative comments, errors and intrusions. In all six MANOVAs, the Age x Story interactions were not significant at the $p < .05$ level. Furthermore, for all the variables except for macrostatements, the Story main effect was not significant. Because of the great similarity between the two stories with regard to gist recall, subsequent analyses in this study are based on conditions collapsed across the Story factor.

Three trials of free recall were obtained from participants. All participants performed immediate and delayed recall of a videotaped stimulus, as well as immediate recall of a written stimulus. The written stimulus recall task occurred between the two trials of the videotaped stimulus. The free recall of the videotaped stimulus data were analyzed using a 3 (Group; YA, OHWM, OLWM) x 2 (Speaking Style; overaccommodative, non-overaccommodative) x 2 (Time; immediate, delayed) mixed Analysis of Variance (ANOVA) with Time treated as a within-subject variable. The results of this analysis showed significant main effects for Time ($F(1, 85) = 74.1$, $p < .001$, $\eta^2 = .46$), for Group ($F(2, 85) = 5.5$, $p < .01$, $\eta^2 = .12$), and for Speaking Style ($F(1, 85) = 6.6$, $p < .05$, $\eta^2 = .07$.) None of the two- or three-way interactions reached statistical significance, and all showed F values below 1.10.

Despite the absence of significant interactions between the main effects, further exploratory analyses were performed to further investigate the Group and Speaking Style effects. First, the effect of the Speaking Style manipulation was tested with analyses of simple main effects within each of the levels of the Group factor. These analyses were carried out independently for the immediate and delayed recall trials.

As can be seen in Figure 1, for immediate recall, Speaking Style did not affect the proportion of propositions recalled by YA nor by OLWM. For OHWM participants, however, the overaccommodative stimuli was better recalled than the non-overaccommodative stimuli, $F(1, 88) = 5.3, p < .05$. For delayed recall, OLWM adults were not affected by Speaking Style. However, both OHWM adults ($F(1, 85) = 6.1, p < .05$) and YA ($F(1, 85) = 4.2, p < .05$) performed better with overaccommodative speech.

Insert Figure 1 about here

Second, in order to explore the differences in performance between the three groups within the two levels of the Speaking Style factor, Student-Newman-Keuls post-hoc tests set at the .05 alpha level were performed. For immediate recall of overaccommodative stimuli, all groups performed similarly. For immediate recall of non-overaccommodative stimuli, YA recalled a significantly higher proportion of propositions than did OLWM adults. At delayed recall, no Group effects were present in the non-overaccommodative condition. In the overaccommodative condition, however, OLWM performed significantly worse than both YA and OHWM groups.

The next analysis concerns recall of the written version of medication instructions. Recall performance on this test was analyzed separately from the videotaped stimuli recall, since the overaccommodative/non-overaccommodative manipulation was not used with the written stimuli. A simple ANOVA showed that there was indeed a strong Group effect for this test, $F(2, 89) = 8.8, p < .001, \eta^2 =$

.41. This analysis was followed up by Scheffe post-hoc tests using .05 as the alpha level. Younger adults ($\underline{M} = 21.5$) recalled a larger proportion of propositions than did both the OLWM adults ($\underline{M} = 14.5$) and the OHWM adults ($\underline{M} = 16.8$). The two older groups did not differ significantly.

Finally, a 3 (Group) by 2 (Modality) mixed ANOVA was carried out with Modality as a within-subject factor. For this analysis, the groups were collapsed across the two Speaking Style conditions. This analysis resulted in a significant main effect for Modality ($\underline{F}(1, 89) = 45.8, p < .001$), and a marginally significant Modality by Group interaction, $\underline{F}(2, 89) = 3.1, p = .051$. (The main effect of the Group factor for the written and videotape stimuli recall was significant, but has been described in detail above.) When separate repeated measure analyses of variance were performed for each of the three levels of the Group effect, it was found that all groups improved recall performance significantly from videotape to written presentation (YA, $\underline{F}(1, 37) = 36.3, p < .001, \eta^2 = .49$; OLWM, $\underline{F}(1, 24) = 7.6, p < .05, \eta^2 = .24$; OHWM, $\underline{F}(1, 28) = 10.9, p < .01, \eta^2 = .28$). The trend toward an interaction is due to the larger difference between videotape stimuli recall and written stimuli for the YA group (\underline{M} difference = 6.5) than for the OLWM (\underline{M} difference = 3.1) or OHWM (\underline{M} difference = 1.9).

Working memory and free recall performance. The relationship between working memory and performance on the free recall measure was investigated through a series of hierarchical multiple regressions. These analyses include the entire sample of older adults tested in this study, whereas the analyses reported above compared

(approximately) the top and bottom third of the older adults as determined by their composite WM score.

In the first analysis, immediate recall was the criterion variable and the predictor variables were entered in the following order: (a) Speaking Style, (b) composite Working Memory score, (c) Age Group, (d) the two-way interaction between Speaking Style and WM score, (e) the two-way interaction between Speaking Style and Age Group, and (f) the two-way interaction between Age Group and WM score. This order of entry was chosen to provide a lenient test of the main hypothesis (Speaking Style effects). As can be seen in Table 2, results indicated that even with this lenient test, the Speaking Style effect was not significant as a simple predictor. However, both the WM scores and the Age Group variable significantly increased the proportion of variance accounted for by the regression equation. None of the two-way interactions increased the variance accounted for when entered separately on a step in the equation. (An additional analysis showed that with all three interactions entered as one block statistical significance was still not obtained.)

Insert Table 2 about here

Although not statistically significant, there was a trend ($p = .07$) suggesting a relationship between the interaction between the Speaking Style x WM interaction and recall performance. This trend was further explored by running separate analyses for the different Speaking Style conditions. Results indicated that with non-overaccommodative speech, Age Group was a significant predictor over and above

WM score. These results indicate that other processes, indexed here by the Age Group variable, are important predictors of recall performance. These processes would include experiential differences between the two age groups, as well as age-related changes in cognitive abilities other than working memory. With the overaccommodative speech, however, WM score was the only significant predictor of recall performance. These analyses are presented in Table 3.

Insert Table 3 about here

These regression results on the full sample concur and extend the results reported above from the analyses on the extreme groups. Thus, it is only with the seemingly easier overaccommodative stimuli that a higher WM score can outweigh the simple and well-documented relationship between age and recall performance.

Parallel analyses were performed on recall of the videotape stimuli after a delay. As with the immediate recall data, Age Group was a significant predictor of recall performance. In this analysis, however, there was only a trend toward an effect of WM score ($p = .07$), and the Speaking Style \times WM interaction was a significant predictor (see Table 2). Further analyses of the interaction revealed a somewhat different pattern from that observed for immediate recall. In the non-overaccommodative stimuli, none of the predictors significantly improved prediction of recall performance. In the overaccommodative condition, however, both WM score and Age Group significantly increased the variance accounted for in recall performance (see Table 3). It is possible that after the one-hour delay, it was only

with the easier overaccommodative stimuli that the processes indexed by the WM composite and Age Group could play a role in determining performance.

Finally, the relationship between Age Group, WM score and recall performance was also examined with the recall of written stimuli. In this analysis, the variables were entered into the equation in the following order: (a) composite WM score, (b) Age Group, and (c) Age Group x WM score interaction. Results showed that only Age Group significantly increased the amount of variance accounted for ($R^2_{ch} = .15$, $F_{ch} = 20.1$, $p < .001$.)

Secondary recall performance variables. The secondary variables in the recall task (semantic elaborations, annotative comments, metastatements, macrostatements and errors) were subjected to a 3 (Group: YA, OHWM, OLWM) x 2 (Speaking Style: overaccommodative, non-overaccommodative) x 2 (Time: immediate, delayed) MANOVA. On this analysis, only the Time factor was statistically significant, Wilks's $F(5, 82) = 58.2$, $p < .001$. Follow-up univariate analyses showed that more semantic elaborations ($F(1, 118) = 26.2$, $p < .001$, $\eta^2 = .18$), more annotative comments ($F(1, 118) = 10.7$, $p < .01$, $\eta^2 = .08$), and fewer errors ($F(1, 118) = 11.6$, $p < .01$, $\eta^2 = .09$) were produced at immediate than at delayed recall. The number of semantic elaborations decreased from $M = 6.6$ to $M = 4.5$ productions per story after a delay, as did the number of annotative elaborations ($M = .78$ to $M = .35$). The number of errors increased slightly from $M = .5$ per story at immediate recall to $M = .9$ after a delay. The number of macrostatements and metastatements did not differ significantly between the immediate and delayed conditions (macrostatements:

immediate, $\underline{M} = 1.2$ and delay, $\underline{M} = 1.0$; metastatements: immediate: $\underline{M} = 3.1$ and delay, $\underline{M} = 2.5$).

The number of secondary recall variables produced was also compared between the two modalities (videotape and written stimuli). In this analysis, groups are collapsed across the two Speaking Style conditions since this manipulation was not present in the recall of the written stimuli. This multivariate analysis yielded a significant Group by Modality interaction, Wilks's $\underline{F}(10, 170) = 3.4$, $p < .01$. Follow-up analyses showed that this interaction was caused by the occurrence of a different pattern of results across the two memory tests by the OLWM group than the other two groups. Specifically, of the three groups compared, only OLWM adults did not have significantly fewer semantic elaborations in written recall than in video presentations (for OHWM, $\underline{t}(24) = 2.6$, $p < .05$; for YA, $\underline{t}(37) = 2.3$, $p < .05$). Also, only OLWM adults had more metastatements in their videotape recall than in their recall of the written stimuli ($\underline{t}(24) = 2.5$, $p < .05$). Furthermore, no group showed Modality effects in the number of errors or annotative comments made, but all groups (OLWM, $\underline{t}(24) = 3.6$, $p < .01$; OHWM, $\underline{t}(28) = 4.6$, $p < .01$; and YA, $\underline{t}(37) = 2.3$, $p < .05$) had more macrostatements in their videotape recall protocols than in their written stimuli protocols, though all groups averaged less than two macrostatements per story. For semantic elaborations, the number of productions per story ranged from 4.3 to 6.9, for annotative comments the range was .08 to 1.4, for metastatements the range was from 2.3 to 3.9, and for errors the range was from .4 to .8 productions per story.

The last secondary recall variable to be analyzed was a particular type of error

produced, namely intrusions from a previously presented stimuli. This variable could be scored in the recall of the written stimulus (the second recall task) and in the delayed recall of the videotape stimulus (the third recall task). A 3 (Group) by 2 (Modality) mixed ANOVA was performed and results indicated significant main effects for both the Group factor ($F(2, 88) = 5.7, p < .01, \eta^2 = .11$) and the Modality factor ($F(1, 88) = 2.2, p < .01, \eta^2 = .09$). More intrusions were present at the delayed recall of the videotape ($M = .5$) than at the recall of the written stimuli ($M = .2$). Furthermore, most intrusion errors were produced by OLWM adults ($M = .64$ per story), the second most were produced by OHWM adults ($M = .34$ per story), and the least number of intrusions were produced by YA ($M = .12$). Only the difference between YA and OLWM groups was statistically significant using a Scheffe post-hoc test.

