CHAPTER 29

OLD FOLKS AT HOME

The structure of our population is going to change dramatically in the years ahead (U.S. Bureau of the Census, 1996). As the baby boomer generation—starting with those people born following the end of World War II—continues to age, the proportion of elderly people in our country's population will shift. This phenomenon has been called the squaring of the pyramid because for years the age distribution in our society has resembled a pyramid with many young people at the bottom and relatively few elderly people at the top. The growing number of aging baby boomers is certain to change the structure of our society and will present new challenges for the future in terms of such things as living arrangements, transportation, and health care.

Elderly people have begun to attract more attention from developmental researchers owing to their increasing numbers. As we mentioned in Chapter 21, in the past it was widely believed that old age represented a continuous decay of abilities. Old people were expected to sink into physical disability or dementia, becoming dependent on others for daily care. However, even poor quality anecdotal data should challenge the universality of this prescription; most of us know an older person who does not fit this model of declining faculties and abilities. At age 90, Picasso was still producing art works. Actress Ruth Gordon won an Emmy Award at age 83. Jazz singer Alberta Hunter gave regular performances in New York when she was 88. In contrast, most of us know an older person who is disabled and confined to an institution. While there are elderly people who are examples of the limits of functional ability and disability, most older people fall between these two extremes.

Well-known researchers Paul and Margaret Baltes have conducted considerable research on adulthood. They believe that many older adults who have made a good transition to older age have adopted a strategy of selective optimization with compensation (Baltes & Baltes, 1990). The word *optimization* describes the behavior of people who focus on particular activities for which they have the necessary motivation and skills. At the same time, these people cease activities that have become too difficult to perform due to aging. For example, a person may give up playing tennis and start to play more golf as reaction time slows. Golf involves challenge and some exercise but does not require the fast action

Incorporating the research of A. E. Dickerson and A. G. Fisher, "Effects of Familiarity of Task and Choice on the Functional Performance of Younger and Older Adults," 1997, *Psychology and Aging, 12,* pp. 247–254.

of a tennis game. A related term, *compensation,* refers to finding new ways to achieve goals that have become blocked by the effects of aging. The person who formerly drove a car while vacationing gives that up because of poor eyesight and reflexes and compensates by taking a senior citizen bus tour.

Elderly people may attract the concern of family members when they begin to show signs that normal activities of daily living (ADLs) can no longer be performed adequately. These may be activities such as cooking, cleaning, shopping, personal hygiene, managing transport, and telephoning. Because the performance of ADLs can mean the difference between independent living and institutional life, they have been an important topic of study for psychologists interested in aging. Andrew Guccione and coworkers (Guccione et al., 1994) studied functional limitations of elderly people who were part of the Framingham Study, a famous longitudinal study of adult health. They found that community-dwelling elderly people were usually able to perform most of the ADLs required for daily functioning without outside help. Even people with illness-related disabilities could perform most daily tasks except for the heaviest home chores.

Anne Dickerson and Anne Fisher (1997) designed a research project to probe some of the reasons why older people might have difficulty performing household tasks. Previous research suggested that elderly people performed better on familiar tasks (Bosman, 1993) and on tasks they had chosen (Perlmuter & Monty, 1986). Choice gives people a feeling of control that seems to increase their motivation for activities (Langer & Rodin, 1976). One of the reasons why Dickerson and Fisher likely undertook this project was to extend our knowledge of the capabilities of elderly people and to try to refine our understanding of performance declines that accompany old age.

PARTICIPANTS

The participants in this study were noninstitutionalized people. This is important because only about 10 percent of elderly people live in institutions (Moos & Lemke, 1985) and many previous studies have used only institutional residents as participants. This may be fine if the goal of a study is to learn about institutionalized people, but in obvious ways residents of nursing homes and adult care centers are not representative of the general elderly population. Probably one reason why institutional residents are often used as participants in studies of older people is that they are a relatively easy sample of people to locate. They are confined to institutions and may be unable to come and go as they please. Community-dwelling elderly people, as studied by Dickerson and Fisher, may be more difficult to find because they are not confined to a given area, complicating recruitment and testing procedures.

