

## Development of Attitude Strength Over the Life Cycle: Surge and Decline

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This article explores the relation of age to manifestations and antecedents of attitude strength. Three studies demonstrate that susceptibility to attitude change is greater during early and late adulthood than during middle adulthood. Three additional studies demonstrate that attitude importance, certainty, and perceived quantity of attitude-relevant knowledge are greater in middle adulthood than during early or late adulthood. These antecedents may therefore explain life cycle shifts in susceptibility to change. Susceptibility to change, importance, certainty, and perceived knowledge differ from one another in terms of their correlations with education, gender, and race, challenging the notion that attitude strength is a unitary construct. Evidence that people incorrectly believe that susceptibility to change declines steadily over the life course reinforces the distinction between operative and meta-attitudinal measures of attitude strength.

For decades, psychologists, sociologists, political scientists, and other social scientists have engaged in a lively debate over the relation between age and one of the defining features of attitude strength: susceptibility to attitude change (for reviews, see Alwin, Cohen, & Newcomb, 1991; Sears, 1975, 1981, 1983). Several hypotheses about this relation have been advanced, and the bulk of the empirical evidence supports one of them, the hypothesis that susceptibility is high during early adulthood and significantly lower later in life. However, these investigations have involved methods that invite alternative explanations for the apparent relation between age and susceptibility to change.

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In this article, we describe studies taking a new approach to exploring susceptibility to attitude change across the life span, avoiding the pitfalls plaguing prior studies. We also explore the relation between age and various attitude features believed to be responsible for attitude strength. In doing so, we gain new insights into the nature and structure of attitude strength generally. We begin by reviewing the hypotheses we tested and describing previous tests of them.

### Hypotheses Regarding the Relation Between Age and Susceptibility to Attitude Change

Five principal views of susceptibility to attitude change across the life span have been proposed. The *increasing persistence* hypothesis suggests that susceptibility is high in early adulthood and gradually decreases across the life span (Glenn, 1974, 1980; see Figure 1A). This hypothesis is predicated on the idea that attitudes reflect the accumulation of relevant experiences across the life span, each of which contributes to increasing stability. In addition, as individuals age, they typically become increasingly entrenched in social networks of others with similar life experiences and worldviews (Berelson, Lazarsfeld, & McPhee, 1954; Newcomb, Koenig, Flacks, & Warwick, 1967), which is likely to reinforce existing attitudes.

A second view, the *impressionable years* hypothesis, is based on the notion that core attitudes, beliefs, and values are crystallized during a period of great plasticity in early adulthood (Sears, 1975). This period of plasticity is thought to reflect the transition from adolescence to adulthood, marked by newfound interest in events outside one's immediate surroundings and a budding political worldview (Dawson & Prewitt, 1969). For the first time, young adults are able to participate in political elections, they can choose to serve in the military, and they may enter the workforce full time. In these ways and many others,

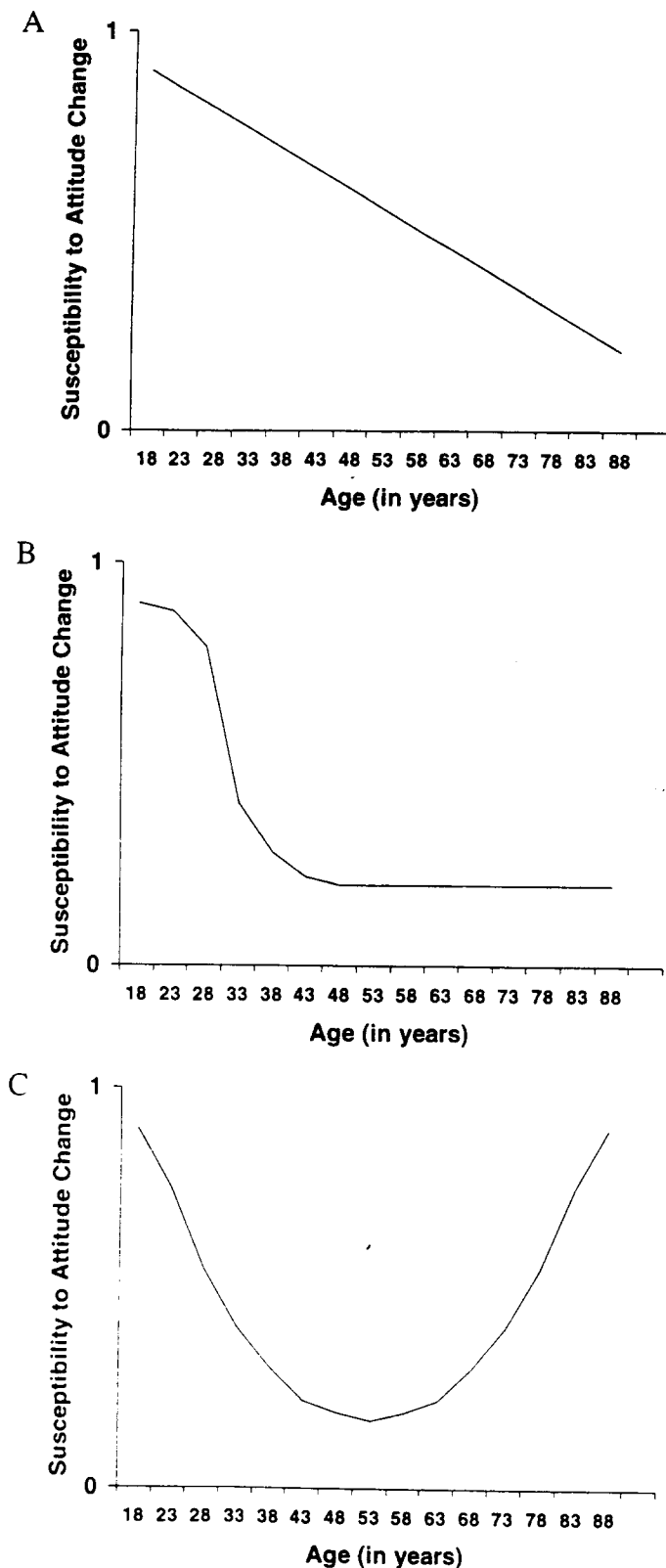


Figure 1. The increasing persistence hypothesis (A), the impressionable years hypothesis (B), and the life-stages hypothesis (C).

young adults interact for the first time with social and political institutions and begin to formulate opinions on a wide range of issues. During this time, they also learn a great deal about their social and political surroundings (Strate, Parrish, Elder, & Ford,

1989), which further contributes to the increasing crystallization of their views of the world. According to the impressionable years hypothesis, the basic orientations formed during this period of early adulthood remain largely unaltered throughout the remaining adult years (Carlsson & Karlsson, 1970; Mannheim, 1952; Ryder, 1965). Thus, the impressionable years hypothesis suggests that susceptibility to attitude change is high during early adulthood but drops sharply after this period and remains low throughout the remainder of the life span (see Figure 1B).

The *life stages* hypothesis also predicts high susceptibility to change during early adulthood and lower susceptibility throughout middle adulthood, for all of the reasons just outlined. But this hypothesis predicts high susceptibility to attitude change in later life as well (Sears, 1981, 1983; see Figure 1C). This upturn in susceptibility at the end of the life cycle may occur because of decreases in social support for one's attitudes due to the deaths of friends or social withdrawal (Burt, 1990; Lang & Carstensen, 1994; Marsden, 1987). In addition, both the early and late adult years are associated with a multitude of role transitions (Glaser & Strauss, 1971; Steckenrider & Cutler, 1989) that may alter people's perceptions of the social and political world, thereby undermining the justifications that reinforced many of their attitudes. Finally, cognitive skills decline toward the end of the life cycle (see, e.g., Verhaeghen & Salthouse, 1997), so people may become less and less able to actively resist attitude change through counterarguing.

What we call the "perpetual susceptibility" hypothesis is a sort of null hypothesis proposing no relation between age and susceptibility to attitude change. And cross cutting all of the preceding hypotheses are two assertions about the general level of susceptibility to change across the life cycle. The *lifelong openness* hypothesis proposes that individuals are at least somewhat susceptible to attitude change throughout their lives (Brim & Kagan, 1980; Gergen, 1980; Lerner, 1984), whereas the *persistence* hypothesis suggests that most of individuals' fundamental orientations are established so firmly during preadult socialization that susceptibility to attitude change thereafter is very low (Davies, 1965; Easton & Dennis, 1969; Hess & Torney, 1967).

### Previous Investigations

A variety of methods, always focused on social and political attitudes, have been used in testing these hypotheses. One set of studies tracking aggregate changes in the attitudes of birth cohorts has generally revealed large attitude shifts in young cohorts and much smaller shifts in middle-aged and older cohorts (Converse, 1976; Converse & Markus, 1979; Crew, Sarlvik, & Alt, 1977; Cutler & Kaufman, 1975; Glenn, 1974; Jennings & Niemi, 1981; Markus, 1979; Mueller, 1973; Nunn, Crockett, & Williams, 1978). Some of these investigations have been cited as supporting the impressionable years hypothesis (e.g., Crew et al., 1977; Mueller, 1973), whereas others have been interpreted as supporting the increasing persistence hypothesis (e.g., Glenn, 1974; Nunn et al., 1978). Such aggregate measures of attitude change, however, can be misleading, because a great deal of cross-cutting attitude change may occur at the individual level that cancels out at the aggregate level.

To overcome this problem, a number of researchers have assessed individual-level attitude stability using test-retest correlations of the same attitude measure taken at two or more points

in time (e.g., Campbell, Dunnette, Lawler, & Weick, 1970; Jennings, 1996; Jennings & Markus, 1984; Jennings & Niemi, 1978; Johansson & Campbell, 1971; Markus, 1979; Newcomb et al., 1967). In general, these studies have revealed weaker test-retest correlations among younger adults than among older adults, as the impressionable years and increasing persistence hypotheses predict.<sup>1</sup> However, test-retest correlations are not pure measures of attitude stability. In addition to genuine attitude change, such correlations reflect random measurement error in attitude reports. Thus, weaker correlations among younger age groups may indicate lower attitude stability or may simply reflect more measurement error.

To separate true attitude change from random measurement error, a number of studies have used panel data to estimate attitude stability more purely via structural equation modeling or related techniques. Although one of these studies yielded results consistent with the increasing persistence hypothesis (Tyler & Schuller, 1991), most have supported the impressionable years hypothesis, showing that attitude stability was lowest among 18–25-year-olds and was higher throughout the rest of the life cycle (Alwin et al., 1991; Krosnick & Alwin, 1989; Sears & Funk, 1996).<sup>2</sup>

Eliminating measurement error in estimates of attitude stability certainly represents a methodological improvement, but this general approach to hypothesis testing still has limitations. Attitude stability (no matter how purely estimated) is an imperfect measure of susceptibility to attitude change because stability reflects both susceptibility to change and opportunity for change. The more attitude-challenging experiences a person has, the more likely attitude change is. And if exposure to attitude-challenging experiences varies across the life span, attitude stability is likely to be an inaccurate index of susceptibility to change.

In an effort to more directly assess the relation of age to susceptibility, Tyler and Schuller (1991) included measures of potentially change-inducing experiences in their investigation of attitude stability across the life span. And, indeed, exposure to some potentially change-inducing experiences was more frequent among younger adults. Furthermore, Tyler and Schuller (1991) found that the correlation between the reported positive or negative nature of the attitude-relevant experiences and subsequent attitudes was highest among older respondents, which they interpreted as evidence that older adults were more susceptible to change than younger adults.

Although this correlation may be evidence that relevant personal experiences influenced attitudes, the reverse could have been true instead: Attitudes could have influenced the reported nature of experiences via self-fulfilling prophecies; people who expected to have bad experiences may have behaved in ways that made the experiences bad. Or attitudes could have shaped the way people perceived their experiences, leading the experiences to appear consistent with positive or negative expectations. Alternatively, attitudes may have biased recall of experiences, such that they were remembered as more consistent with current attitudes than they actually were (Conway & Ross, 1984; Lydon, Zanna, & Ross, 1988; Ross, McFarland, & Fletcher, 1981). If these alternative processes were more common or more powerful among older adults than among young adults, they would have misleadingly inflated apparent levels of susceptibility to change among the former individuals.