Free recall of main ideas. The score on free recall of the main ideas of the medication instructions was obtained by giving two points for each correctly recalled of the eight main elements in the stimulus, and one point for every incompletely (but not incorrectly) recalled of the eight main elements in the stimulus. The main ideas were the following: (a) name of the medication, (b) name of the condition being treated, (c) the number of pills to be taken each day, (d) the times to take the medications, (e) what to do if you forget to take a dose of medication, (f) what drinks or foods to avoid while on the medication, (g) what side-effects were possible, and (h) what to do if any side-effects occurred. This recall score was submitted to a 3 (Group) by 2 (Speaking Style) by 2 (Time) mixed ANOVA, with repeated measures

on the last factor. This analysis showed that the Group x Speaking Style interaction was statistically significant ($F(2, 88) = 4.6, p < .05, \eta^2 = .09$), as were the main effects of Group ($F(2, 88) = 7.8, p < .01, \eta^2 = .15$), Speaking Style ($F(1, 88) = 6.8, p < .05, \eta^2 = .07$), and Time ($F(1, 88) = 12.4, p < .01, \eta^2 = .12$). The Time effect was due to the better performance at immediate ($M = 9.0$) than at delayed ($M = 7.9$) recall. The interaction was further investigated by submitting the average of the immediate and delayed score to univariate analyses.

First, the Group by Speaking Style interaction was investigated by carrying out Scheffe post hoc tests on the Group effect within the two levels of the Speaking Style factor. All tests were done using an alpha criterion of .05. As can be seen in Figure 2, there were no group differences when the stimuli were presented using non-overaccommodative speech, but when overaccommodative speech was used, the OLWM had significantly lower scores than both the OHWM and the YA.

Insert Figure 2 about here

Second, the presence of a significant Speaking Style effect was investigated within the three levels of the Group factor using a simple main effect ANOVA design. Again, this test was done on the average of the immediate and delayed recall of main ideas score. As can be seen on Figure 2, only the YA ($F(1, 88) = 4.0, p < .05$) and the OHWM ($F(1, 88) = 12.9, p < .01$) recalled significantly more of the main ideas when overaccommodative speech was presented than when non-overaccommodative speech was used.

Finally, recall of the two presentation modalities (videotape and written) were compared on recall of main ideas. This analysis yielded a significant Group effect ($F(2, 91) = 8.2, p < .01, \eta^2 = .15$). Neither the Modality effect nor the Group x Modality interaction term was statistically significant. Univariate Scheffe post hoc tests on the average of the videotape and written main idea recall scores indicated that the OLWM group ($M = 7.0$) had a significantly lower score than OHWM ($M = 9.2$) and YA ($M = 9.5$). The OHWM group did not differ from YA.

Topic prompts. Following free recall of the medication instructions, participants were presented with prompts for the main ideas that they had not recalled spontaneously during free recall. In the following analyses, each participant's score on prompted recall is their recall of the eight main ideas in the story, whether freely recalled or in response to topic prompts. The scores range between 0 and 16.

First, a mixed ANOVA was carried out on the prompted recall score of the videotaped stimulus. This was a 2 (Speaking Style) x 3 (Group) x 2 (Delay) design with Delay as a within-subject variable. This analysis yielded a significant Group effect ($F(2, 88) = 8.5, p < .001, \eta^2 = .16$) and a significant Group by Speaking Style interaction ($F(2, 88) = 3.1, p < .05, \eta^2 = .07$). None of the other effects or interactions were statistically significant. These results are presented in Figure 3.

Insert Figure 3 about here

Subsequent analyses were done using the average of the prompted recall scores in the immediate and delayed conditions. First, the effect of the Speaking Style factor

was tested within each of the three levels of the Group factor using a simple main effects design. This analysis showed that the Speaking Style manipulation was only effective for the OHWM where performance improved from 10.9 in the non-overaccommodative condition to 13.2 in the overaccommodative condition. Second, Group effects were tested independently within the two levels of the Speaking Style factor using a Scheffe post hoc test. Within the non-overaccommodative condition, all three groups had similar scores. However, within the overaccommodative condition, OLWM ($M = 10$) performed significantly worse than did OHWM ($M = 13.2$) or YA ($M = 12.2$). The OHWM did not differ significantly from the YA group.

A second analysis was carried out to compare performance on recall of the main ideas between the conditions when no topic prompts were present (free recall of main ideas) and when topic prompts were present. This is therefore a test of whether the provision of prompts significantly improves recall of the main ideas. Only effects concerning the presence of prompts will be discussed. First, as can be seen in Table 4, a significant main effect was found for the presence of prompts ($F(1,88) = 201.9$, $p < .001$, partial $\eta^2 = .70$). Second, significant effects were found for the (a) Prompt x Speaking Style interaction ($F(1,88) = 5.30$, $p < .05$, partial $\eta^2 = .06$), and (b) the Prompt x Delay interaction ($F(1,88) = 11.44$, $p < .01$, partial $\eta^2 = .11$). There was also a trend toward a Group x Prompt interaction ($F(2,88) = 2.89$, $p = .06$, partial $\eta^2 = .06$).

Insert Table 4 about here

Next, the interactions were investigated through a series of univariate analyses. Regarding the Group x Prompt interaction trend, it was found that the presence of prompts significantly improved recall of the main ideas in the story for all three groups, with the largest increase in scores occurring for OHWM (OLWM: $t(24) = 6.7$, $p < .001$; OHWM: $t(28) = 10.7$, $p < .001$; YA: $t(39) = 8.0$, $p < .001$). The presence of prompts increased recall performance by an average of 3.4 main ideas for OHWM, 2.2 main ideas for OLWM and 2.6 main ideas for YA.

Regarding the Prompt x Speaking Style interaction, the presence of prompts was helpful in both the non-overaccommodative ($t(60) = 12.7$, $p < .001$) and overaccommodative conditions ($t(60) = 9.38$, $p < .001$), with the presence of prompts improving recall by 3.2 main ideas for the non-overaccommodative condition, and by 2.4 main ideas in the overaccommodative condition. Finally, regarding the Prompt x Delay interaction, it was established that the effect of the prompts was significant at both immediate ($t(121) = 12.22$, $p < .001$) and delayed recall ($t(121) = 11.36$, $p < .001$), with the largest increase in the delayed condition. The means for these comparisons are presented in Table 4.

Prompted recall performance was also compared between the two groups that recalled information immediately after it was presented (videotaped and written presentation). The analysis carried out was a 3 (Group) x 2 (Modality) mixed ANOVA design with Modality as a within-subject factor. This analysis yielded a significant Modality effect ($F(1, 91) = 6.3$, $p < .05$, $\eta^2 = .06$) and a significant Group effect ($F(2, 91) = 9.0$, $p < .001$, $\eta^2 = .16$). The Group x Modality interaction was

not statistically significant. The Modality effect was due to the higher performance overall with the videotape stimuli ($M = 11.2$) than with the written stimuli ($M = 10.3$). The Group effect was investigated with Scheffe post hoc tests performed on the average of the two Modality scores. These results showed that the performance of the OLWM group ($M = 9.0$) was significantly lower than that of the OHWM ($M = 11.0$) and the YA ($M = 11.6$) groups. The difference between OHWM and YA was not significant.

The effect of receiving topic prompts was also tested for the two conditions in which information was recalled immediately after it was presented (videotaped and written presentation). The presence of the prompts was found to significantly improve recall performance ($F(1,91) = 243.99$, $p < .001$, partial $\eta^2 = .73$) and this factor did not interact with any other variables. The average recall score without the prompt was 8.75 and the average increased to 10.72 with the presence of the topic prompts.

Finally, the last set of analyses on the prompted recall data was designed to compare recall performance across the eight main ideas tested. These analyses were carried out on performance from all of the recall tasks (i.e., immediate recall of the videotape stimuli, immediate recall of the written stimuli and delayed recall of the videotape stimuli) resulting in 24 separate χ^2 tests. For each of these tests, the distributions of the three possible scores (incorrect, semi-correct and correct recall) were compared across the three participant groups (YA, OLWM, OHWM) using chi-square statistics.

The chi-square tests indicated a dependency between the group variable and the

answer category for four of the questions. For the immediate recall of the side-effects presented on the videotape, 8% of OLWM, 34% of OHWM, and 49% of YA were assigned a correct recall score ($\chi^2(4, N = 92) = 15.7, p < .01$). For the delayed recall of the medication name, 9% of OLWM, 31% of OHWM and 46% of YA were assigned a correct score ($\chi^2(4, N = 86) = 12.3, p < .05$). For the recall of the disease name from the written stimuli, 63% of OLWM, 72% of OHWM, and 92% of YA were assigned a correct score ($\chi^2(4, N = 77) = 11.2, p < .05$). Finally, recall of the number of pills to be taken each day from the written stimuli was correct for 74% of OLWM, 96% of OHWM, and 94% of YA ($\chi^2(4, N = 89) = 8.8, p < .05$).

The next set of analyses on the prompted recall data was designed to compare recall performance by the two Speaking Style manipulations across the eight main ideas tested. These analyses were carried out on performance from the two relevant recall tasks (i.e., immediate and delayed recall of the videotape stimuli) resulting in 16 separate chi-square tests. For each of these tests, the distribution of three possible scores (incorrect, semi-correct and correct recall) were compared across the two manipulations (i.e., overaccommodative and non-overaccommodative speech) using chi-square statistics.

The chi-square statistic indicated that these two variables were significantly related for four questions. For the immediate recall of the times to take the medication for the videotape presentation, 47% of the participants receiving the non-overaccommodative stimuli recalled the information completely and correctly, and 73% of the participants with overaccommodative stimuli did so ($\chi^2(1, N = 91) = 6.3, p$

< .05). For the immediate recall of the appropriate responses of side-effects, 23% of the non-overaccommodative recipients had correct recall, and 43% of the overaccommodative recipients were assigned a correct score ($\chi^2(1, N = 92) = 4.3, p < .05$). For the delayed recall of the times to take the medication, 30% of the non-overaccommodative recipients recalled the information correctly, and 60% of the overaccommodative recipients received a correct score ($\chi^2(2, N = 87) = 8.9, p < .05$). Finally, for the delayed recall of the side-effects that can occur, 2% of the recipients of the non-overaccommodative recipients recalled the information correctly, and 19% of the overaccommodative recipients were assigned a correct score ($\chi^2(2, N = 89) = 7.3, p < .05$).

Advice Giving Task

Following their free and prompted recall of the medication directions, participants were asked to give advice to a person described in a vignette. In the first analysis, the two general measures of advice giving were included, namely, the total number of recommendations produced and the ratings of the quality of the advice. These two measures were the dependent variables in a 2 (Speaking Style) x 3 (Group) MANOVA. This analysis yielded a significant Group by Speaking Style interaction, Wilks's $F(4, 164) = 2.8, p < .05$, but neither main effect was statistically significant. Follow-up univariate analyses indicated that neither variable showed significant main or interaction effects when analyzed alone.

Each recommendation was rated as being based on (a) story information or (b) general world knowledge. These two variables were analyzed in a 2 (Speaking Style)

x 3 (Group) MANOVA. In this analysis, only the Speaking Style effect was found to be statistically significant (Wilks's $F(2, 82) = 4.2, p < .05$). Follow-up univariate analyses indicated that the Speaking Style manipulation was only effective for the number of story-based recommendations, $F(1, 87) = 5.5, p < .05, \eta^2 = .24$.

Individuals receiving the overaccommodative speech ($M = 2.5$) produced more recommendations based on story facts than did individuals receiving the non-overaccommodative speech ($M = 1.8$).

There were too few ($M = .07$) recommendations based on generalized strategies to analyze statistically. The last advice-giving variable was a count of the number of instruction infringements committed by the vignette protagonist that were noted by the participant. This variable was subjected to a 2 (Speaking Style) x 3 (Group) ANOVA. Only the Group by Speaking Style interaction was statistically significant ($F(2, 83) = 3.9, p < .05$). Follow-up post hoc tests on the two Speaking Style levels separately did not yield significant Group differences using a Scheffe test with a criterion of .05. However, a statistically significant effect was found when the Speaking Style effect was investigated within each level of the Group factor using a simple main effects design. The Speaking Style effect was significant for OLWM adults ($F(1, 83) = 6.4, p < .05$), but not for the other two groups. OLWM participants noted an average of 1.6 infringements when presented with the non-overaccommodative stimuli, but noted an average of 3 infringements to the medication instructions when presented with the overaccommodative stimuli. The OHWM group noted an average of 2 infringements and the YA noted an average of 2.2 infringements across the two Speaking Style

conditions.

