Social Context Effects on Story Recall in Older and Younger Women: Does the Listener Make a Difference?

Cynthia Adams,[1] Malcolm C. Smith,[2] Monisha Pasupathi,[3] and Loretta Vitolo[4]

[1]University of Oregon, Eugene.
[2]University of Manitoba, Winnipeg, Canada.
[3]University of Utah, Salt Lake City.
[4]Eugene, Oregon.

The story-recall performance of older and younger women was examined within an oral story-retelling context with two listener conditions. Forty-eight older women (*M* age = 67.81 years; *SD* = 2.62) and 47 younger women (*M* age = 20.47 years; *SD* = 1.53) were asked to learn one of two stories with the goal to retell the story from memory either to an experimenter or to a young child. Did the listener make a difference in story recall? Yes. Although age-group differences in propositional recall favoring the younger women occurred when an experimenter was the listener, there were no age-group differences when a child was the listener. In addition, when a child was listening, both older and younger tellers adapted their narratives by producing more elaborations and repetitions, as well as by simplifying the more complex of the two stories. Across stories, however, the older tellers adjusted the complexity of their retellings to the age of their listeners more than did the younger tellers. Results highlight the importance of considering the social context of remembering in memory-aging research.

MEMORY has been extensively studied in gerontology using traditional laboratory tasks, such as word-list recall and paired-association learning. The typical result is poorer memory performance in older adults than in younger adults (for reviews, see Smith, 1996; Smith & Earles, 1996). From this approach, we have learned a great deal about the normative changes in memory performance that accompany aging and the basic information-processing mechanisms that likely account for those changes (e.g., decreasing efficiency in working memory and perceptual speed; Baltes, Lindenberger, & Staudinger, 1998; Salthouse, 1998). Despite this wealth of knowledge, there is increasing concern among researchers (especially those who take a more contextual approach to the study of cognitive aging) regarding the generalizability of these findings to the everyday memory functioning of older adults (e.g., Hess & Pullen, 1996; West & Sinnott, 1992). We know little, for example, about how the aging memory system adapts to different everyday remembering tasks.

One way in which researchers have attempted to address this concern is to bring analogs of everyday memory tasks into the laboratory. A particularly productive approach has been the use of meaningful verbal material (i.e., text) as the to-be-learned and -remembered stimulus—the logic being that people are more likely to encounter text material in their everyday lives than they are word lists, for example. In this research context, although older adults retain the gist and interpretive meanings of text (e.g., Adams, Smith, Nyquist, & Perlmutter, 1997), they still typically recall less information (i.e., fewer propositions) than do their younger counterparts (Hultsch & Dixon, 1983; Meyer & Rice, 1989). When age

differences in propositional recall are not observed, findings are usually attributed to aspects of the stimulus text (e.g., it was simple, it was well organized) or to certain cognitive skills and/or life experiences of the older adult sample (e.g., high verbal ability, expertise in the particular knowledge domain tested) that may have compensated for any otherwise apparent age-related processing deficits (Dixon & Gould, 1996; Hultsch, Hertzog, & Dixon, 1990).

Although text-memory research has brought us closer to understanding how the aging memory system adapts to an ecologically relevant task, it still falls short of mimicking most everyday remembering situations. It certainly is true that text-like materials make up a great deal of what we think about and remember daily, especially the narrative form; the events in our lives, for example, are often constructed and remembered as stories (Schank, 1990; Schank & Abelson, 1995). In everyday life, however, the recall of such material most frequently occurs in a social context. Moreover, the social contexts in which people remember vary from situation to situation and, as such, the specific recall goals and demands of an even nominally identical task—like story recall—can thus vary as well (Blanchard-Fields, 1996).

We believe that to more fully understand the aging memory system and how it functions in everyday life it is imperative to know how older adults adapt their learning and remembering skills to the demands of different social memory contexts. It is also important to know whether some contexts provide more optimal remembering conditions for older adults than do others. The present study is a step toward addressing these issues.

Listener Effects and Story Recall

In the present study, we expanded the prototypical story-recall task by placing it within an oral story-retelling context and varying the listener, a young child or an adult experimenter. *Story-retelling* is defined here as the process of generating a narrative from memory that represents a previously experienced verbal representation of an activity or event—such as the retelling of a movie one has seen, an event one has witnessed, or a story one has heard or read (Dixon & Gould, 1996). Story-retelling is thus a common everyday memory activity for adults.

Although sometimes retold in a written format (e.g., a diary or journal), stories most often are retold in a social context; that is, they are retold orally to one or more listeners. This is important because with a listener present, the product of recall is no longer dependent entirely on characteristics of the individual rememberer (e.g., age, verbal ability, life experiences) and the story being recalled (e.g., complexity, organizational structure). Rather, the product of recall may be affected by the listener as well—even when he or she takes a relatively passive stance (Bavelas, Coates, & Johnson, 2000; Clark, 1996; Dixon & Gould, 1996; Krauss, 1987). Indeed, the mere presence of a listener can alter the contents of recall. In a study by Pasupathi, Stallworth, and Murdoch (1998), for example, research participants produced more elaborations, inferences, and opinions when recalling a previously viewed movie excerpt to a listener compared with their written recall of the same event.

Not only does oral recall to a listener differ from written recall, different kinds of listeners elicit different kinds of recall performances from tellers. For example, in a study with Japanese children, the oral recall of a video-presented story (cartoon) was influenced by who was listening: a peer, the child's mother, or an unfamiliar experimenter (Takahashi & Sugioka, 1994). When the listener was a peer or a mother, children produced more detailed and pictorially vivid information from the story than when the listener was the experimenter. One potential difference among these listeners was familiarity—children knew their peers and mothers better and were likely more comfortable with them than with the experimenter. Another, however, is the fact that the experimenter was not a naive listener; that is, he or she already knew the story. Because children may be less aware of the demand of the experimental context to recall everything possible even when the listener already knows the story, they might have recalled only enough to establish, in a normal conversational setting, that they had seen the cartoon. Whichever the explanation, the point remains that peers and mothers elicited more detailed recollections than those directed toward an experimenter, as well as more vivid and pictorial ones. Thus, the experimenter clearly was not the optimal listener for producing detailed recall from these children.

To our knowledge, there are only three published story-recall studies with adults in which listener conditions have been manipulated. In one of these, Hyman (1994) asked participants to retell a story they had learned to either a peer or an experimenter. When directed toward a peer, the retellings were more elaborative, including more personal reactions and evaluations, than when directed toward an experi-

menter. Although there were no listener differences in the amount of propositional detail produced in the retellings, there were differences in how those details were used. When the experimenter was listening, the propositional details preserved, and filled in, the original narrative structure (i.e., the recall closely followed the original text). By contrast, when a peer was listening, the propositional details were secondary to subjective reactions and were used to support a teller's interpretation or evaluation of the story.

In a second study with adult tellers—the Pasupathi and colleagues (1998) study cited earlier—it was shown that a listener's behavior during a retelling event could influence the nature of the retelling. Participants were asked to recount a movie excerpt either to an attentive listener or to a distracted listener. When directed toward the attentive listener, the recountings were more detailed as well as more elaborative (i.e., included more inferences and opinions) than when directed toward the distracted listener. The authors reasoned that the distracted listener provided few nonverbal rewards for retelling and appeared uninterested, thereby discouraging the tellers from including more details in their recall. Using a very similar research protocol, Dickinson and Givon (1995) observed similar results for uncooperative listeners.