Thus, although incorporating measures of change-inducing

experiences represented a step in the right direction, this general approach to investigating the relation between age and susceptibility to attitude change is inherently limited. It is difficult if not impossible to precisely assess the number and nature of change-inducing experiences respondents have had and to gauge their impact correlationally.

Furthermore, nearly all prior studies of these issues have suffered from a confounding of age with cohort composition in ways that may have distorted the results obtained. For example, during the last 45 years, the proportion of young adults attending college has been rising consistently (U.S. Bureau of the Census, 1953, 1993). In 1952, 18% of 18–24-year-olds in the United States had completed 1 or more years of college, whereas this figure was 45% in 1993 (U.S. Bureau of the Census, 1953, 1993); thus, current 18-year-olds are more educated, on average, than current 65-year-olds. Because better educated people are less susceptible to political attitude change (Sears & Gahart, 1980; Zaller, 1990), the relatively high levels of education in the youngest cohorts may have caused their rates of attitude change to appear misleadingly low. To generate a clean comparison of different age groups, one must control for differences between groups in terms of educational attainment.

Patterns of mortality can also distort comparisons of age groups in representative cross-sectional samples of adults. For example, women tend to live longer than men, so older age groups are likely to be disproportionately female (Centers for Disease Control and Prevention, 1995). Because women may be more susceptible to attitude change than men (Eagly & Carli, 1981), the greater number of women among the oldest age group may produce an illusory rise in susceptibility among this group, thus perhaps masking a true decline in susceptibility at the end of the life cycle.

The demographic composition of age groups is also likely to differ in terms of race. Non-Whites have shorter life expectancies than Whites, which means that older age groups may be disproportionately White (Centers for Disease Control and Prevention, 1995; Markides & Black, 1996). On some issues, racial minority and majority group members may hold attitudes that differ in extremity, personal importance, or other factors associated with resistance to attitude change (see, e.g., Petty & Krosnick, 1995). Therefore, controlling for race may also provide a more accurate assessment of the relation between age and susceptibility to attitude change.

### The Present Investigation

A more direct investigation of the relation between age and susceptibility to attitude change would require exposing adults of various ages to an identical change-inducing experience and

<sup>1</sup> Sears (1981) suggested, however, that careful exploration of the full adult life span yields a different pattern in at least one domain: In a large panel survey, he found that test-retest correlations for racial attitudes were lowest among very young adults and among very old adults, consistent with the life stages hypothesis.

<sup>2</sup> Like Sears (1981), Krosnick and Alwin (1989) found a curvilinear pattern of attitude stability across the life cycle. However, they also found decreased reliability among the oldest respondents, which accounted for the drop in attitude stability at the end of the life cycle in their data and may also account for the pattern reported by Sears (1981).

gauging its impact. Conducting a laboratory experiment along these lines would be quite challenging, because it would be extremely difficult to recruit comparably representative samples of adults of various ages to visit a laboratory. But large, representative samples are relatively easy to contact in a telephone survey, and computer-assisted telephone interviewing systems readily permit the execution of experimental manipulations (see Sniderman & Grob, 1996).

In the first two studies reported here, we used precisely this approach. In the context of telephone interviews, representative samples of adults were asked to express their attitudes on various social and political issues; they were then subjected to potentially change-inducing experiences, and attitude change was assessed. This permitted gauging of differences between age groups in rates of attitude change. In our third study, age-related differences in thought-induced attitude change were explored, again within the context of a telephone survey of a representative sample of adults. In our final three studies, we broadened the focus by examining some of the possible causes of the observed relation between age and susceptibility to attitude change.

### Study 1

Our first study focused on attitudes toward foreign policy positions. Respondents were presented with a hypothetical scenario of an international conflict and were asked to express their attitudes toward U.S. military intervention in that situation. Then all respondents were asked whether they would change their minds if the United Nations recommended the opposite of their initial preference. Controlling for attitudes toward the United Nations and demographic composition of the age groups, we assessed the relation of age to attitude change.

### Method

#### Sample

The data analyzed in this study were collected via telephone interviews with a representative sample of 1,511 English-speaking U.S. adults living in private households. The data were collected by the Ohio State University Survey Research Unit (then called the Polimetrics Laboratory) between April and June 1996 (for details, see Herrmann, Tetlock, & Visser, 1997).

#### Measures

*Attitudes toward U.S. military intervention.* Respondents were told about a military conflict between two hypothetical countries and were given information about the military strength of the attacking country, the history of the relationship between the two countries, and the importance of the attacked country to U.S. economic and security interests. Respondents were then asked "If the attacker cannot be talked into withdrawing, should our government use our military to push back the invaders, or should we stay out of it?" Respondents who said we should stay out were asked "If the United Nations believes that Americans should use military force in this conflict, would you be willing to change your mind about using our military?" Respondents who initially said we should use military force were asked, instead, "If the United Nations believes that Americans should not use military force in this conflict, would you be willing to change your mind about using our military?" A measure of attitude change was coded 0 for respondents who said they would not change their minds and 1 for respondents who said they

would change their minds. Forty-six percent of respondents said they would change their minds, and 54% said they would not.

*Attitudes toward the United Nations.* Respondents were asked to indicate their feelings toward the United Nations on a scale ranging from 0 to 100, where 50 represented neutrality; higher numbers represented warmer, more favorable feelings; and lower numbers represented colder, less favorable feelings.

*Demographic measures.* Educational attainment was coded 0 for people who did not graduate from high school, .25 for high school graduates, .50 for people who attended college but did not graduate, .75 for college graduates, and 1 for people who completed postgraduate work. Gender was coded 0 for female respondents and 1 for male respondents, and race was coded 0 for Whites and 1 for non-Whites. Age was measured in years and recoded to range from 0 (age 18) to 1 (age 89, the highest age in the sample).<sup>3</sup>

## Results

### *Relations of Age to Education, Gender, and Race*

As expected, age was marginally significantly correlated with education, such that older age groups contained fewer highly educated people than did younger age groups ( $r = -.06, p < .05, n = 1,276$ ).<sup>4</sup> Also, older age groups contained disproportionately fewer minorities than did younger cohorts ( $r = -.11, p < .01, n = 1,276$ ), although no significant relation appeared between gender and age ( $r = .04, ns, n = 1,276$ ). Controlling for the demographic composition of the age groups was therefore necessary to explore the effect of age on attitude change.<sup>5</sup>

### *Impact of Age on Susceptibility to Change*

We first regressed the attitude change measure on age and the three other demographic variables (see column 1 of Table 1). Consistent with the increasing persistence hypothesis, the linear effect of age was statistically significant and negative ( $B = -0.12, p < .05$ ), meaning that the likelihood of change decreased with increasing age.

However, the impressionable years and life stages hypotheses predict quadratic effects of age, which we tested by adding age squared as a predictor in the regression equation (see column 2 of Table 1). The linear effect of age in this equation was negative and significant ( $B = -0.47, p < .05$ ), and the quadratic effect was positive and marginally significant ( $B = 0.38, p < .10$ ). Because the effect of age cubed (shown in column 3 of Table 1) was not significant ( $B = -0.69, ns$ ), the linear and quadratic age effects in column 2 provided a complete description of the robust relation of age to attitude change.

<sup>3</sup> Nine respondents did not report their ages and were not included in our analyses. Small numbers of respondents were not included in our subsequent studies for the same reason.

<sup>4</sup> Because we had strong a priori expectations of the directions of age-related differences, we present one-tailed hypothesis tests throughout.

<sup>5</sup> The predicted relations between age and both gender and race are due to differential rates of mortality, and, as such, they should be evident only at the end of the life cycle. And the predicted relation between age and education reflects cohort differences in educational attainment between Americans born before and after the 1930s and should also be evident only at the end of the life cycle. To capture these relations, therefore, we have reported the correlations between each of these demographic factors and age squared.

Table 1  
Unstandardized Regression Coefficients Predicting Attitude Change in Studies 1, 2, and 3

Predictor	Study 1 (n = 1,238)			Study 2 (n = 1,081)			Study 3 (n = 484)		
	Regression 1	Regression 2	Regression 3	Regression 1	Regression 2	Regression 3	Regression 1	Regression 2	Regression 3
Age	-0.12**	-0.47**	-0.83*	-0.09*	-0.59***	-0.61	-0.16	1.01**	1.36
Age squared		0.38*	1.35		0.69**	0.75		-1.35	-2.35
Age cubed			-0.69			-0.05			0.77
Gender	-0.04	-0.04	-0.04	-0.06***	-0.06***	-0.06***	0.02	0.03	0.03
Race	-0.02	-0.02	-0.02	0.05	0.05	0.05	-0.12	-0.12	-0.11
Education	0.00	0.01	0.02	-0.19***	-0.16***	-0.16***	0.39***	0.36***	0.36***
Attitude toward the United Nations	0.50***	0.49***	0.49***	0.09**	0.09**	0.09**			
Need for acceptance									
Age × Question Order									
Age Squared × Question Order							-0.13	-1.50**	-1.45
Age Cubed × Question Order								1.64**	1.55
Gender × Question Order							0.08	0.07	0.07
Race × Question Order							0.00	-0.01	0.00
Education × Question Order							-0.22	-0.17	-0.17
R <sup>2</sup>	.063	.065	.065	.030	.035	.035	.068	.079	.080

\*  $p < .10$  (marginally significant). \*\*  $p < .05$ . \*\*\*  $p < .01$ .

To understand the shape of this relation, we used the regression equation that included the quadratic effect of age to estimate rates of attitude change at various ages across the life span. We plugged into this equation the mean sample values of gender, race, education, and attitudes toward the United Nations for the full sample, and we calculated the predicted attitude change rate for each of a wide array of ages (for an explanation of the procedure, see Cohen & Cohen, 1983, pp. 228–229). Figure 2 provides a graphic representation of the regression equation presented in column 2 of Table 1. As Figure 2 illustrates, attitude change decreased with increasing age up to about age 60, at which point attitude change became increasingly common with increasing age. This is consistent with the life stages hypothesis.

### Other Correlates of Susceptibility to Change

Attitude change was related sensibly to attitudes toward the United Nations: People with more positive attitudes changed more often ( $B = 0.49, p < .01$ ).<sup>6</sup> However, contrary to some prior literature, attitude change rate was not significantly correlated with gender, race, or education ( $B = -0.04, -0.02, \text{ and } 0.01$ , respectively).

### Study 2

Although the shifts in respondents' attitude reports observed in Study 1 may have been due to genuine attitude change, they may also simply have been due to what Kelman (1958) called compliance. Specifically, respondents may have perceived the attitude-challenging questions to be suggesting that the interviewer or researcher believed that they should change their attitudes in response to the new information provided. Consequently, to convey impressions of themselves as cooperative people to their interviewers, some respondents may have claimed that the new information would change their attitudes when this was not, in fact, the case. Because young adults may be especially concerned with presenting favorable self-images (Reifman, Klein, & Murphy, 1989; Tesch, 1983), the evidence of greater attitude change among such individuals could have been due to a greater chronic concern with conveying favorable impressions to their interviewers rather than a greater general susceptibility to attitude change. We explored this alternative explanation in Study 2.

Study 2 involved an experimental design similar to that used in Study 1. Respondents were asked to express their attitudes toward various policies involving issues of race. Immediately after each attitude measurement, respondents were presented with a counterattitudinal argument, and attitudes toward the policy were then remeasured. Here, we were able to assess the relation between age and susceptibility to attitude change controlling for age-related differences in the motivation to make favorable impressions on others.

<sup>6</sup> We also estimated an additional regression model that included terms representing the interactions between attitudes toward the United Nations and (a) age, (b) age squared, and (c) age cubed. None of these interaction terms were significant predictors of attitude change.