The advice-giving task was also administered after recall of the written instructions. The general measures of the advice following the written format (total number of recommendations given and ratings of the quality of the recommendations) were analyzed as the dependent variables with 3 (Group) as the only independent variable in a multivariate analysis of variance. This analysis yielded a significant Group effect (Wilks's $F(4, 164) = 2.6, p < .05$). Follow-up analyses showed that this Group effect was present for the quality ratings ($F(2, 83) = 3.9, p < .05, \eta^2 = .29$) but not for the total number of recommendations. A Scheffe post hoc test indicated that this Group effect was present as a result of the YA participants ($M = 2.8$) producing better quality recommendations than did the OLWM participants ($M = 3.5$). The advice of the OHWM group was given an average rating of 3.

The number of recommendations based (a) on information from the story or (b) on real world knowledge were compared across the three subject groups in a multivariate analysis of variance and no statistical significance was obtained in this analysis. Another variable of interest was the number of recommendations based on generalized strategies. However, as with the videotape presentation, too few generalized strategies were produced for analyses ($M = .02$). Finally, the number of infringements from the medication instructions noted by participants was analyzed and a significant Group effect was obtained ($F(2, 85) = 4.9, p < .05, \eta^2 = .32$). Follow-up Scheffe post hoc tests showed that young adults ($M = 2.9$) noted significantly more infringements than did OLWM ($M = 1.6$). The OHWM adults ($M = 2.4$) did not

differ from either of the other two groups.

Finally a series of analyses was carried out to compare the advice given when the stimuli were presented via videotape or in a written format. For these analyses, the groups were collapsed across the two Speaking Style conditions. First, a 3 (Group) x 2 (Modality) MANOVA was carried out with Modality as a repeated measure. The total number of recommendations made and the rating of the overall quality of the advice were the dependent variables in this analysis. The Modality effect was significant ($F(2,80) = 11.01, p < .001$) but the Group by Modality interaction and the Group main effect were not. Follow-up univariate analyses yielded no significant main effects or interactions for the total number of recommendations. For the ratings of overall quality, the only significant effect was the Modality by Group interaction ($F(2,81) = 4.67, p < .05$). Further investigations of this interaction revealed that only the OLWM adults received significantly different ratings of overall quality in the video presentation condition ($M = 2.8$) than in the written presentation condition ($M = 3.5, F(1,20) = 5.38, p < .05$).

Second, the number of recommendations based on (a) information from the story and (b) world knowledge were submitted to a 3 (Group) x 2 (Modality) MANOVA. Neither of the main effects or the interaction reached statistical significance. Finally, the number of infringements noted was compared across the two modalities. Again, neither of the main effects were significant, although there was a trend for a Group by Modality interaction ($F(1,81) = 2.83, p = .06$). This interaction was explained by the fact that while the performance of the OHWM and the OLWM

groups did not change across modalities, the YA group noted slightly more infringements when they were presented with the written stimuli ($M = 2.9$) than with the videotape stimuli ($M = 2.3$, $F(1,34) = 4.59$, $p < .05$).

Subjective Ratings

Subjective ratings of the videotape stimuli. After recalling the information from the stimuli, participants were asked to fill out a questionnaire in which they rated the videotape stimulus on a series of 5-point Likert scale questions. First, a 2 (Speaking Style) x 3 (Group) MANOVA was carried out with the following adjective ratings as the dependent variables: (a) respectful, (b) nurturing, (c) patronizing, (d) dominant, (e) kind, (f) slow, (g) clear, (h) simple, (i) organized, (j) detailed, and (k) helpful. This analysis yielded a significant Speaking Style main effect (Wilks's $F(11, 78) = 12.9$, $p < .001$) and a significant Group main effect (Wilks's $F(22, 156) = 2.2$, $p < .01$). The interaction between these two factors was not significant. These findings were followed by 2 (Speaking Style) x 3 (Group) ANOVAs on each of the adjectives separately. These results are presented in Table 5.

Insert Table 5 about here

As can be seen in Table 5, the non-overaccommodative speech was found to be more respectful and less patronizing than the overaccommodative speech by the YA group (respectful, $F(1,88) = 23.6$, $p < .01$; patronizing: $F(1,88) = 20.7$, $p < .01$), by the OHWM group (respectful, $F(1,88) = 4.4$, $p < .05$; patronizing ($F(1,88) = 48.9$, $p < .01$) and by the OLWM group (respectful, $F(1,88) = 8.3$, $p < .01$; patronizing, $F(1,88) =$

33.7, $p < .01$). The YA group also rated the overaccommodative speech as being clearer ($F(1,88) = 7.9$, $p < .01$) and less simple ($F(1,88) = 6.6$, $p < .05$) than the non-overaccommodative speech. The ratings produced by the OHRM group also indicated a significant difference in perceived speech rate between the two Speaking Style conditions ($F(1,88) = 6.8$, $p < .05$). Age Group differences were also present, with the YA group finding the non-overaccommodative speech more patronizing and the overaccommodative speech more organized than did both groups of older women.

In order to further examine the pattern of findings obtained above, two variables were formed, in a manner similar to that used by Ryan and Cole (1990). The first was the average of the ratings on the adjectives that related to the person doing the speaking, rather than to the speech itself (i.e., respectful, nurturing, patronizing, dominant, kind, and helpful). For this analysis, the patronizing score was reversed so that a higher score corresponded to a subjectively preferable outcome. The second variable was the average of the ratings on the adjectives that related to the speech itself (i.e., slow, clear, simple, organized, and detailed). These two variables were then used as the dependent variables in a 2 (Speaking Style) by 3 (Group) MANOVA. This analysis indicated a significant Speaking Style effect (Wilks's $F(2, 87) = 18.6$, $p < .001$) and a trend for a Group effect (Wilks's $F(4, 174) = 2.3$, $p = .06$).

Follow-up univariate analyses showed that the person doing the speaking was rated more highly in the non-overaccommodative condition ($M = 3.6$) than in the overaccommodative condition ($M = 3.0$), $F(1, 92) = 19.5$, $p < .001$, $\eta^2 = .42$). For

the ratings of the speech itself, however, the non-overaccommodative condition ($M = 3.4$) was given a significantly lower rating than the overaccommodative condition ($M = 3.7$), $F(1, 92) = 16.0$, $p < .001$, $\eta^2 = .38$. Group effects were also investigated within the two variables using post hoc tests, but no significant effects were obtained. In sum, participants preferred the speech characteristics of overaccommodative speech such as the clarity, simplicity and detail, but did not appreciate the perceived patronizing and disrespect that went along with it.

Attitude questionnaire. At the very end of the study, older participants were asked to fill out an Attitudes questionnaire. Specifically, they rated the manner in which (a) young people talk to seniors and (b) young people should talk to seniors. The adjectives used for these 5-point Likert scale ratings were a subsample of the ones used to evaluate the recall stimuli. This correspondence in rating words thus allowed a comparison between older adults' perceptions of speaking style used (a) in the stimuli in the present study and (b) by young people in our society.

As a first step in this analysis, ratings of the videotape were compared to ratings of how young people generally talk to seniors in a 2 (Speaking Style) x 2 (Group) x 2 (Context: videotape, society) MANOVA with Context as a within-subject factor. This analysis yielded a significant Speaking Style by Context interaction (Wilks's $F(8, 39) = 6.7$, $p < .001$) and significant main effects of Speaking Style (Wilks's $F(8, 39) = 4.9$, $p < .001$) and Context (Wilks's $F(8, 39) = .455$, $p < .001$). The Group main effect, the Group by Speaking Style interaction, the Group by Context interaction, and the three-way interaction did not reach statistical significance.

T1: same pattern of findings were obtained for ratings of how young people should talk to seniors (Speaking Style x Context interaction, Wilks's $F(8, 40) = 7.3, p < .001$; Speaking Style, Wilks's $F(8, 40) = 4.6, p < .001$; Context, Wilks's $F(8, 40) = 13.0, p < .001$).

In the second step of these analyses, a series of 2 (Speaking Style) x 2 (Context) ANOVAs with Context as a within-subject variable were carried out on each of the adjectives presented. These results are presented in Table 6 in the following manner. For each adjective, the average difference score (across the OHWM and OLWM groups) between the videotape rating and the societal rating is presented. Thus, whereas a positive mean indicates that the videotaped speaker was judged to be higher on that adjective than the societal rating, a negative mean indicates that the videotaped speaker was judged to be lower on that adjective than the societal rating. For adjectives where a significant Context effect is present, ratings of the videotaped speaker were significantly different from ratings of speakers in society at large. For adjectives where a significant Speaking Style effect is present, ratings made by participants having received the overaccommodative speech were significantly different from those made by participants having received the non-overaccommodative speech. Finally, the Context by Speaking Style interaction indicates that the amount of discrepancy between the videotape rating and the societal rating differs across the two Speaking Style conditions.

Insert Table 6 about here

In the two columns at the left of Table 6 (under the heading "Youth Speech") the differences in ratings between the videotaped speaker and the manner that youth generally address the elderly is presented. As can be seen in Table 6, the main effect for Context was significant for the adjectives respectful, nurturing, clear, and simple. For all four adjectives, the mean differences in ratings were positive, indicating that the videotaped speaker received a higher rating on these adjectives than did the societal ratings. Analysis of the adjective patronizing also yielded a significant main effect for the Speaking Style factor. The non-overaccommodative videotape speaker was judged to be less patronizing than the societal rating (-1.37) and more patronizing than the overaccommodative speaker (+1.08). Finally, significant Context x Speaking Style interactions were found for the adjectives respectful, patronizing, slow, and simple. The non-overaccommodative videotape speaker was found to be more respectful than youth in general but the overaccommodative videotape speaker was perceived very similarly to the way that young people speak to seniors in general. The non-overaccommodative videotape speaker was also found to be less patronizing and less slow than youth in general, but the overaccommodative speaker was perceived as more patronizing and slower than societal ratings. Finally, whereas both videotape presentations were perceived as simpler than societal ratings, this was particularly true when overaccommodative speech was used.

The older adults were also asked to rate how young people should speak to seniors. The mean differences in these ratings are presented in the two columns at the right of Table 6, under the heading "Ideal Speech." When these ratings of what ideal

speech to the elderly would be were compared to the videotape ratings, it was found that the actor was more dominant, less kind, more clear and more simple than older adults thought ideal. The overaccommodative actor was also found to be less respectful, while the non-overaccommodative actor was found to be slightly more respectful than was the ideal. While the actor was considered to be too patronizing in both Speaking Style conditions, he was considered much more so in the overaccommodative condition. Finally, while the actor was thought to be speaking somewhat too quickly in the non-overaccommodative condition, he was judged to be slightly too slow in the overaccommodative conditions.

In their evaluation of the recall stimuli, participants were also asked to compare the videotaped presentation to the oral instructions that they have received from their physicians or pharmacists in the past. The 94% of the sample who reported having received oral medication instructions from a physician or pharmacist in the past participated. Chi-square analyses were carried out to test if the distribution of ratings was dependent on the variables of Speaking Style and Group. The first question asked the participants whether they preferred the videotape instructions or those provided by their doctor or pharmacist. The distribution of ratings was strongly affected by Speaking Style ($\chi^2(2, N = 88) = 12.6, p < .01$). Indeed, while only 45% of the participants who had heard the non-overaccommodative speech preferred their physician's instructions to those on the videotape, 82% of the participants in the overaccommodative condition preferred their own doctor's instructions. The participants' choice of preferred instructions (videotape or own physician) was also

dependent upon the Group factor ($\chi^2(4, N = 88) = 11.1, p < .05$); 58% of OLWM adults preferred their own doctor, as did 46% of OHWM adults and 80% of the YA. Only 13% of OLWM preferred the videotape instructions, as did 32% of OHWM adults and 11% of the YA. The rest of the participants rated the two types of instructions as similar.

