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ABSTRACT

Word associations to 51 stimulus words selected from the Kent and Rosanoff stimulus list were obtained from 110 graduate and 75 undergraduate teacher trainees. Associations were analyzed so that comparisons between teacher-trainee associations and several adult normative collections could be made. Response homogeneity was found to increase significantly from 1910 to 1967, and undergraduate Ss were found to have significantly more response homogeneity than graduate Ss. Teacher trainees demonstrated a high degree of response homogeneity to the list of stimulus words. Although they are not significantly different in their associative habits from other adult populations, future research should examine the possible effects that response homogeneity may have on the language used in the classroom. (Author/JS)

STANFORD CENTER FOR RESEARCH AND DEVELOPMENT IN TEACHING

Research Memorandum No. 28

Systematic Changes in Adult Word-Association Norms 1910 - 1967: Implications for the Language of the Classroom[1] [2]

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Abstract

Word associations to 51 stimulus words selected from the Kent and Rosanoff stimulus list were obtained from 185 graduate and undergraduate teacher-trainees. Associations were analyzed so that comparisons between teacher-trainee associations and several adult normative collections could be made. Response homogeneity was found to increase significantly from 1910 to 1967 and undergraduate Ss were found to have significantly more response homogeneity than graduate Ss. The findings were discussed in terms of the cumulative effect of "mass culture" on associations over time and the impact that response conformity may have on the use and meaning of language in the classroom.

Systematic Changes in Adult Word-Association Norms 1910-1967: Implications for the Language of the Classroom

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Intuitively, the language that teachers and students use in the classroom should be related to a variety of pupil performance characteristics. Bellack, et. al. (1966) examined the effects of language used in the classroom and were able to develop a list of rules for the language game of teaching. Smith and Meux (1960) investigated the effects of the logic of verbal communication on pupil behavior, Getzels and Jackson (1962) investigated the relationship between teacher-student communication variables and creativity and intelligence, and Taba (1964) developed a system for representing the impact of teacher verbal behavior on patterns of student cognitive performance. Thus several investigations of teacher-student verbal interactions have shown that the "language of the classroom" is significantly related to patterns of student performance.

The study of word associations represents the interaction of two old and active fields of research, the area of personality dynamics (or individual differences) and the area of cognition (or the various aspects of knowing). Recent word association research has been concerned with the impact of "mass culture" on free associations as they are related to intelligence and social class (Entwisle, 1966), language development in children (Brown & Berko, 1960), and systematic changes in associations of children over time (Palermo & Jenkins, 1964; Koff, 1965).

Free association research has been addressed to the question of systematic changes in associations of adults (Jenkins & Russell, 1960). In their comparison of adult norms, Jenkins and Russell theorized that the effects of "mass culture," "other-directedness," and similar constructs used to characterize our culture would have significant effects upon associations over time. Their studies showed that there is a general tendency for the frequency of primary (common) responses to increase with time, that words used as responses to stimuli tend to change slowly but systematicly over time (with the highest-ranking responses having the highest stability), and that

there was a significant tendency for superordinate responses to decrease with time. Jenkins and Russell are the only investigators who have explored the issue of systematic change in free associations, but their findings were based on groups of adults who did not plan to become teachers.

The purpose of the present inquiry was to examine the word associations of a group of teacher-trainees and to relate their associative response patterns to the potential effect they may have on the use and meaning of language in the classroom. Within the context of this paper teachers are viewed as primary transmitters of the culture and as such are significant determiners of the language used in the classroom. This paper presents first the associations of a group of teacher-trainees to a standardized list of stimulus words selected from the Kent and Rosanoff (1910) stimulus list. Second, differences in associative patterns between college education major undergraduates and Master of Arts in Teaching graduate students are examined. Third, comparisons of teacher-trainee associations with several adult normative collections are made. In conclusion, speculations are made as to the effects that "response homogeneity" may have on the use and meaning of language for students in the classroom.

