

Supplement to YCCI Handbook for Middle School Educators: Administration Guidelines for the Computer Attitude Questionnaire*

I. Introduction

This supplement is for educators considering use of the Computer Attitude Questionnaire (CAQ). This instrument was developed as an extension of the Young Children's Computer Inventory (YCCI) during 1993-95. Whereas the YCCI is intended for use in primary school (grades 1-4), the CAQ is targeted for middle school audiences (grades 6-8). The following sections discuss the intended purpose of the questionnaire, the psychological constructs it is designed to measure, the instrument's validity (appropriateness), reliability (accuracy), and recommended administration and scoring procedures. Currently, only an English language version of the CAQ is available for distribution.

II. Purpose of the Questionnaire

The Computer Attitude Questionnaire (CAQ) is a 62-item, Likert-type self-report questionnaire with three additional paired-comparisons categories added to gather supplemental information. The 62 Likert-type items subsume all 48 items comprising the YCCI, while the paired-comparisons items are from a research instrument used by Krendl and Broihier (1992) for their longitudinal study of student responses to computers. The CAQ is intended for use in the middle school environment.

III. What the Instrument Measures

Like the Young Children's Computer Inventory, the CAQ measures attitudes (feelings toward a person or thing) and prevailing attitudes (dispositions), rather than achievement. Up to eight psychological indices can be produced by summing responses to related items. Six indices are shared in common with the YCCI. These six include two kinds of attitudes toward computers: Computer Importance and Computer Enjoyment; Study Habits; Empathy; Motivation/Persistence; and Creative Tendencies. Two indices are new for the CAQ: Computer Anxiety, and Computer Seclusion.

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Procedures for producing these indices are described in Section VII below.

The paired comparison items provide relative ratings of computer use compared to watching television, reading a book, and writing, in the categories of Computer Preference (preferred use), Computer Difficulty (difficulty of use), and Computer Learning (perceived usefulness for learning). Procedures for producing these indices are also described in Section VII.

IV. Validity

Since the CAQ is based on the YCCI, most issues related to validity are addressed in Section IV of the Handbook itself. Only the newly developed indices of Computer Anxiety and Computer Seclusion will be addressed in this section.

Computer Seclusion was identified through a higher-order factor analysis of 1993 YCCI data gathered from grades 1-8 at a public school in northern Texas. Because this factor did not emerge among data for children from grades 1-4, it was hypothesized that this attribute might become stronger as children grew older. 1995 data was gathered from a large number of middle school students, in part, to test this hypothesis. As reported in the following section, the high internal reliability for this scale for 1995 data supports the construct validity of this subscale.

Computer Anxiety items were selected from various published instruments developed to produce indices in this area for adults. Since analysis of the 1993 grade 1-8 data which included these items indicated young children (grades 1-4) tended to perceive computer anxiety as the opposite of enjoyment, while older students tended to view anxiety as somewhat independent of enjoyment, it was hypothesized that Computer Anxiety would emerge as a factor independent of Enjoyment for middle school students in 1995 data. Factor analyses (ULS, Oblimin rotation) extracting 5, 6, and 7 factors as the most probable number of meaningful indices¹, all resulted in Computer Anxiety separated from Computer Enjoyment and Computer Importance. In addition, the 8 items most strongly related to Computer Anxiety were the same in each of the 5, 6, and 7-factor solutions. This provides further evidence for the independent construct of Computer Anxiety existing in middle school students. A comparison of the number of items comprising the various subscales of the CAQ versus the YCCI is provided in Table A1.

¹ Based upon examination of a scree plot of the eigenvalues for all theoretically-derivable factors (Dunn-Rankin, 1983).

Table A1
YCCI vs. CAQ Item Selection

SCALE	YCCI Version 3	CAQ Version 1
Computer Importance	9	7
Computer Enjoyment	5	9
Computer Anxiety	none	8
Computer Seclusion	none	13
Motivation/Persistence	6	9
Study Habits	7	10
Empathy	9	10
CreativeTendencies	13	13
Computer Preference	none	1(6 pairs)
Computer Difficulty	none	1(6 pairs)
Computer Learning	none	1(6 pairs)
Total Items	48	65

One middle school participating in the validation portion of this study requested that the researchers use the data gathered to make a preliminary comparison of possible effects of thematic integration versus a computer literacy course as alternative methods of teaching information technology applications to students. Several significant differences among CAQ subscales were found (Christensen and Knezek, 1995). These results were deemed sufficient to demonstrate the discriminating power of the CAQ, and provide further evidence of its validity.