In sum, listeners can influence the story-recall performances of tellers. As listeners vary across different social remembering contexts, the specific goals and demands of the recall task can vary as well. The rememberer, thus adapting to such changing demands, will likely produce different kinds of retellings—retellings that vary in propositional detail and completeness, elaborative content, and resemblance to the original material.

Focus of the Present Study

In the present study, we examined age-group differences in story-recall performance with either a young child or an adult experimenter as the listener. Because our primary focus was memory performance—and not the social interaction per se between tellers and listeners—we limited our analysis to recall variables. Specifically, we were interested in examining age-group differences in (a) the proportion of propositional content recalled, (b) the number of elaborations generated, and (c) the complexity of recall in response to the two listener conditions.

We chose the child-listener condition for several reasons. First, we wanted a listener whose very presence would naturally demand a complete and detailed retelling of a story as opposed to a gist or summary retelling. We believed that a young child—who would not be interested in the gist of a story so much as in its complete retelling—would create such a demand. Second, we believed the child-listener condition would be more relevant to the social–cognitive goals of aging than would the experimenter-listener condition. By social–cognitive goals, we mean goals related to the social roles of different life stages and/or tasks perceived to be integral to an individual's everyday functioning (see Blanchard-Fields, 1996). A number of authors have suggested that a prototypic social–cognitive goal for mature adults is to transmit sociocultural knowledge and information to younger generations—especially to children (e.g., Chinen, 1989; Merg-

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ler, Faust, & Goldstein, 1985; Mergler & Goldstein, 1983). It also has been suggested that a crucial task for elders is to integrate the personal and collective past with the present and that this is often done through storytelling and retelling (Schacter, 1996). We reasoned, then, that our child-listener condition would provide a "good match" to the social–cognitive goals of aging and would likely be a more optimal context (compared with the experimenter condition) for facilitating the propositional recall of older adults. By contrast, youth has been characterized as a life stage during which it is important to rapidly acquire large amounts of new information (Carstensen, 1993; Labouvie-Vief & Schell, 1982; Schaie, 1977/1978). Thus, younger adults should be especially attuned to storing and recalling as much propositional information as possible in many different learning and retrieval contexts, including those similar to our child and experimenter conditions.

Finally, a young child as listener (compared with the more traditional experimenter as listener) presents a very different set of social–cognitive demands to which a teller—young or old—must adapt. For example, to make the story itself more comprehensible and interesting to a young child, the story recall would ideally be propositionally complete, as well as simple, coherent, and rich in elaborative content. Elaborations are important because they can add inferred details to the propositional content, thereby enhancing story interest (Gould, Trevithick, & Dixon, 1991). Elaborations can also enrich a narrative's meaning by relating story content to personal and collective life experiences (Adams, 1991; Adams, Labouvie-Vief, Hobart, & Dorosz, 1990; Labouvie-Vief & Schell, 1982) and by providing commentary on the story and its characters (Gould et al., 1991; Schank, 1990). By including the child condition, we were thus able to examine not only age-group differences in propositional recall, but also younger and older tellers' adaptations to the specific social–cognitive demands presented by a young child as the listener.

Once we decided to include a child-as-listener condition, we wanted younger and older tellers with (at least somewhat) equivalent experience interacting with young children so as not to confound any age-group differences with sheer lack of familiarity telling or reading stories to young children. Thus, in this initial study, we chose to limit our sample to women. This was based on the assumption that women in both age groups were more likely than men (especially older men) to have some babysitting, teaching, and/or primary child-caregiving experience and thus were more likely to have some experience or familiarity with telling or reading stories to young children.

Hypotheses

On the basis of previous research, we expected age-group differences in propositional recall favoring the young in the experimenter-listener condition. But because the child condition was presumed to be a better match to the social–cognitive tasks of aging (and hence a more optimal recall context for older adults), we expected age-group differences in propositional recall to be eliminated when a child served as the listener. In addition, because older adults are typically more elaborative than younger adults during story recall

(Adams et al., 1990; Gould et al., 1991; Hultsch & Dixon, 1983; Tun, 1989)—a phenomenon consistent with the effective oral transmission of information to others—we expected the older women in this study to produce a greater number of elaborations at recall than the younger women, regardless of listener condition. Finally, because the social–cognitive demands of a young child as listener are so salient, we hypothesized that older and younger women in the child-listener condition would adapt their story retellings to meet those demands. We examined two specific changes that would reflect such adaptations: (a) whether women in the child-listener condition would produce more elaborative retellings than women in the experimenter-listener condition and (b) whether women who were asked to learn the more complex of two stories (see stimulus texts below) would simplify their retellings in response to a child listener.

METHODS

Participants

A total of 95 women participated in this study: 48 older women ranging in age from 63 to 73 years of age (M age = 67.81 years; SD = 2.62) and 47 younger women ranging in age from 18 to 24 years (M age = 20.47 years; SD = 1.53). The younger women were University of Oregon undergraduates recruited from the psychology department's participant pool; the older women were University of Oregon alumni who responded to a mailing requesting volunteers for studies in cognitive aging. Forty-seven children of both genders, aged 5 and 6, were recruited from local community groups to serve as story listeners.

Within the two age groups, participants were randomly assigned to one of two listener conditions: child-listener or experimenter-listener. Table 1 presents descriptive data for the sample broken down by age group and listener condition. The table also presents the significance tests (F values) for these two main effects (Age Group and Listener Condition) and their interactions for each of the descriptive variables. As shown, there were no significant interactions. Therefore it is unlikely that any observed Age Group × Listener Condition effects in our major recall variables could be explained by group differences in education, verbal ability, health, or activity.

There were, however, a number of differences between the two age groups. As shown in the table in the column labeled age group, the younger and older groups differed in years of education and vocabulary scores, with the older women higher on both. Although there were age-group differences on vision and hearing ratings favoring the young, and on the overall heath rating favoring the older participants, both age groups' mean ratings fell between the good and excellent points on all three rating scales. There were no age-group differences in the socioeconomic scores or on the mental, social, or physical activity rating scales. Both age groups rated themselves on the active end of these three scales.

Because Age × Listener Condition differences in experience telling and/or reading stories to children could affect our recall results, we collected a number of experience ratings (see *Procedure* section for details). Means and standard

Table 1. Descriptive Data on Participants: Age Group × Listener Condition

	Younger Women				Older Women						
	Experimenter (n = 24)		Child (n = 23)		Experimenter (n = 24)		Child (n = 24)				
Variable	M	SD	M	SD	M	SD	M	SD	Age Group	Listener Condition	Interaction
Age	20.63	1.50	20.30	1.58	67.96	2.81	67.67	2.48	—	0.47	0.00
Social status score[a]	49.33	8.57	48.70	10.61	51.23	8.03	51.61	7.67	1.76	0.00	0.08
Education (in years)	14.29	1.36	14.00	1.48	15.56	1.35	15.75	2.09	21.19***	0.03	0.53
Vocabulary score[b]	26.38	5.76	25.04	7.31	34.08	4.48	34.96	3.21	63.56***	0.04	1.00
Health rating[c]	3.04	0.55	3.09	0.79	3.67	0.48	3.67	0.48	24.93***	0.04	0.04
Vision rating[c]	3.17	0.70	3.43	0.51	3.04	0.69	3.00	0.66	4.46*	0.73	1.37
Hearing rating[c]	3.29	0.62	3.52	0.59	3.13	0.74	2.88	0.54	9.94**	0.01	3.46
Physical activity rating[d]	3.21	0.78	3.39	0.66	3.46	0.51	3.25	0.79	0.15	0.01	1.88
Social activity rating[d]	3.33	0.56	3.52	0.67	3.17	0.70	3.21	0.88	2.69	0.62	0.25
Mental activity rating[d]	3.50	0.51	3.74	0.45	3.41	0.50	3.58	0.58	1.28	3.69	0.12

[a]Based on Hollingshead's (1975) Four-Factor Index. Values range from a low of 8 to a high of 66.