The second question required the participants to judge whether the instructions in the videotape or those typically given by their own doctor or pharmacist were longer. These ratings were not affected by either the variable of Speaking Style or Group, with 94% of the participants rating the 6 to 8 minute videotapes as the longer instruction.

In the third question, participants were asked to choose which of the two oral presentations of medication instructions (their physician/pharmacist or the videotape) was easier to understand. Although Speaking Style was not found to affect the distribution of ratings on this question, there was a significant effect for Group, $\chi^2(4, N = 87) = 13.9, p < .01$. While 63% of the younger adults felt that their physician/pharmacist was easier to understand, only 37% of the OLWM, and 25% of the OHWM adults felt the same. Only 12% of OLWM found the videotaped instructions easier to understand, as did 29% of OHWM adults and 3% of the YA. The rest of the participants rated the two types of instructions as similar.

Finally, participants were asked to decide which instructions were easier to remember. Again, the Speaking Style did not affect the distribution of ratings, but the Group variable did, $\chi^2(4, N = 87) = 18.2, p < .01$. A larger percentage of the young

adults (80%) found their physician's instructions easier to remember, with only 42% of the OLWM, and 28% of the OHWM in agreement. Only 21% of OLWM found the videotaped instructions easier to remember, as did 25% of OHWM adults and 6% of the YA. The rest of the participants rated the two types of instructions as similar.

Finally, participants were asked to judge the likelihood of wanting the individual on the videotape as their personal physician. This rating was analyzed in a 3 (Group) x 2 (Speaking Style) ANOVA. Results indicated that both the Speaking Style factor ($F(1, 88) = 36.9, p < .001, \eta^2 = .53$) and the Group effect ($F(2, 88) = 3.6, p < .05, \eta^2 = .24$) were statistically significant, but their interaction was not. The Speaking Style effect was the result of participants having received non-overaccommodative speech reporting that they would be more likely ($M = 3.2$) to want this person as their physician than did participants having been exposed to the overaccommodative speech ($M = 1.9$). As for the Group effect, the OLWM group was slightly more likely to want the individual as their physician ($M = 3.0$) than was the OHWM group ($M = 2.5$) or the YA ($M = 2.3$), but Scheffe post hoc tests on the Group effect did not yield any statistically significant group comparisons.

Subjective ratings of written stimuli. After recalling the information from the written stimuli, participants were asked to fill out a questionnaire on which they rated the stimulus on a series of 5 point Likert scale questions. First, the three groups were compared in a MANOVA with the following adjective ratings as the dependent variables: (a) respectful, (b) nurturing, (c) patronizing, (d) dominant, (e) kind, (f) slow, (g) clear, (h) simple, (i) organized, (j) detailed, and (k) helpful. This analysis yielded

a significant multivariate Group main effect, Wilks's $F(20, 164) = 2.6, p < .001$. This finding was followed up by univariate ANOVAs performed on each adjective rating. These results showed that Group effects were only present for two adjectives: (a) nurturing ($F(2, 91) = 16.9, p < .001, \eta^2 = .52$) and (b) kind ($F(2, 91) = 10.9, p < .001, \eta^2 = .44$). For the nurturing adjective, a Scheffe post hoc test indicated that YA's ratings ($M = 2.4$) were significantly different from those of the OLWM adults ($M = 3.7$) and the OHWM adults ($M = 3.4$). The two older groups did not differ significantly. Similarly, young adults rated the written stimuli as significantly lower for the adjective "kind" ($M = 2.6$) than did OLWM adults ($M = 3.6$) and OHWM adults ($M = 3.3$).

Finally, participants were asked to compare the written medication instructions to typical written instructions that they had received from their physicians or pharmacists. Only the 63 women (or 67% of the sample) who had received such instructions from their physicians in the past participated in this task. The distribution of these choices across the three groups was tested using a chi-square test, and no question was affected by the Group factor. Furthermore, which group the participant belonged to did not affect the likelihood of wanting the writer of the medication instructions as one's physician, and all groups gave fairly neutral ratings, with a range of 3.3 to 3.5 on a 5-point scale.

Prediction ratings. Participants in this study made predictions about hypothetical future behaviours involving the written and videotaped medication instructions presented in this study. First, participants were asked to rate the

likelihood that, given the medication instructions that they had received in the present study, they would follow these instructions perfectly for two months. A chi-square comparison indicated that the distribution of the frequencies on the 5-point scale ranging from 1 (Extremely Likely) to 5 (Extremely Unlikely) were not significantly different across the two Speaking Style levels, $\chi^2(4, N = 92) = 5.9, p > .05$. When the distributions of ratings were examined within the Speaking Style manipulations, however, it was found that there was a significant group difference for the non-overaccommodative condition, $\chi^2(6, N = 48) = 18.6, p < .01$, but not for the overaccommodative condition, $\chi^2(8, N = 45) = 11.3, p > .05$. These analyses should be interpreted with caution, however, since many cells were empty or contained frequencies smaller than 5. For the non-overaccommodative condition, the significant difference was present because, although only 55% of the young women rated themselves as very or extremely likely to follow the instructions, 92% of OLWM, and all of the OHWM group chose these ratings.

Finally, participants were asked to choose reasons why they might not follow perfectly the medication instructions presented in this study. Each of the eight reasons given could be chosen by the participants, and the frequencies of choosing these reasons were analyzed through separate chi-square analyses for each of the reasons proposed. First, it was found that the individuals having received the overaccommodative stimuli were not significantly different from the non-overaccommodative group on any of the eight choices. The only reasons for non-compliance chosen by more than 20% of the participants were (a) forgetting and (b)

stopping the medication once the condition has improved. In a second group of analyses, the distribution of reasons chosen for non-compliance across the three groups of subjects were compared. Only two of the eight reasons for noncompliance offered showed significantly different distributions across the three groups. Forgetting was chosen by 56% of OLWM, 55% of OHWM, and 82% of YA, $\chi^2(2, N = 94) = 7.5, p < .05$. Stopping the medication due to an improvement in condition was chosen by 16% of OLWM, 17% of OHWM, and 42% of YA, $\chi^2(2, N = 94) = 7.7, p < .01$.

Discussion

Recall of Medication Instructions

The main goal of this study was a test of the effectiveness of overaccommodative speech as a way to improve recall and comprehension of spoken information. It was hypothesized that older individuals with lower scores on a composite measure of working memory would differentially benefit from the exaggerated prosody and the simplified vocabulary and syntax that form the basis of such speech. However, a somewhat different pattern of results emerged. At immediate recall, only the older adults with higher working memory performance significantly benefited from the use of overaccommodative speech. Thus, as predicted, working memory did play a role, at least to some extent, in determining the usefulness of overaccommodative speech, though it was the higher working memory performers who seemed to benefit the most from this speaking style. All groups did benefit somewhat from the use of overaccommodative speech since the Speaking Style main effect was statistically significant, and the Group by Speaking Style interaction was not. (Within-group analyses were nonetheless carried out to test the a priori hypotheses of the study.) Moreover, the significantly better recall performance of the YA group over the OLWM group present in the non-overaccommodative speech condition was no longer present in the overaccommodative speech condition. It is possible, however, that with larger samples, the difference between the OLWM group ($M = 12\%$ of propositions recalled) and the YA and OHWM groups (both with $M = 15\%$ of propositions recalled) would have been significant.

The role of working memory in determining the usefulness of overaccommodative speech was further explored by carrying out regression analyses including both extreme and intermediate working memory performers. These analyses provided further evidence for the notion that working memory does indeed mediate the usefulness of overaccommodative speech in increasing recall performance. These regression analyses indicated that when recalling non-overaccommodative speech, age was the best predictor of performance. When recalling overaccommodative speech, however, working memory performance became the important predictor. Indeed, similar findings were obtained by Stine and Wingfield (1990) who found that working memory predicted performance solely with higher density (i.e., more difficult) texts.

In the present study, participants were asked to recall the videotapes stimuli once again after a delay of approximately one hour during which they read and recalled written instructions for a second medication. At this point, both the young adults and the older adults with higher performances on working memory significantly benefitted from the use of overaccommodative speech.

One possible interpretation of this pattern of results is that both the cognitive abilities of the individuals and the difficulty of the task determine whether certain adaptive strategies based on overaccommodative speech characteristics will be adopted. Thus, at immediate recall, such strategies are not necessary for young adults who are already performing at high levels, but are useful to older adults with higher performances on working memory. Even immediate recall of these long complex instructions may be too difficult for the latter group to perform at optimal levels.

When recalling the delayed recall task, the difficulty of the task may have increased enough that both the young adults and the old adults with higher performance on working memory need to adopt strategies to maintain high performance levels. In contrast, for the older adults with lower working memory abilities, the recall task--whether immediate or delayed--may be so difficult that no cognitive resources are available to permit the use of adaptive strategies. Thus, in the same way that mostly older adults with higher verbal ability have been found to sacrifice details with the goal of maintaining high performance on main ideas (e.g., Dixon, Hultsch, Simon, & von Eye, 1984) adaptive strategies based on overaccommodative speech characteristics were perhaps used mostly by the present high working memory ability subjects. Indeed, when recalling written stimuli, where prosody and overly simplified syntax and vocabulary were not present as potential aids to enhance performance, age, but not working memory performance, was a significant predictor of recall performance. (Of course, the role of task difficulty in determining the use of text-based strategies will necessitate further investigation, particularly given the lack of a three-way interaction between Delay, Group and Speaking Style in the present results. It is possible, however, that with a longer delay, this relationship would have yielded statistical significance.)

In summary then, the use of different speaking styles was found to be differentially effective across different groups of participants, but the groups that benefited the most from overaccommodative speech were the OHWM and (sometimes) the YA. One issue of great concern is identifying what characteristics of

overaccommodative speech are the ones potentially being used as aids to increase or maintain optimal levels of performance. Normal prosody (e.g., Cohen & Faulkner, 1986; Stine & Wingfield, 1987), simplified syntax (e.g., Norman et al., in press) and simplified vocabulary (Ley, 1979) have all been shown to enhance recall performance in the older adults. The present study extends these findings by showing that lengthy overaccommodative speech is also effective. The speech used in the present study differed from previous stimuli in many ways. First, it contained exaggerated prosody, rather than normal prosody (as did Stine & Wingfield 1987), or only stressed key words (as did Cohen & Faulkner, 1986). Second, both exaggerated prosody and simplified syntax and vocabulary were included in the same stimuli. The present results indicate that the use of exaggerated prosody did not negate all benefits of the simplified vocabulary and syntax by making listeners so offended or upset as to be inattentive to the overaccommodative videotaped instructions. Indeed, many characteristics of overaccommodative speech may help to improve recall performance. Comprehension of the material in question may be raised as the complexity of the discourse decreases, or at the very least, participants' motivation may be improved with simpler discourse. Furthermore, the prosody may serve to pre-process the discourse by highlighting the high level information contained therein.