V. Reliability

Reliability has previously been introduced in this Handbook. It refers to the ability of a questionnaire to measure accurately.

Results of the most recent reliability analyses for the CAQ are displayed in Table A2. The overall reliability of the total Likert scale is .94, utilizing 53 of the 62 Likert items contained in the instrument. Subscale reliabilities range from a low of .80 to a high of .87. All are in the “very good” range according to the following guidelines regarding acceptable reliabilities for research instrument scales:

below .60	unacceptable
between .60 and .65	undesirable
between .65 and .70	minimally acceptable
between .70 and .80	respectable
between .80 and .90	very good
much above .90	consider shortening the scale (DeVellis, 1991, p.85).

Internal consistency reliability for the paired comparisons portion of the CAQ is also thought to be quite high. Although computing facilities were not available to analyze the reliability of the paired comparisons data gathered in 1995, a circular triad analysis of 1993 paired comparisons data (n=210) at the University of Hawaii indicated reliabilities of .90 for Computer Preference, .89 for Computer Difficulty, and .92 for Computer Learning (Dunn-Rankin, 1982; Knezek & Miyashita, 1994). Since data from students in grades 4-8 was included in the 1993 analysis, it is probable that data gathered exclusively from middle school students (grades 6-8) will be at least as reliable.

Table A2
Internal Consistency Reliability For CAQ
Based Upon 1995 Data

	# ITEMS	RELIABILITY	ITEMS CONTRIBUTING
COMPUTER IMPORTANCE	7	0.82	3,6,8,9,10,11,12
COMPUTER ENJOYMENT	9	0.82	1,2,4,5,10,49,50,51,54
COMPUTER ANXIETY	8	0.84	7,13,50,51,52,53,54,55
COMPUTER SECLUSION	13	0.81	6,11,17,18,19,22,25,38,53,55,56,57,60
MOTIVATION /PERSISTENCE	9	0.80	15,16,17,19,21,22,23,60,61
EMPATHY	10	0.87	26,27,28,29,30,31,32,33,35,59
STUDY HABITS	10	0.82	15,18,19,20,23,24,25,57,58,60
CREATIVE TENDENCIES	13	0.86	36,37,38,39,40,41,42,43,44,45,46,47,48
OVERALL	53	0.94	1,2,3,4,5,6,8,9,10,11,12,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,54,57,58,59,60,61

VI. Recommended Administration Procedures

Classroom administration takes 15-20 minutes for a typical middle school class. Experience to date indicates that students have no difficulty completing the questionnaire without teacher assistance.

VII. Recommended Scoring Procedures

This section will begin with a discussion of manual procedures for producing measurement indices for the CAQ. Suggested procedures for coding and analyzing data by computer will be discussed as well.

The recommended CAQ scoring procedure is to simply sum the numeric values of the responses for related items listed in Table A2, to produce eight subscale scores. For example, to produce a student's score on Motivation/Persistence, just add up the responses the student circled for items 15, 16, 17, 19, 21, 22, 23, 60 and 61. However, as noted in Appendix A1, ten items on the YCCI have negative wordings and must be reversed before adding to others. These are items 2, 7, 14, 34, 50, 51, 52, 53, 54 and 56. One simple way of doing this is to use a colored pen to circle the reflected values of the numbers marked by the student for these 10 items. If the student circled 1, make it 4; if a student circled 3, make it 2, etc. Then subscales which use these can be produced in a normal manner. For example, Computer Enjoyment will be the sum of items 1, 2, 4, 5, 10, 49, 50, 51, and 54, but 2 must be reversed (reflected) before inclusion in the sum.