[b]Based on Jastak and Jastak's (1964) 20-item written form of the Wechsler Adult Intelligence Scale Vocabulary subtest. A total of 40 points is possible.

[c]Self-rating scales: (1) poor, (2) fair, (3) good, (4) excellent.

[d]Self-rating scales: (1) very inactive, (2) somewhat inactive, (3) somewhat active, (4) very active.

*$p < .05$; **$p < .01$; ***$p < .001$.

deviations for the ratings of younger and older tellers are presented in Table 2. To determine whether the younger and older tellers differed in their experience ratings, we ran a multivariate analysis of variance (MANOVA) with the six experience rating scores as the dependent variables. The overall age effect was significant, Wilks's lambda = .812, $p < .01$. Univariate tests showed that the age groups differed in their ratings of past experience only, with the older women reporting greater frequency telling, $F(1,93) = 8.64$, $p < .01$, and reading, $F(1,93) = 15.87$, $p < .001$, stories to children. This age difference is not so surprising given that most of the older women probably had children of their own to whom they had read and told stories. The age groups did not differ, however, in their present experience reading or telling stories (including personal stories) to children (see Note 1). In addition, none of the six experience variables correlated with any of the recall performance variables (i.e., propositions, elaborations, and complexity).

Stimulus Texts

Two narrative texts were used as the material to be learned and recalled. One was a contemporary children's fable (Lobel, 1980), and the other was a modified version of a Sufi teaching tale (Shah, 1967). The two texts, representing two experimental conditions, differed in complexity. This allowed us to examine the robustness of our Age × Listener prediction across different levels of story complexity. In addition, we were able to examine whether tellers would simplify their retellings of the more complex story to a child listener.

The fable was a simple story about a wolf who disguised himself as a tree to trick a hen into coming outside her house. The text of the fable contained 284 words, 130 propositions, and 24 sentences, with an average of 11.8 words per sentence. The fable scored 2.6 on the Flesch-Kincaid index, a rough index of text complexity (Schuyler, 1980). This index computes readability, or how easy a document is to understand, on the basis of the average number of syllables per word and the average number of words per sen-

tence. It yields a score indicating a grade-school level; the lower the score, the easier the text is to read.

The Sufi tale was an allegory about a stream on a journey in search of its identity. The text contained 473 words, 220 propositions, and 36 sentences, with an average of 13.1 words per sentence. The Sufi tale scored 5.2 on the Flesch-Kincaid index.

Design

The study was a 2 × 2 × 2 factorial design with three between-group factors: Age Group (younger and older adult women), Listener (child and experimenter), and Story (fable and Sufi tale). The eight cells comprised 12 participants each, with the exception of one cell in which 1 younger participant was missing (this was in the child-listener condition with the Sufi tale text; see Note 2).

Procedure

The experiment was conducted in a carpeted room on the University of Oregon campus. The room was furnished with

Table 2. Experience Ratings for Younger and Older Women

	Younger Women (n = 47)		Older Women (n = 48)	
Variable	M	SD	M	SD
Present experience				
Telling stories to children	1.75	0.71	1.98	0.85
Telling personal stories to children	2.15	0.86	2.49	0.93
Reading stories to children	2.06	0.85	2.38	0.99
Past experience				
Telling stories to children	2.51	0.98	3.06**	0.85
Telling personal stories to children	2.77	0.91	3.04	0.81
Reading stories to children	3.11	0.81	3.72***	0.68

Note: Experience ratings were coded as 1 = never, 2 = rarely, 3 = sometimes, and 4 = often.

**$p < .01$; ***$p < .001$.

a table and two chairs set at right angles to each other. A small tape recorder was on the table. Each participant was randomly assigned to either the experimenter-listener or child-listener condition prior to her arrival to the laboratory. This was so we could schedule a child in advance. To prevent systematic differences in age, gender, or some other unknown variable (e.g., verbal ability) in the children assigned to younger and older tellers, the child listeners were randomly assigned to age-group by story conditions.

On arrival at the lab, demographic information was collected orally by a female experimenter in her 30s, and written health and activity rating scales were completed by each participant. In the child-listener condition, each participant was given one of the two stories (fable or Sufi tale) and verbal instructions to learn the story to be able to retell it from memory to a 5- or 6-year-old child. She was told that the story need not be memorized verbatim, but that she should try to remember as much of the story as she could. She was also encouraged to do whatever she needed to do to learn the story (such as making notes or practicing out loud) and was reminded that the retelling would be from memory. Finally, she was told that she could take as much time as she needed to learn the story. The experimenter then left the lab while the participant learned the story. When the participant was finished learning the story, she signaled to the experimenter by tapping on the laboratory door. Learning time was recorded with a digital stopwatch.

During this time, the child was waiting in another room with her or his parent and a second female experimenter in her 30s with whom the child was establishing rapport. The parent and child were told that the child would soon be taken to another room (the lab) and introduced to an adult woman who was going to tell a story to the child. The child was assured that his or her parent would be waiting right outside the room and that the child could stop listening to the story if for some reason he or she did not want to continue.

When the adult teller signaled that she was finished learning the story, the child was brought into the lab by the second experimenter and introduced to the teller. The second experimenter (with whom the child already had rapport) then facilitated rapport between the child and adult teller. A period of 4 min was allocated for this. The child was then asked if he or she was ready to listen to the story. At this time, the first experimenter returned to the lab, asked the participant if she was ready to retell the story to the child, and turned on the audiotape recorder. The first experimenter then said to the child, "[Participant's name] is going to tell you the story now." The two experimenters left the room and the story-retelling commenced.

Although the children were not explicitly told to remain quiet, they were told they would be "listening to a story" and were not encouraged to ask questions or make comments during the retelling. As it turned out, very few utterances were initiated by children during the recall task (see Results section). On completion of the story recall task, the second experimenter returned to escort the child out of the lab and the first experimenter continued the protocol with the adult participant (see below).

In the experimenter-listener condition, the learning instructions were identical to those in the child-listener condition with the exception that the participant was told that the experimenter would be listening to the retelling. The procedures were also identical with the following minor modifications. When the participant signaled that she was finished learning the story, the second female experimenter entered the lab, stated that the first experimenter would be back momentarily, and chatted with the participant for a period of 4 min. This delay prior to retelling was designed to match the delay in the child-listener condition by keeping it the same length and having the second experimenter involved. At the end of the 4 min, the first experimenter returned to the lab, asked the participant if she was ready to retell the story, turned on the tape recorder, and the retelling commenced.