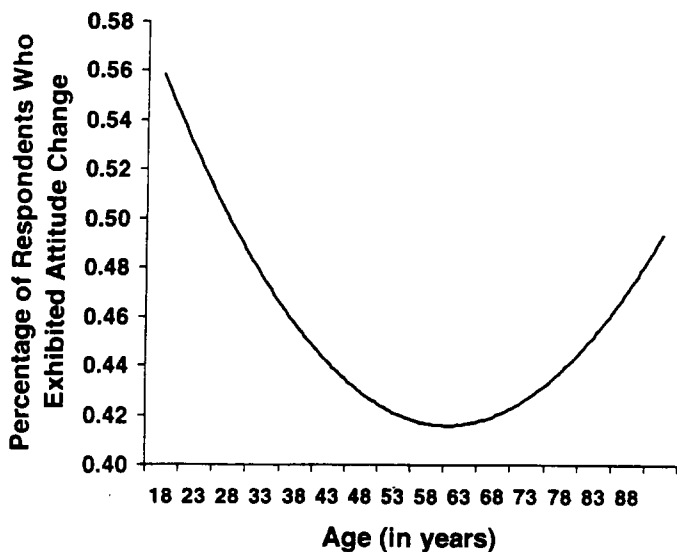


Figure 2. Relation of age to attitude change in Study 1.

### Method

#### Sample

The data analyzed in this study were collected via telephone interviews with a representative sample of 1,113 English-speaking adult residents of the five-county San Francisco–Oakland Bay area in northern California (for details, see Sniderman & Piazza, 1993).<sup>7</sup> The data were collected by the Survey Research Center of the University of California, Berkeley, between August and October 1986.

#### Measures

Four items asked respondents whether they supported or opposed (a) increased federal spending on programs to help Blacks, (b) antidiscrimination housing laws, (c) antidiscriminatory employment laws, and (d) preferential admission to colleges and universities for Black students (for the questions' wordings, see Sniderman & Piazza, 1993, pp. 142–146). Immediately after each of these questions, respondents were presented with a brief counterattitudinal challenge from an unspecified source, and attitude change was measured.

For example, respondents initially supportive of preferential admission to colleges and universities for Black students were asked "Would you still feel that way, even if it means fewer opportunities for qualified Whites, or would you change your mind?" Conversely, respondents initially opposed to the admission policy were asked "Would you still feel that way, even if it means that hardly any Blacks would be able to go to the best colleges and universities, or would you change your mind?" Responses were coded 0 for people who said they would not change their minds on any of the issues and 1 for people who said they would change their minds on at least one issue. Seventy-three percent of the respondents said they would change their opinions on at least one issue, and 27% said they would not change their opinions on any issues.<sup>8</sup>

As a means of assessing motivation to make favorable impressions on others, respondents were asked "How important is it to you to be accepted by other people: very important, somewhat important, or not important?" Responses were coded 3, 2, and 1, respectively. Education, gender, race, and age were measured and coded as in Study 1.

### Results

#### Relations of Age to Education, Gender, and Race

Older age cohorts contained significantly fewer well-educated people than younger cohorts ( $r = -.29, p < .01, n = 1,086$ ),

but age was unrelated to gender ( $r = -.02, ns, n = 1,086$ ) and race ( $r = -.03, ns, n = 1,086$ ).

#### Relation of Age to Susceptibility to Change

When demographic characteristics were controlled, the linear relation of age to attitude change was marginally significant and negative, which is consistent with the increasing persistence hypothesis ( $B = -0.09, p < .10$ ; see column 4 of Table 1). However, the quadratic effect of age was also positive and significant ( $B = 0.69, p < .05$ ; see column 5 of Table 1), and the negative linear effect of age was significant in the equation that included the quadratic effect of age ( $B = -0.59, p < .01$ ). The cubic effect of age was again not significant ( $B = -0.05, ns$ ; see column 6 of Table 1). Figure 3 illustrates the rates of attitude change predicted by the equation in column 5 of Table 1, and they are again clearly in line with the life stages hypothesis: Attitude change rates were highest among the youngest and oldest adults.

#### Other Correlates of Susceptibility to Change

As expected, people who had a greater need to be accepted by others were more likely to change their attitudes ( $B = 0.09, p < .05$ ).<sup>9</sup> Because the relation between age and attitude change remained significant even when this variable was included in the regression equation (see column 5 of Table 1), need for acceptance cannot account for the observed age-related differences in susceptibility to change. Attitude change was also more common among less educated respondents than among more educated respondents ( $B = -0.16, p < .01$ ), and more change occurred among women than among men ( $B = -0.06, p < .01$ ). No relation appeared between attitude change rate and race ( $B = 0.05, ns$ ).

### Study 3

The results of Study 2 suggest that the age-related differences in attitude change observed in Studies 1 and 2 were not the result of a stronger motivation among particular age groups to be responsive to the perceived expectations or wishes of the

<sup>7</sup> A potentially important advantage of these data is the inclusion of people living in dormitories or serving in the military in the sampling frame. Such individuals were excluded from the National Election Study surveys analyzed in many past studies of aging and attitude change. As Krosnick and Alwin (1989) noted, people living in dormitories (and perhaps people serving in the military as well) are likely to be primarily young adults. If those individuals were more resistant to attitude change (because of their high levels of education, strong social networks, or other factors) than their peers who were not living in dormitories or serving in the military, excluding the former from past analyses may have been partly responsible for the age-related differences observed previously. Our results are not subject to this confound and can therefore make a clearer statement about age-related differences.

<sup>8</sup> Other ways of coding the attitude change dependent variable yielded comparable results to those reported subsequently.

<sup>9</sup> We also estimated an additional regression model that included terms representing the interactions between the importance of being accepted by others and (a) age, (b) age squared, and (c) age cubed. None of these interaction terms were significant predictors of attitude change.

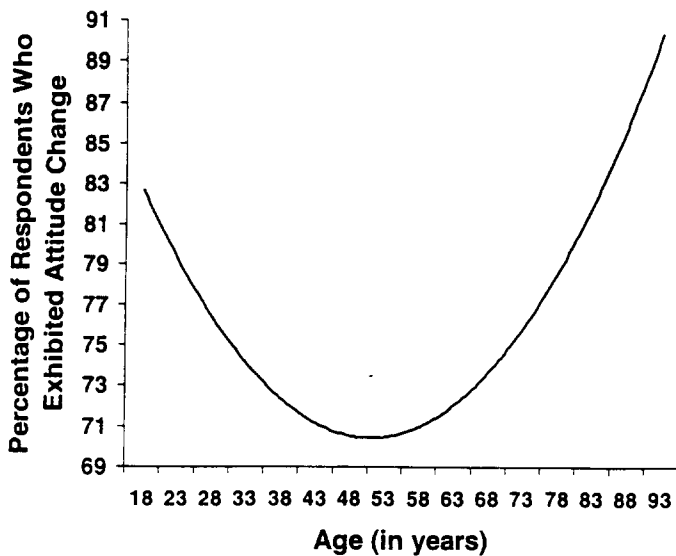


Figure 3. Relation of age to attitude change in Study 2.

interviewer. However, the analyses in Study 2 relied on a single item to measure this motivation. The reliable association between self-reports of the importance of being accepted by others and subsequent attitude change suggests that the single item did capture meaningful variance in the motivation to make favorable impressions on others, but a more precise measurement of this motivation may have yielded different results. For a stronger test of this alternative explanation, we turned to a design that completely removed the interviewer from the attitude change process, eliminating the possibility that observed attitude shifts may simply reflect self-presentational concerns.

Considerable evidence indicates that the presentation of a persuasive message is not required for attitude change to occur. Simply thinking about an attitude object can cause people to become more positive or more negative toward the object (see, e.g., Neijens, 1987; Tesser, Martin, & Mendolia, 1995). If age is indeed related to susceptibility to attitude change, thought-induced attitude change should be particularly pronounced among the youngest and oldest respondents. On the other hand, if apparent age-related differences in susceptibility to attitude change were artifacts of the interview context, the magnitude of thought-induced attitude change should not vary significantly across age groups. In Study 3, we tested these hypotheses.

The attitude change measure used here was a bit different from that used in Studies 1 and 2. In those studies, respondents were presented with a counterattitudinal message and reported whether or not the new information would cause them to change their attitudes. Study 3 measured attitudes either before or after people were induced to think about the object so that we could directly assess attitude change.

### Method

#### Sample

For this study, a representative sample of 505 English-speaking adults living in private households in Ohio were interviewed by telephone. The survey was conducted by the Ohio State University Survey Research

Unit (then called the Polimetrics Laboratory) between December 1995 and January 1996.

#### Measures

Respondents' attitudes toward global warming were assessed via the following question:

Scientists use the term "global warming" to refer to the idea that the world's average temperature may be about 5 degrees Fahrenheit higher in 75 years than it is now. Overall, would you say that global warming would be good, bad, or neither good nor bad?

As a means of best capturing the attitude change that occurred, good and neither good nor bad were coded 0, and bad was coded 1. Education, gender, race, and age were measured and coded the same as they had been in Studies 1 and 2.

#### Thought Induction

The thought induction manipulation used was inspired by the structured reasoning task used in the Choice Questionnaire (Neijens, 1987). Respondents were randomly assigned to be asked about their attitudes toward global warming either before the structured thinking exercise or after it.

In the thinking exercise, participants answered a series of questions about whether or not they thought global warming would affect seven aspects of the environment. Respondents were randomly assigned to be asked about either one set of seven aspects (sea levels, water shortages, the number of different kinds of plants in the world, the overall number of plants in the world, the number of plants in the county in which the respondent lived, natural scenery in the world, and natural scenery in the county in which the respondent lived) or another (annual rainfall, hurricanes and tornadoes, the number of different types of animals in the world, the overall number of animals in the world, the number of animals in the county in which the respondent lived, animal migration, and availability of food for human consumption). Respondents also reported the certainty with which they held each belief and how good or bad each expected consequence would be.

For example, respondents were asked "In the next 100 years, do you think global warming would cause the level of the oceans in the world to go up, to go down, or would global warming have no effect on the sea level?" Some respondents volunteered that global warming would cause the sea level to go up in some places and down in others, and interviewers accepted such answers. Respondents were then asked "How sure are you of your answer to that question? Extremely sure, very sure, somewhat sure, or not sure at all?"

Finally, respondents who said that global warming would affect the sea levels were asked whether the change they expected (sea levels going up or down or both) would be good or bad for most people in the world and to what degree. For example, respondents who said that global warming would cause the sea levels to go up were asked "For most people in the world, would the sea level going up be good, bad, or neither good nor bad?" Respondents who said "good" or "bad" were asked "Would it be very [good/bad], or somewhat [good/bad]?" Similar questions were asked with respect to all of the other potential consequences of global warming.

### Results

#### Relations of Age to Education, Gender, and Race

Older age cohorts contained significantly fewer well-educated people than younger cohorts ( $r = -.12, p < .01, N = 505$ ) and fewer racial minorities ( $r = -.11, p < .05, N = 505$ ), but age was unrelated to gender ( $r = .05, ns, N = 505$ ).

### Impact of the Thought Induction on Attitudes

To examine the impact of the thought induction on attitudes toward global warming, we regressed attitudes on a dummy variable coded 0 for people who expressed their attitudes before the thought induction exercise and 1 for people who expressed their attitudes after the thought induction. The question order manipulation significantly affected attitudes: Thinking about potential consequences caused respondents to express significantly more negative attitudes ( $B = 0.16, p < .001$ ).

### Relation of Age to Susceptibility to Change

To determine whether the magnitude of this thought-induced attitude change varied by age, we conducted additional regressions predicting attitudes with question order, age, and the product of question order and age. A significant regression coefficient for this interaction term would indicate that thought-induced attitude change varied as a function of age. To control for compositional differences across age groups, we included education, gender, and race in the regression, along with interaction terms between each of these demographics and question order.

The interaction between age represented linearly and question order was not significant ( $B = -0.13, ns$ ; see column 7 of Table 1). However, when we added age squared and the interaction between age squared and question order to the equation, the quadratic effect of age on attitude change was positive and significant ( $B = 1.64, p < .05$ ; see column 8 of Table 1), and the negative linear effect of age on attitude change was also significant in that equation ( $B = -1.50, p < .05$ ). The cubic effect of age on attitude change was again not significant ( $B = 0.03, ns$ ; see column 9 of Table 1). Figure 4 illustrates the rates of attitude change predicted by the equation in column 8 of Table 1. As in Studies 1 and 2, there is clear support for the life stages hypothesis here: Attitude change rates were highest among the youngest and oldest adults.

