Florida Journal of Educational Research, 1972, 14

THE MULTIDIMENSIONAL ASSESSMENT OF GAINS IN SCHOOL (MAGS): A CONSUMER-ORIENTED PRODUCT

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SUMMARY

An instrument is described which measures gains in the social, attitudinal, and motivational areas for fifth grade school children. Total gain is based upon consumer-specified weights for the factor analytically derived subscale scores.

INTRODUCTION

So often the skills of the test constructor are dedicated to the development of instruments needed in university-based research. Perhaps current wide-spread demands for accountability can bring about a reordering of priorities for the use of the time of instrument developers. At least it provoked us into accepting the challenge to develop a consumer-oriented product to assess gains in school in the usually-overlooked social, attitudinal, and motivational areas. We started out by stating our consumer-oriented goals and establishing means to achieve them (See Table 1).

We set out to develop a way of evaluating gains in school that would avoid the main shortcomings of instruments in use. Our test is designed to measure change where change occurs first, before achievement, namely in attitudes or dispositions toward school. Since we believe the child's life is important, we did not try to evaluate only his dispositions to formal learning but included a wider scope. We think that education must take the position, vis a vis accountability, that increased interest in academic activities and a healthier, happier adjustment will be followed by increased achievement, not on just the standardized test for one year, but for all the child's life. We maintain that these changes in dispositions will prove to be better indicators of how much achievement to expect in the future than present increased learning rate as measured by the standardized test. We should be less concerned with teaching the children than in promoting the desire to learn. If accountability is to be used for performance contracting, we would like to see the teachers rewarded for interesting the children rather than forcing them to learn a certain quantity of testable knowledge.

TABLE I

GOALS	MEANS OF ATTAINING
I. Purposes	
1. Identify benefits of school training as early as possible.	1. Evaluate non-substantive gains (attitudes and interests).
2. Evaluate personal characteristics without the undesirable implications of a personality test.	2. Subject gets to express his everyday interests and preferences.
3. Evaluate total gain independent of substantive areas.	3. Use items not related to knowledge.
4. Avoid total dependence upon theory-based dimensions.	4. Analyze dimensions out of exhaustive item sampling.
5. Customer determines relative importance of total gain components.	5. Option in scoring for unequal component weights.
II. Effectiveness and Efficiency	
1. Secure subject cooperation.	1. Intrinsic appeal of expressing opinions and preferences.
2. Optimize item validity.	2. Use item analysis to determine subscale weighting.
3. Extract full information from test.	3. Use multidimensional scoring with aid of a computer.
4. Convey full information to all who are concerned.	4. Computed scores generate a detailed narrative report from the computer.
5. Eliminate dependence on expensive, highly-skilled interpreters.	5. Provide computer program scoring.
6. Get maximum information for administration time expended.	6. To be self-administered.
III. Protect Validity	
1. Minimize opportunity for falsification so as to look "good."	1. Utilize forced-choice type instrument.
2. Minimize obscure and far-fetched interpretations.	2. Utilize items with high face validity.
3. Not lose validity by wide grade-range application.	3. Develop similar tests for each range (three grades each).
4. Not lose validity by ignoring sex.	4. Develop seperate forms for male and female.

We set out to produce a forced-choice, easily administered instrument with high face validity. This instrument should depend as little as possible on how professors of education, teachers, and test constructors conceptualize. Since this target was to be fifth graders, we arranged for them to provide the scales they would be measured on. Factor analyses of an exhaustive set of items gave us this multidimensional picture of what things went together for them in their preferences and we merely had to come up with labels for these scales.

Our preliminary 400 interest, occupational, and activity item choices were gathered by the authors from several academic discussions of children's interests and from an exhaustive searching for all possibilities, including asking our own children. These choices were rated by 100 male and 100 female fifth graders in Orlando schools. We are indebted to David Winger for his generous help in this. These results permitted us to arrange choices into groups of four all with similar preference values. This prevents the subject from selecting the item which he feels is more socially acceptable (thus "looking good"). Teachers also rated the choices for desirability in their students. The items were grouped into sets of four to maximize the heterogeniety of these item values (from teachers) while maintaining the homogeniety of choices with respect to preference value (students).

The final 124 sets of 4 choices each were administered to a total sample of 600 pupils composed of both sexes and grades 4, 5, and 6. Pupils from three socioeconomic level schools participated. Some poor readers required some individual halp, but return was almost 100%. Administration, including an instruction period, took 45 to 65 minutes.