Method

The sample consisted of a total of 185 education students divided as follows: 75 undergraduates who attended a large state college and 110 Master of Arts in Teaching graduates who attended a private university. Ss completed the test materials during their regular educational psychology classes in the fall of 1967. Each S was given a test booklet which contained 100 stimulus words from the Kent and Rosanoff stimulus list. However, only 51 words selected from the stimulus list were analyzed for the present study. The criteria for selection of these stimulus words were those employed by Koff (1965).

Test conditions and instructions were kept as similar to the Russell and Jenkins (1960) study as possible. The following instructions were read aloud to the Ss.

This is one of the studies of verbal behavior being done at the Stanford Center for Research and Development in Teaching. This particular experiment is on free-association.

Do not write your name on the outside of the paper passed to you.

When you open these sheets, you will see a list of 100 stimulus words. After each word, write the first word that it makes you think of.

Start then to go on to the next word.

Use only a single word for each response.

Do not skip any words.

Work rapidly until you have finished all 100 words.

When you are through, turn your paper over and write on the back the letter that appears on the board at that time.

Are there any questions?

Ready? Now go.

In order to place moderate time pressure on Ss the letter "A" was written on a blackboard at the front of the room at the beginning of the test period, and succeeding letters were placed on the blackboard a five-minute intervals.

Test administration in the present study differs in certain respects from previous word association studies. The major difference in testing procedure was that Ss were not required to put their names on their test booklets. It was felt that this procedure would serve to decrease response homogeneity because of the anonymity it guaranteed each S. Ss were asked after they had completed the questionnaire whether it made any difference to them that they had not put their names on their test booklets. Ss were unanimous in their agreement that they would not have responded differently had they been asked to write their names on the test booklets. It is recognized that variations in test procedures may have an effect upon response production, but studies by Clousing (1927), Boyer and Elton (1958) and Jenkins and Russell (1960) suggest that oral-individual or group administration procedures have had little effect on responses.

Results

The data were analyzed in order to answer the following questions: (1) Do state college education Ss show more response homogeneity than university graduate teacher-trainees? (2) Is the trend toward increased response homogeneity continued in a sample of teacher-trainees? (3) Is response homogeneity more pronounced for teacher-trainees than for the general adult population?

Table 1 shows the stimuli, primary responses and average percentage of primary, secondary and tertiary responses for the graduate and undergraduate teacher-trainees. Out of a total of 51 stimulus words, 13 showed primary response changes. That is, undergraduate and graduate teacher-trainees responded with the same primary response a total of 38 times. From the percentage of the total number of associations that the primary, and primary, secondary and tertiary responses represent it can be seen that there is a high degree of response agreement between the two groups even though the undergraduate Ss show more response homogeneity. The primary responses for the 51 stimulus words shown in Table 1 accounted for 39.3 and 42.7 percent of the responses for the graduate and undergraduate Ss respectively. These average percentages are not significantly different from each other. For the graduate Ss the primary, secondary and tertiary responses accounted for a total of 52.9 percent of the total number of responses. For the undergraduate Ss this figure was 61.5 percent, a significant ($p < .05$) increase of 8.6 percent (Johnson, 1949, pp. 93-97).

Insert Table 1 About Here

Table 2 shows the average percent of primary, and primary, secondary and tertiary associations for eight normative collections from 1910 to 1967. It is clear from Table 2 that the trend toward response homogeneity has been continued and replicated in the present sample. The average percent primary response in 1910 and 1967 was 25.2 and 41.3 respectively; an average increase of 16.1 percent. The average percent primary, secondary and tertiary responses was

45.2 in 1910 and 57.4 in 1967. Thus there has been an average increase in primary, secondary and tertiary response homogeneity of some 12.2 percent over the last 57 years.

The Russell and Jenkins 1952 sample shows slightly more response homogeneity than the 1967 sample (an average increase of 1.6 percent in the primary response category and 4.8 percent in the primary, secondary and tertiary category). These differences are not significant and may be attributable to variations in test administration. For example, Russell and Jenkins required Ss so write their names on test booklets, thus making the testing procedure more similar to individual administration than was the case in the present study. The differences are, however, so small that they do not seem to represent any systematic evidence that would indicate that response homogeneity in 1967 has increased significantly from 1952.

