

Perceived Intellectual Performance Change over Seven Years

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Abstract

The present study examined participant's actual and perceived intellectual performance change over seven years. A sample of 837 subjects from the Seattle Longitudinal Study who participated in two testing occasions (1977 and 1984) responded to five measures of Thurstone's Primary Mental Abilities (PMA) test. At the later testing occasion, subjects completed a retrospective measure that asked them to compare their present performance on the PMA test to their past performance in 1977. Subjects' actual performance change was examined and based on difference scores subjects were categorized into three performance categories: 1) maintaining performance levels 2) increasing performance 3) declining performance. Actual performance was linked to subjects' perceived performance change and a typology was developed based on these cross-tabulations. Participants who accurately estimated their performance were labeled realists. Those who overestimated their performance were considered optimists, while those who underestimated their performance were labeled as pessimists. The classification of subjects varied across ability. Women were more likely to be pessimists on Space than men. Older individuals were significantly more likely to be pessimists on Verbal and Reasoning ability, and to be realists on Number than younger subjects.

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Introduction

Research on intellectual aging has typically focused on objective measures of performance. Recently, however, research has begun to examine participants' subjective appraisals of their cognitive performance. These subjective assessments have been theorized to play an important role in the process of intellectual aging. Personal expectations been linked to actual performance (Lachman, 1983). Further, self perceptions of ability may change over the lifespan and interact with measured intellectual performance (Cornelius & Caspi, 1986; Lachman & Jelalian, 1984).

Research testing whether subjective assessments of performance were linked to actual performance across age groups found that elderly women despite performing as well as men made lower performance predictions. Both young and older subjects predicted their performance more accurately when that performance was high (Lachman & Jelalian, 1984).

The present study contributes to this literature of subjects' perceptions of ability by using longitudinal data. The subjects, participants of a longitudinal study, were asked to rate their current performance as compared to their performance 7 years prior. Thus, the measure assessed the subjects' perception of intellectual change on five separate abilities over seven years. The participants were categorized into a typology based on their perceived and actual performance change.

The questions posed were:

- 1) How accurately can subjects' evaluate their performance change on five cognitive abilities?
- 2) Do subjects predict with the same accuracy for all abilities?
- 3) Are there gender and age differences in the ability to predict performance for each ability?

Method

Subjects

The subjects were members of the Seattle Longitudinal Study (SLS), a 28-year study designed to assess cognitive development in adulthood. The participants in the SLS are randomly recruited from a Health Maintenance Organization and represent a community-dwelling population drawn from a range of occupational and economic backgrounds. The sub-sample selected for this particular study were those people who were tested in 1977 and returned for testing in 1984. This criterion produced a sample of 837 participants (383 men, 454 women) with a mean age of 61.4 and a mean educational level of 14.2 years.

Measures

As part of a larger cognitive test battery, the subjects responded to the Primary Mental Abilities Test (Thurstone and Thurstone, 1949). The Primary Mental Abilities (PMA) test is composed of five subtests: 1) Verbal Meaning tests the range of passive

vocabulary. 2) Spatial Orientation tests the ability to visualize and rotate objects in 2 or 3 dimensional space. 3) Reasoning tests whether the subject can identify a rule in a series. 4) Number measures subjects' ability to add sums of numbers quickly and accurately. 5) Word Fluency measures active vocabulary and the speed and ease of using words.

After completing the PMA test, subjects answered the Primary Mental Abilities Retrospective Questionnaire. This questionnaire reminded the subjects that they had taken the same five ability tests several years ago and asked them to assess whether their performance on the tests today (1984) was the same, better, or worse than their earlier performance (1977). Subjects evaluated their relative performance for each of the five abilities using a five-point scale with the categories: 1) much better today 2) better today 3) about the same 4) worse today 5) much worse today.

Initially, the distribution of retrospective responses was examined for a response set across the five abilities. However, sufficient variability existed to suggest subjects' were able to distinguish their performance over time for each of the five abilities. Because of the lower number of people in the extreme categories (1 or 5), the categories were collapsed to a 3 point scale, better, same, and worse.

Results

Subjects were classified according to how their actual performance had changed between the two times of testings on each of the five abilities. Difference scores from 1977-1984 were computed and subjects were classified into groups showing significantly

higher, the same, or significantly lower performance for each ability. The criteria for classification was a positive or negative change of one standard error of measurement from 1977-1984.

Cross-tabulations between actual performance change and perceived performance change were examined. Based on these patterns in these tables, the sample was categorized into three groups: 1) Pessimists- individuals who underestimated their current performance relative to their 1977 performance. 2) Realists-those individuals who accurately predicted their later performance relative to their prior performance. 3) Optimists- those who over-estimated their performance at the second measurement point.

See Table One

Subjects realistically compared their current and prior performance best on Verbal ability. Spatial ability had the highest percent of pessimists (34%) and approximately 30% of the sample was optimistic about their performance change. Approximately, half of the sample were able to realistically compare their performance.

Analysis of Variance models comparing the means of the typology groups determined that the Realist group had significantly higher performance on Reasoning and Verbal ability. This finding supports the results of Lachman and Jelalian (1984) suggesting that accuracy is better with higher performance.

This grouping was done for all subjects and all five abilities. Patterns of

categorization for individuals were also examined across the five PMA subtests, but no consistent pattern was evident. People categorized as a pessimist on one ability, were likely to be a realist on another, and potentially an optimist on a third. Nearly all the different combinations of ability change were present with the highest frequency on any one pattern being 30, the pattern of being a realist on all five abilities. This finding points to the multi-dimensionality of intellectual abilities, the presence of different ability change and perceived change patterns.

Significant differences for sex were found for only one ability, Spatial Orientation. Women were more likely to be pessimistic about their ability change than men ($X^2(6, N=818)=6.4, p<.05$). Regarding age, the oldest group of subjects were more likely to be pessimistic concerning their Verbal ability ($X^2(6, N=818)=19.1, p<.01$) and Reasoning ability ($X^2(6, N=818)=13.8, p<.05$) ability. Yet, the oldest group was significantly more realistic in the judgement of their performance change on the Number test ($X^2(6, N=753)=26.01, p<.000$).

Discussion

The present study finds that approximately half of the sample could accurately evaluate their performance change over time. However, subjects generally did not predict with the same accuracy for each ability.

Furthermore, the Realists had a significantly higher performance on two ability tests supporting the previous work suggesting accuracy is linked to higher performance. Women also were more likely to be pessimistic about their performance on Spatial Ability,

a fluid measure. Older adults were unduly pessimistic about their performance on Verbal ability and Reasoning ability, but were much more realistic about their performance on Number. These findings underscore the importance of looking at perceived change for specific abilities, rather than global indicators. Analyses are presently continuing to identify the personal characteristics and possible predictors for classification in the typology.

Table One

Percent in Category by Ability

	Verbal	Space	Reason	Word Fluency	Number
Optimists	29.2	18.5	29.0	31.8	30.8
Realists	60.5	47.6	48.9	48.6	50.6
Pessimists	10.3	34.0	22.1	19.6	18.6

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