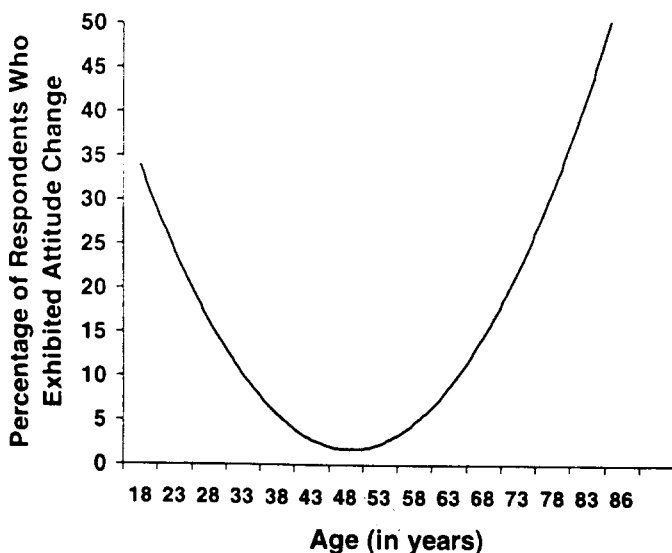


Figure 4. Relation of age to attitude change in Study 3.

### Other Correlates of Susceptibility to Change

In this study, none of the demographic control variables were associated with attitude change ( $B$ s = 0.17, 0.07, and  $-0.01$  for education, gender, and race, respectively).

### Meta-Analysis of Studies 1, 2, and 3

The pattern of results across Studies 1, 2, and 3 appears quite consistent; in one case, however, a key aging effect was on the boundary of significance. It seemed worthwhile, therefore, to assess the robustness of the observed effects by meta-analyzing the data from all three studies. Doing so revealed that, when assessed simultaneously, the linear and quadratic effects of age on attitude change susceptibility were significant ( $z = 3.69, d = 0.15, p < .001$ , and  $z = 3.13, d = 0.12, p < .001$ , respectively). More important, the linear and quadratic effects of age on attitude change were homogeneous, meaning that they did not vary significantly across the three studies,  $\chi^2(2, N = 2,803) = 0.53, ns$ , and  $\chi^2(2, N = 2,803) = 0.86, ns$ , respectively.

### Study 4

Up to this point, we have focused on variation across the life span in resistance to attitude change. To better understand the meanings of our findings, it is useful to recognize that resistance to change is one of the four defining qualities of strong attitudes (Krosnick & Petty, 1995). According to Krosnick and Petty, strong attitudes 'are those that (a) resist change, (b) persist over time, (c) influence thinking, and (d) motivate and guide behavior. Thus, if one wants to understand why attitudes are most resistant to change in middle adulthood, it is useful to consider what causes attitude strength.

Fortunately, a sizable literature now exists regarding the causal antecedents of attitude strength. There is evidence, for example, that attitudes based on a great deal of knowledge tend to be stronger than attitudes based on very little knowledge (Wood, Rhodes, & Biek, 1995). Similarly, attitudes about which people are highly certain tend to be stronger than attitudes about which they are less certain (Gross, Holtz, & Miller, 1995). Attitude importance is another antecedent of attitude strength: Attitudes that people consider personally important tend to be more resistant to change, more stable over time, more likely to influence thinking, and more likely to direct behavior (Boninger, Krosnick, Berent, & Fabrigar, 1995). In fact, roughly a dozen such antecedents of attitude strength have been identified in past work (for a review, see Petty & Krosnick, 1995). In light of this literature, it seemed worthwhile to broaden the scope of our investigation by exploring the relation of age to such antecedents of attitude strength.

We begin by considering some of the social and psychological processes by which various antecedents of attitude strength may come to rise and fall over the adult life span, thereby producing the observed age-related differences in susceptibility to change. We then briefly describe two other issues in the attitude strength literature that our next studies explored: the structure of attitude strength antecedents and the distinction between meta-attitudinal and operative indexes of attitude strength and its antecedents.

### Underlying Mechanisms

When young people enter adulthood, begin to vote in elections, and otherwise take on active social responsibilities, they

are presumably inspired to learn about their places in the social world and the relevance of public issues to their material interests, reference groups or individuals, and values. As a result, people may come to attach increasingly more personal importance to public issues (see Boninger, Krosnick, & Berent, 1995). And this increase in personal importance may lead people to seek out information on these issues, leading to an accumulation of relevant knowledge in memory (see, e.g., Boninger, Krosnick, Berent, & Fabrigar, 1995). Late in the life cycle, social and cognitive disengagement may occur, as people retire from the workforce and focus on new challenges of their daily lives (e.g., transitions in places of residence, emerging physical health problems, and spousal caregiving). This increasing disconnection from the active workings of social institutions may cause declines in the personal importance people attach to public issues. Simultaneously, declines in cognitive skills (e.g., Verhaeghen & Salthouse, 1997) may cause people to become less able to store and retrieve issue-relevant knowledge from memory.

Thus, the personal importance of public issues and knowledge about them may rise in early adulthood and fall in late adulthood, just as susceptibility to attitude change apparently does. Attitude importance and knowledge both reduce the likelihood of attitude change, because they reinforce attitudes socially and cognitively (see, e.g., Boninger, Krosnick, Berent, & Fabrigar, 1995; Wood et al., 1995). Therefore, if importance and knowledge surge just after early adulthood and decline late in life, they may be partly responsible for the surge and decline in resistance to attitude change.

### *Structure of Attitude Strength Antecedents*

Results of this sort would also speak to another debated issue within the attitude strength literature: whether or not the various antecedents of attitude strength (e.g., knowledge, certainty, and personal importance, among others) are manifestations of a single, unitary underlying construct. For the most part, these antecedents are all positively associated with one another, and they are all positively associated with the four defining features of strong attitudes (resistance to change, stability over time, and impact on thinking and on behavior). Because of this, many attitude researchers have assumed, during the last five decades, that all of these defining features and their antecedents are manifestations of a single underlying latent factor appropriately called attitude strength (for a review, see Krosnick, Boninger, Chuang, Berent, & Carnot, 1993).

There has been empirical support for this single-construct view from some factor-analytic studies (e.g., Verplanken, 1989). However, other investigators have suggested that two underlying constructs are present (Bassili, 1996; Pomerantz, Chaiken, & Tordesillas, 1995) or have found evidence of three distinct constructs (Abelson, 1988; Lastovicka & Gardner, 1979), and still others have found evidence of four (Erber, Hodges, & Wilson, 1995). Finally, some investigators have concluded that all of the antecedents of attitude strength are essentially independent of each other and that no higher order attitude strength construct or constructs exist (Krosnick et al., 1993; Krosnick & Petty, 1995). Evidence that attitude importance and knowledge rise and fall together across the life span would be consistent with the single-factor view of attitude strength antecedents, as well as with the midrange hypothesis that importance and knowledge

both reflect a single underlying factor, even if other antecedents of strength do not (Erber et al., 1995; Pomerantz et al., 1995).

### *Meta-Attitudinal Versus Operative Indexes of Attitude Strength*

This study offered an opportunity to explore another interesting question about the structure of attitude strength as well. Bassili (1996) recently proposed a distinction between meta-attitudinal and operative indexes of attitude strength (see also Greenwald & Banaji, 1995, on indirect vs. direct measures). The former involve people's perceptions of their attitudes, whereas the latter describe the operation of the attitudes more directly, unmediated by perceptions. In our first three studies, we focused on the relation of age to an operative index of strength: actual rates of attitude change. Here, we explored the relation of age to the corresponding meta-attitudinal index: people's perceptions of the susceptibility of their attitudes to change.

In short, we asked: Are people aware that they are especially susceptible to attitude change at the beginning and end of the life cycle? Perceptions of attitudinal qualities can at times be quite divergent from reality. For example, Krosnick et al. (1993) found surprisingly weak correlations between direct measures of the volume of attitude-relevant knowledge and people's perceptions of how much such knowledge they possessed (more generally, see Nisbett & Wilson, 1977). Just as some psychologists have endorsed the increasing persistence hypothesis, the impressionable years hypothesis, or the life stages hypothesis, so may laypersons as well. This would reinforce the utility of distinguishing between meta-attitudinal and operative measures in general and with regard to susceptibility to change in particular. The data we analyzed for this study provided an opportunity to explore this question, and we did so.

### *Method*

#### *Sample*

In 1984, the National Opinion Research Center's General Social Survey involved face-to-face interviews with 1,473 noninstitutionalized English-speaking people 18 years of age or older living within the continental United States.

#### *Measures*

Attitude importance, perceived attitude-relevant knowledge, and perceived likelihood of attitude change were assessed for six political issues: pornography, the death penalty, gun control, crime, law enforcement, and race relations.<sup>10</sup>

*Importance.* Respondents were asked how important each issue was to them, and the response options were one of the most important (coded 1), important (coded .66), not very important (coded .33), and not important at all (coded 0). The six importance scores were averaged to yield a single importance score for each respondent.<sup>11</sup>

<sup>10</sup> The wordings of all questions used for these analyses are shown in the cumulative General Social Survey codebook, which is available from the National Opinion Research Center.

<sup>11</sup> When the analyses reported in this study and the ones to follow were done separately for each issue individually, the same patterns emerged, although a bit more weakly.

*Perceived knowledge.* Respondents were asked how much information they had about each issue, and the response options were all the information you need (coded 1), most of the information (coded .66), some information (coded .33), and very little information (coded 0). Perceived knowledge scores were averaged across the issues to yield a single perceived knowledge score for each respondent.<sup>12</sup>

*Perceived likelihood of attitude change.* Respondents were asked how firm their opinion on each issue was, and the response options were very likely to change (coded 1), somewhat likely to change (coded .66), somewhat unlikely to change (coded .33), and very unlikely to change (coded 0). Likelihood of change scores were averaged across all six issues to yield a single score for each respondent.

*Demographic measures.* Education, gender, and race were measured and coded in the same manner as in the previous studies.

## Results

### *Relations of Age to Education, Gender, and Race*

Age was significantly associated with education, gender, and race as expected. Older age cohorts contained fewer well-educated people ( $r = -.24, p < .01, n = 1,465$ ), fewer women ( $r = -.05, p < .01, n = 1,467$ ), and fewer racial minorities ( $r = -.05, p < .01, n = 1,467$ ) than did younger age cohorts.

### *Relation Between Attitude Importance and Perceived Knowledge*

Consistent with previous studies (see, e.g., Krosnick & Abelson, 1992; Krosnick et al., 1993), the two attitude strength antecedents were only weakly correlated with one another ( $r = .17, p < .01, n = 1,410$ ). Thus, these aspects of attitudes were largely independent.

### *Relation of Age to Attitude Importance*

When assessed alone, the linear effect of age on attitude importance was positive and significant ( $B = 0.10, p < .05$ ), indicating that importance increased with increasing age (see column 1 of Table 2). However, the quadratic effect of age was significant and negative ( $B = -0.54, p < .01$ ), and the linear effect of age was positive and significant when the quadratic effect was included in the equation ( $B = 0.56, p < .001$ ; see column 2 of Table 2). The cubic effect of age was not significant ( $B = -0.45, ns$ ). As Figure 5 illustrates, attitude importance rose in early adulthood, up to age 50, and importance began to fall after about age 65. Thus, attitude importance was lowest precisely when attitude change was most common.

As column 2 of Table 2 illustrates, attitude importance was greater among better educated respondents than among less educated respondents ( $B = 0.12, p < .01$ ), greater among women than among men ( $B = -0.12, p < .001$ ), and greater among non-Whites than among Whites ( $B = 0.10, p < .01$ ). These relations again attest to the value of controlling for these demographics in exploring the relation of age to attitude importance.

### *Relation of Age to Perceived Knowledge*

The results of regressions predicting perceived knowledge were quite similar to those involving importance (see Table 3). The linear effect of age was positive and significant in predicting perceived knowledge ( $B = 0.11, p < .05$ ). When the quadratic

effect of age was added to the equation, the linear effect of age was positive and significant ( $B = 0.93, p < .001$ ), and the quadratic effect was significant and negative ( $B = -0.94, p < .001$ ). The cubic effect of age was not significant ( $B = -0.03, ns$ ). Figure 6 illustrates that perceived knowledge rose early in the life cycle and fell after about age 55.