Following the story-retelling session, in both conditions, the adult participants were asked to respond to a number of questions, rating scales, and other written tasks. They were first presented with a list of learning strategies and were asked to check all strategies used in preparation for retelling the story. Strategies on the list included: "reread the story several times," "practiced the story aloud," "visualized the story in my mind," "connected the story with real life experiences," and "tried to abstract the deeper meaning of the story." In addition, there was space to write in any other strategy used. They were then asked to indicate and describe the learning strategy they used the most. Following the strategy questions, participants were asked to rate the story from 1 (not at all) to 5 (very) on the extent to which they (a) found the story difficult to understand, (b) were familiar with this type of story, (c) liked the story, (d) identified with a character in the story, and (e) found the story to be personally meaningful. They were then asked to rate their storytelling experience on six scales, three pertaining to the present and three to the past: "Thinking about the [present/the past], how often [do you/did you] tell stories to children from memory, like traditional fairy tales, fables, and parables?", ". . . how often [do you/did you] tell more personalized kinds of stories to children from memory, like recounting a movie you saw, a book you read, a dream, or a life event?", and ". . . how often [do you/did you] read stories to children?" Respondents checked one of the following to each of the six questions: never, rarely, sometimes, or often. At the end of the session, participants completed the vocabulary task (see Table 1).

Coding Procedures

The oral story-retellings were transcribed from the audiotapes in preparation for scoring. Each recall protocol was then coded for propositional and elaborative content. In all cases, coders were unaware of the participant's age and the listener condition. Each protocol also was analyzed for the proportion of main ideas relative to details included (i.e., a levels analysis, which was used as an indicator of recall coherence) and was given a complexity score (see below).

Propositional content.—Each recall protocol was first scored for the number of propositions present. Using a lenient criterion (Turner & Greene, 1977), we scored a proposition as correctly recalled if it represented the gist of a text-based proposition's meaning. One trained individual coded the entire set of 95 protocols. To check the reliability of the

propositional coding, a second trained individual coded a randomly selected sample of 28 protocols (14 for each story), representing 29% of the total number of protocols. There was 91.7% and 84.4% agreement achieved between the two coders on the fable and the Sufi tale, respectively. The first coder's propositional scores were used in the data analysis.

In preparation for the levels analysis, Adams and Smith independently rated each proposition in the fable and the Sufi tale as representing one of four levels of importance (see Adams et al., 1997). First-level propositions were those that stated the main ideas of the story. Second-level propositions were supporting statements of the main ideas. Third-level propositions were supporting details, and fourth-level propositions were inessential details. There was 91.7% agreement for the fable and 88.6% agreement for the Sufi tale. Differences in the ratings were resolved by consensus to provide a final set of levels for each story. For the fable, the resulting number of propositions for Levels 1 through 4 was 44, 40, 27, and 19, respectively. For the Sufi tale, the number of propositions at each level was 50, 61, 58, and 51, respectively. Each proposition in the participants' recall protocols was then assigned to one of the four importance levels.

Elaborative content.—Once the text-based propositional coding was completed, the remaining recall content was coded for the number of elaborations present (broken down into propositional units using the criteria in Turner & Greene, 1977). Elaborations were defined as propositions generated by the teller during story recall that added to and extended the meaning of the original text base. These included pragmatic inferences, inferred psychological and physical attributes of characters, and inferred explanations for a character's behavior. Propositions that were completely unrelated to text-based content and/or were inaccurate were coded as errors (see Note 3). Because propositions that repeated either an original text-based proposition or a teller-generated elaboration were prevalent, and because the use of repetitions can create a rhythm that draws the listener into the story (L. F. Erz, professional storyteller, personal communication, June 13, 1999), we included a category called *repetitions* in our coding.

One individual coded the entire set of protocols and a second individual coded 25% of the protocols (these were randomly selected). Percentage agreement between the two coders was 82.7. The first coder's data set was used in the data analysis.

Complexity.—We used the Flesch-Kincaid readability score (Schuyler, 1980) as a rough index of the complexity of a retelling. As stated earlier, this index computes how easy a document is to understand on the basis of the average number of syllables per word and the average number of words per sentence. The lower the score (indicating a grade-school level), the easier the document is to understand. We applied the Flesch-Kincaid formula through the Microsoft Word 97 software package to each of the transcribed retelling protocols. Because this formula was originated for use with written, not oral, text and because it is based on rela-

tively simple criteria (e.g., length of words), caution is warranted when interpreting individual complexity scores. However, for group comparisons as a function of listener and story conditions, we have found this to be a useful and interesting, albeit rough, index of retelling complexity.

RESULTS

Below, we begin by reporting the findings for our major hypotheses concerning age and listener effects on propositional recall, elaboration in recall, and complexity in recall. We then consider several potential explanations for the findings, including the age-group differences in storytelling experience reported above in the sample description.

Age-Group Differences in Story Recall: Does the Listener Make a Difference?

The primary measure of story recall in this study was the number of propositions produced in the retelling protocols. Prior to data analysis, this number was transformed into a proportion score. Then, to simplify the levels analysis, we summed the original raw scores for Importance Levels 1 and 2 (main ideas) to form a single main-idea level score, and summed Importance Levels 3 and 4 to form a single-detail level score. Next, the main-ideas score was transformed into a proportion using the sum of the total number of propositions in Levels 1 and 2 as the denominator. The detail score was likewise transformed, using as a denominator the sum of the total number of propositions in Levels 3 and 4.

Propositional recall.—A 2 (Age Group) $\times$ 2 (Story) $\times$ 2 (Listener) $\times$ 2 (Level) analysis of variance (ANOVA) with repeated measures on the levels variable was conducted on the proportion data. There was a main effect for Story, $F(1,94) = 74.18$, $p < .001$, with propositional recall significantly greater for the fable ($M = 0.73$, $SD = 0.15$) than for the Sufi tale ($M = 0.43$, $SD = 0.17$). This is not so surprising, given the complexity differences between the stories. None of the interactions with Story were significant. The main effects for Age Group and Listener were not significant. The predicted Age Group $\times$ Listener interaction was, however, significant, $F(1,94) = 4.78$, $p < .05$. Because there were no significant Story interactions, Figure 1 presents the data for the Age Group $\times$ Listener interaction across the two stories. As shown, although age differences in favor of the younger tellers occurred when the experimenter was listening ($M_{younger} = 0.61$, $SD = 0.22$; $M_{older} = 0.52$, $SD = 0.21$), simple effects test, $F(1,87) = 5.11$, $p < .05$, age differences did not hold when the child was listening, with older adults recalling as many propositions as younger adults in this condition ($M_{younger} = 0.58$, $SD = 0.24$; $M_{older} = 0.61$, $SD = 0.19$), simple effects test, $F(1,87) = 0.69$, $p = .41$ (see Note 4).