This can all be done very quickly by computer if the researcher enters the data into a file according to some systematic scheme such as:

CAQ Code Sheet for School 12, 1995

Var	Label	Columns	Width	Description
1.	Year	1-2	2	95
2.	Month	3-4	2	03
3.	Country	5-6	2	01
4.	School	7-8	2	12
5.	Grade	9-10	2	07 or 08, see write-up on pack
6.	ID	11-14	4	Class,Student ex: 0101, see each form
7.	Gender	15	1	1 = B, 2 = G , see each form
8.	Age	16-18	3	blank
9.	Ethnic	19	1	blank
10.	Items 1-48	20-67	48	punch number circled for each
11.	Version	68-70	2	100(SD-SA 4 pt+pairs, 80 total items)
12.	Group	71	1	1=Computer literacy 2=Integration 3=Both comp lit and integration
13.	Record #	72	1	1

(New Information on Record 2)

10.	Items 49-62	20-33	14	punch number circled for each
11.	Items 63-65	34-51	18	punch 1 or 2 as circled for each
12.	Version	68-70	3	100 (SD-SA 4 pt.+Pairs, 80 total items)
13.	Group #	71	1	1=Computer literacy 2=Integration 3=Both comp lit and integration
14.	Record #	72	1	2

Then a statistical package such as SPSS (1984) can be used to read the data, reverse the ten items required, add up the subscale values, and produce descriptive statistics. An example SPSS program might look like (comments are in brackets []):

```
[tell SPSS where to find data]
DATA LIST FILE "Amarillo95.dat" FIXED RECORDS = 2
```

```
[tell SPSS how to interpret numbers in each record (line) of the file;
use code sheet above]
```

```
/ year 1-2 month 3-4 country 5-6 school 7-8 grade 9-10
  ID 11-14 gender 15 var1 to var48 20-67
/ var49 to var80 20-51 ver 68-69.
```

```
[reverse scores for ten items]
COMPUTE VAR2=5-VAR2.
COMPUTE VAR7=5-VAR7.
```

```
COMPUTE VAR14=5-VAR14.  
COMPUTE VAR34=5-VAR34.  
COMPUTE VAR50=5-VAR50.  
COMPUTE VAR51=5-VAR51.  
COMPUTE VAR52=5-VAR52.  
COMPUTE VAR53=5-VAR53.  
COMPUTE VAR54=5-VAR54.  
COMPUTE VAR56=5-VAR56.
```

[tell SPSS these items will now have 5's for missing data; i.e.. skip over 5's]

```
MISSING VALUES VAR2 VAR7 VAR14 VAR34 VAR50 VAR51  
VAR52 VAR53 VAR54 VAR56(5).
```

[sum values to produce six subscale scores according to factor loadings in Table 2]

```
COMPUTE
```

```
I=(VAR3+VAR6+VAR8+VAR9+VAR10+VAR11+VAR12)/7.
```

```
COMPUTE
```

```
J=(VAR1+VAR2+VAR4+VAR5+VAR10+VAR49+VAR50+VAR51+  
VAR54)/9.
```

```
COMPUTE
```

```
M=(VAR15+VAR16+VAR17+VAR19+VAR21+VAR22+VAR23+VAR60+  
VAR61)/9.
```

```
COMPUTE
```

```
S=(VAR15+VAR18+VAR19+VAR20+VAR23+VAR24+VAR25+VAR57+  
VAR58+VAR60)/10.
```

```
COMPUTE
```

```
E=(VAR26+VAR27+VAR28+VAR29+VAR30+VAR31+VAR32+VAR33+  
VAR35+VAR59)/10.
```

```
COMPUTE
```

```
C=(VAR36+VAR37+VAR38+VAR39+VAR40+VAR41+VAR42+VAR43+  
VAR44+VAR45+VAR46+VAR47+VAR48)/13.
```

```
COMPUTE
```

```
Anxiety=(VAR7+VAR13+VAR50+VAR51+VAR52+VAR53+VAR54+  
VAR55)/8.
```

```
COMPUTE Seclusr=(VAR6+VAR11+VAR17+VAR18+VAR19+  
VAR22+VAR25+VAR38+VAR53+VAR55+VAR56+VAR57+VAR60)/  
13.
```

[Sum votes for reading book, writing, TV, computer]

```
COMPUTE PREAD=0.
```

```
COMPUTE PWRITE=0.
```

```
COMPUTE PTV=0.
```

COMPUTE PCOMP=0.
COMPUTE DREAD=0.
COMPUTE DWRITE=0.
COMPUTE DTV=0.
COMPUTE DCOMP=0.
COMPUTE LREAD=0.
COMPUTE LWRITE=0.
COMPUTE LTV=0.
COMPUTE LCOMP=0.