In this study, the behavior of 28 community-dwelling elderly volunteers was compared to the behavior of 31 young adults. Participant volunteers were solicited from a variety of settings including a retirement community, several recreational groups, a student group, and a military base. The elderly people had a mean age of 69.19 years (range = 59 to 81, $SD = 5.17$) and consisted of 9 men and 19 women. The younger adults were 11 men and 20 women whose mean age was 29.90 years (range = 21 to 41, $SD = 5.07$). In order to qualify for the study, participants had to rate their health as being at least an 8 on a scale running from 1 (poor health) to 10 (excellent health). Furthermore, all participants had to be high school graduates to participate in the study. Mean self-reported health scores for the

two groups were not significantly different but there was a significant difference ($p < .03$) in educational attainments. The older group had a higher mean education level ($M = 16.14$, $SD = 2.97$) than the younger group ($M = 14.71$, $SD = 1.77$). This is slightly unusual because typically most young adults have had more educational opportunities. We have no particular explanation for this outcome, but there is no reason to think that this difference is responsible for biasing the outcomes of the study.

SKILL ASSESSMENT

A standardized instrument called the Assessment of Motor and Process Skills (AMPS; Fisher, 1995) was used to evaluate the performance of the participants. The AMPS has a scoring scheme that can be used by a trained observer to quantify the skill levels people display while performing basic tasks. The instrument allows for the measurement of two different types of performance: motor skills and process skills. Motor skills are actions performed by individuals such as lifting, gripping, walking, and reaching. In contrast, process skills are observable movements that are indicators of cognitive ability. Examples of process skills include:

Sequencing: the ability to take on subtasks in the correct order to facilitate completion of major tasks

Accommodating: performing actions that might help overcome personal deficits

Choosing: selecting appropriate actions or objects for task performance

The difference between process skill tasks and motor skill tasks can be seen in the amount of cognitive processing that is required for the behavior. Sequencing, accommodating, and choosing have a large and more obvious cognitive component than motor skills such as lifting, gripping, walking, and reaching, which seem more automatic and do not require much conscious thought.

The AMPS evaluates 16 motor skills and 20 process skills. The use of the AMPS scale requires an individual to undertake two tasks. Task performance is observed and rated by an observer trained in the use of the AMPS. The observer gives a maximum score of 4 for each motor skill and process skill on the instrument. When the task being rated is performed with no obvious problems it is scored as a 4 (competent). If there is even a slight indication of a deficit, the task is rated as 3 (questionable). A score of 2 (ineffective) is given when there is some obvious problem that interferes with the effectiveness of the task, and a 1 (deficit) is the score given when the task cannot be completed, becomes dangerous, or is performed too slowly to be practical. For example, the task undertaken by a participant might be to make a salad using a specific list of ingredients, including red onions. If the onions are left out, he or she would be scored 2 for the AMPS process skill items *chooses* and *heeds*. The participant has failed to choose the correct object and failed to heed the instructions to include red onions. If the participant had tried to grab the onion and it was dropped, a score of 2 would be given for the motor skill item *grips*. If the participant had sliced the onion and accidentally cut a finger, the *grips* score would be 1 because of the demonstrated danger of the skill.

The AMPS is an excellent instrument to use in the assessment of normal people's real-life skills because it can be applied to practical daily tasks. The tasks observed are not artificial and this would seem to increase the ecological validity of the measurement.

RESEARCH DESIGN

A research design called a *2 × 2 × 2 factorial design* was used. This means that there were three variables used, each having two possible levels. The effects of each variable could be examined either independently or in relationship to one or both of the other variables. The three variables and the levels assessed by Dickerson and Fisher were:

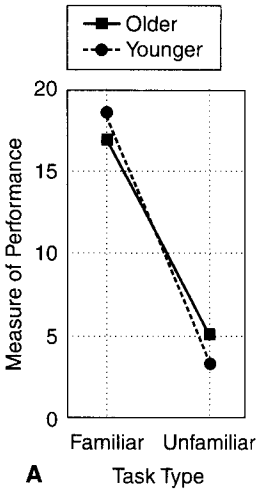
VARIABLE	LEVELS
1. Age	Older or younger
2. Task familiarity	Familiar or unfamiliar
3. Task choice	Chosen or assigned without choice

