

Statistical Analysis of Keys Data submitted in 2005 – Moscow

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Data were submitted by Keys leaders in August, 2005 of pre and post tests for a total of 118 subjects. The data were analyzed by using t-tests resulting in p values to find significant differences between the pretest and post test scores. It is customary to describe findings as statistically significant when the difference between the two scores is less than the 5 out of 100 chance that they would be different because of random error. Therefore, differences that are less than 5% are considered significant. **Percentages listed that are the smallest are the most significant.** It should be noted that the analysis measures significant *change* in the percentages of answers from no on the pretest to yes on the post test or the reverse. In many instances the percentages on the pretest were 100% yes which did not allow for change to the post test.

Conclusions. Clearly the Keys Program made a difference in the cognitive learning and in the attitudes of the children who received the program. The program was most effective in the area of understanding feelings. Second most successful was connection to God. Third was factual material about alcohol and drugs. It was least successful in changing behavior and planning to change behavior, although changes were apparent there as well.

Data were analyzed three ways: (1) Aggregate analysis in which all data were pooled for pre-test and all data were pooled for post-test to show change; (2) Analysis by age group to show differences in data pooled for ages younger than 9 years old (YAG) and those older than age 9 (OAG). These age groupings may be in error because some of the sites submitted data simply marked “younger class” and “older class” and others labeled them “9-14”. (3) Analysis by site in which it was shown which questions showed changes in the pre and post-testing in each of the submitting sites. In addition, questions were categorized into content areas for the above conclusions.

Aggregate Analysis. Two data points were entered for each of the 118 children: a pre-test and a post test. Only those questionnaires were entered in which there was both a pre and a post test for each child were used. **Pre and post test data were lumped together to see if there was significant change for the entire group.** Significance must meet a standard of 5%. In some cases the pre test numbers and the post test numbers were so similar that no change was discernable.

Aggregate Analysis. Questions are listed in order from most significant change to least but all are significant.

10 of the 22 questions that showed significant change for the whole group were:

2. I can express my anger without hurting myself or others	0.00%
21. If a person has an alcoholic or drug addict in the family, he has a greater risk of becoming an alcoholic or addict himself	0.03%
19. Smoking (nicotine) influences mental abilities	0.13%
11. My choices now can affect my future life	0.16%
4. My body helps me understand what I am feeling	0.17%
16. I can make healthy choices for my self and for my own life.	0.17%
3. My defenses allow me to hide my feelings from others	0.24%
1. All my feelings are important	0.37%
6. I can talk about all my feelings to God	0.57%
14. God cares about what I am feeling	0.69%

Age Group Analysis. The data were divided into age groups with 9 years old as the cut-off between the young age group (YAG) and older age group (OAG). In some cases the identifying data were incomplete with only “younger group” or “upper” to designate age groups. **There were significant differences in the changes made by age groups that were different than the aggregate data above. Trainers should pay particular attention to those questions that moved**

in the undesired direction: q 5, 7, and 8 as they are important concepts. Q13 is puzzling in that more students in both groups said they were in physical fights at the close of the program than at the beginning.

Analysis by Age Group. Please refer to the Question by Age Analysis Sheet

There were 78 subjects in the Older Age Group (OAG) and 44 in the Younger Age Group (YAG). In some cases the numbers were fewer because the subject left a question blank.