A priori weights for choices within each item set had to be derived. To minimize the bias, both personal and cultural, three rather different people made up trial weights independently (a secretary and the two authors--an educational psychologist, a clinical psychologist turned educator.) All three have had considerable cross-cultural experience. In all, over 300 weighted item sets produced scores to get intercorrelations to determine factor structure for each sex form.

The following tables give tentative names for the seven male and 10 female factors. Sample items characteristic of the factor are included as scored by weights 1, 2, 3, 4. For example, the first set for males high on this factor should show a preferred choice of the second listed, "Discover a cure for a disease," with its weight of 4. Thus the choice contributes the maximum of 4 to the factor subscale core. Then if "Be a general," is least preferred with its weight f 1, the subject will be given the maximum possible score on that em. By obtaining many such maximum item scores, his total score on the items that make up the factor subscale will be very high.

Male Factors

Instructions

BELOW ARE MANY SETS OF FOUR THINGS A PERSON LIKE YOU COULD WISH FOR. SOME CHOICES DEAL WITH THINGS TO DO, OTHERS ARE ABOUT JOBS.

DECIDE WHICH ONE OF THE FOUR CHOICES YOU LIKE MOST IN A SET. WRITE THE NUMBER OF THAT CHOICE IN THE SPACE PROVIDED AT THE RIGHT AFTER THE WORD "MOST". SOMETIMES IT MAY BE HARD TO DECIDE WHICH ONE YOU LIKE MOST. MAKE UP YOUR MIND ANYWAY AND WRITE IN THE NUMBER. DON'T LEAVE BLANKS.

THERE WILL BE THREE ITEMS LEFT AFTER YOU CHOOSE THE ONE YOU LIKE MOST. DECIDE WHICH ONE OF THESE THREE YOU LIKE LEAST AND WRITE THE NUMBER FOR IT AFTER THE WORD "LEAST." THEN CONTINUE ON TO THE NEXT SET.

YOU MAY NOTICE THAT SOMETHING MAY SHOW UP AGAIN ALONG WITH THREE DIFFERENT ITEMS. DON'T WORRY ABOUT WHAT YOU SAID THE FIRST TIME BECAUSE THE ITEM WAS BEING COMPARED WITH THREE OTHER ONES. HOW YOU FEEL ABOUT THE CHOICES IN THE SET YOU ARE WORKING ON IS WHAT REALLY COUNTS. GO AHEAD AND BEGIN. WORK QUICKLY.

1. Social-Consciousness vs. Unrealistic Escapism*

1* BE A GENERAL IN THE ARMY	MOST____
4 DISCOVER A CURE FOR A DISEASE	
3 HELP OTHERS ALL MY LIFE	LEAST___
2 BE PRESIDENT OF THE UNITED STATES	

2. Politeness vs. Pursuing Own Interests

4 HAVE GOOD MANNERS	MOST____
1 EAT MY FAVORITE MEAL	
2 WIN A FOOT RACE	LEAST___
3 BE HELPFUL TO THE TEACHER	

3. Academic Interests vs. Non-Constructive Activities

2. TAKE TOYS AND THINGS APART	MOST____
1 SING TO MYSELF	
3 PLAY GAMES WITH NUMBERS	LEAST___
4 LEARN HOW TO USE A NEW WORD	

4. Striving for Perfection vs. Having Fun

3 BE ABLE TO WRITE BETTER	MOST____
4 BE PERFECT IN EVERYTHING	
2 SIT WITH LOTS OF KIDS AT LUNCH	LEAST___
1 PLAY ON THE WEEKEND	

5. Adult Responsibility vs. Childish Interests

4 KNOW ALL ABOUT MY COUNTRY	MOST____
1 HAVE A BIRTHDAY PARTY	
3 EAT POLITELY	LEAST___
2 BE STRONG	

*Subscale headings and weights do not appear on the actual instrument.

Male Factors (Continued)

6. Academic Striving vs. Organized Sports

2	BE VERY GOOD LOOKING	MOST____
4	BE BETTER IN SCHOOLWORK	
3	BE ABLE TO WRITE FUNNY STORIES	LEAST___
1	WATCH FOOTBALL ON TV	