Finally, the main effect for Level was significant, $F(1,94) = 557.48$, $p < .001$, with a greater proportion of main ideas ($M = 0.66$, $SD = 0.21$) recalled relative to details ($M = 0.47$, $SD = 0.21$), indicating that tellers were sensitive to a text's hierarchical structure. More important, the Age Group $\times$ Level interaction was nonsignificant, indicating that both older and younger tellers produced structurally coherent
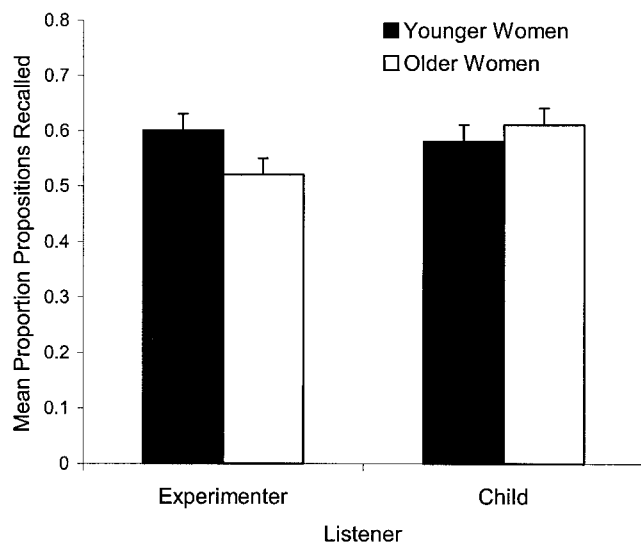
Figure 1. Mean proportion propositions recalled for younger and older women within each listener condition. Bars represent the standard error of the mean.

narratives across stories and listeners. None of the other interactions with Level were significant.

Because any utterance spontaneously initiated by a child listener could prompt a teller to produce extra propositions, we followed up the above analysis in the following manner. First, we counted the number of utterances initiated by the child in each protocol. We then examined the teller's responses, if any, to the child's utterances, looking for those that could be classified as text-based propositions. The child posed a question in only one case, and in two cases the child commented on the story's content. However, there were no cases in which a child's utterance prompted any new propositions from the storyteller.

Elaborative recall.—A 2 (Age Group) × 2 (Story) × 2 (Listener) MANOVA was conducted on the number of elaborations and repetitions generated at recall. Contrary to expectations, the main effect for Age was not significant. The expected listener effect was, however, significant, Wilks's lambda = .70, $p < .001$. Univariate tests revealed that significantly more elaborations, $F(1,94) = 30.43$, $p < .001$, as well as repetitions, $F(1,94) = 12.24$, $p < .01$, were produced in response to a child ($M_{elaborations} = 35.06$, $SD = 19.93$; $M_{repetitions} = 10.34$, $SD = 11.10$) compared with an experimenter listener ($M_{elaborations} = 19.42$, $SD = 13.64$; $M_{repetitions} = 4.19$, $SD = 5.13$). In addition, the main effect for Story was significant, Wilks's lambda = .67, $p < .001$. This was due to the number of elaborations produced: Tellers in the Sufi tale condition generated more elaborations ($M = 36.58$, $SD = 20.49$) than did those in the fable condition ($M = 17.94$, $SD = 10.58$), $F(1,94) = 42.92$, $p < .001$. None of the multivariate interactions were significant.

Complexity scores.—A 2 (Age Group) × 2 (Story) × 2 (Listener) ANOVA was run on the retelling complexity scores. In this analysis, the main effects for Listener, $F(1,94) =$

24.55, $p < .001$, and Story, $F(1,94) = 91.51$, $p < .001$, were significant. These effects were moderated, however, by a significant Story × Listener interaction, $F(1,94) = 15.11$, $p < .001$. Participants maintained the complexity of the original Sufi tale (complexity score = 5.2) when retelling it to an experimenter ($M = 5.06$, $SD = 1.26$), but significantly reduced its complexity when retelling it to a child ($M = 3.40$, $SD = 0.93$), simple effects test, $F(1,87) = 38.66$, $p < .001$. This was not the case, however, for the already simpler fable (complexity score = 2.6; $M_{exp} = 2.54$, $SD = 0.60$; $M_{child} = 2.34$, $SD = 0.85$), simple effects test, $F(1,87) = 0.73$, $p = .40$. Thus, both older and younger tellers in the child-listener condition adapted their retellings of the more complex Sufi tale to better match the perceived comprehension level of the child.

Although the main effect for Age Group was not significant, there was a significant Age Group × Listener interaction, $F(1,94) = 4.96$, $p < .05$. As shown in Figure 2, this interaction was driven by a significantly greater disparity in the complexity scores between experimenter and child conditions for the older adults ($M_{exp} = 4.01$, $SD = 1.82$; $M_{child} = 2.67$, $SD = 0.94$), simple effects test, $F(1,87) = 26.09$, $p < .001$, compared with the younger adults ($M_{exp} = 3.58$, $SD = 1.36$; $M_{child} = 3.05$, $SD = 1.10$), simple effects test, $F(1,87) = 3.68$, $p = .058$. This result suggests a greater sensitivity by the older women to the comprehension levels of their listeners. Neither the Age Group × Story nor the Age Group × Story × Listener interactions were significant.

To summarize, thus far our analyses suggest that older adults' propositional recall is enhanced by a child listener as compared with an experimenter listener, and that although both younger and older adults show adaptation in their storytelling to children, older adults may be more sensitive to the cognitive competencies of different age listeners. In what follows, we examined several potential explanations of the observed age differences, including the greater storytelling and reading experience of our older adult tellers, the
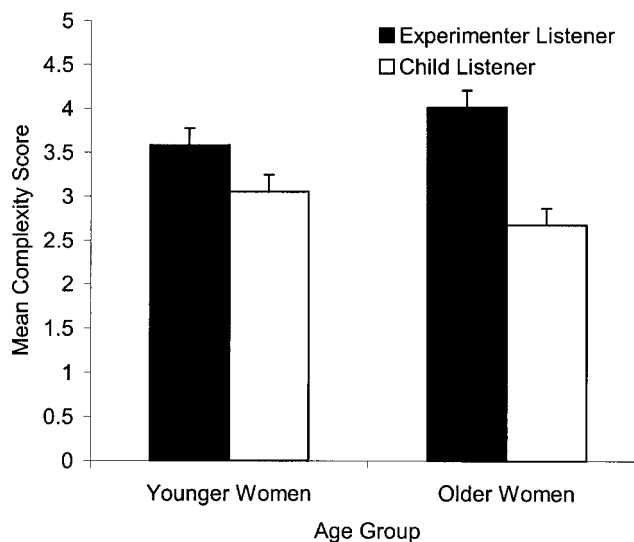

Figure 2. Mean complexity scores for the experimenter- and child-listener conditions within each age group. Bars represent the standard error of the mean.

possibility that older and younger adults might have differed in their learning time and strategies, and the possibility that older and younger adults might have differed in their perceptions of the stories.

Does Experience Explain the Age × Listener Condition Effect in Story Recall?

As noted earlier, our age groups differed in their prior experience with telling and reading stories to children. Such differences might explain why the older adults gave more detailed propositional retellings to child listeners and why they adapted the complexity of their stories to the age of their listeners more than younger adults did. To examine this possibility, we conducted two analyses of covariance (ANCOVAs), one for propositional recall and one for complexity. In each case, Age, Listener Condition, and Story served as between-subjects factors, and prior experience (an average of prior experience reading and telling stories to young children, as these variables correlated at .50) served as a covariate.

For propositional recall, the experience variable contributed significantly to predicting the proportion of propositions recalled, $F(1,93) = 4.72$, $p < .05$. However, the Story main effect remained, and the Age × Listener Condition effect remained a trend, $F(1,93) = 3.40$, $p < .07$. Follow-up examination of the simple effects of Age within the two listener conditions suggested that, again, age differences in propositional recall were evident in the experimenter-listener context, simple effects test, $F(1,85) = 7.45$, $p < .01$, but were not evident in the child-listener context, simple effects test, $F(1,85) = 0.01$, $p = .90$. This suggests experience is not the best explanation for our findings.

For complexity, all results were identical, and experience did not contribute significantly to the model, $F(1,93) = 0.02$, $p = .87$.