1. All my feelings are important. Significant in both age groups
2. I can express my anger without hurting myself or others. Significant in both age groups
3. My defenses allow me to hide my feelings from others
OAG Significant change
YAG Non-significant change
4. My body helps me understand what I am feeling. Significant for both
5. There are safe people whom I can go to for help. Reversal for both age groups
6. I can talk about all my feelings to God. Significant for both
7. If family members try hard enough they can cause the alcoholic not to drink too much
Reversal for both age groups.
8. If someone touches me in a way that makes me feel uncomfortable I should be polite and not resist. Non-significant for both. YAG moved in the wrong direction.
9. Everyone needs friends. Non-significant for both because the numbers of "yes" answers was near 100% on the pretest and did not allow for movement.
10. God loves me and cares what is happening to me. Non-significant for both but more movement in the OAG.
11. My choices now can affect my future life
Highly non-significant for the Older Age Group and highly significant for the younger age group. This can be explained by the pretest numbers of 89% for the OAG which can be interpreted as not a new concept to the Older children. The YAG changed from 68% yes in the pretest to 95.5% in the post test. The program clearly changed their thinking on this concept.
12. I can say no to friends who try to convince me to do something
Though the numbers are non-significant, there is a big difference in the responses of the OAG and the YAG on this question. The YAG showed more change.
13. During the last month I have been involved in a physical fight. Non-significant in both but both age groups show change for more yes responses at post test, meaning that more participants in both groups were involved in a physical fight than in pre-test.
14. God cares about what I am feeling. Non-significant in the OAG but significant in the YAG. This was a new concept to the younger children.
15. I have special talents. This question is notable because the OAG showed some change from yes to no. 75 of the subjects answered yes on the pretest and 74 answered yes on the post test. The YAG showed change but not significant change.
16. I can make healthy choices for my self and for my own life. Significant for both groups
17. Alcoholism is a disease. Some change in both groups but non-significant. Most knew this one before the program.
18. There is only one way to communicate with people. The OAG had a reversal or non-desired response. There was change in the YAG but non-significant for both groups

19. Smoking (nicotine) influences mental abilities. Non-significant for the OAG but highly significant for the YAG. Again the OAG knew this one going in.
20. Using alcohol under age 18 increases the risk of developing alcoholism. No change in the OAG. The YAG showed change but not significant change.
21. If a person has an alcoholic or drug addict in the family, he has a greater risk of becoming an alcoholic or addict himself. Significant for both groups. This is a highly effective concept and the message got through to all ages.
22. If parents drink too much or use narcotics, it hurts their children and every member of the family. Non-significant in both groups but there are clear differences in the age groups. The OAG knew this one already but the YAG learned something, even though the change did not meet the standard of significance.

Analysis by Site. **The data were divided by site, which again showed differences from both the aggregate and from the age group differences.** These site differences could be accounted for in many ways: differences in teaching methods, differences in leaders and attendance by leaders, attendance by the participants, pre-program learning, understanding the questions, and differences in the environments of the groups, among others..

Analysis by Site

Listed below are the sites and the questions in which there were significant changes from pretest to post test. Please refer to question sheet.

YAG (Age 9 and below)

Cheboksari Family Social Center ages 6-9 Larissa. N= 5

Q6
Q13
Q18
Q22

Dmitrov Public School Younger Grades N=13

Q2
Q4
Q10
Q15
Q19
Q22

Tosno Public School Tatiana 1st level N=5

Q14

Younger Class 1 N=10

Q2
Q11
Q19
Q21

Younger Class 2 N=11

Q2
Q3
Q11
Q19
Q21

Older Age Group (Older than 9)

Cheboksari Family Social Center ages 9-14 at risk. N=4

No questions showed significant change

Dmitrov City Center Oksana ages 9-10

Q3

Izhevsk Public School Veronica ages 9-10 N=24

Q2

Q3

Q6

Q10

Q11

Q15

Q17

Q18

Nickolskaya Private School ages 13-14 N=11

Q3

Q13

Place Unknown Upper Grades N=7

Q21

St. Petersburg Street Kids shelter ages 13-16 Gennady Ksusha N=9

No questions showed significant change

St. Petersburg Summer Camp ages 14-16 N=7

Q1

Q7 significant change from yes (7) on pretest to no (5) on post test. Desired result

Q10 same as above. Not desired result

Q15 same as above from 6 to 5. Not desired result

Tosno Public Schools: Tatiana Upper N=3

No questions showed significant change

There were a few questions that did not result in significant change at any site with any age group:

Q5. There are safe people to whom I can go for help.

There were changes in groups with very small n's which were not enough to reach a significant level. However, in the aggregate, there was a reverse trend – from 92.4% at pretest to 91.4% at post test.

Q9. Everyone needs friends. Most responses were 100% yes on pretest.

Q12. I can say no to friends who try to convince me to do something.