Interestingly, the demographic correlates of perceived knowledge were somewhat different from those of importance. Whereas women attached more importance to these issues, men reported having more knowledge about them ( $B = 0.18, p < .001$ ). Whereas Whites attached less importance to the issues than did non-Whites, Whites reported having more knowledge about them than did non-Whites ( $B = -0.14, p < .01$ ). And whereas education was modestly positively related to importance, the positive relation of education to perceived knowledge was much stronger ( $B = 0.55, p < .001$ ). Thus, although importance and perceived knowledge were positively correlated with one another and had equivalent relations to age, they were distinct in terms of their demographic correlates.

### *Relation of Age to Perceived Likelihood of Change*

Perceptions of likelihood of attitude change were partly accurate and partly inaccurate (see Table 4). A negative and significant linear effect of age appeared ( $B = -0.44, p < .001$ ), meaning that perceived likelihood of change decreased with age. The quadratic and cubic effects of age were nonsignificant ( $B = 0.16$  and  $B = 0.66$ , respectively), meaning that perceptions of likelihood of change decreased steadily across the life cycle. This is especially clearly illustrated in Figure 7, which provides a graphic representation of the regression equation from column 1 of Table 4. Thus, people were correct in recognizing that they were highly susceptible to attitude change during early adulthood, but they did not realize that susceptibility increased late in life.

Perceived likelihood of attitude change was also distinct from actual susceptibility in terms of correlations with other demographics. A meta-analysis of the results of Studies 1, 2, and 3 revealed that less educated people manifested significantly more attitude change than more educated people ( $d = -0.09, z = 2.26, p = .01$ ), women manifested significantly more attitude change than men ( $d = -0.08, z = 2.22, p = .01$ ), and the combined effect of race on susceptibility was not significant ( $d = 0.01, z = 0.29, ns$ ). In line with this last finding, race was also not associated with perceived likelihood of change ( $B = -0.05, ns$ ). However, more educated respondents perceived a greater likelihood of change than less educated respondents ( $B = 0.10, p < .05$ ), and men reported marginally significantly more perceived likelihood of attitude change than women ( $B = 0.05, p < .10$ ). Thus, perceived likelihood of change did not match actual likelihood of change in terms of correlations with these two demographic variables, in addition to age.

<sup>12</sup> Shifts over the life course in answers to this question could be due to changes either in the perceived volume of knowledge one possesses or in the volume of knowledge one thinks one needs. Regardless, however, any shifts observed reflect changes in the gap between these two. This is clearly a meta-attitudinal measure of knowledge, one presumably based at least in part on actual levels of knowledge (see Krosnick et al., 1993).

Table 2  
Unstandardized Regression Coefficients Predicting Attitude Importance in Studies 4, 5, and 6

Predictor	Study 4 (n = 1,462)			Study 5 (n = 2,059)			Study 6 (n = 1,698)		
	Regression 1	Regression 2	Regression 3	Regression 1	Regression 2	Regression 3	Regression 1	Regression 2	Regression 3
Age	0.10**	0.56****	0.33	0.06**	0.35****	0.40*	0.00	0.29****	0.03
Age squared		-0.54****	0.09		-0.36****	-0.52		-0.32****	0.36
Age cubed			-0.45			0.13			-0.50**
Gender	-0.12****	-0.12****	-0.12****	0.01	0.01	0.01	0.01	0.01	0.01
Race	0.10***	0.10***	0.10***	0.09****	0.09****	0.09****	0.04****	0.04****	0.04****
Education	0.13***	0.12***	0.12***	0.04**	0.03	0.03	0.02**	0.01	0.02
R <sup>2</sup>	.011	.014	.014	.011	.015	.015	.012	.025	.027

\*  $p < .10$  (marginally significant). \*\*  $p < .05$ . \*\*\*  $p < .01$ . \*\*\*\*  $p < .001$ .

### Discussion

Although attitude importance and perceived knowledge exhibited similar trajectories across the life cycle, they had distinct demographic correlates, suggesting that these antecedents of attitude strength are not manifestations of a common underlying construct. Similarly, the meta-attitudinal measures of attitude change in this study and the operative measures of change used in Studies 1, 2, and 3 seem not to have tapped the same construct: The meta-attitudinal and operative measures had distinct demographic correlates, and they also exhibited different patterns of change across the life span. This suggests that the distinction between meta-attitudinal and operative indexes of attitude strength is a useful one.

The distinction between the meta-attitudinal measure of attitude change and the attitude change measures used in Studies 1 and 2 is subtle but important. Because these latter two studies relied on self-reported attitude change rather than direct observations of change, one might think they were meta-attitudinal indexes, not operative ones. Yet, the relation between age and susceptibility to change observed in Studies 1 and 2 was replicated in Study 3 with a purely operative measure of change, and the effect there was homogeneous with the effects in Studies 1 and 2. Therefore, when answering the question "Would you change your mind if . . . ?" respondents were apparently describing actual attitude change that occurred at that moment rather than more generic guesses about their likelihood of change. Reinforcing this conclusion, we observed a different relation between age and a purely meta-attitudinal measure of attitude change.

### Study 5

To explore the replicability of the findings of Study 4, we turned to another set of national survey data to assess the relation of age to attitude importance using a different set of political issues.

### Method

#### Sample

In 1984, the Center for Political Studies at the University of Michigan conducted face-to-face interviews with a nationally representative probability sample of American adults for the National Election Study. During the weeks immediately preceding the 1984 U.S. presidential election, interviews were conducted with 2,257 people living in private households.

#### Measures

*Attitude importance.* Respondents were asked to express their attitudes on four political issues: government services, U.S. involvement in Central America, improving the economic status of women, and federally guaranteed jobs.<sup>13</sup> After each attitude question, respondents were asked how important it was to them that the federal government adhere to their

<sup>13</sup> The wordings of all questions used for the analyses in this study, as well as those used in Study 6, are shown in the codebooks for the 1984 and 1996 American National Election Studies, which are available from the Inter-University Consortium for Political and Social Research at the University of Michigan.

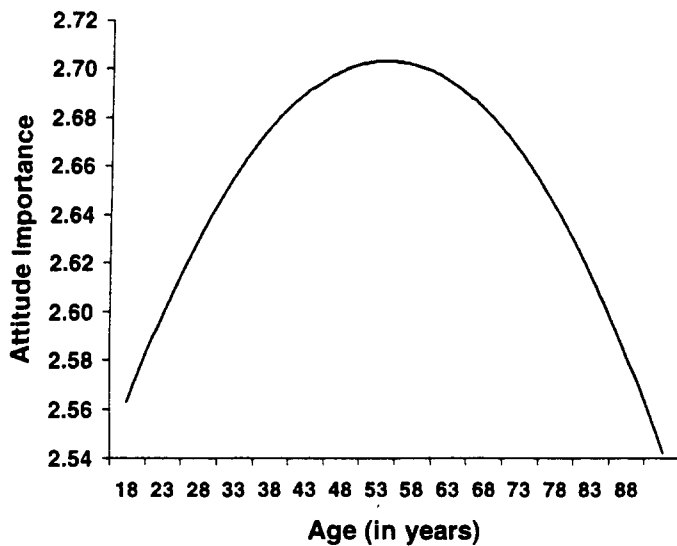


Figure 5. Relation of attitude importance to age in Study 4.

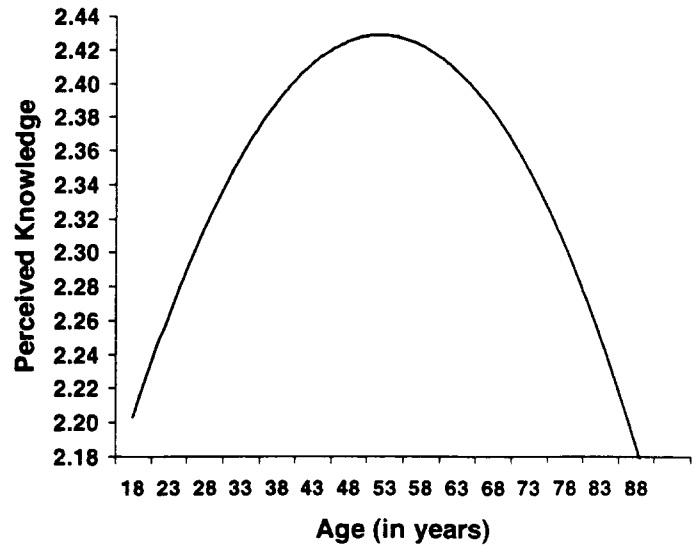


Figure 6. Relation of perceived knowledge to age in Study 4.

preferred policy on that issue (extremely important, very important, somewhat important, or not important at all, coded 1, .66, .33, and 0, respectively).<sup>14</sup> Answers to these questions were averaged to form an overall index of attitude importance.

*Demographic measures.* Education, race, and gender were coded as they had been in previous studies.

## Results

### Relations of Age to Education, Gender, and Race

Age was significantly associated with education and race as expected: Older cohorts contained fewer well-educated people ( $r = -.29, p < .01, n = 1,904$ ) and fewer racial minorities ( $r = -.05, p < .05, n = 1,902$ ). Age was not associated with gender ( $r = -.02, ns, n = 1,902$ ).

### Relation of Age to Attitude Importance

The relation of age to attitude importance here was comparable to that seen in Study 4 (see columns 4–6 of Table 2). The linear effect of age was significant and positive when tested by itself ( $B = 0.06, p < .05$ ) and when tested along with a quadratic effect of age ( $B = 0.35, p < .001$ ). The quadratic effect of age

was also significant and negative ( $B = -0.36, p < .01$ ), and the cubic effect of age was not significant ( $B = 0.13, ns$ ). As Figure 8 illustrates, importance rose during early adulthood, peaked at about age 45, and began to drop after about age 65.

## Study 6

Our final study made use of another national survey data set to examine the relation of age to another antecedent of attitude strength: certainty. Attaching importance to a public issue, as well as the extensive thought and information gathering that follow from importance, may make a person increasingly confident in his or her attitude. Thus, the dynamics of attitude importance and perceived knowledge documented in Studies 4 and 5 may produce parallel changes in attitude certainty over the life cycle. If this is true, certainty may be partly responsible for the shifts in resistance to change over the life span, because certainty enhances resistance to attitude change (see, e.g., Gross et al., 1995). And if certainty manifests the same surge and decline over the life course as the other antecedents of strength, this would reinforce the one-factor view of attitude strength antecedents. Study 6 explored these possibilities and assessed the replicability of the relation between age and attitude importance with yet another set of political issues.

## Method

### Sample

In 1996, the Center for Political Studies at the University of Michigan conducted face-to-face interviews with a nationally representative probability sample of American adults for the National Election Study. During

Table 3  
Unstandardized Regression Coefficients Predicting Perceived Attitude-Relevant Knowledge in Study 4

Predictor	Regression 1	Regression 2	Regression 3
Age	0.11**	0.93****	0.92*
Age squared		-0.94****	-0.90
Age cubed			-0.03
Gender	0.19****	0.18****	0.18****
Race	-0.13***	-0.14***	-0.14***
Education	0.57****	0.55****	0.55****
$R^2$	.069	.074	.074

Note.  $n = 1,462$ .

\*  $p < .10$  (marginally significant). \*\*  $p < .05$ . \*\*\*  $p < .01$ . \*\*\*\*  $p < .001$ .

<sup>14</sup> The phrasing of this question was not optimal in that it addressed the federal government instead of simply asking about the personal importance of the issue (see Boninger, Krosnick, Berent, & Fabrigar, 1995). However, the fact that Study 5 replicated the findings of Studies 4 and 6 regarding attitude importance (in which the simpler importance questions were asked) reinforces confidence in this measure as tapping attitude importance.