Do Age Differences in Learning Time and Learning Strategy Explain Our Results?

To determine whether the age groups differed in the amount of time spent learning a story, we conducted a 2 (Age Group) × 2 (Story) × 2 (Listener) ANOVA on learning time (in minutes). Although the Age-Group main effect only approached significance, $F(1,94) = 3.35$, $p = .071$, the older women, on average, took 5 min longer to learn a story ($M = 18.16$, $SD = 16.23$) compared with the younger women ($M = 13.62$, $SD = 8.26$; see Note 5). The main effect for Listener was not significant, nor was the Age Group × Listener interaction. Thus, older women in both the child ($M = 18.00$, $SD = 12.88$) and experimenter ($M = 18.31$, $SD = 19.29$) conditions took an equivalent amount of time to learn a story. Likewise, younger adults took an equivalent amount of time to learn the story in the child ($M = 12.66$, $SD = 7.48$) and the experimenter ($M = 14.54$, $SD = 9.00$) conditions. The Story main effect was significant, $F(1,94) = 14.61$, $p < .001$. Not surprisingly, participants learning the more complex Sufi tale took about 20 min to do so ($M = 20.78$, $SD = 15.99$), whereas those in the simpler fable condition took about 11 min ($M = 11.15$, $SD = 6.59$). None of the interactions with Story were significant.

To determine whether learning-time differences between younger and older women contributed to the lack of age dif-

ferences in propositional recall in the child condition, we first examined the distributions of the learning-time data and noted two outliers. It turned out that two older women took a disproportionately long time to learn the Sufi tale (73.75 min and 77.00 min). But because both women were in the experimenter condition, these outliers did not affect the age-group analysis in the child condition. Second, we covaried the learning-time data out of the propositional recall ANOVA. Interestingly, unlike the original analysis, this analysis indicated a main effect for Age, $F(1,94) = 5.08$, $p < .05$, which was moderated, however, by a still significant Age Group × Listener interaction, $F(1,94) = 5.08$, $p < .05$. Thus, differences in favor of the younger group held for the experimenter-listener condition, and no age-group differences held for the child-listener condition. Finally, to make sure our original nonsignificant age effect held for the child condition, the proportion of propositions recalled was regressed against learning time in this condition. The resultant $R^2 = .003$ indicated that learning time did not account for variation in propositional recall in this condition.

To examine whether differences in learning time could explain the Age × Listener effect in the complexity of the retellings, we conducted an ANCOVA on the complexity scores with Age, Listener Condition, and Story as between-subjects factors and learning time as a covariate. The results did not change, nor did learning time contribute significantly to the model, $F(1,94) = 0.19$, $p = .66$.

With respect to the learning strategies used, overall, the most frequently checked learning strategies used by both younger and older participants were "reread the story several times" (96% of the total sample), "tried to remember the sequence of events" (93%), "repeated the story to self several times" (68%), and "visualized the story" (72%). When asked to describe the learning strategy they used most, 73% of the participants described some kind of grouping or organizational strategy (e.g., sequencing, focusing on key words, blocking into sections, outlining main points, understanding the meaning). To determine whether the age groups differed in the types of learning strategies used, we ran chi-square tests on each of the listed strategies. There were no age-group or listener differences in the types of strategies used. Story differences, however, emerged for two of the strategies: "tried to remember the details" and "abstracted the meaning of the story." The detail strategy was used more often in the fable as compared with the Sufi tale condition, $\chi^2(1, N = 95) = 6.52$, $p < .05$, whereas the abstract meaning strategy was used more often in the Sufi tale than in the fable condition, $\chi^2(1, N = 95) = 28.42$, $p < .001$. This is not surprising because Sufi teaching tales are known to contain multiple deep meanings (Shah, 1967). Finally, a 2 (Age Group) × 2 (Story) × 2 (Listener) ANOVA was conducted on the total number of strategies used. There were no significant main effects or interactions. In sum, the younger and older women in this study used similar learning strategies and did so regardless of listener condition.

Do Age Differences in Story Ratings Contribute to Our Results?

The means and standard deviations for the story rating variables by Age Group and Listener Condition are presented in

Table 3 for each story. To determine whether the two age groups differed on any of the story rating variables, a 2 (Age Group) $\times$ 2 (Story) $\times$ 2 (Listener) MANOVA was conducted with the five story rating scores as the dependent variables. The Listener condition was included because participants were asked to rate the story following the retelling task. There were no Age Group or Listener main effects, and there were no significant interactions. Thus, age and listener condition differences in perceptions of the stories cannot explain the observed pattern of results.

There was, however, a significant multivariate effect for Story, Wilks's lambda = .655, $p < .001$. Univariate tests showed that the fable was rated as more familiar ($M = 3.44$, $SD = 1.34$) than the Sufi tale ($M = 2.65$, $SD = 1.16$), $F(1,93) = 9.09$, $p < .01$; the Sufi tale was rated more personally meaningful ($M = 3.15$, $SD = 1.15$) than the fable ($M = 2.00$, $SD = 0.97$), $F(1,93) = 28.35$, $p < .001$; and participants identified more with a character in the Sufi tale ($M = 2.83$, $SD = 1.20$) than with a character in the fable ($M = 2.02$, $SD = 1.18$), $F(1,93) = 10.38$, $p < .01$.

Age, Individual Differences in Story Ratings, and Recall

To identify patterns of individual differences in the story ratings that might be related to recall performance in the two age groups, we ran a series of Pearson correlations with the three recall variables (propositions, elaborations, and complexity) for each age group across story and listener condition. Because the "identified with a character in the story" rating turned out to be highly correlated with the "personal meaningfulness" rating, overall $r(94) = .59$, $p < .001$, of the two, we included only the personal meaningfulness rating in the following analyses. These correlations are presented in Table 4.

When examining the correlations for each age group, we found different ratings correlated with different features of recall in the two age groups. As shown in the table, in the younger group, familiarity correlated positively with the

number of propositions recalled and negatively with complexity of recall. Thus, younger tellers who rated a story as familiar were more likely to produce longer and/or simpler retellings than younger tellers who rated a story as unfamiliar. Being familiar with a story thus appeared to benefit younger, but not older, adults in this study.

In the older group, the personal meaningfulness rating correlated positively with the number of elaborations produced and with complexity of recall, but negatively with propositional recall. Thus, older tellers who rated a story high on personal meaningfulness (relative to those who did not) were more likely to elaborate on and/or to increase the complexity of the story at the expense, however, of reproducing some of the story's propositional content. No other correlations were significant in either age group.

DISCUSSION

In the present study, we placed a story-recall task within an oral story-retelling context, varied the listener (either a young child or an experimenter), and posed the question: Does the listener make a difference in the story recall performances of older and younger adult women? The results of the present study suggest that, yes, the listener can make a difference and, in the present study, did so in the following ways. First, and of central concern to this study, the listener influenced the occurrence of age differences in propositional recall. Although age differences in favor of the young occurred in the experimenter-listener condition (the more typical research context), age differences did not occur when a child was the listener. Older women in the child-listener condition recalled as much propositional content as their younger counterparts, at the same time maintaining the structural coherence of the narrative. This effect was not due to differences in verbal ability, education, health, activity, or learning time and strategy use between the two listener groups within each age group. Nor did the child prompt additional propositions from the older women in the child-listener condition. Moreover, age differences in past storytelling and story reading experience could not explain the effect. Our findings thus suggest that the aging memory system performs differentially in different recall contexts, and that, in the present study, the child condition presented the more optimal context for a more complete propositional recall by older adults. In fact, in examining Figure 1, it appears that the experimenter context may have suppressed the propositional recall of the older adults though not changing the younger adults' recall.