Q20. Using alcohol under age 18 increases the risk of developing alcoholism. In 5 sites, two OAG and three YAG was there a change from no to yes but not the level of significance. In two others there was a change from yes to no on post test. For 6 sites the responses were essentially the same on pre and post test. It is curious that there was a reversal at the 2 sites.

The questions represent a cross-section of the material and can be looked at by the following categories:

Questions about God: Two questions showed significant change in the aggregate analysis:

6. *I can talk about all my feelings to God*

14. *God cares about what I am feeling.*

These questions are nearly identical.

The 3rd question did not result in significant change:

10. *God loves me and cares what happens to me.* There was more change in the OAG than the YAG. The YAG felt positive about this concept before the program.

Questions about factual material. Two questions were significant in the aggregate:

19. *Smoking (nicotine) influences mental abilities*

21. *If a person has an alcoholic or drug addict in the family, he has a greater risk of becoming an alcoholic or addict himself.*

Three questions were non-significant in the aggregate but showed more change in the YAG than OAG

17. *Alcoholism is a disease*
20. *Using alcohol under age 18 increases the risk of developing alcoholism*
22. *If parents drink too much or use narcotics, it hurts their children and every member of the family.*

One question resulted in undesired change:

7. *If family members try hard enough they can cause the alcoholic not to drink too much.*

Yes answers increased in both YAG and OAG. Either the question or the concept was not understood by the participants.

Questions About Feelings: The first 4 questions address feelings. All 4 are significant in the aggregate. #6 overlaps feelings with God and is not counted here.

1. *All my feelings are important*
2. *I can express my anger without hurting myself or others*
3. *My defenses allow me to hide my feelings from others.* This was significant for OAG only. Perhaps the YAG did not understand the question, or it is too complex a question for those under age 9.
4. *My body helps me understand what I am feeling.*

Questions About Behavior. Four questions approach measuring actual behavior:

5. *There are safe people to whom I can go for help.* Both YAG and OAG had 92% yes on pretest which is so high that we can assume that this concept was already established and did not need much teaching. The curious thing is that in both groups the number of yes answers declined which was not the desired result. Something happened to make fewer of the participants feel that there were safe people.
8. *If someone touches me in a way that makes me uncomfortable I should be polite and not resist.* The wording of this question is difficult. A yes answer means that the participant will allow themselves to be touched or molested. Yes answers increased in the YAG and decreased in the OAG. Decrease is the desired result. A better question might be: *If someone touches me in a way that makes me uncomfortable I know how to resist.*
11. *My choices now affect my future life.* This is a question about behavior later and was highly significant to YAG. Not so with OAG who are closer to future life.
12. *I can say "no" to friends who try to convince me to do what I don't want to do.*

The OAG had no change on this question and the YAG had change but not significant change. This is such an important concept and leaders should examine the way skills in this area are presented.

16. *I can make healthy choices for myself and for my own life.* Significant aggregate change indicates that real learning and change took place.

One question actually asked for evidence of behavior change:

13. *During the last month I have been involved in a physical fight.* The desired result is a decrease in the yes answers from pretest to post test. The OAG went from 29.9% yes to 39.9 on post test. The YAG went from 30.2 to 40.9% yes. Can it be that there was such a substantial increase in the number of fights? It is more surprising because of the changes in q2 above dealing with ability to express anger without hurting myself or others. This change did not translate into behavior.

Other: Three questions did not fit in the above categories:

15. *I have special talents.* This is probably a self-esteem question but it had a non-desired result as the number of yes answers decreased from pretest to post test in OAG.
9. *Everyone needs friends.* This question made showed no differences between pre and post-test.
18. *There is only one way to communicate with people.* This question relates to something specific in the curriculum. The number of yes answers decreased in the OAG and increased in the YAG.

Recommendations for future data analysis

1. Number the questions. The new evaluation instruments have the questions numbered. Be sure they are transferred to the translated instruments.
2. Have participant's ages on the instruments.
3. Have the facilitator's name or number on the instruments and the site.
4. Note how many sessions the participant attended – particularly if they stopped coming during the training. It is important to know if they had only a part of the program.

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