IF (VAR63 EQ 1) PREAD = PREAD+1.
IF (VAR66 EQ 2) PREAD = PREAD+1.
IF (VAR67 EQ 1) PREAD = PREAD+1.
IF (VAR63 EQ 2) PWRITE = PWRITE+1.
IF (VAR64 EQ 1) PWRITE = PWRITE+1.
IF (VAR68 EQ 1) PWRITE = PWRITE+1.
IF (VAR64 EQ 2) PTV = PTV+1.
IF (VAR65 EQ 1) PTV = PTV+1.
IF (VAR67 EQ 2) PTV = PTV+1.
IF (VAR65 EQ 2) PCOMP = PCOMP+1.
IF (VAR66 EQ 1) PCOMP = PCOMP+1.
IF (VAR68 EQ 2) PCOMP = PCOMP+1.

IF (VAR69 EQ 1) DREAD = DREAD+1.
IF (VAR72 EQ 2) DREAD = DREAD+1.
IF (VAR73 EQ 1) DREAD = DREAD+1.
IF (VAR69 EQ 2) DWRITE = DWRITE+1.
IF (VAR70 EQ 1) DWRITE = DWRITE+1.
IF (VAR74 EQ 1) DWRITE = DWRITE+1.
IF (VAR70 EQ 2) DTV = DTV+1.
IF (VAR71 EQ 1) DTV = DTV+1.
IF (VAR73 EQ 2) DTV = DTV+1.
IF (VAR71 EQ 2) DCOMP = DCOMP+1.
IF (VAR72 EQ 1) DCOMP = DCOMP+1.
IF (VAR74 EQ 2) DCOMP = DCOMP+1.

IF (VAR75 EQ 1) LREAD = LREAD+1.
IF (VAR78 EQ 2) LREAD = LREAD+1.
IF (VAR79 EQ 1) LREAD = LREAD+1.
IF (VAR75 EQ 2) LWRITE = LWRITE+1.
IF (VAR76 EQ 1) LWRITE = LWRITE+1.
IF (VAR80 EQ 1) LWRITE = LWRITE+1.
IF (VAR78 EQ 2) LTV = LTV+1.
IF (VAR77 EQ 1) LTV = LTV+1.
IF (VAR79 EQ 2) LTV = LTV+1.

```
IF (VAR77 EQ 2) LCOMP = LCOMP+1.
IF (VAR78 EQ 1) LCOMP = LCOMP+1.
IF (VAR80 EQ 2) LCOMP = LCOMP+1.
```

[print out values for all variables, just to check]

LIST.

[produce means and standard deviations for each subscale.]

Descriptives I J M S E C Anxiety Seclun PREAD TO LCOMP.

Usually it is a good idea to produce a data listing and descriptive statistics before proceeding to more sophisticated analysis of the results. For example, the statement above might produce the following output:

Summary Statistics

Number of valid observations (listwise) =

457

Variable Label	Mean	Std Dev	Minimum	Maximum	Valid N
I	3.11	0.56	1.00	4.00	560
J	3.20	0.52	1.44	4.00	554
M	2.62	0.52	1.00	4.00	556
S	2.63	0.50	1.00	3.90	549
E	2.95	0.58	1.00	4.00	552
C	2.83	0.49	1.00	3.92	546
ANXIETY	3.15	0.57	1.00	4.00	565
SECLUSN	2.83	0.44	1.38	4.00	537
PREAD	0.91	0.89	0.00	3.00	588
PWRITE	0.52	0.71	0.00	3.00	588
PTV	1.89	1.04	0.00	3.00	588
PCOMP	1.90	1.05	0.00	3.00	588
DREAD	1.40	0.94	0.00	3.00	588
DWRITE	1.93	1.09	0.00	3.00	588
DTV	0.32	0.73	0.00	3.00	588
DCOMP	1.47	1.03	0.00	3.00	588
LREAD	1.57	1.01	0.00	3.00	588
LWRITE	0.46	0.71	0.00	3.00	588
LTV	0.81	0.85	0.00	3.00	588
LCOMP	2.02	1.00	0.00	3.00	588

VIII. Interpretation and Use of Results

Interpretation of results from the Likert scale portion of the CAQ is a process very similar to the one described in the main body of the YCCI Handbook. Differences between sums of preferences for paired comparisons items can be analyzed using non-parametric statistical techniques such as the rank sum method developed by Dunn-Rankin (1983). For example, in the descriptive summary report of the previous section, it appears that the students prefer using the computer and watching TV over reading and writing. However, it is not easy to say just how far apart in average ratings two objects must be in order to make the difference significant. According to tabled values provided by Dunn-Rankin (1983, p. 58), at least 33 students judging the four objects of reading, writing, watching TV, and using a computer, would be necessary in order to make it theoretically possible for all 4 objects to be significantly different at the .01 level (19 would be sufficient for $p = .05$). Therefore, 588 subjects in our example certainly provide ample theoretical opportunities for significant differences to emerge.