7. Conformity vs. Interest in Cars

2	FIX CLOCKS	MOST____
1	BE A TRUCK DRIVER	
4	STUDY ENGLISH	LEAST___
3	LIVE IN A FOREIGN COUNTRY FOR A YEAR	

Female Factors

1. Industrious vs. Self Gain

4	DISCOVER A CURE FOR A DISEASE	MOST____
3	WORK HARD	
2	BE VERY GOOD LOOKING	LEAST___
1	BE RICH	

2. Academic Pursuits vs. Self Indulgence

2	FEED A BABY	MOST____
4	MIND THE TEACHER BETTER	
1	LAUGH A LOT	LEAST___
3	DRAW NICE PICTURES	

3. Good School Adjustment vs. Whimsical Indulgence

2	WORK HARD	MOST____
4	BE HAPPIER AT SCHOOL	
3	MAKE UP A SONG	LEAST___
1	FIND THINGS TO FILL IN MY FREE TIME	

4. Adult Activities vs. Active Play

1	PLAY WITH A BOY	MOST____
2	GET HELP WITH HOMEWORK FROM A FRIEND	
4	READ THE FRONT PAGE OF A NEWSPAPER	LEAST___
3	LEARN ABOUT SPACE	

5. Physical Activities vs. Quiescence

4	GO TO A FOOTBALL GAME	MOST____
2	HAVE THE TEACHERS GIVE ME MORE HELP	
1	SIT QUIETLY IN MY SEAT IN SCHOOL	LEAST___
3	LEARN BY TRYING	

6. Mature Independence vs. Overcautiousness

4	VISIT A BIG CITY	MOST____
2	VISIT WITH OTHERS BETWEEN CLASSES	
3	HELP PAINT THE OUTSIDE OF A HOUSE	LEAST___
1	SIT QUIETLY AND HEAR MUSIC	

Female Factors (Continued)

7. Social Conformity vs. Adventurous Activity

1	PLAY WITH A BABY	MOST____
3	GET LETTERS IN THE MAIL	
2	TALK DURING RECESS	LEAST___
4	PLEASE MY TEACHER	

8. Constructive Conformity vs. Unrealistic Escapism

1	BE A NEWSPAPER REPORTER	MOST____
3	WORK DURING THE SUMMER	
4	STUDY ENGLISH	LEAST___
2	WRITE CHILDREN'S STORIES	

9. Social Responsibility vs. Constructive Indulgence

2	GO FOR A RIDE FAR AWAY	MOST____
3	WATCH ANIMAL SHOWS ON TV	
1	WATCH A POLICE STORY ON TV	LEAST___
4	BE A BABY SITTER	

10. Adult Responsibilities vs. Childish Interests

2	LEARN ABOUT ELECTRICITY	MOST____
4	TALK WITH MANY PEOPLE ABOUT THEIR JOBS	
1	WATCH A WAR MOVIE	LEAST___
3	LEARN ABOUT THE STARS IN THE SKY	

Our scoring procedure will permit the customer to specify what weights should be used in combining subscale scores to give a total gain score. If MAGS is used to evaluate benefits of a Title 1 remedial program, then the third male factor should be given a disproportionately heavy weight in computing total gain. The corresponding female factor two would be weighted similarly in those circumstances.

The sign of the weight permits the educator-customer to specify whether an increase in "Adventurous Activity" is to be regarded as a gain or if the weight is negative, a loss. In the same county one set of weights might include a negative one for "Adventurous Activity" for a group of over-indulged, upper class boys yet the weight for the same scale for disadvantaged females in a cultural enrichment program could be positive. The educator is assured of the opportunity to evaluate changes in pupils appropriate to the goals and activities of his academic program. Most educators are ready to make projects accountable for achieving appropriate short-term goals but not for gain in standardized test scores.

Scoring will provide differential weighting (User option of linear or exponential for each subscale or any combination desired) for deviation from the "happy median." That is, when a child's post test score moves farther away from the group norm, he gets less gain score than if he moved the same amount but toward the group mean. A child who is already moderately high in "Industrious" will get less gain credit for the pre-post difference score than a child who started out low on that subscale. Total gain for accountability purposes would consist of the sum of all the adjusted gains on subscales (or losses) combined according to user specified weights (and signs).

The factor analysis briefly described above provided the information for computing factor scores for each subject. These scores on each factor served then as criteria with which to correlate each of the 596 choices (as they appear in a set). The procedure next used was to obtain each person's subscale score by evaluating his choices with the 596 validity coefficients for each scale produced by this correlational item analysis. Thus, each person had new subscale scores based upon 596 choices instead of the smaller number of items which entered in determining the less reliable factor scores.

These intermediate subscale scores next provided criteria for item analysis as done before with factor scores. This iterative procedure permitted us to develop refined sets of 596 validity coefficients to be used for scoring the subscales. At this point we are developing a final computer program to give a numerical score print-out. Simultaneously, we will be correlating teacher ratings of pupils with the subscale scores obtained in order to provide external validations of the measures. Last we must elaborate on the computer program to provide a verbal descriptive or narrative print-out.