EFFECTS OF BIAS AND EDUCATIONAL EXPERIENCE ON TWO KNOWLEDGE OF AGING QUESTIONNAIRES

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EFFECTS OF BIAS AND EDUCATIONAL EXPERIENCE ON TWO KNOWLEDGE OF AGING QUESTIONNAIRES

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Palmore's Facts on Aging Quiz (FAQ)-Part 1 (1977) has been used frequently to gauge a respondent's knowledge of aging. The preponderance of positively-valenced items on the FAQ, however, is such that score on the test may be more representative of a respondent's attitude toward, than knowledge about aging and the elderly, positive attitudes being associated with a higher FAQ score. Although such confounding of directional bias and knowledge is acceptable in an "edumetric" test, it is problematic in a research instrument. In experiment 1, the FAQ's vulnerability to bias was tested by having young adults complete the FAQ under instructions to adopt either a positive or negative bias toward the elderly, their scores being compared to their own performance when requested to respond neutrally (i.e., on the basis of knowledge alone). Scores on the FAQ were found to be greatly affected by the direction of bias. A new Knowledge of Aging and the Elderly (KAE) questionnaire, patterned after the FAQ but more balanced in item valence, was evaluated using the same procedure. The KAE was shown to be relatively immune to direction of bias. In experiment 2, a comparison of the FAQ and KAE indicated that the KAE was also moderately, but significantly, more sensitive to course-based differences in knowledge regarding aging and the elderly.

INTRODUCTION

Since its introduction to the gerontological community, the Facts on Aging Quiz (FAQ)-Part 1 (Palmore, 1977) has been used extensively to assess a respondent's knowledge of the elderly and the aging process. The brevity of this questionnaire, as well as its ease of administration,

This research was carried out while the first, second, and third authors were in the Department of Psychology, University of Notre Dame, Notre Dame, IN. The project was supported by a Research Career Development Award (No. K04AG00199) from the National Institute on Aging and a Mary and Alexander P. Hirsch Award from Fight-for-Sight to the first author. The authors express their great appreciation to Professor A. E. D. Schonfield for his many helpful comments in preparing the manuscript and his assistance in documenting the answers to the KAE.
has made it an attractive and widely used instrument for both research and educational applications. Further, FAQ scores appear to generalize to non-U.S. populations (Luszcz, 1982; Matthews, Tindale, & Norris, 1984), giving it some cross-cultural utility. For a review of its applications, see Palmore (1980, 1981, 1988).

Some researchers have argued that the FAQ includes items that have an equivocal factual base (Miller & Dodder, 1980), or that the questionnaire as a whole is sensitive to attitudinal bias toward the elderly (Klemmack, 1978). Palmore (1977, 1981) clearly recognized the latter point and, describing the FAQ as an “edumetric” not “psychometric” instrument (Palmore, 1978), held that one use of the FAQ was the indirect assessment of bias. This limits its utility to applications where the combined assessment of knowledge and bias is acceptable (e.g., West & Levy, 1984). The FAQ has been utilized, however, as though it were an index of knowledge alone. Examples include assessing knowledge for the purpose of providing direction for training clergy (Wallace & Wallace, 1982), evaluating learning in gerontological courses (Dail & Johnson, 1985), and determining knowledge in an evaluation of the beliefs and attitudes of community adolescents (Doka, 1986). Minimally, an effective research test of knowledge of aging and the elderly ought to possess two characteristics: First, scores on the test should vary directly with a respondent's gerontological knowledge and secondly, test scores should not depend on the direction of a respondent’s bias. The purposes of the present research were to examine the degree to which induced negative and positive bias would influence scores on the FAQ differentially, and to develop a quiz for use by researchers that possessed the FAQ's desirable properties (e.g., brevity and ease of administration), but was not directionally sensitive to bias.