Alternative views of the effects of age on working memory performance can be contrasted when exploring the mediating role of working memory on the effectiveness of overaccommodative speech. One possibility is that lower functioning older adults may not allocate their cognitive resources in an optimal manner. In other words, they

may be unable to filter out irrelevant information from working memory. This position seems to be offered inconsistent support by the findings in the present study. On the one hand, older adults with lower working memory abilities were more likely to make intrusion errors during their recall. Intrusions occurred when participants recalled information from a previous stimulus. On the other hand, the OLWM group did not make more annotative comments during their recall than did other groups. High numbers of such comments would have been expected if the low ability participants were using some of their cognitive resources to process information irrelevant to the recall task at hand (such as information about their own real-life medication regimens, or their feelings and opinions about the task and the stimuli.)

A second possible interpretation for these findings is that lower ability older adults simply have a lower level of available resources. Indeed, taking advantage of stimuli characteristics such as redundancy and explicit discourse organization may necessitate larger working memory spans. For example, the optimal use of explicit organizational structures necessitates being able to hold the information about the text organization in memory, while at the same time registering new information and reorganizing this new information in terms of the organizational structure. Individuals with smaller working memory spans may not be able to manage this simultaneous storage and processing activity. Interestingly, such organizational aids are designed to help such older adults, as well as lower-ability adults. Similarly, when listening to highly redundant materials, individuals with higher working memory abilities may be able to simultaneously store the incoming (redundant) pieces of information, and sift through

them to establish what is the main idea worth storing more permanently. Thus, by constantly updating and processing the redundant material, these individuals may carry out more elaborative processing than do more passive recipients.

One issue that has been noted already is the importance of text difficulty in determining whether or not strategies may be needed or adopted to maintain high levels of recall performance. In the present study, multiple indicators were used to determine text difficulty. It is an important but complicated task to create written and spoken materials that are equivalent in content and structure. In the present study, measures such as readability and redundancy (both measures developed for written rather than spoken materials) indicated that the written text was objectively more difficult than the spoken stimuli, and of course that the non-overaccommodative passage was more difficult than the overaccommodative passage (see Table 1). The increased difficulty in the written passage must be considered in the context of the very different presentation formats. With written, but not spoken stimuli, it is possible for the individual to control the input rate of the information, to reread particularly difficult sections of the text, and to use such structural aids as underlined section titles. Participants were allowed 8 minutes to read the text (a rate of approximately 1 word per second) to allow such strategies to be used. Thus, even though objective measures of the written text suggested that it would be more difficult to comprehend than the videotaped stimuli, the written text resulted in consistently superior recall performance across groups and speaking style conditions. However, it should be noted that such differences between recall of written and videotaped stimuli are very difficult to

interpret. Indeed, the two stimuli types differ not only in modality, but also in exposure time and task presentation order.

One strength of the present project was the use of multiple indicators of recall performance. Thus, recall performance was tested not only with free recall, but also with recall of the main ideas following prompting. It is important to note that when the recall stimuli consist of medication instructions, the most important facts to remember may include very detailed information such as numbers or specific names (e.g., the number of pills to take and the name of the medication). Adults have been shown to be aware of the importance of such specifics when recalling medication instructions (Crichton et al., 1978), though older adults are particularly disadvantaged when such specific recall is required (Cohen & Faulkner, 1986). For the free recall of the main points in the instructions, the data show both the YA group and the OLOWM group benefiting from the use of overaccommodative speech. However, when topic prompts were provided--thereby rendering the task less difficult than free recall--the young adults may no longer have needed to take advantage of the overaccommodative speech characteristics to maintain optimal performance levels. This strategic use of overaccommodative speech characteristics would still have been adaptive to older adults with higher working memory abilities. In contrast, in both free and prompted recall of the main ideas, the OLWM group was unaffected by the speaking style manipulation, possibly as a result of their inability to garner the resources necessary to instigate the strategic use of overaccommodative speech characteristics.

One aspect of the recall results that may, at first glance, seem worrisome is the

very low scores obtained on the gist recall variable measuring proportion of propositions recalled. All groups recalled less than an average of 16% of the propositions in the stimuli. Of course, the stimuli used were quite long (on average they contained over 350 propositions). More importantly, scores on the free recall of main ideas were on average 55% of the total score possible, and after the topic prompts were presented, 68% of the possible score points were obtained. Finally, the similarity of the results across the different measures of recall suggests that the findings obtained with the proportion of propositions recalled variable are not due to floor effects.

In summary then, the pattern of results obtained with the first group of recall measures are consistent with a model proposing that the effectiveness of overaccommodative speech is dependent on the cognitive abilities of the individuals, as well as the difficulty of the recall task. A certain level of ability may be necessary for an individual to have the potential to focus on speech characteristics that enhance recall. Moreover, recall performance may only be enhanced by overaccommodative speech characteristics when a certain level of difficulty is present, such as exists for even young adults when recall is delayed, and exists for older adults whenever recall of long and complex instructions is attempted.

Advice Giving Task

A further measure of recall and comprehension in the present study was the use of an advice-giving task. It had been hypothesized that older adults, particularly those with lower working memory performance, would note fewer of the infringements to

the medication instructions in the vignette, and would base more of their recommendations on pre-experimental knowledge and general medication strategies. Neither of these two hypotheses were supported, as the groups did not differ on the use of story- or world-knowledge based strategies, and group differences were not obtained on the number of infringements noted. It is of interest, however, that the number of story-based recommendations made was higher in the overaccommodative speech condition than in the non-overaccommodative condition. This implies that more information was encoded from the overaccommodative than the non-overaccommodative instructions. Moreover, on the number of infringements noted, the speaking style manipulation was effective only for the OLWM group. One interpretation of this finding is that the OLWM, like the OHWM, had encoded slightly more information with the overaccommodative stimuli than with the non-overaccommodative stimuli, but for the OLWM, it was only in this specific task that this previously unrevealed information was evoked. In other words, given a situation where recalling facts from a stimulus has practical meaning, OLWM may be more likely to reproduce encoded information, especially when this information has a potentially more subjective nature, such as noting someone's errors in conduct. The cognitive aging literature does offer some suggestions that the elderly (Gould et al., 1991) and especially the lower-functioning elderly (Cohen, 1979) are more likely to focus on the subjective nature of stimuli. One could speculate that for the OLWM, low performance on prose recall could be due to recall situations that are not sufficiently contextually-based, or indeed tied to subjective or interpersonal contexts.

Such interpretations, of course, are very tentative, and the interaction between cognitive functioning level and the effectiveness of contextual support at recall remains an empirical question of great significance.

One hypothesis of particular interest for the advice-giving task was that the older adults were expected to produce more recommendations based on generalized strategies. It was expected that the older adults' greater experience with prescription medications, and with medical care in general, could have led to the development of strategies applicable across multiple medical situations. There is a strong possibility that the strategies that older adults use to make decisions about medication questions, and the beliefs about medication and health that they hold, may directly influence compliance to medication instructions. Indeed, individuals may function under the assumption that it is always best to take a larger or smaller dosage than that recommended by a physician, or that one should always or never accompany prescription medications with over-the-counter products. Unfortunately, so few general strategy recommendations were produced in the present study that analyses were not possible on this variable. This is unfortunate, since it would have been of great interest to investigate the older adults' use of generalized strategies given Ley's (1979) findings. Ley found that the elderly, despite their greater experience with medications and health care situations, were not more knowledgeable in this area. It is possible however, that Ley's older participants did not appear more knowledgeable because they have developed strategies that are generalized across situations, rather than specific to situation. Such an elaboration of Ley's findings will necessitate

questions that will better tabulate the strategies that individuals have about medical predicaments than did the advice-giving task--at least as used in the present research.

Subjective Ratings

Based on past research (e.g., Caporael, et al., 1983; Ryan & Cole, 1990), it was hypothesized here that older adults with lower working memory scores would be less offended by overaccommodative speech than would be the higher ability older adults. However, all three groups of participants had similar general reactions to the two types of stimuli: they preferred the speech attributes (e.g., clarity, rate, organization) in the overaccommodative speech, but preferred the person attributes (e.g., respectfulness, dominance, kindness) of the non-overaccommodative speaker.

This trend was further investigated with post hoc systematic comparisons of the content of all of the annotative elaborations produced during recall. Although few annotative comments were produced, and no significant group or condition effects were obtained on a simple count of the number of these comments, an overview of the content of these comments is revealing. For the non-overaccommodative stimuli, most of the positive annotative comments produced concern the speaker himself. He is described as considerate, personable, concerned, nice looking, and professional. The negative comments produced during recall of the non-overaccommodative speech all had to do with the information being presented, which was described as confusing, too detailed, and too lengthy. On the other hand, all of the positive comments made during recall of the overaccommodative stimuli dealt with the presentation of the information. Comments noted that the instructions were clear, and that the doctor

spoke slowly and deliberately. The negative reactions to the overaccommodative stimuli were, however, clearly aimed at the character of the speaker. The overaccommodative speaker was described as patronizing, and the mode of delivery was compared to babytalk. One older participant remarked: "In the first place I found the doctor very patronizing, and I certainly would not have a doctor who treated me as a two year old." Another older adult said (about a hypothetical patient receiving these instructions): "I thought he was stupid and he talked to her as if she was not only mentally retarded but about two years old!" A few older adults also reacted negatively to the overly simplified vocabulary ("...except for what he calls tummy troubles. I prefer to call them abdominal upsets") and the redundant information (when recalling having been told explicitly to take the prescription to the drugstore, one woman remarked: "this is what tickle' me, where else would I go with a prescription?"). In summary, then, the annotative comments made during recall mirror the results obtained with the ratings of the stimuli: The participants, both young and old, appreciate the clarity of the overaccommodative speech, but not its patronizing and demeaning tone.

There are many potential explanations for the lack of replication here of a relationship between functional ability and acceptance of overaccommodative speech. First, in previous research there were great differences between the samples being compared. In the Ryan and Cole (1990) study, institutionalized and non-institutionalized older participants were compared. In the Caporalet al. (1983) study, both groups of adults were institutionalized, but group distinctions were established

through gross ratings of daily living activities, behaviour problems and sensory deficits. In the present study, participants from both the OHWM and the OLWM groups were community dwelling and the distinctions in functioning between them were much finer than those used in previous studies. Thus, the two older groups may have been too similar for differences to emerge in their subjective reactions to the overaccommodative speech--even though how much they benefit from the overaccommodative speech differed.

A further possibility is that the results obtained in previous work do not suggest a link between functional ability and acceptance of overaccommodative speech, but rather that the relationship between the speaker and the recipient is the main determinant of the recipient's reaction to overaccommodation. Indeed, such a conception is emphasized in Speech Accommodation Theory (Ryan et al., 1986). Thus, both the institutionalized older adults in the Ryan and Cole (1990) study, and the lower functioning older adults in the Caporalet al. (1983) research may have been more dependent on the producers of the overaccommodative speech than were participants in the other conditions. In the present research, however, neither the OLWM nor the OHWM groups were in a relationship with the speaker such that his manner could threaten their self-esteem, or that their negative reaction to his manner could threaten their physical and emotional well-being. It is probable than in real-world interactions, older adults receive offensively overaccommodative speech from individuals whose opinions matter to them, as well as from others whose underevaluations of their abilities do not threaten their emotional well-being. A

consideration of the relationship between the intergenerational interactants, as well as the cognitive abilities of the older individual, may be vital for understanding older adults' reactions to overaccommodative speech.

Of course, another distinction between the present study and previous ones investigating responses to overaccommodative speech is that here the speech being responded to was produced in the laboratory. This allows us (a) to know exactly what the individual is reacting to, and (b) to compare different age and ability groups on their reactions to the same speech. One issue in such a design is that the laboratory speech may differ from what is normally experienced by older adults as overaccommodative speech. In the present study, this issue was addressed in two ways. First, a comparison was made of older adults' ratings of how younger people generally speak to them with ratings of the videotape stimuli. The two sources of speech (the videotape and societal youth) were similar on some dimensions and different on others. They were equally respectful, dominant, and kind. However, the overaccommodative videotaped speech was rated as slower, simpler and more patronizing than the speech of youth in general. It is thus possible that the overaccommodative speech used in these stimuli exaggerated some characteristics of overaccommodative speech, and differed from what the older adults generally experience with their young interactants.