The formula for determining the critical range between objects at the .01 level is given by Dunn-Rankin (1983, p. 59) as:

$$\text{SQRT}(N(K)(K+1)/12 * 4.403).$$

For our example, $N = 588$ subjects, and $K = 4$ objects, so the equation becomes: $\text{SQRT}(588*4*3/12*4.403)$.

The evaluated expression yields a critical difference between objects of 50.8 “votes,” which indicates that there is no significant difference among the students in the example between their preferences for using a computer versus watching TV $((1.90 - 1.89) * 588 = 5.88)$, but there is a difference in preference between reading a book and writing $(.91 - .52) * 588 = 229.32$, as well as between using a computer or watching TV and reading a book or writing. Comparable calculations could be carried out for the data in the areas of Computer Difficulty and Computer Learning, as well as the category of Computer Preference used in this illustration.

IX. References

- Christensen, R. and Knezek, G. (1995, June). A comparison of two computer curricular programs at a Texas junior high school using the Computer Attitude Questionnaire (CAQ). Denton, TX: Telecommunications and Informatics Laboratory Technical Report 95.1.
- DeVellis, R.F. (1991). Scale development. Newbury Park, NJ: Sage Publications.
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- Krendl, K.A. and Broihier, M. (1992). Student responses to computers: A longitudinal study. J. Educational Computing Research, 8(2), 215-227.
- SPSS (1984). SPSS-x BASICS. New York: McGraw-Hill.

Computer Attitude Questionnaire

Name: _____

This survey contains 65 brief questions. Read each statement and then circle the number which best shows how you feel.

SD = Strongly Disagree

D = Disagree

A = Agree

SA = Strongly Agree

		SD	D	A	SA
(1)	I enjoy doing things on a computer.	1.	2.	3.	4.
(2)	I am tired of using a computer.	1.	2.	3.	4.
(3)	I will be able to get a good job if I learn how to use a computer.	1.	2.	3.	4.
(4)	I concentrate on a computer when I use one.	1.	2.	3.	4.
(5)	I enjoy computer games very much.	1.	2.	3.	4.
(6)	I would work harder if I could use computers more often.	1.	2.	3.	4.
(7)	I think that it takes a long time to finish when I use a computer.	1.	2.	3.	4.
(8)	I know that computers give me opportunities to learn many new things.	1.	2.	3.	4.
(9)	I can learn many things when I use a computer.	1.	2.	3.	4.
(10)	I enjoy lessons on the computer.	1.	2.	3.	4.
(11)	I believe that the more often teachers use computers, the more I will enjoy school.	1.	2.	3.	4.
(12)	I believe that it is very important for me to learn how to use a computer.	1.	2.	3.	4.
(13)	I think that computers are very easy to use.	1.	2.	3.	4.
(14)	I would like to study with a teacher rather than using a computer.	1.	2.	3.	4.
(15)	I study by myself without anyone forcing me to study.	1.	2.	3.	4.
(16)	If I do not understand something, I will not stop thinking about it.	1.	2.	3.	4.
(17)	When I don't understand a problem, I keep working until I find the answer.	1.	2.	3.	4.

SD = Strongly Disagree

D = Disagree

A = Agree

SA = Strongly Agree

(Continued)