According to Palmore (1977), 16 of the 25 true/false items on the FAQ-Part 1 are biased positively, an observation confirmed in a pilot study in which we asked eight young subjects to “sort” the FAQ items as to positive or negative bias. They categorized 16 of the items as positive in valence, that is, either positive in character and true \((N = 6)\) or negative and false \((N = 10)\). The balance of the items were categorized as neutral \((N = 3)\) or negative \((N = 6)\) in valence. (When the items composing the FAQ-Part 2 were sorted, 14 were categorized as positive, 2 were neutral, and 9 were negative.) To the degree that bias affects one's responses, individuals with positive attitudes toward aging and the elderly would be more likely to respond “correctly” to the items of positive valence, inflating their FAQ score; conversely those less favorably disposed toward aging would tend to receive lower scores. Courtney and Weidmann (1985) have shown that the addition of a “don’t know” alternative to the FAQ reduces the number of incor-
rect guesses. Although the “don’t know” alternative could enhance the utility of the FAQ as a research tool by removing bias effects through a reduction in response uncertainty, it is not without its own problems. If “don’t know” responses are not counted as incorrect in establishing the knowledge score, then they reduce in equal measure the number of items available to measure knowledge, creating a test that is idiosyncratic in both length and content. Also, it is not clear if “don’t know” responses are indicative of lack of knowledge or lack of certitude about that knowledge. For research purposes, the development of an instrument that achieves a better balance of positive and negative valence items would seem the preferred alternative.

This study sought to answer three questions. Would a respondent’s score on the FAQ be influenced by the induction of either a negative or positive “attitude” toward the elderly? Would a new questionnaire, in which item valence was balanced more effectively, be relatively immune to such effects? To what degree would the FAQ and the new instrument discriminate between education-based differences in knowledge of aging?

In experiment 1, the Palmore Quiz-Part 1 (Palmore, 1977) was administered to a group of young adults under conditions in which they were asked first to adopt a neutral (i.e., unbiased factual) attitudinal set and then, either a negative or positive response set toward the elderly. The same procedure was also carried out with a separate group of young adults using the Knowledge of Aging and the Elderly (KAE) Questionnaire, a new instrument that balanced item valence more closely. It was hypothesized that the two bias conditions would affect the FAQ and KAE very differently. Given the preponderance of items of positive valence on the FAQ, it was expected that compared to the neutral condition, scores would be reduced significantly by negative but not positive bias. In contrast, it was expected that the respondents’ scores on the KAE would be lowered by bias of either type. In experiment 2, the FAQ and KAE were compared in regard to their ability to discriminate differences in knowledge across three courses that differed in their level of gerontological content. It was expected that scores on the FAQ and KAE would be higher in courses with greater gerontological content.

METHOD

Subjects

In experiment 1, 56 college-aged (19–23 years) adults (28 men and 28 women) served as subjects. In experiment 2, the participants were stu-
dents from three different university courses: psychology of aging ($N = 19$), life-span personality ($N = 43$), and other non-gerontological social science classes ($N = 33$). All participants were undergraduate volunteers from a private, midwestern university.

Materials

The FAQ includes items related to several different topic areas including aging and mental health, social and work issues, physiology, and demography. The new instrument being evaluated, the KAE, is also a 25-item quiz in true/false format, and like the FAQ, it assesses factual knowledge pertaining to many aspects of aging and the elderly. The items comprising the KAE are presented in Appendix 1, along with a documented scoring key. Sorting of the items by eight pilot subjects indicated that the KAE contained 8 items with a positive valence (3, 4, 5, 11, 12, 15, 19, 21), 7 neutral (1, 2, 7, 8, 18, 20, 22), and 10 negative (6, 9, 10, 13, 14, 16, 17, 23, 24, 25).

Design and Procedure

In experiment 1 subjects were tested in a single session that lasted approximately 35 min. They were given an individual packet of questionnaires and response sheets, the contents of which were specific to both test type (FAQ or KAE) and response-set condition. One-half of each gender group (14 men and 14 women) were randomly assigned the FAQ, while the other half received the KAE. Participants were first requested to answer each item using a “factual” approach. In this condition, they were asked to answer each item as accurately as possible independent of their answers to any other items. Subsequently, the participants were randomly selected to complete the same questionnaire, half (7 men and 7 women) with a positive response bias and half with a negative response bias. In the positive bias condition respondents were asked to answer each item as if they were positively disposed toward aging and the elderly, regardless of either their true feelings toward the elderly or their beliefs about the accuracy of the statements. Instructions to respondents in the negative condition were identical, except that they were asked to answer each item as if they were negatively disposed toward aging and the elderly. Subjects completed the instruments at their own pace.