One can speculate, however, that the overaccommodative speech shown here may nonetheless be similar to what is experienced in medical settings. Indeed, many researchers have suggested that ageism may be particularly rampant in medical settings

(Ashburn & Gordon, 1981; Greene et al., 1986), and that this may lead to high levels of overaccommodative speaking. In a second evaluation of the stimuli used here, participants were asked to compare their own health care provider (physician or pharmacist) to the videotaped speaker. Results here are somewhat ambiguous, with 48% of the older adults stating that their own health provider is equally easy to understand as the videotape, and 44% stating that both are equally easy to recall. Furthermore, for the OLWM group, preference of medication instructions (videotape or own health care provider) did not significantly depend on the speaking style used on the videotape.

In summary, the older adults' perceptions of the overaccommodative speech presented to them in the present study may differ somewhat from their perceptions of the speech they experience in their everyday encounters with youth and with medical health-care providers. Two main issues are important to consider in evaluating these findings. First, the types of ratings elicited here are extremely likely to be highly influenced by the relationship between the interactants (Ryan et al., 1986). Consequently, ratings of a videotape featuring a stranger may be based on very different criteria than ratings of speech produced by acquaintances. Second, whereas the ratings produced about the speech experienced in everyday interactions are made of averages across situations, times, and individuals, the ratings concerning the videotape are much more specific. Thus, the fact that the average young person does not speak in this manner to the seniors in this study does not indicate that these individuals have never experienced this level of overaccommodation (particularly in

health-care settings), and more importantly does not invalidate the inquiry of whether overaccommodative speech is effective in increasing levels of comprehension and recall in older recipients.

Of further importance in evaluating the stimuli used in the present study is their consistency across different presentation formats. As shown on Table 1, language materials can be compared on many dimensions. Of primary importance in the present context was the consistency of the information contained in the different presentation formats. Thus, each of the stimuli contained the same topics and the same 8 main points. The stimuli differed in how this basic information was presented. In the overaccommodative stimulus, this information was presented using simplified syntax and vocabulary, more tag questions, and increased levels of redundancy and repetition. Thus, paraphrases often replaced difficult words, and even simple words or concepts were defined, resulting in stimuli that took longer to say, and that contained more words and sentences. A more relevant comparison is therefore the correspondence in the number of content words in the two spoken stimuli.

One last issue concerning the stimuli used in the present study is the amount of detail included in these medication instructions. Participants consistently rated these medication instructions to be longer than those they had received from their own health-care providers in the past. Indeed, the stimuli used here approximated the amount of information that should be provided to patients (e.g., Crichton et al., 1978; Morrow et al., 1988), rather than the amount of information that usually is provided to them. Given our goal of evaluating the effectiveness of different speaking styles, the

use of optimal instructional detail was deemed appropriate.

Limitations and Future Directions

The present study is partially based on Speech Accommodation Theory (Coupland et al., 1988). This model highlights the interactive nature of discourse by noting the roles of both the speaker and the recipient in determining the success of a conversation. Of particular interest in an aging context is the use of overaccommodative speech, defined as speech perceived by the recipient as underestimating his or her comprehension abilities. Of course, conversations did not occur in the present study and future research should focus on the use of overaccommodative speech during actual interactions. Indeed, it would be useful to carry out fine-grained analyses of actual interactions to investigate the roles played by both the young and old interactants in determining the amount and quality of overaccommodation present.

The results obtained here suggest that the relationship between the speech produced and the reactions to it is a very complex one. Indeed, at least some older individuals in this study benefitted from the overaccommodative qualities in the text but still found the overaccommodative speaking style far from ideal. Thus, older adults may not be accurate judges of their own comprehension needs and the appropriate speech required for optimal recall. This notion corresponds to findings by Kemper et al. (in press) who found that their subjects' reading preference scores did not correlate with scores on reading comprehension or speed. The role played by metacognitive processes in judging the appropriateness of speaking styles used may

show itself to be a very fertile area of investigation.

These differences between preferences for stimuli and optimal comprehension and recall performance is an intriguing one. The use of more-fine grained questions in measuring older adults' reactions to materials may be revealing. It is possible that older adults are indeed able to identify which stimuli lead to optimal recall, but state their preferences based on other criteria such as enjoyment or interest. Another possibility is that they are making decisions based on difficulty of recall, but are unable to distinguish between easy and difficult texts. Investigation of these issues would necessitate a within-subject design, rather than the between-subject design used here.

One implication of the results obtained here is the importance of the distinction between the affective and the clarification components of speech (Brown, 1977). Indeed, the participants in this study appreciated the clarification aspects of the overaccommodative speech, and the recall results suggested that this speech may have been appropriate for at least some of the participants. Even so, decisions about instruction format preference (own physician or videotape) and about wanting the videotaped speaker as one's own physician reflected their evaluations of the affective or inter-personal nature of the speech. Indeed, 69% of OHWM preferred their own health care provider's instructions to those of the overaccommodative videotaped speaker-- even though such speech was effective in increasing their recall performance. Furthermore, all groups reported that they were not likely at all to want the overaccommodative speaker as their own physician. In summary, the results suggest

that older adults may base their behaviour more on their subjective reactions to other's speech than on the appropriateness of this speech for their comprehension abilities. If this interpretation is accurate, repercussions for the use of overaccommodative speech in medical settings can be suggested.

One way of framing the results of the present study is by asking whether speech containing the characteristics of exaggerated prosody and simplified vocabulary and syntax should be used in medical contexts, particularly when providing medication instructions. On the one hand, it has been shown that the overaccommodative speech used here increased recall performance for at least some of the elder adults, and that predictions of (hypothetical) compliance were not affected by the speaking style used to present the medication instructions. Of course, such a measure of hypothetical compliance behavior is very problematic. Indeed, even self-report measures of past compliance have been greatly criticized and recent work in the compliance area has emphasized the use of such technical developments as microchips in bottle lids to record the times and frequency of pill taking (Park, Willis, Morrow, Diehl & Gaines, in press). Of obvious interest would be a study comparing compliance over time to instructions received in overaccommodative and non-overaccommodative speech. Despite similar compliance predictions upon receiving the medication instructions, it is possible that with time a relationship between compliance and attitude toward the provider of the instructions might appear.

On the other hand, some of the results obtained here suggest that the use of overaccommodative speech may not be effective. Participants were clearly unhappy

with this speaking style as indicated by (a) their comments during recall, (b) their preference for their own physician's medication instructions, and (c) their ratings of the likelihood to want the overaccommodative speaker as their personal physician. Other issues also argue for the inappropriateness of overaccommodative speech. Many researchers have noted the importance of a positive doctor-patient relationship in obtaining high levels of compliance to medical regimens (e.g., Garrity & Lawson, 1989; Musialowski, 1988) and the role of overaccommodation in lowering self-esteem and well-being has also been highlighted (Ryan et al., 1986; Street, 1991). Long-term relationships involving speech that is perceived as patronizing and demeaning are likely to have negative effects on both the quality of the doctor-patient relationship and the emotional well-being of the patient. These non-cognitive factors may then easily overwhelm the memory benefits of using overaccommodative speech to provide medication instructions to older patients.

Given the present findings, the potential for developing an ideal speaking style for presenting complex instructions to older adults seems clear. Using Brown's (1977) distinction of the affective and clarification aspects of babytalk, it may be possible to train individuals to use the clarification features of overaccommodative speech without also integrating the affective dimension. However, at this juncture, the empirical challenge becomes the identification of precisely which features of overaccommodative speech are perceived as offensive, and by whom. The use of tag questions and exaggerated pitch, for example, are only two of the features that could potentially fall in either the affective or clarification dimensions. Another issue of interest int

determining the relationship between arousal and cognitive performance is gender of the recipient and of the speaker. In the present study, only women's recall of a male physician's speech was tested. However, in piloting the stimuli for this project, a very small number of older men were exposed to the overaccommodative stimuli, and their subjective reactions seemed (at least anecdotally) to be much more negative. Thus, it is possible that because of different expectations and experiences in the lives of men and women of this cohort, that (a) speech characteristics that are not perceived as offensive by women may be perceived as such by men, and (b) speech that does not upset women enough to reduce recall performance, may do so in older men. These gender differences are certainly worthy of further investigation.

The pattern of results obtained in the present study are consistent with a model proposing that the effectiveness of overaccommodative speech is dependent on the cognitive abilities of the individuals, as well as the difficulty of the recall task. This remains, of course, a very tentative interpretation. One way to pursue this notion is to carry out a series of investigations of the role of working memory ability in determining the use of cognitive strategies that improve or maintain cognitive performance. Are older adults with higher (rather than lower) working memory abilities more likely to sacrifice details and recall main ideas when remembering prose? Are older adults with higher working memory abilities more likely to use text markers to improve recall performance? Are older adults with higher working memory abilities more likely to benefit from the presence of normal or exaggerated prosody? And are such adaptive strategies more likely to be used by subjects of any

age when the task is difficult enough to require strategy use, but easy enough that the individual's cognitive resources are not overwhelmed?

In conclusion, the role of Speech Accommodation Theory in helping health care providers generate optimal speech for their older patients seems to reside in its potential to further specify what characteristics of speech help, hinder and anger older recipients. The present findings demonstrate the need to take into account the variability in cognitive abilities of the older recipients, as well as the multi-dimensionality of their responses to the spoken word.

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Appendix A

Recall Stimuli for BendoralA: Written Format

Name of Doctor: Dr. Samuel Smythe (Telephone 596-3434)

Name of medication: Bendoral (in tablet form)

Purpose: Bendoral is prescribed for the treatment of certain types of respiratory conditions such as Fletcher's Disease. It helps to relax the muscles in the chest cavity so that your breathing is less difficult.

Dose: Take three tablets a day.

Times to take medicine: You should take one tablet in the morning, one at noon, and one before bed. You may take one tablet during the night if breathing becomes difficult, but a dosage of 4 tablets a day should not be exceeded without your physician's express approval.

If you miss a dose of Bendoral and remember within an hour or so then take the Bendoral right away and go back to your regular schedule. However, if you have missed a dose of Bendoral for more than 1 1/2 hours, do not take the missed dose at all and do not double the next one. Instead, wait until the next scheduled dose and return to your regular dosing schedule.

Duration: This prescription may be renewed two times.

Warnings: Avoid drinking beverages containing caffeine such as tea, coffee and cola. You should also avoid any alcoholic drinks while taking Bendoral.

You must take Bendoral regularly as prescribed. It may take up to two weeks before you begin to feel better, and up to a month may pass before you feel the full effect of this medication. Do not take other pain-relievers such as Aspirin while you are taking Bendoral.

While taking this medication, please remember to tell any other physician or pharmacist that you may consult that you are taking Bendoral. Report any adverse reactions to your physician, and maintain regular medical checkups to ensure that the medication is safe and effective. Please keep this and other medications out of the

reach of children.

Mild Side-effects: Some people experience stomach upsets while taking Bendoral. To lessen stomach upsets, take this medication immediately after a meal, or with food or milk.

If stomach upset (indigestion, nausea, or stomach pains) continue, contact your physician. He or she may then decrease the dosage or replace Bendoral with another medication.

Severe Side-effects: Before you begin to take this medication, you should advise your physician if you have ever had any allergic reactions (such as skin rashes or runny nose) to either Bendoral or ASA (aspirin). You should also tell your physician about any other medication that you may be taking at the same time as Bendoral.