Insert Table 2 About Here

Table 2 also shows that teacher-trainee associations do not deviate significantly from earlier normative collections. However, the data do illustrate the fact that teacher-trainee associations are consistent with respect to the trend toward increased response homogeneity over time. To be more confident of this finding, however, teacher-trainees should be compared with more recent adult control groups.

Discussion

The results of this study have implications for issues of concern to investigators of word association patterns and to educators. The study showed that teacher-trainees are, on the average, as homogeneous in their associative responses as other adult populations sampled in the past and that undergraduate state college Ss are significantly ($p < .05$) higher in response homogeneity than university M.A.T. Ss. The study also showed that there is a general trend toward increased response homogeneity over time, but that the data collected in the present study reflected no significant increase in the general

tendency for increased response homogeneity. In summary, response homogeneity has remained at about the same level since Jenkins and Russell's 1952 study of University of Minnesota students.

The finding that teacher-trainees in a graduate education program show significantly less response homogeneity than state college undergraduates is consistent with earlier results reported by Kent and Rosanoff (1910). In their study Kent and Rosanoff found that more highly educated Ss made less use of popular response words than less well educated Ss. However, the present finding is inconsistent with data interpretations made by Jenkins and Russell (1960). It is possible that the results for the present sample were due to factors other than education level; intelligence, age, or subtle differences in testing procedures may account for the differences found.

Perhaps an asymptote has been reached with respect to homogeneity of associations to this particular list of stimulus words. It would appear, however, that there is still room for greater response homogeneity since about 60 percent of the more recent adult word collections gave similar primary, secondary and tertiary responses. The years between 1910, 1925-1933, and 1952-1967 could be viewed as single time periods, with each study conducted during these periods serving as independent replications of the original. Although the number of years between studies has not been consistent, greater differences between samples are to be found when the number of years is increased between them.

The present study has not provided evidence which would support the "mass culture" hypothesis advanced by Jenkins and Russell. Cross-cultural studies of association patterns from countries whose populations are exposed to varying degrees of "mass culture" are needed. Such studies ought to confirm the hypothesis that the greater the degree of exposure to "mass culture," the more likely there will ben increased associative response homogeneity. Entwisle (1966) has studied word associations of Amish children, but the stimulus words used in her study do not permit comparison with earlier samples.

The results of this study show that teacher-trainees demonstrated a high degree of response homogeneity to a selected list of stimulus

words. Although teacher-trainees are not significantly different in their associative habits from other adult populations, future research should examine the possible effects that response homogeneity may have on the language used in the classroom. Teachers should be made aware of the high associative response probabilities attached to certain combinations of verbal stimuli and be trained to change their verbal behavior in order to maximize the effects that such associative links may have on perceptual factors in word recognition and meaning.

It would seem that we are now in a position to inquire into what the effects of response homogeneity may have on pupil performance characteristics. What effect may response homogeneity have on such constructs as creativity, ideational fluency, short and long term memory, transfer, etc.? What relationships are there between social class variables and response homogeneity as they are manifested in the utilization of language in the classroom?

Table 1
Stimuli, Primary Responses and Average Percentage of Primary and Primary, Secondary and Tertiary Responses for 185 Graduate and Undergraduate Education Students