		SD	D	A	SA
(18)	I review my lessons every day.	1.	2.	3.	4.
(19)	I try to finish whatever I begin.	1.	2.	3.	4.
(20)	Sometimes, I change my way of studying.	1.	2.	3.	4.
(21)	I enjoy working on a difficult problem.	1.	2.	3.	4.
(22)	I think about many ways to solve a difficult problem.	1.	2.	3.	4.
(23)	I never forget to do my homework.	1.	2.	3.	4.
(24)	I like to work out problems which I can use in my life every day.	1.	2.	3.	4.
(25)	If I do not understand my teacher, I ask him/her questions.	1.	2.	3.	4.
(26)	I feel sad when I see a child crying.	1.	2.	3.	4.
(27)	I sometimes cry when I see a sad play or movie.	1.	2.	3.	4.
(28)	I get angry when I see a friend who is treated badly.	1.	2.	3.	4.
(29)	I feel sad when I see old people alone.	1.	2.	3.	4.
(30)	I worry when I see a sad friend.	1.	2.	3.	4.
(31)	I feel very happy when I listen to a song I like.	1.	2.	3.	4.
(32)	I do not like to see a child play alone, without a friend.	1.	2.	3.	4.
(33)	I feel sad when I see an animal hurt.	1.	2.	3.	4.
(34)	Sometimes children have no friends because they do not want any.	1.	2.	3.	4.
(35)	I feel happy when I see a friend smiling.	1.	2.	3.	4.
(36)	I examine unusual things.	1.	2.	3.	4.
(37)	I find new things to play with or to study, without any help.	1.	2.	3.	4.
(38)	When I think of a new thing, I apply what I have learned before.	1.	2.	3.	4.
(39)	I tend to consider various ways of thinking.	1.	2.	3.	4.

SD = Strongly Disagree

D = Disagree

A = Agree

SA = Strongly Agree

(Continued)

		SD	D	A	SA
(40)	I create many unique things.	1.	2.	3.	4.
(41)	I do things by myself without depending upon others.	1.	2.	3.	4.
(42)	I find different kinds of materials when the ones I have do not work or are not enough.	1.	2.	3.	4.
(43)	I examine unknown issues to try to understand them.	1.	2.	3.	4.
(44)	I make a plan before I start to solve a problem.	1.	2.	3.	4.
(45)	I invent games and play them with friends.	1.	2.	3.	4.
(46)	I invent new methods when one way does not work.	1.	2.	3.	4.
(47)	I choose my own way without imitating methods of others.	1.	2.	3.	4.
(48)	I tend to think about the future.	1.	2.	3.	4.
(49)	I feel comfortable working with a computer.	1.	2.	3.	4.
(50)	I get a sinking feeling when I think of trying to use a computer.	1.	2.	3.	4.
(51)	Working with a computer makes me nervous.	1.	2.	3.	4.
(52)	Using a computer is very frustrating.	1.	2.	3.	4.
(53)	I will do as little work with computers as possible.	1.	2.	3.	4.
(54)	Computers are difficult to use.	1.	2.	3.	4.
(55)	Computers do not scare me at all.	1.	2.	3.	4.
(56)	I can learn more from books than from a computer.	1.	2.	3.	4.
(57)	I listen to my teacher carefully.	1.	2.	3.	4.
(58)	If I fail, I try to find out why.	1.	2.	3.	4.
(59)	I am glad to do work that helps others.	1.	2.	3.	4.
(60)	I study hard.	1.	2.	3.	4.
(61)	When I do a job, I do it well.	1.	2.	3.	4.
(62)	I feel that I am a person of worth, at least on an equal plane with others.	1.	2.	3.	4.

SD = Strongly Disagree

D = Disagree

A = Agree

SA = Strongly Agree

(Continued)

(63) Which would you rather do? (circle one of each pair):

- | | | |
|----------------------|----|----------------------|
| (1) read a book | or | (2) write |
| (1) write | or | (2) watch television |
| (1) watch television | or | (2) use a computer |
| (1) use a computer | or | (2) read a book |
| (1) read a book | or | (2) watch television |
| (1) write | or | (2) use a computer |

(64) Which would be more difficult for you (circle one of each pair):

- | | | |
|----------------------|----|----------------------|
| (1) read a book | or | (2) write |
| (1) write | or | (2) watch television |
| (1) watch television | or | (2) use a computer |
| (1) use a computer | or | (2) read a book |
| (1) read a book | or | (2) watch television |
| (1) write | or | (2) use a computer |

(65) Which would you learn more from (circle one of each pair):

- | | | |
|----------------------|----|----------------------|
| (1) read a book | or | (2) write |
| (1) write | or | (2) watch television |
| (1) watch television | or | (2) use a computer |
| (1) use a computer | or | (2) read a book |
| (1) read a book | or | (2) watch television |
| (1) write | or | (2) use a computer |