While some side-effects may simply be uncomfortable, others may require medical attention. You should stop taking the medication and notify your physician immediately if you develop any allergic or adverse reactions to this medication. Possible adverse reactions include: tightness of the chest, skin rashes, swelling or hives, runny nose, discoloration of the skin or eyes, blurred vision, mental confusion and depression, or hearing problems.

In case of emergency: Call 9-1-1

B: Transcription of Non-overaccommodative Stimulus

Ok, well the laboratory tests have been returned, and it seems that your respiratory problems are due to a condition known as Fletcher's Disease. It's a fairly rare condition, and there has been some medication developed quite recently that seems to work quite well for most patients. So I'm going to give you a prescription for tablets called Bendoral. Now, what Bendoral does is it relaxes the muscles in the chest, in the chest cavity so that your breathing will come much easier, and you'll find that you don't become out of breath nearly as often or as easily as you have been in the past.

I'd like you to take the Bendoral three times a day, morning, noon, and evening. Now, on top of that you can take, another tablet of Bendoral during the night if you find that your breathing becomes excessively laboured. However, you shouldn't exceed four tablets a day without having called me first.

Ok, what else. Oh yes, a lot of my patients ask me what to do if they forget to take their medication and then remember later on. Well, if you miss a dose of Bendoral and remember about it in about an hour, then take the Bendoral at that time and then return to your regular medication schedule. But, if you miss a dose and by the time you remember it's been, say, an hour and a half, then don't take the pill, and don't double up on your next dose. Instead, just simply wait until your next scheduled dose and return to your regular medication schedule. Oh, by the way, I'm going to give you a prescription for a few months, so that you can renew this twice after the first prescription.

Ok, now what other information did I want to give you. Oh yes, I should, I should give you some warnings associated with this medication. It is best for you to avoid all beverages with caffeine, any coffee, tea, peps, coke. You should also avoid alcoholic beverages, and you shouldn't take any aspirin-based drugs or other over-the-counter flu or cold medications while you're taking this Bendoral. You should be very careful about taking this Bendooral as regularly as possible, just as it's prescribed. You may find that it takes a little while for the effects of the medication to appear; and it may take up to two weeks before you feel better, in fact it may take an entire month before the full effect of the medication becomes obvious.

Don't forget that whenever you consult a physician or a pharmacist you should tell them whatever medication you are presently taking. So if you if you experience any negative side-effects, you should call in, and you should plan to come back for regular check-ups, and while you're on this Bendoral. Oh, and as always, keep that prescription bottle out of the reach of children.

Ok, some mild side-effects are somewhat common when people are taking Bendoral. One of the most common ones is having stomach upsets from the tablets. Now, usually the stomach problems clear up after a few days and they will often disappear if you are sure to take the medication immediately after a meal, or some people just simply take the pills with a glass of milk instead of water and that just seems to do the trick. Anyway, if you get serious stomach upsets, such as indigestion, or nausea, stomach pains, and they continue even after you have taken the pills with food, just call in and I'll either change your prescription or change the dosages of your prescription.

Of course, with most medication, there are some possible negative side-effects that may necessitate immediate medical attention. So, if you've ever had allergic reactions, negative side effects that may, anything like that, either to Bendoral or ASA, aspirin, you should say so, and uh, and you should also inform me of, immediately of any medication that you're presently taking. Now, as you begin taking the Bendoral, you should be careful about noting the appearance of any negative side-effects. If you get any allergic reactions, or any negative side-effects, you should stop taking the Bendoral right away and call my office as soon as possible. The side-effects to be particularly wary of are: tightness in the chest,; skin rashes or hives, swelling of the skin, flu-like symptoms such as a runny nose, discoloration of the skin or the eyes, uh, blurred vision or hearing difficulties, and mental confusion or depression.

So, that's about it. Take three pills a day, morning, noon, and evening, and of course in the case of a real emergency you can always call 9-1-1.

C: Transcription of Overaccommodative Stimulus

Well, you know those tests we gave you? Well they say that what you have is called Fletcher's Disease. Now I'm going to give you some pills called Bendoral. This medicine should help relieve the pressure and fix the muscles in your chest so that you can breathe easier.

Now, I'm going to tell you a lot of things about how to take your pills, so you listen carefully, ok? Ok. Now, I want you to take this paper to the drugstore and they will give you some pills. I want you to take three pills every day. I want you to take one pill in the morning. I want you to take one pill at noon, and I want you to take one pill before bed. Now, sometimes it gets a little hard to breathe in the night and you can take one pill at that time. Now, you must remember that you never can have more than four pills in any one day. The only time that you can have more than four pills is if you call me first, ok? Can you remember that? Alright, one pill in the morning, one pill at noon and one pill at night and maybe a little bit during your sleep.

Now, the next thing I'm going to talk about is what to do when you forget to take your pill and you remember a little bit later on, but of course, you're not going to forget are you? That's right. So, if it's, oh say, more than an hour after you were supposed to take your pill, then you just take your pill right along as you were supposed to. If it's more than an hour and a half though you just wait until the next pill time, and take your pill then. Do you understand? When you go to the drugstore, they will give you one bottle of pills. You can go back to the drugstore when it's

empty and get this prescription filled again two more times with this one paper.

Next, I want to talk to you about things that you should not do when you take these pills. I don't want you to drink any tea, or any coffee, or any pop like pepsi or coke, ok? and I don't want you to take any liquor, no liquor when you take this medicine. So no beer, and no hard stuff, and no wine, ok? Oh, and another thing: I don't want you to take any aspirin, or any other pain pills that you can buy yourself.

Now, you have to take these pills just like I told you. It's going to take as much as two weeks before your breathing starts to get better and it might take a whole month before the pills are really working. Now, that is a long time, isn't it?

Oh, and now, here is another thing for you to remember. If you talk to other doctors or to the drugstore, you must tell them that you are taking Bendoral. And if you have bad reactions to the pills, I want you to call my office. I want you to keep coming back to see me so we make sure that everything is all right. And, you should put these pills away from where little children can get at them because that could be bad for them, couldn't it? yeah.

Ok. Next, I want to talk about some bad things that happen to some people when they take medicine. One thing that might happen is that your tummy won't feel well when you take these pills. If you get a tummyache, you should eat or drink a glass of milk before you take the pill. If you take a pill with food, or with a glass of milk you probably won't get a tummyache. If the tummyache, however doesn't go away then, I want you to call me, and I'll take care of it, ok?

Now some of the reactions that some people have to the pills can be very bad.

So there are some things I want you to be sure to tell me. First, I want you to tell me if you have ever had an allergy or any kind of allergic reaction to Bendoral or to Aspirin. Now, an allergy is when you get a, a rash on your skin, or your nose gets runny, or you have another kind of bad reaction. Now the other thing that I want you to tell me is if you are taking any other medicines. It can be bad for you to take more than one pill at the same time. So you tell me if you have any allergies, or if you are taking any other medicines.

Like I said before, sometimes the reactions that some people have to the medicines can be very bad. If you get a bad reaction to the medicine, I want you to stop taking the medicine right away, stop taking those pills right away. I want you to call me right away if your chest starts feeling tight, or if you change, you get changes in your skin like if your skin starts to change color or if you get a rash, or if it starts to puff up. Ok, another thing I want you to watch for is that you don't get a runny nose when you are taking the pills, and I especially want you to be sure that there's no change in the colour of your eyes or the colour of your skin. I want you to be sure, too, that how well you see and how well you hear doesn't change all of a sudden because of the pills. And I want you to tell me if you get a little confused in your thinking, or a little bit depressed when you're taking the same pills, ok? Well, that's a lot of things to be careful about, isn't it? But it's very important that you pay special attention to these things. I know it's a lot of things to remember but you'll be able.

Do you think you can remember all that? Ok, now the big thing is to remember to take three pills every day, one in the morning, one at noon and one at night. And if

you have an emergency at home, you can always dial 9-1-1 and you can get the police or the ambulance or whatever you need for help, ok? okay.

Appendix B

Stimuli for Advice-giving TaskA: Bendoral vignette

Betty is a 79 year-old widow who lives alone in an apartment. She speaks to her daughter, Jennifer almost everyday on the telephone, and goes out for a cup of coffee and a chat with Jennifer a couple of times a week. The one thing that stops Betty from being involved in more activities outside her home are the respiratory problems that result from her having Fletcher's Disease. She has difficulty breathing when it is windy or she has to walk up stairs and often cannot go on outings for this reason. Last week, Betty's physician prescribed Bendoral for Fletcher's Disease. The physician said that her breathing would improve, and that Betty would feel better quite soon.

Betty has been taking Bendoral for a week and does not find any substantial improvement. Furthermore, she believes that she is getting a cold since has had a stuffy nose for the last few days, and she feels tired and depressed as well. Betty went out for coffee with her daughter Jennifer this morning, and Jennifer suggested that she stop taking the Bendoral for a few days while she takes over-the-counter medication for her cold. Betty prefers to take the cold medication as well as the Bendoral. What do you think Betty should do? Why?

B: Cranidil vignette

Jack has had problems with stomach pains since he started working as a chef in an Italian restaurant five years ago. Apart from that, he has always been in good physical shape and even rode his bicycle to work until a few weeks ago. Recently, however, he has been feeling tired and drowsy all day and doesn't ride his bicycle anymore.

Three months ago, Jack's physician diagnosed him as having Grant's Condition and prescribed Cranidil tablets. Jack has found that the Cranidil is very effective in controlling the stomach pains that he feels when he is tasting the spicy sauces and other dishes that he prepares at the restaurant all day. Recently, however, he finds that the Cranidil does not control the pain and that he needs to take antacid tablets at the same time as the Cranidil to control his pain. This morning, he realized that he only has 3 or 4 tablets left in his pill bottle, even though his next appointment with the doctor is over three weeks away. Jack needs to decide whether he should try to get more Cranidil from his pharmacist right away, or whether he should try taking only antacid tablets to control his stomach pains. What do you think Jack should do?

Why?

Appendix C

Task Presentation Order

1. Reading Span test of Working Memory
2. Vocabulary Survey
3. Videotape Presentation: Condition 1: Overaccommodative Speech
Condition 2: Non-overaccommodative Speech
4. Videotape Stimulus Evaluation Questionnaire
5. Free Recall of Videotape Stimulus
6. Prompted Recall of Main Ideas
7. Advice-Giving Task
8. Personal Information Questionnaire
9. Alpha Span Test of Working Memory
10. Recall Stimulus Presentation: Written Form
11. Written Stimulus Evaluation Questionnaire
12. Free Recall of Written Stimulus
13. Prompted Recall of Main Ideas
14. Advice-Giving Task
15. Sentence Repetition Test of Working Memory
16. Delayed Free Recall of Videotape Stimulus
17. Delayed Prompted Recall of Videotape Stimulus
18. Attitudes Questionnaires

Note: Participants were offered a break for refreshments after Task 10.

Table 1

Recall Stimuli Characteristics

	Presentation Format ^a					
	Bendoral			Cranidil		
	WR	NOA	OA	WR	NOA	OA
Word count	487	815	1086	461	747	1039
Content word count ^b	467	769	849	441	693	767
Syllable count	826	1173	1344	771	1096	1258
Proposition count	286	363	447	236	338	440
Sentence count	29	34	58	30	37	64
Clause count	68	100	181	59	101	170
Clause/sentence	2.3	2.9	3.1	2.0	2.7	2.7
Readability ^c	46 (A)	60 (B)	83 (C)	50 (A)	62 (B)	88 (C)
Redundancy ^d	.42	.35	.22	.42	.37	.23
Words/sentence	17	24	19	15	20	16
Duration	--	5 min 57 s	8 min 26 s	--	5 min 50 s	8 min 43 s

^a WR: Written version; NOA: Non-overaccommodative version; OA: Overaccommodative version.