In experiment 2, the FAQ and KAE were given to students midway through the semester in three university courses which differed in their level of gerontological content: psychology of aging (high), life-span personality (intermediate), and other social science courses (low).
Respondents, who were unfamiliar with either quiz, were asked to complete the questionnaires as accurately as possible and without bias. Approximately one half of the three classes completed the FAQ before the KAE, the other half received the reverse order. As in experiment 1, the tests were self-paced.

RESULTS

Experiment 1: An initial omnibus $2 \times 3 \times 2$ analysis of variance (ANOVA) on number correct in relation to test, bias, and gender indicated that there were no gender differences or interactions. Gender was therefore excluded from the subsequent planned comparisons used to examine the effects hypothesized. The mean number of correct responses for each questionnaire and bias condition are shown in Table 1.

As hypothesized, induced bias had very different effects on the number of correct responses on the FAQ and KAE. Compared to the neutral condition, negative bias lowered scores on the FAQ dramatically, $t(13) = 16.41, p < .001$ but positive bias had virtually no effect on them ($p = .426$). Relatedly, FAQ scores under positive bias were significantly greater than those under negative bias, $t(26) = 13.77, p < .001$. In contrast, scores on the KAE were lowered from the neutral condition by both positive, $t(13) = 3.32, p < .01$, and negative bias, $t(13) = 3.24, p < .01$. Scores on the KAE were not different from each other in the positive and negative bias conditions ($p = .334$).

The FAQ's directional sensitivity to bias was also apparent when the two tests were compared directly. The change in score from the neutral condition was much greater for the FAQ than the KAE with negative bias, $t(26) = 8.61, p < .001$ and conversely, much less with positive bias, $t(26) = 3.07, p < .005$.

<table>
<thead>
<tr>
<th>Bias</th>
<th>FAQ</th>
<th>KAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral</td>
<td>15.36</td>
<td>15.21</td>
</tr>
<tr>
<td>Positive</td>
<td>16.00</td>
<td>12.93</td>
</tr>
<tr>
<td>Negative</td>
<td>7.29</td>
<td>13.71</td>
</tr>
</tbody>
</table>

TABLE 1 Mean Number Correct (25) for FAQ and KAE Instruments as a Function of Response Set Adopted
Experiment 2: When scores on the FAQ and KAE were compared for the aging, life-span personality, and social science classes, mean scores on both tests, shown in Table 2, increased directly with gerontological content. Planned comparisons indicated that these differences were significant only for the KAE. The KAE scores of the aging class were moderately but significantly higher than both those from life-span personality, \( t(60) = 1.85, p < .05 \), and the other social science courses, \( t(50) = 2.48, p < .01 \); the corresponding probability levels for the FAQ were .42 and .30, respectively.

The mean overall scores on the FAQ in the present investigation (\( M = 16.05 \)) were quite comparable to those determined by Palmore (1977) for undergraduate students (\( M = 16.25 \)). Also, the mean score obtained on the KAE (\( M = 16.81 \)) was similar to that obtained on the FAQ, indicating that the two instruments are similar in level of difficulty.

**DISCUSSION**

As hypothesized, scores on the FAQ-Part 1 were very much a function of the direction of a respondent's response bias toward aging and the elderly. Scores on the FAQ were actually slightly higher when based on a "positive attitude" rather than knowledge. Relatedly, scores were lowered dramatically when based on negative bias. These findings are wholly consistent with the overall positive valence of the FAQ (e.g., Palmore, 1977; Klemmack, 1978). The extent to which scores on the FAQ would be influenced by bias from more "natural" sources is not clear. Presumably it would depend on a variety of factors including the strength of the bias, the respondent's prior beliefs, knowledge, attitudes, and the demand conditions of the test environment. Sources of bias less explicit than that used here, however, can exert powerful effects. It has been shown, for example, that descriptive context alone can act to bias one's expressed attitudes toward the elderly (Stier & Kline, 1980).