Any one of these variables might have been associated with important outcomes. For example, a study of these three variables might find that only the familiarity of the task had a significant impact on performance, with no effect by age or choice. This would be called a *main effect.* In a 2 × 2 × 2 factorial design it is also possible to see the effects of two or all three variables acting together, rather than separately as in a main effect. For example, imagine that task familiarity might have made a difference in performance, but only for the younger participants—not for the older ones. This kind of relationship between two variables is called an *interaction,* meaning the findings depend on the way two variables interact. Put another way, the effect of one variable depends on the level of another variable. Figure 29.1 contains fictitious data that illustrate a main effect (left) and an interaction (right). These outcomes are only used as examples and do not represent the actual findings of the research under discussion.

PROCEDURE

Six kitchen tasks were identified for use as the familiar tasks in the study. These involved preparing common food items. A detailed written description was developed for each task. Familiar tasks specified the preparation of a green salad, a tuna sandwich, a grilled cheese sandwich, an omelet with toast and beverage, a fruit salad, and two eggs with toast and beverage.

Familiar tasks were quite easy to find. Because previous research had suggested that elderly people might have trouble with unfamiliar tasks, Dickerson and Fisher wanted to include this as a variable. In order to do so, they had to design unfamiliar tasks that were comparable to the familiar tasks. This presented a challenge. Considerable creativity was required to actually design somewhat parallel unfamiliar tasks. The unfamiliar tasks had to be things that ordinary people could do by following instructions, but they had to be tasks none of the participants had ever undertaken before. Dickerson and Fisher created nine such tasks. These unfamiliar tasks were pilot-tested on people other than the actual participants to see if ordinary people could complete them from written instructions. Based on pilot



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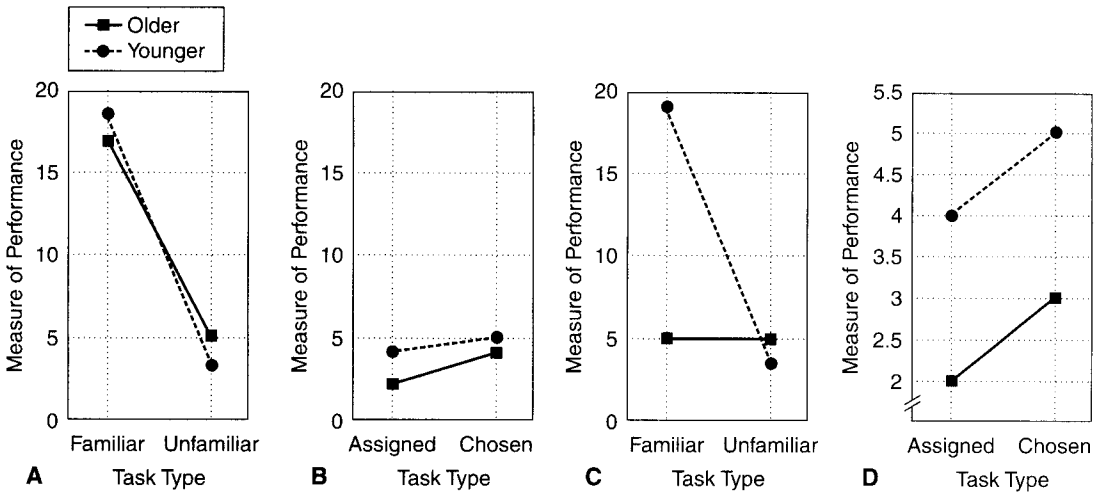


FIGURE 29.1 Fictitious Data Created to Illustrate a Main Effect (A and B) and an Interaction (C and D). We created these data using the variables described in this chapter but these are not real findings, only illustrations. If the data existed for Panels A & B with statistical significances for the large differences in panel A, there would be a main effect for task familiarity. Panel C is a classic interaction. Younger people perform better, but only on the familiar task. Two variables, age and familiarity, interacted to produce these results.

tests, six of the unfamiliar tasks were chosen. Dickerson and Fisher named these tasks and described them as follows:

> *Cheeriopotato:* covering a peeled raw potato with sugar and placing it on a glass of water after piercing it with toothpicks and placing cheerios on the toothpicks
>
> *Canned Tent:* making two flour-and-water dough balls and placing them on top of a sheet placed over two chairs with the four corners held down by a can of food placed on top of a washcloth
>
> *Dark Secret:* cutting strips of newspaper, mixing them with popcorn in a container, then covering the mixture with soil, macaroni, and salt and placing it in a bag, and putting the bag in a dark place
>
> *Hold That Water:* screwing six to eight screws into a precut board and winding string around the screws to make a structure strong enough to hold a cup of water
>
> *PVC Lunch:* putting together pieces of polyvinyl chloride (PVC) pipe into a three-legged structure that has string, which has been boiled, hanging over the pieces and a peeled carrot dangling from the center joint
>
> *Hang Them High:* boiling six clothes pins and hanging them from strings of varying lengths attached to a wire coat hanger that has a ribbon decorating its neck

As you can see, Dickerson and Fisher went to considerable lengths to ensure that the unfamiliar tasks were not familiar. Have you ever buried anything in soil and macaroni?

The participants performed both the familiar and unfamiliar tasks in their homes while being observed and videotaped by a researcher. The researcher brought particular items necessary for the tasks to the homes of the participants. It was felt that participants might feel more comfortable doing the tasks in their own kitchens, using their own stoves, sinks, and other basic equipment. For the familiar food preparation tasks, the participants were instructed to make the object "as they would normally do it." For the unfamiliar tasks, they were instructed to follow the directions and to perform the tasks "as they might expect" them to be done. They were told that the researchers were interested in observing the process of doing the task and in the final product. They were assured that they could have all the time they needed to do each task and that time was not important to the researchers. They were asked to read the directions and to signify that they understood each task.

Each participant, young and old, performed eight tasks as part of the study. Four of these were familiar food preparation tasks and four were unfamiliar tasks. Participants were allowed to choose two of the familiar tasks and two of the unfamiliar tasks. They were randomly assigned two additional familiar tasks and two additional unfamiliar tasks.

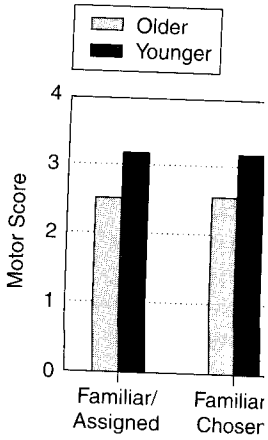
Participants were tested in two separate sessions about a week apart. One reason for this might have been to keep single sessions to a reasonable length of time. Dickerson and Fisher also noted that observations were made in two separate sessions to try to ensure that the experience of one session did not influence the other. A session consisted either of assigned tasks or chosen tasks. Half of each group, young and old, were given the tasks they had chosen in their first session. The other half of each group was given the tasks they were assigned as their first session. This procedure is called *counterbalancing,* and it is used as a check, or control, to be sure that previous experience in a research project has not biased the results of later parts of the research. For example, if performing familiar tasks first had made it easier to perform subsequent unfamiliar tasks, the effects could be demonstrated by comparing unfamiliar task outcomes occurring in the first sessions with those in the second sessions.

As a manipulation check, participants were asked to rate the familiarity of the tasks on a 5-point scale from 1 (unfamiliar, never do this activity) to 5 (familiar, do this activity frequently). This is a check of the manipulation because if, for some reason, the unfamiliar tasks were familiar to participants, or vice versa, it would be impossible to interpret the results of task familiarity. The results of these rating scales showed no significant differences in the ratings of young and old people; they agreed about the degree of familiarity of the tasks. The manipulation seemed to be sound because both old and young people rated familiar tasks as significantly different from unfamiliar tasks ($p < .001$).

The data in this study were generated from the ratings of people trained in the use of the AMPS. One of these raters, the primary investigator Anne Dickerson, watched the videotapes and rated all participants. In addition, most of the participants were scored by at least one of five other raters on at least two of the tasks. Dickerson excepted, the AMPS raters were not aware of the hypothesis. In all, 64 percent of all the tasks were scored by one of these other raters. There was a high degree of interrater reliability.