^b This is a word count without non-informative phrases such as tag questions, repetitions, and definitions of easy terminology.

^c Readability based on the Flesch scale (1948): A = Difficult; B = Standard, C = Easy.

^d Redundancy refers to the number of different words divided by the total number of words in the text.

Table 2

Regression Analyses for Free Recall

Order of Blocks	Immediate Recall		Delayed Recall	
	R^2_{ci}	F_{ch}	R^2_{ch}	F_{ch}
Full Sample (n = 120)				
1. Speaking Style	.02	2.8	.02	2.3
2. WM Score	.05	5.6*	.03	3.3
3. Age Group	.05	7.1**	.08	10.03**
4. Style x WM	.02	3.3	.03	4.2*
5. Age Group x Style	.01	.71	.01	.62
6. WM x Age Group	.00	.05	.01	.62

* $p < .05$, ** $p < .01$

Table 3

Regression Analyses for Free Recall within Subject Categories

Order of Blocks	Immediate Recall		Delayed Recall	
	R^2_{ch}	F_{ch}	R^2	F_{ch}
Non-Overaccommodative Condition (n = 60)				
1. WM Score	.00	.07	.00	.11
2. Age X WM Score	.08	5.2*	.04	2.1
3. Age	.00	.2	.03	1.7
Overaccommodative Condition (n = 60)				
1. WM Score	.16	10.9**	.14	9.2**
2. Age X WM Score	.02	1.5	.11	8.1**
3. Age	.00	.01	.00	.03

* $p < .05$. ** $p < .01$

Table 4

Changes in Recall of Main Ideas with the Presentation of
Prompts for Unrecalled Topics

	Immediate		Delayed	
	No Prompt	With Prompt	No Prompt	With Prompt
Groups				
OHWM	9.5	11.7	7.8	12.4
OLWM	7.3	9.3	6.6	9.1
YA	9.8	11.9	9.0	12.2
Conditions				
NOA	8.3	10.8	7.0	11.0
OA	9.4	11.2	8.5	11.4

Note. OHWM = Older higher working memory performers;
OLWM = Older higher working memory performers;
YA = Younger adults;
NOA = Non-overaccommodative presentation; and
OA = Overaccommodative presentation.

Table 5

Subjective Reactions to the Videotape Stimuli

	NOA			OA		
	YA	OHWL	OLWM	YA	OHWL	OLWM
Respectful	3.8	3.9	4.3	2.3 ^b	3.1 ^b	3.2 ^b
Nurturing	3.1	3.6	3.8	3.4	3.8	2.9
Patronizing	2.9 ^a	1.8	1.6	4.4 ^c	4.5 ^c	4.0 ^c
Dominant	3.1	2.3	2.4	3.1	2.4	3.2
Kind	3.4	3.4	3.8	3.8	3.5	3.2
Slow	3.3	2.5	2.3	3.8	3.6 ^c	3.1
Clear	3.9	4.5	4.4	4.6 ^c	4.8	4.7
Simple	3.4	4.1	4.2	4.1 ^b	4.7	4.7
Organized	2.8	2.1	1.8	2.5 ^a	1.6	1.4
Detailed	3.8	3.6	3.5	3.8	4.0	3.8
Helpful	3.7	4.1	4.1	3.8	4.1	3.9

Note. Group effects were established with Scheffe post hoc tests ($p < .05$). The subscript ^a indicates that young adults gave higher ratings for that variable than both older adult groups.

^b NOA > OA. ^c NOA < OA.

Table 6

Mean Differences in Ratings between Videotape Stimuli and Societal Perceptions

Adjectives	Youth Speech		Ideal Speech	
	NOA	OA	NOA	OA
Respectful	1.11	.04 ^{ac}	.19	-.56 ^{abc}
Nurturing	.96	.42 ^a	.41	.04
Patronizing	-1.37	1.08 ^{bc}	.41	2.58 ^{abc}
Dominant	-.74	.04	.52	1.0 ^a
Kind	.37	-.25	-.37	-.58 ^a
Slow	-.56	.75 ^c	-.78	.75 ^c
Clear	1.41	1.46 ^a	.74	1.08 ^a
Simple	1.0	1.83 ^{ac}	1.33	1.62 ^a

Note. Youth Speech = Older adults' ratings of how young adults generally speak to them; Ideal Speech = Older adults' ratings of how younger adults should speak to them.

^aMain effect for Context, $p < .05$.

^bMain effect for Speaking Style, $p < .05$.

^cContext X Speaking Style interaction, $p < .05$.

Figure 1
Gist Recall of Videotape Stimuli

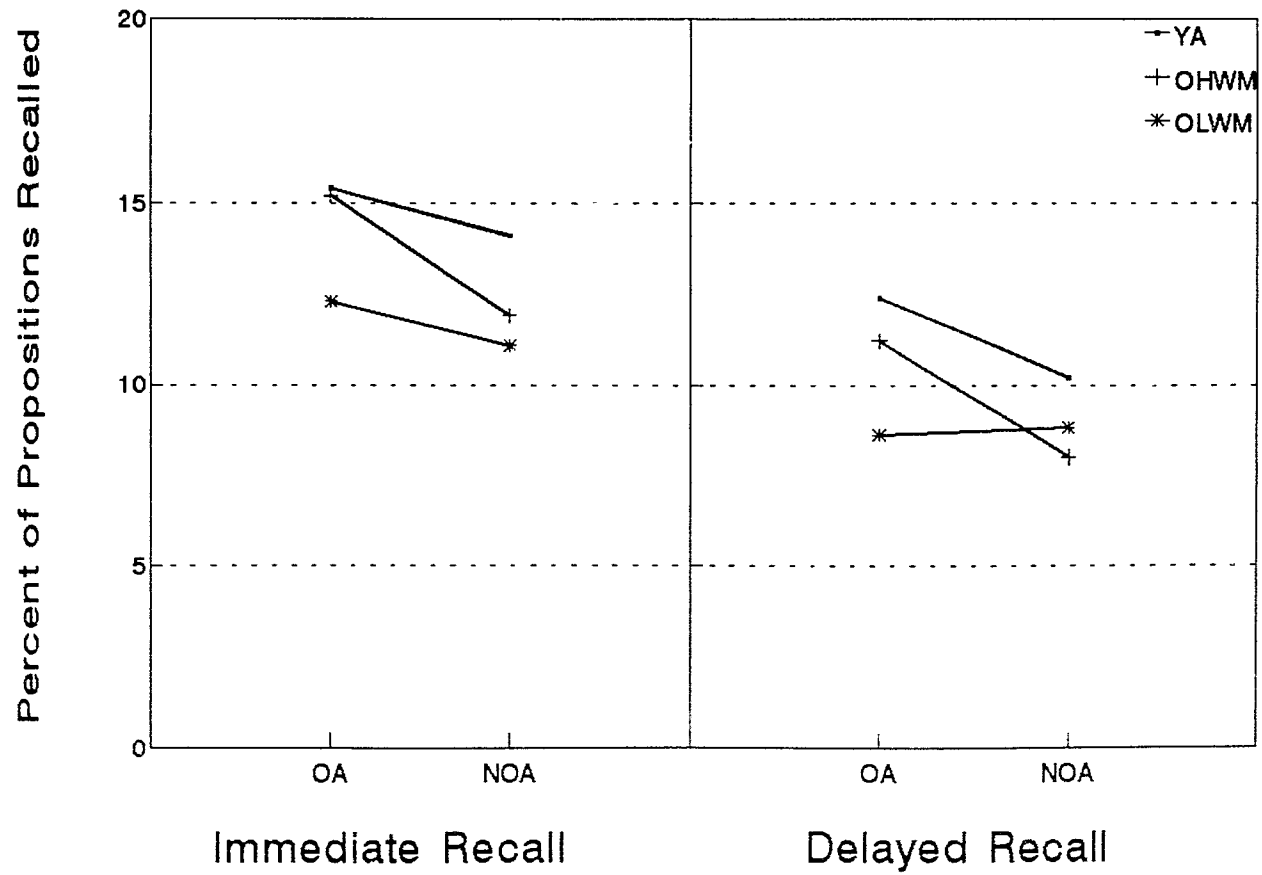


Figure 2
Recall of Main Ideas from
Videotape Stimuli

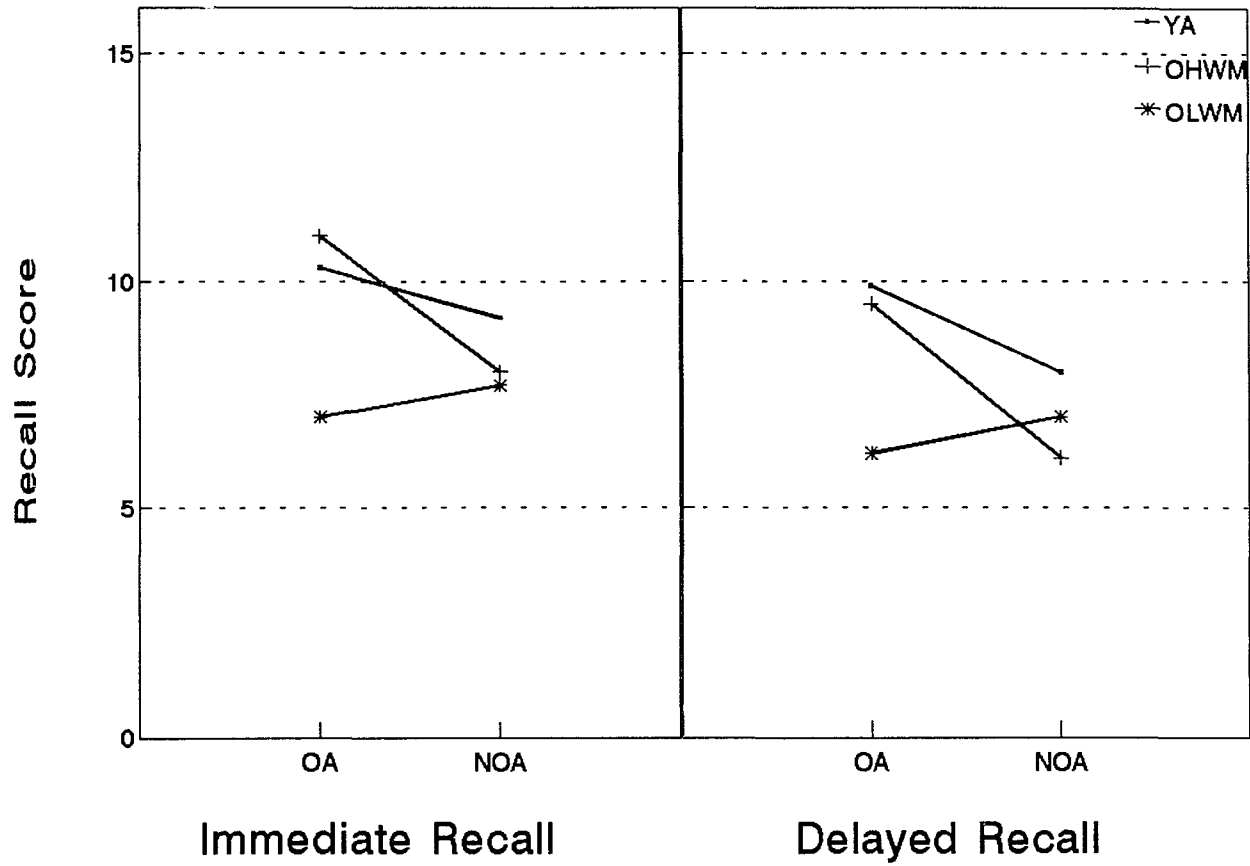


Figure 3
Prompted Recall from Videotapes