In contrast to the FAQ, the KAE was not unidirectionally sensitive to bias; scores were reduced significantly and comparably by positive biases.
or negative bias. In fact, the results of experiment 1 suggest that item valence is balanced more effectively on the KAE (less than one item of difference between positive and negative bias) than was suggested by sorting the items (two items different). On the FAQ the positive bias score corresponded exactly to the number of positively-valenced items on the test (i.e., 16). The KAE, by balancing item valence, and thus its susceptibility to positive and negative bias, would presumably be more effective for use in research settings that seek to measure knowledge about aging while avoiding the directional effects of bias. In addition, the KAE allows the researcher to derive somewhat separate estimates of knowledge and bias by comparing individual or group scores for the three types of item valence. It is not clear, however, that a complete separation of knowledge and attitudes regarding aging is feasible; some studies (e.g., Gallie & Kozek, 1985) have shown that knowledge and attitude are positively related. This would not be a problem, however, in “edumetric” applications (Palmore, 1978) where an admixture of directional bias and knowledge is acceptable. In such circumstances, either the FAQ or KAE could be used effectively.

Combined administration of the FAQ and KAE might have advantages over the use of either instrument alone. Given that the two tests appear to be comparable in degree of difficulty, a higher score on the FAQ could be used as a coarse estimate of positive bias toward aging and the elderly. An even more refined separation of bias and knowledge could be derived from an analysis of scores across the three valence types on both tests. A researcher could use this information to determine whether bias or knowledge better predicts student responses to different gerontological materials. Similarly, it might be possible to determine what type of gerontological education would be most effective for persons who are biased, uninformed, or both. In any case, both instruments appear to have utility, the degree of which varies with the need to consider the effects of knowledge and directional bias separately.

In experiment 2, scores on the KAE and the FAQ were higher among students with greater exposure to gerontological course content, a difference that was significant only for the KAE. The relatively small effect of course experience, however, was not surprising considering that the tests were administered only midway through the semester. Additionally, neither the psychology of aging nor the life-span personality courses presented the breadth of multidisciplinary material covered by the FAQ or KAE. A comparison of the degree to which the KAE and the FAQ assess general knowledge about aging and the elderly will depend on future research that is based on scores from different points in a more extended and comprehensive gerontology curriculum.
REFERENCES


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APPENDIX 1

Knowledge of Aging and the Elderly Questionnaire (KAE)

1. There are more old widowed women than old widowed men in the United States.
2. Lung diseases are the number one cause of death among the elderly.
3. Of the elderly who live in the community, a majority of them live with one of their children.
4. Retirement is not a very difficult experience for almost all old people.
5. Among young adults, you find a great many personality types, but there are relatively few personality types among old people.
6. The prevalence of vision and hearing impairments increases greatly with age.
7. An older person with a failing memory tends to forget long past events more so than recent ones.
8. Old individuals who are depressed and passive tend to live longer than those who are grouchy and easily upset.
9. Older adults tend to have fewer years of formal education than young adults.
10. Old people are more likely than young adults to have a low socioeconomic status.
11. Mental abilities decline steadily after age 20.
12. There is a large decrease with age in the speed at which nerves in the body conduct impulses.
13. Older persons are more likely than younger ones to experience problems with sleeping.
14. Old people, especially old men, have a lower suicide rate than young people.
15. Old people are less alike than are young people.
16. Due to the effects of aging and illness, there is an irreplaceable decline in the number of brain cells with age.
17. Old people generally have slower reaction times (i.e., take longer to respond to a stimulus) than younger people.
18. For those receiving it, Social Security by itself provides an adequate income for most older people.
19. Over 10% of all aged persons live in long-term health care institutions (i.e., nursing homes, homes for the aged, mental hospitals, etc.).
20. People do not get more religious as they age.
21. Older workers are less efficient and have more on-the-job accidents than younger workers.