Table 4  
Unstandardized Regression Coefficients Predicting Perceived Likelihood of Attitude Change in Study 4

Predictor	Regression 1	Regression 2	Regression 3
Age	-0.44****	-0.59***	-0.25
Age squared		0.16	-0.75
Age cubed			0.66
Gender	0.05*	0.05	0.05*
Race	-0.05	-0.05	-0.05
Education	0.10*	0.10**	0.09**
R <sup>2</sup>	.028	.028	.029

Note. *n* = 1,461.  
\* *p* < .10 (marginally significant). \*\* *p* < .05. \*\*\* *p* < .01. \*\*\*\* *p* < .001.

the weeks immediately preceding the 1996 U.S. presidential election, 1,714 people living in private households were interviewed.

Measures

**Attitude importance.** Respondents were asked to express their attitudes on five political issues: government spending on social services, defense spending, government assistance to Blacks, abortion, and environmental protection. After each attitude question, respondents were asked how important each issue was to them personally (extremely important, very important, somewhat important, not too important, or not important at all, coded 1, .75, .50, .25, and 0, respectively). Answers to these questions were averaged to form an overall index of attitude importance.

**Attitude certainty.** For each of the same five issues, respondents were asked to express the certainty with which they held their attitude (very certain, pretty certain, or not very certain, coded 1, .50, and 0, respectively). Answers to these questions were averaged to create an overall index of attitude certainty.

**Demographic measures.** Education, race, and gender were coded as they had been in previous studies.

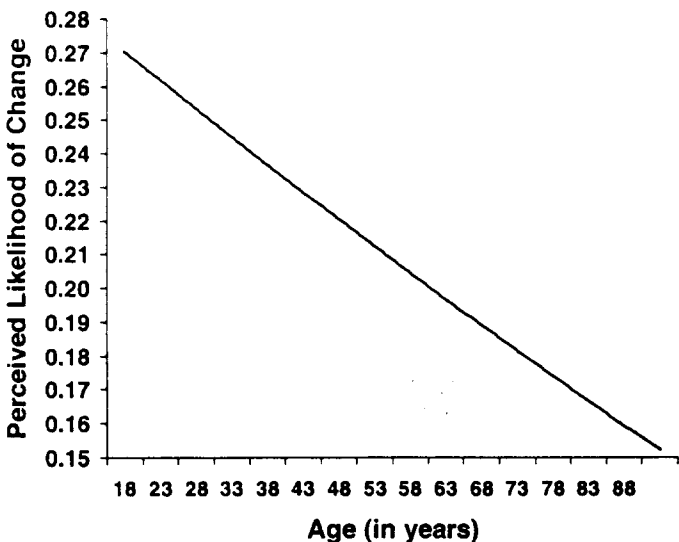


Figure 7. Relation of perceived likelihood of attitude change to age in Study 4.

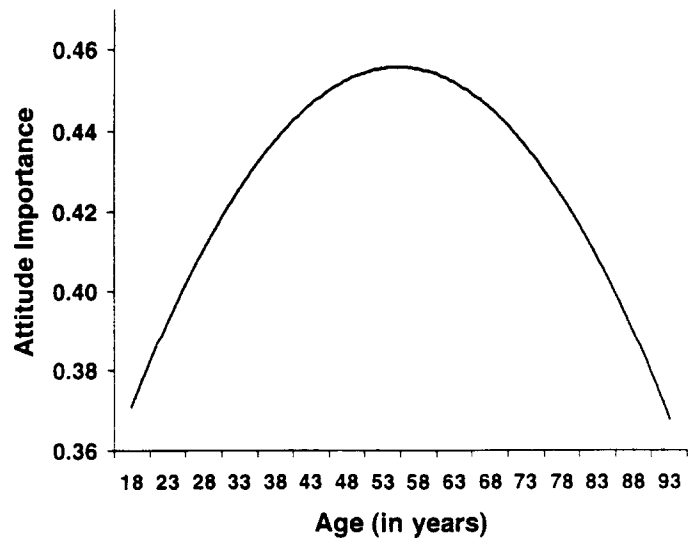


Figure 8. Relation of attitude importance to age in Study 5.

Results

Relations of Age to Education, Gender, and Race

Older cohorts contained significantly fewer well-educated people (*r* = -.18, *p* < .001, *n* = 1,709), and fewer racial minorities (*r* = -.07, *p* < .01, *n* = 1,702). Age was not associated with gender (*r* = -.03, *ns*, *n* = 1,702).

Relation Between Attitude Importance and Certainty

The correlation between attitude importance and attitude certainty was positive (*r* = .41, *p* < .001, *n* = 1,710), but was far enough from perfect to suggest that the two attributes are partly independent of one another.

Relation of Age to Attitude Importance

The relation of age to attitude importance here essentially replicated that seen in Studies 4 and 5 (see columns 7 and 8 of Table 2). Although the linear effect of age alone was not significant (*B* = 0.00, *ns*), the effect was positive and significant (*B* = 0.29, *p* < .001) when the quadratic effect was included, and the quadratic effect was negative and significant (*B* = -0.32, *p* < .001). Although the cubic effect of age was significant (*B* = -0.50, *p* < .05), it did not notably alter the relation of importance to age, and the effects of age here were not significantly different from those on importance that we observed in Studies 4 and 5: age,  $\chi^2(2, N = 5,219) = 0.75, ns$ ; age squared,  $\chi^2(2, N = 5,219) = 1.50, ns$ ; and age cubed,  $\chi^2(2, N = 5,219) = 2.72, ns$ . Figure 9 provides a graphic representation of the regression equation presented in column 9 of Table 2. As Figure 9 illustrates, importance again increased across early adulthood, peaked at about age 50, and began to fall after about age 65. Although attitude importance was not as low among young adults here as it was in Studies 4 and 5, the same basic trajectory of attitude importance across the life cycle emerged in these data.

Education was not significantly related to attitude importance (*B* = 0.02, *ns*). As in the previous studies, non-Whites attached

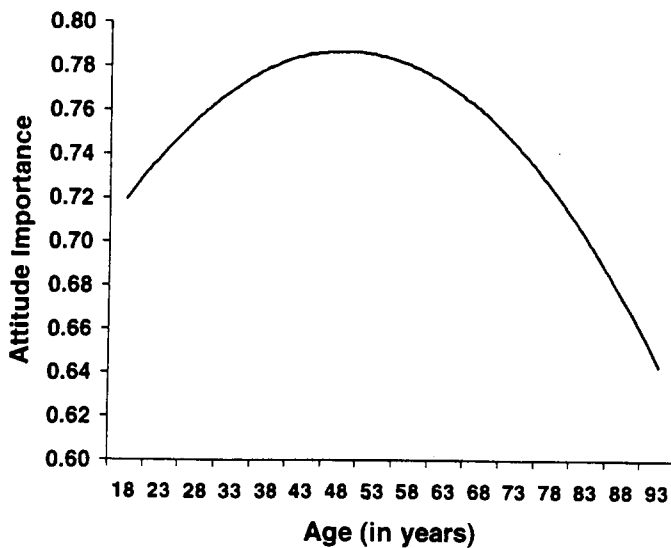


Figure 9. Relation of attitude importance to age in Study 6.

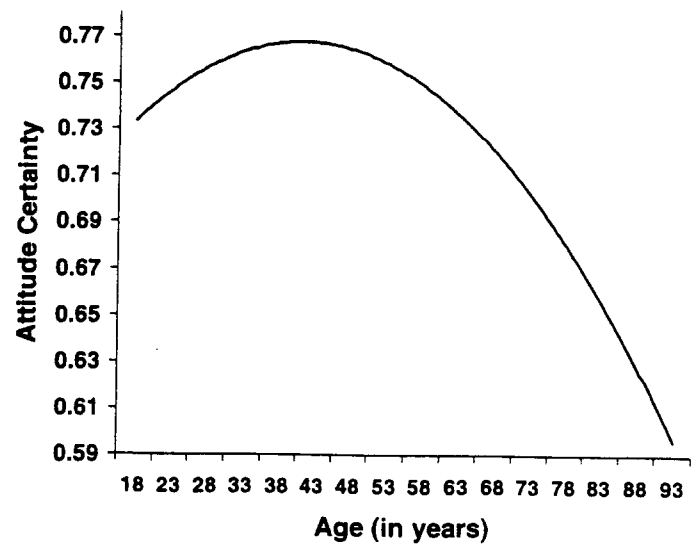


Figure 10. Relation of attitude certainty to age in Study 6.

more importance to their attitudes on these issues than did Whites ( $B = 0.04, p < .001$ ). And, again, there were no differences between men and women in the importance they attached to these issues ( $B = 0.01, ns$ ).

#### Relation of Age to Certainty

Consistent with the other strength antecedents, certainty increased early in the life cycle and declined late in the cycle (see Table 5 and Figure 10). The linear effect of age alone was negative and significant ( $B = -0.08, p < .001$ ). When the linear and quadratic age effects were estimated simultaneously, the linear effect was positive and significant ( $B = 0.23, p < .01$ ), and the quadratic effect was negative and significant ( $B = -0.36, p < .001$ ). The cubic effect of age was not significant ( $B = 0.01, ns$ ).

The associations between certainty and the other demographics were consistent with the associations between importance and those demographics. Certainty was unrelated to education ( $B = 0.00, ns$ ), significantly greater among men than among women ( $B = 0.03, p < .01$ ), and significantly greater among non-Whites than among Whites ( $B = 0.04, p < .01$ ).

Table 5  
Unstandardized Regression Coefficients Predicting  
Attitude Certainty in Study 6

Predictor	Regression 1	Regression 2	Regression 3
Age	-0.08****	0.23****	0.24
Age squared		-0.36****	-0.37
Age cubed			0.01
Gender	0.03****	0.03****	0.03***
Race	0.04***	0.04***	0.04***
Education	0.01	0.00	0.01
$R^2$	.021	.030	.030

Note.  $n = 1,696$

\*\*\*  $p < .01$ . \*\*\*\*  $p < .001$ .

## General Discussion

Our findings have general implications regarding the literatures on attitude change and on the structure of attitude strength antecedents. We discuss these implications in turn before considering the limitations of our evidence and directions for future studies.

### Attitude Change

#### Aging and Susceptibility to Change

Using methods that overcome various limitations of past studies, Studies 1, 2, and 3 support the life stages hypothesis and challenge the perpetual susceptibility hypothesis, the impressionable years hypothesis, and the increasing persistence hypothesis. Because considerable attitude change was evident even among the least susceptible age groups, our findings are more in line with the lifelong openness view than with the persistence hypothesis.

It is interesting to note that our findings in this regard offer an extension of some very old laboratory studies of susceptibility to persuasion among preadults. For example, Whipple (1909) described a study by Stern (1907–1908) in which susceptibility to attitude change was found to be three times greater among 7–14-year-olds than among 16–19-year-olds. Similarly, Stukat (1958) found almost three times as much attitude change among 8-year-olds as among 14-year-olds, with a smooth decline in susceptibility between these ages. And Marple (1933) found that attitude change was greater among high school seniors than among college seniors, who in turn manifested more change than did older adults. In none of these studies was representative sampling of age groups done, so it is impossible to know whether the various age groups can legitimately be compared with one another. Furthermore, these studies did not offer opportunities to differentiate among the increasing persistence, impressionable years, and life stages hypotheses, because they did not compare older adults of different ages. But Stern (1907–1908), Stukat (1958), and Marple (1933) nonetheless provided

evidence consistent with the claim that susceptibility to attitude change declines during preadulthood, a finding that resonates with our own evidence regarding the adult portion of the life cycle.

### *Reconciling the Present Findings With Other Evidence*

Although our finding of greater susceptibility to attitude change during early adulthood than during middle adulthood is consistent with most previous correlational research, our evidence of greater susceptibility during late adulthood is inconsistent with most of the existing literature. One possible explanation for this discrepancy is the methods of analysis used. Virtually without exception, previous investigations have divided samples into several discrete age groups and examined the average level of attitude stability for each group. This strategy requires researchers to lump together spans of ages to achieve subsamples that are sufficiently large to yield reliable parameter estimates for each group.