Second, the listener influenced the nature of recall. When a child was listening, the story retellings of both older and younger adults were more elaborative and repetitive than when an experimenter was the listener. In addition, in the Sufi tale condition (the more complex of the two stories), younger and older participants reduced the complexity of their retellings for the child listener, compared with the adult experimenter listener. These results indicate that both younger and older tellers were sensitive to the social–cognitive demands of the young child listener and adapted their narratives accordingly. Across stories, however, the older tellers adapted the complexity of their narratives to the age of their listeners more so than did the younger adults, sug-

Table 3. Mean Story Ratings by Age Group and Listener Condition

| | Younger Women | | | | Older Women | | | |
| | Child ($n = 11$) | | Experimenter ($n = 12$) | | Child ($n = 12$) | | Experimenter ($n = 12$) | |
Rating	M	SD	M	SD	M	SD	M	SD
Fable								
Difficult	2.33	(0.78)	1.75	(0.75)	2.17	(1.11)	2.67	(1.15)
Familiar	3.75	(1.06)	3.67	(1.30)	3.50	(1.57)	2.83	(1.34)
Like	3.58	(0.79)	4.08	(0.67)	3.50	(0.90)	3.67	(1.23)
Id. w/character	2.00	(1.13)	2.17	(1.19)	2.00	(1.04)	1.92	(1.44)
Meaningful	1.92	(0.90)	2.17	(1.19)	2.00	(0.95)	1.92	(0.90)
Sufi tale								
Difficult	2.45	(1.13)	2.33	(0.78)	2.27	(0.90)	2.50	(1.24)
Familiar	2.72	(1.01)	2.50	(1.24)	2.55	(1.44)	2.83	(1.03)
Like	3.73	(0.90)	3.75	(1.06)	4.27	(0.90)	4.25	(0.62)
Id. w/character	2.36	(1.43)	2.75	(1.14)	2.73	(0.79)	3.42	(1.24)
Meaningful	2.45	(1.21)	3.00	(1.28)	3.64	(1.03)	3.50	(0.80)

Notes: Rating scales range from 1 = not at all to 5 = very. Difficult = story was difficult to understand; Familiar = familiar with this type of story; Like = liked the story; Id. w/character = identified with a character in the story; Meaningful = found the story to be personally meaningful.

Table 4. Correlations Between Story Ratings and Recall Variables by Age Group Across Story and Listener Conditions

Rating	Younger Women (n = 47)			Older Women (n = 48)		
	Propositions	Elaborations	Complexity	Propositions	Elaborations	Complexity
Difficult	−.006	.220	.064	.200	−.131	−.110
Familiar	.420**	−.052	−.297*	−.041	.006	−.092
Like	.138	.039	.033	−.253	.216	.279
Meaningful	−.064	.077	.145	−.332*	.392**	.418**

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

gesting a greater sensitivity—or at least responsiveness—to the cognitive competencies of different age listeners.

Social Context, Recall Performance, and Aging

The effect of listener on age differences in propositional recall performance highlights the importance of considering social context in memory-aging research. It also raises the question of why some remembering contexts more than others might optimize the propositional recall of older adults. As discussed in the introduction, we believe that when the demand characteristics of the learning/memory context are relevant to—or "match"—the social–cognitive goals and tasks of later adulthood, a more complete propositional recall performance may be facilitated. In the present study, the child-listener condition was likely a better match to the social–cognitive goals of aging than the experimenter-listener condition. When the goal was to learn and retell a story to a child, the skills required to do so may have felt more practiced and comfortable (i.e., more natural) for older adults than when the listener was to be an experimenter. Moreover, because retelling a story to a child was likely interpreted to be more relevant and meaningful to our older tellers than was retelling the story to an experimenter, older participants in the child condition may have been more motivated to learn and recall as much of the story as possible, perhaps expending more mental energy than their counterparts in the experimenter-as-listener condition, although they did not take more learning time or use different learning strategies.

In addition, with a lifetime of experience in conversational contexts, an increased sensitivity to the changing demands of different memory contexts may come with aging. Thus, in response to the perceived cognitive requirements of a young child compared with an experimenter, the older women in our study may have accommodated their retellings more than the younger women did—increasing the propositional content to provide a more complete recounting of the original tale than would be required for the (nonnaive) adult experimenter listener. This explanation is bolstered by the fact that the older women accommodated the complexity of their retellings to the age of their listeners more than did the younger women. Consistent with Mergler and colleagues (Mergler et al., 1985; Mergler & Goldstein, 1983), our findings could thus suggest that the storytelling performance of older adults is better tuned to the communicative needs of listeners than that of younger adults. They could also be taken as support for older adults' skills at nar-

ration (e.g., Kemper, Rash, Kynette, & Norman, 1990). But because memory performance, and not communication skill, was the focus of the present study, implications of our findings for communication and aging are speculative.

It could be argued, however, that the greater propositional recall by older women in the child condition was merely an artifact of the greater number of elaborations produced in that condition. Because elaborations can serve as retrieval cues (Reder, 1982), the larger number generated in response to a child could have facilitated and supported the production of greater propositional recall by older adults in that condition. Similar to this, we have elsewhere observed (Adams et al., 1997) that older adults, but not younger adults, who interpreted a story before recalling it (i.e., elaborating on the story's meaning first) produced more propositions than older adults who recalled a story before interpreting it. To test this interpretation, we ran an ad hoc analysis of covariance on propositional recall with elaborations as the covariate. The original results did not change. Thus, the greater number of elaborations generated when a child was listening did not appear to contribute to the lack of age differences in propositional recall in this condition.

Finally, there is the possibility that stereotype threat could have been operating in the experimenter-listener context. For example, in the presence of a young child, the older adults in that condition may simply have been less anxious than those in the experimenter-listener condition. Given the stereotype of the "forgetful elder," the older women with the experimenter listener could have perceived the story-recall task as evaluative and thus threatening to their memory competence. By contrast, such a perceived threat was not likely to have occurred when a child was the listener. Potentially less burdened by the anxiety of exemplifying the forgetful elder stereotype, the older women in the child condition may have been more efficient at remembering and therefore better able to produce a more complete propositional recall (see Levy, 1996; Levy & Langer, 1994; Steele, 1997; Steele & Aronson, 1995). Alternatively, the older women in the experimenter condition may have wanted to avoid being perceived as exemplifying the "rambling elder" stereotype and thus shortened their retellings accordingly (see Note 6). Although our data cannot directly address the potential cognitive effects of these or any other kinds of stereotypes that may be operating in the social contexts in which older adults are embedded, we believe that understanding the role of such stereotypes is critical to a better understanding of the everyday cognitive functioning of older adults.

Although we have identified several possible explanations for older adults' differential recall performance, the present data do not provide for distinctions among these various explanations. In future research, it will be important to not only vary parameters of social context (e.g., listener), but also to assess relevant social–cognitive factors such as motivation, stereotype vulnerability, the sense of social–cognitive match participants may experience, and the way participants interpret a context and its demands (e.g., what kind of recollection they felt they should provide). Such assessments will help us to better understand the specific aspects of a social context that optimize, or hinder, older adults' memory performance.