22. Modern medical science has substantially increased both the average number of years a person is likely to live, as well as the maximum upper age limit of a human life.

23. Old people pay very little for health care since Medicare covers almost all their medical expenses.

24. Studies indicate that with increasing adult age there is a decline in sexual interest and activity.

25. One of the leading causes for admission to state mental hospitals is mental disorders associated with old age.

KAE Scoring Key and Documentation

1. (T) More elderly women than men are widowed due to the greater life-expectancy of women and because wives are very frequently younger than their husbands. [e.g., Brody, J. A., & Brock, D. B. (1985). Epidemiologic and statistical characteristics of the U.S. elder population. In C. E. Finch and E. L. Schneider (Eds.), Handbook of the Biology of Aging (2nd ed.). (pp. 3-26). New York: Van Nostrand Reinhold].


3. (F) Most persons 65 and over live in families that consist of an elderly married couple with no children or other relatives residing in their homes. [e.g., Brody, J. A., & Brock, D. B. (1985). Epidemiologic and statistical characteristics of the United States elderly population. In C. E. Finch and E. L. Schneider (Eds.), Handbook of the Biology of Aging (2nd ed.). (pp. 3-26). New York: Van Nostrand Reinhold].

4. (T) The evidence indicates that most retirees adjust to retirement with little trauma, and that when there is difficulty, it is often related to other factors such as health or income. [e.g., La Rue, A., Dessonville, C., & Jarvik, L. F. (1985). Aging and mental disorders. In J. E. Birren and K. W. Schaie (Eds.), Handbook of the Psychology of Aging (2nd ed.). (pp. 664-702). New York: Van Nostrand Reinhold].

5. (F) Although changes in personality characteristics can occur with


7. (F) Age differences in remote or tertiary memory are minimal; a decline in the recall of recent events (secondary memory) is more likely. [e.g., Poon, L. (1985). Differences in human memory with aging: Nature, causes, and clinical implications. In J. E. Birren and K. W. Schaie (Eds.), Handbook of the Psychology of Aging (2nd ed.). (pp. 544–593). New York: Van Nostrand Reinhold].

8. (F) There is a strong correlation between physical illness and depression in the aged [e.g., La Rue, A., Dessonville, C., & Jarvik, L. F. (1985). Aging and mental disorders. In J. E. Birren and K. W. Schaie (Eds.), Handbook of the Psychology of Aging (2nd ed.). (pp. 664–702). New York: Van Nostrand Reinhold] and evidence that survival is better among those who are hostile or angry than those who are depressed or passive [e.g., Botwinick, J. (1984). Aging and Behavior (3rd ed.), New York: Springer].

9. (T) Although it is narrowing, there is still a large gap between the young and old in level of educational attainment. [e.g., Soldo, B. (1980). America’s elderly in the 1980’s. Population Bulletin, 35, 1–47].

10. (T) Although the difference in poverty rates between the aged and nonaged has narrowed over the last several decades, poverty is somewhat higher among the aged. [e.g., Chen, Y.-P. (1985). Economic status of the aging. In R. H. Binstock and E. Shanas (Eds.), Handbook of Aging and the Social Sciences (2nd ed.). (pp. 641–665). New York: Van Nostrand Reinhold].

11. (F) Different mental abilities change at different rates, they peak at different ages and in some, very little or no decline is observed until very old age. [e.g., Willis, S. L. (1985). Towards an educational psychology of the older adult learner: Intellectual and cognitive bases. In J. E. Birren and K. W. Schaie (Eds.), Handbook of the
12. (F) The evidence indicates that very little of the slowing in behavior with age can be attributed to such "peripheral" factors as a decline in nerve conduction speed; most of it seems be "central" in its origin. [e.g., Salthouse, T. (1985). Speed of behavior and its implications for cognition. In J. E. Birren and K. W. Schaie (Eds.), *Handbook of the Psychology of Aging* (2nd ed.). (pp. 400-426). New York: Van Nostrand Reinhold].