RESULTS

AMPS motor and process scores for each task type at each age are shown in Figure 29.2. Motor and process scales have been shown to measure separate but related abilities. Al-



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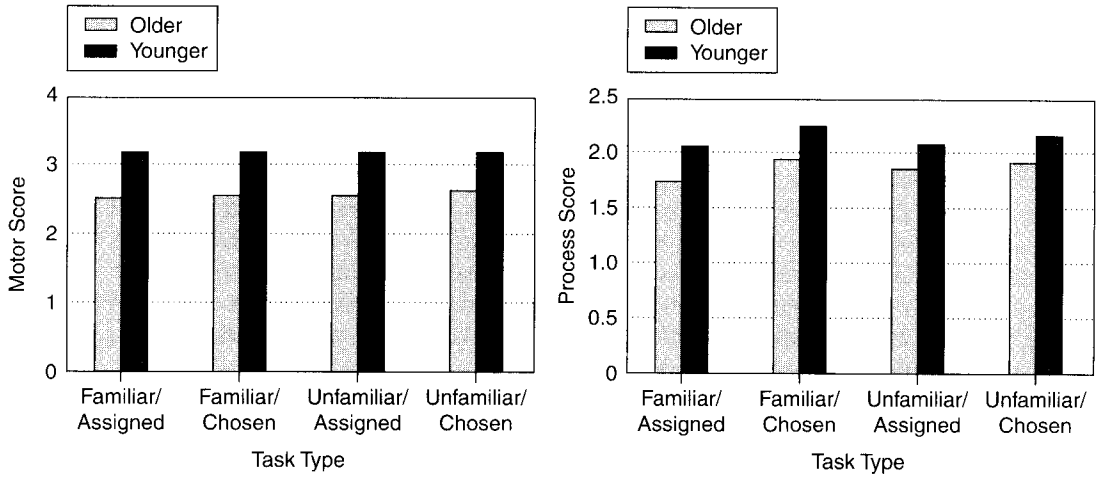

FIGURE 29.2 Outcomes of AMPS Motor (left) and Process (right) Scores for Age, Task Familiarity, and Task Choice. These scores are reported in a unit called a *logit,* which is a type of mathematically transformed mean.

Source: From Dickerson, A. E. & Fisher, A. G. (1997). Effects of familiarity of task and choice on the functional performance of younger and older adults. *Psychology and Aging, 12,* 250.

though they both measure aspects of the functional ability of adults, they focus on different aspects of performance. Scores on the two measures have been shown to be moderately correlated, $r = .50$ (Fisher, 1995). The magnitude of this correlation suggests that knowing one score does not enable a very good prediction of the other score. While these two measures are not completely independent, they are not measuring the same things.

Figure 29.2 suggests that there were important effects of age group on the performance of motor tasks and, indeed, these age differences were statistically significant ($p < .001$). Older people performed less well than younger people. For motor scales shown in Figure 29.2, there were no significant differences for familiarity ($p < .38$) or for choice ($p < .29$).

The process scores shown in Figure 29.2 also suggest a statistically significant age difference ($p < .001$) with older adults doing more poorly, the same direction as was seen on the motor scale. There was no significant difference for task familiarity ($p < .92$) but the difference between chosen and assigned tasks was significant for process skills ($p < .04$). The overall age difference did not interact with these findings. That is, familiarity did not affect performance no matter how old people were. Choice did make a difference, but that difference was not related to age: Older and younger people did better when they could choose the task. Another way to phrase this would be to say that for process skills there were main effects for age and choice but no interactions.

DISCUSSION

At least with these kinds of tasks, age makes a difference. Every attempt was made to see that the tasks used in the study were either part of daily life or abstracted from tasks of daily

living. Because these either resembled cooking operations or were cooking operations, we think the study can claim substantial ecological validity. Although some of the unfamiliar tasks were artificial, they were composed of the sorts of actions and cognitive processing that is required for independent living.

The results presented here suggest that older people differ from younger people in the performance of the ADLs. This study does not support the contention that older people perform poorly only because the tasks on which they are examined are artificial or because they cannot choose their tasks. It is further possible to reject the rival hypothesis that older people do less well on manual tasks in research because they are more affected by the laboratory environment than are younger people. All participants here were observed in their own homes. Participants often scheduled the task observations to take place at the same time that they normally worked in the kitchen.