Finally, it is important to consider the specific learning and memory mechanisms through which our listener manipulation might have operated. Because during the learning task our participants were aware who later would be listening to their retelling (a child or an experimenter), both encoding and retrieval mechanisms could potentially have been affected. Although our study was not specifically designed to tease apart the effects of our manipulation on these two mechanisms, the fact that the learning time and learning strategy data did not differ in the two listener conditions suggests that encoding was not differentially influenced; thus, differential retrieval mechanisms, likely activated in the presence of a child or an experimenter, may have made the difference in the retellings. The addition of a nonlistener condition (e.g., written recall) to the research protocol, along with the addition of matching listener conditions with participants unaware at encoding that there would be a listener at retrieval, would help to tease apart the mechanisms through which the social context manipulation operates.

Social Context, Elaborations, and Aging

The finding of no age-group differences in the number of elaborations produced is somewhat surprising. When recall protocols are analyzed for elaborative content, older adults typically are shown to produce more than younger adults (Gould et al., 1991; Hultsch & Dixon, 1983; Stine & Wingfield, 1987; Tun, 1989). Moreover, the number of elaborations generated in the present study was substantial in both child and experimenter conditions. By contrast, most studies examining elaborations report very low frequencies (e.g, Tun, 1989). Part of the elaborative tendency in our study can probably be attributed to the use of narrative text. Research has shown that people tend to generate more elaborations when recalling a story compared with other types of material, such as expository text (Graesser, 1981; Tun, 1989). But the use of narrative cannot provide the whole explanation; other studies examining elaborations in story recall typically report low frequencies (see Gould et al., 1991). We believe having a listener present made the difference—inducing both younger and older participants to elaborate generously on the original text. This interpretation is consistent with the Pasupathi and colleagues (1998) finding in which having a listener present elicited significantly greater elaboration compared with written recall.

Our study also showed that different kinds of listeners can make a difference in the amount of elaboration produced at recall. Specifically, the presence of a child listener in our study elicited more elaborative retellings than did the presence of an experimenter listener. This finding is consistent with the study by Hyman (1994) in which the presence of a peer evoked greater elaborative responding compared with the standard experimenter condition. Such results suggest that elaborations may play a fundamental role in everyday social remembering. For example, they may serve to communicate a teller's interpretations of the motives and values of the actors in a story or real-life social situation; they can also serve to enhance a listener's interest in the story retelling. On this view, it is possible, then, that the greater elaborative tendency of older adults often observed in other research is not necessarily compensatory, serving to "fill in" for an inability to recall details of the original text. Instead, it could be the result of elders interpreting the recall context differently than the younger adults they are typically compared with—with elaborations serving productive social functions. It is likely, of course, that elaborations serve many different kinds of functions, including compensatory and productive, depending on person, stimulus, and social–context variables. Future research will be necessary to determine the specific conditions under which elaborative production is facilitated or inhibited in story-recall contexts for various age groups, as well as to determine the kinds of functional roles elaborations might be serving in different retrieval contexts.

Age, Emotional Engagement, and Recall

Although suggestive at best, our correlational analyses uncovered an interesting relationship between emotional engagement in a story and recall among the older adults only. Specifically, those older women who rated a story high in personal meaningfulness produced retellings that were more elaborative and more complex, but contained fewer propositions, than did those who rated a story low in personal meaningfulness. This pattern is consistent with a suggestion we have made elsewhere (Adams, 1991; Adams et al., 1997); namely, that it may be more important for mature processors to elaborate the meaning of new information than to merely reproduce the information verbatim (see also Labouvie-Vief & Schell, 1982). Our present results suggest, however, that this type of elaborative processing style may be most likely to occur when an older processor is emotionally involved with the material.

The fact that the personal meaningfulness rating correlated with recall in the older, but not the younger, group is consistent with Carstensen's theoretical perspective, which states that the importance of emotionally meaningful information increases with age (Carstensen, Isaacowitz, & Charles, 1999; Carstensen & Turk-Charles, 1994). Because much everyday social information is laden with emotional content, examining the role of emotions in older adults' processing and memory of narrative seems critical for our further understanding of age differences in everyday memory functioning. We are currently addressing this issue in our Oregon and Utah labs.

Limitations

Although significant listener effects on age differences in story recall were obtained in this study, the generalizability

of our results is limited. First, our sample was White, highly educated, and composed only of women. Future studies will be required to see if the same results hold for men and for more representative populations. Second, our findings are limited to the comparison between a child and an experimenter as listeners. There are many other kinds of listeners (e.g., a peer, a good friend, a boss, a new acquaintance), each potentially posing different sets of recall demands. Third, our listeners were relatively passive participants, whereas in real life listeners are likely to be more active participants in the recollection process. Thus, it will be important to examine collaborative interactions between tellers and listeners and their influence on age differences in remembering (see Dixon, 1996; Dixon & Gould, 1996; Gould & Dixon, 1993). Fourth, variation in social context is not limited to the kinds of listeners possible; the setting itself varies (e.g., laboratory vs home). Moreover, the same listener in a different setting (e.g., the boss at work vs the boss at a dinner party) can create a different set of demands. Future studies will need to further elaborate not only the listener variable, but other social contextual variables as well. Fifth, unlike in real life, our participants were given an explicit memory task and were encouraged to take their time to learn the story to better retell it. Future studies using implicit memory tasks would more closely approximate everyday remembering situations. Finally, as mentioned earlier, a descriptive accounting of the effects of social context on age differences in memory is but one step toward understanding how the aging memory system functions in everyday life. Future studies will need to discern the specific features of a memory context that optimize—or hinder—older adults' memory performance, as well as the cognitive mechanisms affected by variation in social context.

Conclusion

The critical finding in this study was that the propositional recall of older adults was facilitated with a child as listener, but not with an experimenter as listener. This finding suggests that age differences in learning and remembering may well depend on social aspects of the memory context and that some social contexts provide more optimal remembering conditions for older adults than do others. Moreover, such findings underscore the importance of considering the role of changing social contexts in cognitive aging research. Indeed, as Blanchard-Fields (1996) has cogently argued, for us to fully understand adult developmental changes in cognition, it is vitally important to examine the reciprocal relationships between age-related social and cognitive changes in the individual on the one hand and changing social contexts and interactions on the other hand. The present study is a step in this direction.

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Appendix

Notes

1. It might be presumed that if driven by social–cognitive goals to transmit information to younger children, older adults should report greater present experience in storytelling than younger adults. However, because we did not measure goals per se in the present study, our findings do not speak to the match between goals and behavior in the daily lives of our participants.

2. Because of statewide budget cuts, Cynthia Adams' department and laboratory were closed just prior to testing of the last participant in the study.

3. The errors observed in the recall protocols were negligible and therefore were not included in the following data analysis.

4. As is suggested by these means, the recall performance of the older adults differed significantly by listener condition, simple effects test of Listener Condition within older adults, $F(1,87) = 4.20$, $p < .05$, whereas the younger adults' performance remained the same across Listener Conditions, simple effects test, $F(1,87) = 1.10$, $p = .30$.

5. In examining this distribution, it was found to be positively skewed. We therefore transformed the data using the formula log 10(x) as suggested by Tabachnick and Fidell (1989) and re-ran this analysis. The Age effect remained nonsignificant.

6. We thank one of the reviewers for suggesting this possibility.