This is particularly necessary at the upper end of the life cycle: survey samples include relatively small numbers of very old adults, because of mortality and other factors. As a result, the oldest age group in previous investigations has often spanned a wide range (e.g., ages 65 to 90 years) but has contained many more people at the younger end of the range than at the older end. Averaging across these individuals may therefore have masked changes that occur at the very end of the life cycle, because the oldest members of the group were far outnumbered by the younger members of the group.

In the studies reported here, we took an analytic approach not yet used in any studies of aging and attitude change. Rather than arbitrarily breaking the samples into subgroups, we used linear and nonlinear regression models to more precisely assess the relation between age and susceptibility to change across the entire adult life cycle. And, in fact, when we reanalyzed our data using the traditional approach, our results were notably different.

For example, we broke the sample from Study 1 into five age categories (18–25, 26–35, 36–50, 51–65, and 66–97 years), and we gauged the average proportion of respondents in each group who exhibited attitude change. Consistent with most previous research, we found striking evidence of increased susceptibility to change among young adults. Also consistent with this literature, we found no evidence of an upturn in susceptibility at the end of the life cycle: The mean rates of attitude change for these age groups (adjusted for differences between groups in education, gender, and race) were .57, .49, .44, .45, and .43, respectively. Comparable results were obtained when we conducted similar analyses with the data from Studies 2 and 3. Thus, the methods of analyses used seem likely to account for the discrepancy between our results and the results of prior investigations regarding susceptibility to attitude change at the end of the life cycle.

One other difference between the current research and previous investigations may also have contributed to the discrepancy. As we have discussed, earlier investigations used attitude stability as an index of susceptibility to attitude change, which is likely to underestimate true susceptibility to change among people who experience few attitude-challenging experiences. If older adults were particularly unlikely to encounter these sorts

of experiences, attitude stability levels would paint a distorted portrait of susceptibility to change at the end of the life cycle. Thus, when the dependent variable is attitude stability rather than attitude change, even linear and nonlinear regression analyses may yield misleading evidence about the late adult years.

### *Understanding the Relation Between Age and Susceptibility to Attitude Change*

Virtually without exception, previous investigations of aging and attitude change have been entirely descriptive. The causal mechanism or mechanisms underlying the relation between age and susceptibility to attitude change have gone largely ignored. The present investigation provides an initial step toward understanding causal underpinnings by documenting relations of age to antecedents of attitude strength. Specifically, we found that attitude importance, perceived knowledge, and certainty surged and declined roughly in parallel with changes in susceptibility to attitude change. Changes in these antecedents of attitude strength may therefore provide clues about the causal mechanisms responsible for the dynamics of susceptibility to attitude change.

In particular, resistance to change may increase because people attach more importance to their attitudes, think more frequently and deeply about them as a result (see Boninger, Krosnick, Berent, & Fabrigar, 1995), and consequently develop a confidence and sense of knowledgeability that motivates resistance to change. And resistance to change may decline later because importance, perceived knowledge, and certainty drop. Future investigations directly testing these mediation hypotheses (by measuring susceptibility to change as well as importance, perceived knowledge, and certainty in the same representative sample survey) clearly seem to be warranted.

In addition to antecedents of attitude strength, a number of other mechanisms may also be partly responsible for the relation of age to susceptibility to attitude change. Our initial discussion of the life stages hypothesis alluded to some of these mechanisms. For example, early and late adulthood are both periods of relatively frequent role transitions during which individuals are resocialized to new sets of demands and expectations (Glaser & Strauss, 1971; Steckenrider & Cutler, 1989). Often, role adoption encourages certain attitudes and discourages others (Bogardus, 1927), and the adoption of new roles can lead to changes in attitudes (e.g., Lieberman, 1950). The density of role transitions in early and late adulthood may contribute to a general increase in susceptibility to attitude change as individuals reconsider their relation to the social world and redefine their social identities.

Changes in social networks may also play a role in the relation between age and susceptibility to change. When discussing social and political issues, people strategically select friends and discussion partners with whom they agree (Byrne, 1961; Huckfeldt & Sprague, 1987, 1988; Newcomb, 1961), and, as a result, discussions with such individuals reinforce their original attitudes. People also selectively misperceive the views of their discussion partners when those views are at odds with their own (Huckfeldt & Sprague, 1987, 1988), further inflating people's perceptions of social support for their attitudes. Thus, having large social networks with whom one comes into frequent contact may reduce susceptibility to change.

And the sizes of people's social networks change over the life span. As people move from young adulthood to the middle adult years, they increasingly discuss important matters with a wide range of people outside of their families (Marsden, 1987). This trend reverses, however, at the end of the life cycle: Relative to middle-aged adults, older adults have far fewer people with whom they discuss important matters (Burt, 1990; Lang & Carsensen, 1994; Marsden, 1987). Increased susceptibility to attitude change at the beginning and end of the adult life cycle may be due in part to these changes in social support.

A number of other potential mechanisms may account for heightened susceptibility to attitude change during early adulthood but not late adulthood. For example, because young adulthood is typically the point of entry into the political realm, attitudes are likely to be formed one at a time, in relative isolation from one another. But as a person ages, he or she is likely to come to see the interrelations among various attitudes and the applicability of overarching principles such as ideologies or values. Consequently, among middle-aged adults, attitudes are more often embedded within overarching cognitive structures and are more strongly associated with other cognitive elements (Daniels & Clark-Daniels, 1995; Kirkpatrick, 1976). Such associations stabilize attitudes (Ostrom & Brock, 1969; Scott, 1968) and thus may partly account for the decline in susceptibility to change after early adulthood.

Because young adults have had fewer life experiences, they may also have had fewer opportunities to behaviorally commit themselves to their attitudes (e.g., describing their attitudes to others or engaging in attitude-congruent behaviors). Behavioral commitment increases resistance to change (Brehm & Cohen, 1962; Hovland, Campbell, & Brock, 1957; Kiesler, 1971) and may partially account for the heightened susceptibility to attitude change at the beginning of the adult life cycle.

Still other processes may uniquely account for the decline in resistance to attitude change later in adulthood. For example, recent meta-analyses have revealed relatively large changes across the life span in cognitive functioning (Salthouse, 1992; Verhaeghen, Marcoen, & Goossens, 1993; Verhaeghen & Salthouse, 1997). Performance of cognitive tasks declines beginning at approximately age 20, but the rate of decline becomes especially steep after age 50 (Salthouse, 1992, 1996; Verhaeghen et al., 1993). Thus, the oldest adults may find it hardest to generate effective counterarguments in the face of persuasive appeals, increasing their susceptibility to attitude change.

Finally, late adulthood may see an increase in susceptibility to change because attitudes may become strikingly obsolete at that time. Young adults apparently form attitudes on a range of political issues for the first time, and these attitudes remain through middle adulthood. Yet, during these middle adult years, the political world in which the attitudes were formed begins to change because of technological and social innovations and the march of time more generally. Thus, for example, people who came of age during the Great Depression probably found that as the country's economic conditions improved, the attitudes they formed early in adulthood were less and less suitable to new world conditions. Because social reform and structural change occur slowly, dramatic discrepancies between one's early-formed attitudes and current world conditions are not likely to occur until late in adulthood. And this may make people especially open to change at that time.

In addition, the very meaning of some attitude objects may change over the several decades that divide early and late adulthood. In the contemporary political context, for example, the term *welfare* calls to mind a certain set of programs that assist a particular subset of the population. In the 1950s, welfare referred to an entirely different set of programs that assisted a different subset of people. Likewise, support for civil rights in the early part of the 20th century meant support for integration of workplaces, neighborhoods, schools, and other social institutions. But in recent years, support for civil rights has meant support for redistribution of economic resources and opportunities to offset past inequalities (Schuman, Steeh, & Bobo, 1985). Thus, some people who formed attitudes toward civil rights decades ago may find that those attitudes are no longer applicable, therefore opening them up to change. And this should occur most among the oldest adults, whose attitudes were formed longest ago.

All of these processes, summarized in Table 6, represent plausible mechanisms for the observed relation between age and susceptibility to attitude change, and each implies something different about which of the myriad social, psychological, and biological aspects of aging are responsible for changes over the life cycle in susceptibility to attitude change. We look forward to future research that investigates the role of each of them, along with other potential mechanisms.

One possibility that we were able to test with the data from Study 2 turned out not to be a plausible mechanism of the relation between age and susceptibility to change. That data set included a measure of the number of adults living in respondents' households, providing one index of domestic social sup-

Table 6  
*Potential Mechanisms of Decreasing and Increasing Susceptibility to Attitude Change During Early and Late Adulthood*

Early adulthood	Late adulthood
Increasing recognition of the relevance of public issues to one's material interests, values, and reference groups, resulting in increased attitude importance	Decreasing attitude importance
Acquisition of knowledge about the social and political world	Decreasing retrievable knowledge
Increasing certainty with which attitudes are held	Decreasing certainty with which attitudes are held
Frequent role transitions	Frequent role transitions
Growing social networks	Shrinking social networks
Increasing attitude constraint	
Increasing opportunities for behavioral commitment to attitudes	
	Declining cognitive resources with which to generate effective counterarguments
	Increasing obsolescence of attitudes
	Changes over time in the meaning associated with particular attitude objects

port. Linear and nonlinear ordinary least squares regression models revealed that the proportion of respondents who lived alone increased sharply from young adulthood to middle adulthood (from about 16% to about 30%), remained steady across the middle adult years (at about 30%), and rose steeply during the late adult years (to about 40% among 65–74-year-olds and about 50% among those 75 years old or older). Thus, social support decreased at roughly the same time that susceptibility to attitude change increased, raising the possibility that the former may mediate the relation between age and susceptibility to change at the end of the life cycle.

However, this measure of social support was unrelated to attitude change, both in the full sample ( $B = 0.00$ ,  $ns$ ) and among the subsample of respondents 50 years old or older ( $B = 0.06$ ,  $ns$ ). Social support in the form of living companions, therefore, cannot account for the age-related differences in susceptibility to change observed in Study 2. This surprising result illustrates the importance of formally testing the possible mechanisms of the relation between age and susceptibility to change. Other intuitively appealing mechanisms of this relation, many of which we outlined earlier, may also be rejected when subjected to empirical scrutiny.

### Societal Implications

Our findings have interesting implications for social change across history, both in the past and in the future. To understand some of these implications, it is useful to begin with Figure 11, which displays the distribution of age in the American adult population starting in 1950 and projected out to 2050 (U.S. Bureau of the Census, 1953, 1993). The width of each band in this figure represents the proportion of adults in each age group in each year. The consistent widening of the solid band at the top represents the consistent growth of the 65-year-old and older age group, a process often referred to these days as the "graying" of America. The hump in the band at the bottom between 1970 and 1980 represents the baby boom generation, which

began to reach age 18 in the late 1960s. That hump is also apparent in each of the older age groups, but it moves progressively to the right (representing the aging of the baby boomers).

If the perpetual susceptibility hypothesis had been true, these changes in the age distribution of Americans would have no implications at all. And if the impressionable years hypothesis had been true, the growth of the oldest age group would have had no implications for change in the susceptibility of the American public to attitude change across this 100-year period. But because the life stages hypothesis seems correct, the growing band of older Americans signals a likely steady increase in the susceptibility of the population to attitude change. Therefore, increased volatility in public opinion may be apparent in the future, especially during periods of intense public debate (e.g., during presidential election campaigns).

Because the 18–24-year-old group was disproportionately large between 1970 and 1980, and because these individuals were presumably highly susceptible to change, the malleability of the aggregated public's views on political issues was probably a bit higher during those years than before or after. The national turmoil of the late 1960s and early 1970s is no doubt attributable primarily to dramatic events such as the Vietnam War and Watergate, but the reverberation of such events throughout those years (and even today) may have been especially loud and sustained because an easily influenced age group was unusually large at that time.