The findings here also do not support the idea that extensive experience or practice on a task will help to inoculate individuals against the declines of old age. The older participants in this study had practiced the skills of these tasks, in part or whole, for many years and they performed more poorly nevertheless. While some studies reported findings that seem to indicate this kind of practice effect (Bosman, 1993; Denny, 1982; Geary, Frensch, & Wiley, 1993; Morrow, Leirer, Alteri, & Fitzsimmons 1994; Salthouse, 1985), this study suggested that the declines of old age may not be completely overcome by years of practice, at least with the types of activities that were studied.

In seeking an explanation for this discrepancy, Dickerson and Fisher pointed out that past studies often evaluated the product resulting from a task, rather than the efficiency of the task itself. Young and old people may both be able to produce a perfectly adequate tuna sandwich as lunch but the AMPS is sensitive to aspects of performance that go beyond the adequacy of the product. The AMPS also measures inefficiency and ineffective attempts to overcome performance problems. Imagine an older person making a salad and forgetting one item, the tomatoes, until after the salad dressing had been applied and the salad had been tossed. This is the type of activity that the AMPS would detect. While the tomatoes might be added at the end and the salad tossed again, this type of inefficiency in process would result in a lower AMPS score.

Who cares when the tomatoes are added, as long as the salad is OK? While you might think that this is a meaningless distinction, there has been considerable interest in the gradual nature of deficit onset associated with old age. These deficits might not show in a finished product such as a salad, but an instrument as sensitive as the AMPS may be able to discover earlier indications of problems in the procedures of making the salad.

Choice of task did not make a difference in the motor scale outcomes. This may not be surprising if you consider that many studies have demonstrated that motor performance fades with advanced age (e.g., see, Meeuwsen, Sawicki, & Stelmach, 1993). Declines in motor performance probably have some neurological and/or muscular components. The impacts of these physiological deficits are not likely to be altered whether a task is chosen or assigned. Choice of task did make a difference in the process measures. Other studies have demonstrated that choosing tasks may be associated with enhanced effectiveness in task performance (Chan, Karbowski, Monty, & Perlmuter, 1986). This may be because perceived control over events increases motivation to do the task efficiently. Motivation may be more likely to increase efficiency than it is to alter the physiological constraints that may

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underlie motor performance. When we want to do something and feel we have chosen it, we are more likely to do it well. This seems to be the case for older as well as younger people.

Dickerson and Fisher initially expected that choice would have little or no impact on the unfamiliar tasks compared to the familiar tasks. They believed that the unfamiliar tasks, in a way, offered less choice because they were so meaningless. It would be difficult for a participant to give reasons for choosing any particular one of the somewhat bizarre unfamiliar tasks. Their data did not support this contention. Choice did make a difference on the process score of the AMPS. People did better when they chose and this did not interact with task familiarity. There might be two reasons for this outcome. First, the unfamiliar tasks may not have been all that unfamiliar. They were, after all, composed of familiar components but combined in unusual ways. Second, participants may have had reasons for choosing some over others. For example, we could guess that some participants avoided dark secret because they did not want to get soil all over the place or because they saw it as a waste of food. Additionally, the unfamiliar tasks were somewhat humorous and perhaps even fun. This may have increased motivation to undertake them. In any event, it is important to remember that age was not a factor. Both young and older people did better when they had some choice.

As a group, younger participants did better on the tasks in this study than older participants, but there was a great deal of variability within the groups. Some older participants did better than a few of the younger participants. It is important to remember that older people are quite diverse in the things they are able to accomplish. Probably all of us know an old person who is barely able to do anything and, at the same time, some old people who are more active than many 20-year-olds. Some of the diversity of ability seen in this study might be better understood by a longitudinal approach to ADLs. Nevertheless, the variability within the older group observed in this study should act as a caution against stereotyping the functional abilities of older people.

CRITICAL THINKING TOOLKIT ITEMS

It is important to know where a study was conducted and specifically what was measured in order to make judgments about ecological validity. Brief media reports rarely supply this information but often imply that findings are ecologically valid.

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