13. (T) Increasing age is associated with a number of sleeping difficulties including increased interruption of sleep and more problems of disordered breathing. [e.g., Dement, W., Richardson, G., Prinz, P., Carskadon, M., Kripke, D., & Czeisler, C. (1985). Changes of sleep and wakefulness with age. In C. E. Finch and E. L. Schneider (Eds.), *Handbook of the Biology of Aging* (2nd ed.). (pp. 692-717). New York: Van Nostrand Reinhold].

14. (F) Suicide is much higher among men than women, and except for a dip between 25 and 40 years of age, suicide in males is increasingly frequent with age until the eighth decade. [e.g., Kastenbaum, R. (1985). Dying and death: A life-span approach. In J. E. Birren and K. W. Schaie (Eds.), *Handbook of the Psychology of Aging* (2nd ed.). (pp. 619-643). New York: Van Nostrand Reinhold].


17. (T) One of the most commonly observed behavioral changes with age is a slowing in behavior, including a decrease in response speed. [e.g., Salthouse, T. (1985). Speed of behavior and its implications for cognition. In J. E. Birren and K. W. Schaie (Eds.), *Handbook of the Psychology of Aging* (2nd ed.). (pp. 400-426). New York: Van Nostrand Reinhold].

18. (F) Although Social Security is an important source of income for a majority of older persons, it does not account for half of the income received by them as a group. [e.g., Chen, Y.-P. (1985). Economic status of the aging. In R. H. Binstock and E. Shanas (Eds.), *Aging and Behavior*. (3rd ed.), New York: Springer].

19. (F) Although the probability of living in a nursing home does increase with age, only about 5% of the elderly live in group housing of any type (i.e., congregate housing, personal care homes, or nursing homes). [e.g., Atchley, R. C. (1983). Aging: Continuity and Change. (pp. 142–143). Belmont, CA: Wadsworth.]

20. (T) With advancing age there appears to be considerable stability in religious values, and often, a decline in religious activity. [e.g., Blazer, D. & Palmore, E. (1976). Religion and aging in a longitudinal panel. The Gerontologist, 16, 82–85.]


22. (F) The dramatic gains that have been made in life-expectancy have been due primarily to reductions in early-life illness; maximum life-span has remained largely unchanged. [e.g., Bierman, E. L., & Hazzard, W. R. (1979). Biology of aging. In D. W. Smith, E. L. Bierman, and N. M. Robinson (Eds.), The Biologic Ages of Man (2nd ed.). (pp. 22–32). Philadelphia: W. B. Saunders.]

23. (F) It has been estimated that an elderly individual with hospitalization insurance and Medicare would have to pay about one-third of the cost of health care in the U.S. [e.g., Cunningham, W. R., & Brookbank, J. W. (1988). Gerontology: The Psychology, Biology and Sociology of Aging (p. 239)]. Note: This item scored (T) in Canada where medicine is socialized, most of the costs of medically-necessary services are paid for governmentally. [e.g., 1986–87 Canada Health Act Annual Report, Catalogue No. 88-02882].

24. (T) Although most elderly adults are quite capable of sexual expression, studies generally indicate, that for a variety of reasons, there is a decline in level of sexual activity and interest. [e.g., Harman, S. M., & Talbert, G. B. (1985). Reproductive aging. In C. E. Finch and E. L. Schneider (Eds.), Handbook of the Biology of Aging (2nd ed.). (pp. 457–510). New York: Van Nostrand Reinhold.]

25. (T) Mental disorders in old age, and in particular, organic psychiatric disorders are a leading cause of first-admissions to mental hospitals in the U.S. [e.g., La Rue, A., Dessonville, C., & Jarvik, L. F.
Aging and mental disorders. In J. E. Birren and K. W. Schaie (Eds.), *Handbook of the Psychology of Aging* (2nd ed.), (pp. 789-817). New York: Van Nostrand Reinhold. Note: This item would be scored (F) in Canada; the three leading causes of psychiatric hospitalization are schizophrenia, affective psychoses, and personality disorders. [e.g., Statistics Canada: Health Division, Health Care Section (1987). Mental Health Statistics 1982-83 and 1983-84. Catalogue 83-204].