### Impact of Education, Gender, and Race on Susceptibility to Change

Social psychologists have had long-standing interest in the relation of other demographics to attitude change susceptibility, most notably gender (e.g., Cooper, 1979; Eagly, 1978; MacCoby & Jacklin, 1974). In a meta-analysis of 148 studies that explored gender differences in influenceability, Eagly and Carli (1981) found that women were significantly more open to change than were men. Consistent with Eagly and Carli's find-

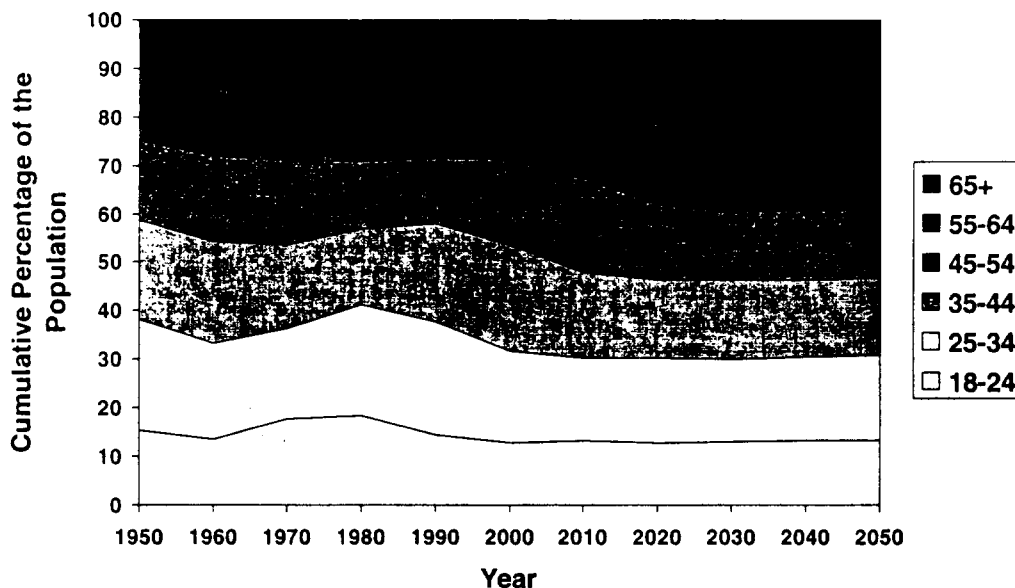


Figure 11. Age distribution of U.S. adults.

ings, our own meta-analysis combining Studies 1, 2, and 3 revealed that women manifested attitude change significantly more than men.

In line with Zaller's (1990) findings, less educated people manifested significantly more attitude change than more educated people ( $d = -0.09$ ,  $z = 2.06$ ,  $p = .04$ ). Because education is strongly correlated with intelligence (Ceci, 1991), this finding may reflect the well-documented greater resistance to attitude change among more intelligent people when a persuasive message is easy to comprehend and equally exposed to everyone, as was the case here (e.g., Eagly & Warren, 1976; Rhodes & Wood, 1992). However, educational attainment is correlated with many other individual differences as well (see, e.g., Hyman, Wright, & Reed, 1975; Nie, Junn, & Stehlik-Barry, 1996). Thus, our finding encourages further study of the psychological sources of this relation.

Given that the oldest age cohort was less educated and more predominantly female than the younger age cohorts, the relation of education to susceptibility would have been systematically distorted if we had not controlled for these characteristics. In contrast, the combined effect of race on susceptibility was not significant ( $d = 0.02$ ,  $z = 0.32$ ,  $p = .75$ ), so controlling for this variable here had no effect. But our documentation of the expected relation between race and age suggests that other investigators of aging should be attentive to this aspect of changing cohort composition over the life course.

### *Structure of Attitude Strength*

#### *One Construct or Many?*

To the extent that antecedents of attitude strength are all manifestations of a single underlying construct, they should exhibit similar trajectories across the adult years. Whereas susceptibility to attitude change, attitude importance, and perceived knowledge manifested nearly identical relations with age, attitude certainty increased less dramatically early in the life cycle and declined more slowly, beginning at an earlier age. More strikingly, different attitude attributes correlated differently with gender, race, and education.

Averaging across Studies 4, 5, and 6, attitude importance was significantly higher among women than among men ( $d = 0.06$ ,  $z = 3.43$ ,  $p < .01$ ), whereas men reported higher levels of knowledge,  $d = 0.24$ ,  $t(1456) = 5.60$ ,  $p < .01$ , and certainty,  $d = 0.14$ ,  $t(1691) = 2.96$ ,  $p < .01$ . Non-Whites reported higher attitude importance (averaging across Studies 4, 5, and 6;  $d = 0.14$ ,  $z = 5.65$ ,  $p < .01$ ) and higher certainty than Whites,  $d = 0.13$ ,  $t(1691) = 2.70$ ,  $p < .01$ , but Whites reported having more knowledge than non-Whites,  $d = 0.12$ ,  $t(1456) = 2.83$ ,  $p < .01$ . And more educated people reported higher attitude importance (averaging across Studies 4, 5, and 6;  $d = 0.07$ ,  $z = 3.31$ ,  $p < .01$ ) and much higher knowledge,  $d = 0.43$ ,  $t(1456) = 9.93$ ,  $p < .01$ , but education was completely unrelated to certainty. Thus, no two of these attributes manifested the same relations with all three demographics.

Taken together, then, this body of evidence challenges the single-construct view of attitude strength. In fact, the distinction between importance and perceived knowledge is inconsistent with even the modest suggestion that importance and perceived knowledge reflect a single latent factor (e.g., Erber et al., 1995;

Pomerantz et al., 1995). It therefore seems wise, when studying attitude strength, to measure multiple dimensions, each with multiple items (to eliminate measurement error), and to assess the effects of each dimension individually, no matter what a factor analysis suggests about the potential to combine dimensions into a single meta-dimension.

### *Meta-Attitudinal Versus Operative Indexes of Strength*

Although attitude change susceptibility fell after early adulthood and rose again late in life, people are apparently not aware of this. Rather, in Study 4, we observed a negative linear relation between age and perceived susceptibility to attitude change. Therefore, people were partly correct, in that they perceived susceptibility to drop after early adulthood, but they were incorrect in their beliefs about the rest of the life cycle. Likewise, partial accuracy appeared when gauged by correlations between susceptibility to change and other demographics. Women correctly recognized that they were more susceptible to attitude change than men, and people recognized that there was no robust relation of race to attitude change. However, highly educated people perceived themselves to be especially open to attitude change, whereas, in fact, they were unusually resistant to change. All of this reinforces the claim that meta-attitudinal measures of attitude properties can differ significantly from operative measures of those same properties (see also Bassili, 1996; Krosnick et al., 1993). Thus, there seems to be theoretical value in further exploration of the origins and consequences of both meta-attitudinal and operative indexes, because the conclusion one reaches in any given investigation may hinge on which type of measure is used.

### *Limitations*

#### *Aging Effects Versus Birth Cohort Effects*

The age-related differences in attitude attributes documented here could be due to progress through the life cycle, as we have presumed, or they could be due to differences between birth cohorts in the nature of their socializing experiences (Mannheim, 1952). That is, the young adults in our samples may manifest constant attitude attributes throughout their lives, and the older adults may manifest different but constant attributes throughout their lives. The differences we have documented may be attributable not to changes over the life course but to differences in the early life experiences of these individuals.

It is impossible to rule out this alternative explanation with the data we analyzed, because age and cohort effects are inevitably confounded. However, many longitudinal studies conducted over 30 years indicate that attitude change has been more common among young adults than among older adults, reinforcing the generalizability of the early life cycle pattern we saw (e.g., Alwin et al., 1991; Krosnick & Alwin, 1989). And even the relatively small number of attitude change data sets we analyzed were collected over a span of more than 10 years, long enough for members of the youngest cohort in the earliest data set to move into middle adulthood when the latest data set was collected. The replication across the three data sets provides at least tentative support for the generalizability of our effects across cohorts. As additional survey data are collected from

different birth cohorts at different points in their life cycles via methods such as those used in Studies 1, 2, and 3 here, it will be possible to further explore the generalizability of our results regarding the life cycle.

### Object Domains

Another useful direction for future research would be to explore the relation between age and susceptibility to attitude change in other domains of objects. Our studies and most in this literature have focused on political attitudes. Early adulthood is typically the period during which many individuals begin attending to and becoming behaviorally engaged in the political process, whereas people may become cognitively and socially disengaged from politics late in life. Some issues become especially relevant to people as they reach the end of the life cycle (e.g., government spending on social security), but most social and political issues probably seem increasingly irrelevant to people as they grow old. This dynamic may account for the life cycle shifts we observed.

In contrast, attitudes toward other sorts of objects may crystallize much earlier in life and may be no more susceptible to change during early adulthood than later in life. Food preferences, for example, may be established during childhood and may remain relatively invulnerable to change throughout adulthood. And some attitudes may remain central to people's lives throughout old age, so they may become no more open to change late in the life cycle. Thus, the life stages hypothesis may be correct regarding only some attitudes.

Alternatively, the crystallization of any given attitude may not occur independently of other attitudes. Instead, life experiences across a broad range of domains may contribute to an increase in the stability of all attitudes early in adulthood. That is, through the accumulation of diverse experiences, individuals may arrive at a constellation of attitudes and beliefs that capture a sense of order and understanding of the social environment. Once a consonant system of attitudes and beliefs is established, individuals may resist changes to any element within the system. Such resistance may be driven by the motivation to avoid dissonance within the system or by a general sense of mastery of one's social environment and confidence in the validity of one's views. And late in life, as people have more restricted behavioral opportunities and interact with more narrow groups of people, all of their preferences may weaken.

Partly consistent with this latter view, several diverse lines of research suggest that early adulthood is a period of relative plasticity across many domains. For example, personality traits gradually increase in stability during young adulthood (Nesselroade & Baltes, 1974) and become highly stable across the remaining adult years (Caspi, Bem, & Elder, 1989; Costa, McCrae, & Arenberg, 1983; McCrae & Costa, 1994; Schuerger, Tait, & Tavernelli, 1982; Schuerger & Witt, 1989; Schuerger, Zarrella, & Hotz, 1989). Similarly, self-images exhibit considerable instability during early adulthood but show much greater stability later in life (Mortimer, Finch, & Kumka, 1982). Many social identities, too, show this pattern of stability. Identification with a political party, for example, tends to be substantially less stable during young adulthood than it is during middle adulthood (Alwin et al., 1991; Alwin & Krosnick, 1991). Even antecedents of attitude strength, such as attitude-relevant knowledge, are

less stable in early adulthood than they are later in adulthood (Jennings, 1996). The findings of each of these lines of inquiry, along with our own results, provide convergent evidence of the malleability of young adulthood. These additional indexes of malleability suggest that the pattern we observed here regarding early adulthood may describe a wide range of psychological phenomena. Much less attention has been devoted thus far to careful study of these processes in representative samples of adults late in the life cycle, and we look forward to such work.

### Conclusion

Aging is a complex, multifaceted process (Birren & Schaie, 1996). The passages from infancy to childhood, childhood to adolescence, adolescence to young adulthood, and across the adult years are marked by myriad changes in mental, physical, and social processes. Beneath what may appear to be smooth, even linear transitions in thinking styles and behavior over the life cycle is undoubtedly rich and elaborate interplay of these various processes. Therefore, the social and psychological mechanisms underlying the effect of aging we have highlighted may be complex and challenging to identify and to document. But the work we have reported here provides at least some impetus to initiate such inquiry in the future.

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## Call for Nominations

The Publications and Communications (P&C) Board has opened nominations for the editorships of the **Journal of Abnormal Psychology**, **Journal of Comparative Psychology**, **Journal of Experimental Psychology: Learning, Memory, and Cognition**, **Journal of Personality and Social Psychology: Attitudes and Social Cognition**, **Professional Psychology: Research and Practice**, **Psychological Review**, and **Psychology, Public Policy, and Law** for the years 2001-2006. Milton E. Strauss, PhD; Charles T. Snowdon, PhD; James H. Neely, PhD; Arie W. Kruglanski, PhD; Patrick H. DeLeon, PhD, JD; Robert A. Bjork, PhD; and Bruce D. Sales, JD, PhD, respectively, are the incumbent editors.

Candidates should be members of APA and should be available to start receiving manuscripts in early 2000 to prepare for issues published in 2001. Please note that the P&C Board encourages participation by members of underrepresented groups in the publication process and would particularly welcome such nominees. Self-nominations are also encouraged.

To nominate candidates, prepare a statement of one page or less in support of each candidate. Send nominations to the attention of the appropriate search chair—

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