	UNDERGRADUATES			GRADUATES		
Stimulus	Response N = 75	Ss Making Response Primary (%)	Ss Making Primary, Secondary and Tertiary (%)	Response N = 110	Ss Making Response Primary (%)	Ss Making Primary, Secondary, and Tertiary (%)
Table	Chair	84.9[1]	93.2		74.0[2]	82.0
Dark	Light	84.9	95.9		67.0	87.0
Sickness	Health	37.0	56.2		38.0	68.0
Man	Woman	89.0	97.3		75.0	85.0
Deep	Shallow	26.0	53.4		29.0	50.0
Soft	Hard	28.8	54.8		23.0	37.0
Eating	Food	49.3	68.5		31.0	55.0
Mountain	High	19.2	49.3	Hill	18.0	47.0
House	Home	41.1	52.1		37.0	47.0
Black	White	65.8	78.1		58.0	69.0
Short	Tall	52.1	84.9		40.0	68.0
Butterfly	Beautiful	16.4	37.0	Yellow	16.0	36.0
Chair	Table	49.3	73.0		32.0	59.0
Sweet	Sour	42.5	75.3		39.0	74.0
Whistle	Blow	9.6	27.4	Stop	9.0	21.0
Woman	Man	57.5	74.0		54.0	68.0
Cold	Hot	52.1	75.3		35.0	71.0
Slow	Fast	65.8	71.2		48.0	57.0
White	Black	41.1	61.6		38.0	65.0
Beautiful	Pretty	17.8	37.0	Ugly	19.0	45.0
Rough	Smooth	45.2	60.3		37.0	46.0
Foot	Shoe	28.8	63.0	Toe	19.0	47.0
Needle	Thread	38.4	79.5		38.0	64.0
Red	Blue	23.3	50.7	Black	13.0	34.0
Girl	Boy	72.2	76.7		54.0	64.0
High	Low	63.0	75.3		60.0	70.0
Sour	Sweet	43.8	63.0		36.0	57.0
Earth	Round	16.4	37.0	Dirt	14.0	37.0
Soldier	War	24.7	45.2		15.0	31.0

Table 1 continued

Stimulus	UNDERGRADUATES Response N = 75	Ss Making Response Primary (%)	Ss Making Primary, Secondary and Tertiary (%)	GRADUATES Response N = 110	Ss Making Response Primary (%)	Ss Making Prim Secondary and Tertiary (%)
Cabbage	Lettuce	21.9	45.2	Slaw	9.0	24.0
Hard	Soft	65.8	75.3		58.0	71.0
Yellow	Red	8.2	24.7	Bird	14.0	28.0
Bread	Butter	38.4	53.4		28.0	43.0
Boy	Girl	75.3	87.7		64.0	71.0
Light	Dark	68.5	78.1		48.0	57.0
Sheep	Calf	30.1	56.2	Lamb	19.0	39.0
Blue	Sky	27.4	52.1		23.0	3[illegible].0
Hungry	Food	52.1	58.9		27.0	47.0
Long	Short	69.9	74.0		60.0	69.0
Hammer	Nail	64.4	75.3		40.0	56.0
Square	Round	36.6	63.0		38.0	52.0
Doctor	Nurse	26.0	47.9	Lawyer	19.0	47.0
Loud	Soft	39.7	72.6		50.0	69.0
Lion	Tiger	27.4	45.2		14.0	36.0
Heavy	Light	54.8	65.8		44.0	56.0
Moon	Star(s)	15.1	34.3		22.0	35.0
Quiet	Loud	21.9	57.3		24.0	42.0
Salt	Pepper	54.8	65.8		45.0	55.0
Street	Road	12.3	30.1	Car	14.0	29.0
King	Queen	68.5	76.7		58.0	68.0
Cheese	Cake	13.7	33.0	Mouse	12.0	26.0
Average Percent		42.7	61.5		39.3	52.9*

1. Rounded off to the nearest tenth percent.
2. Rounded off to the nearest percent.

* Refers to significant difference ($p < .05$) between primary, secondary and tertiary response categories between graduate and undergraduate Ss.

Table 2

Average Per Cent of Primary and Primary, Secondary and Tertiary Associations for Eight Adult Normative Collections: 1910-1967 [1]

Sample	Year Collected	N =	Average Per Cent Primary Response	Average Per Cent Primary + Secondary + Tertiary Response
Kent/Rosanoff	1910	1000	25.2[2]	45.5
O'Connor	1925	1000	35.1	55.4
Schellenberg	1927	925	28.8	48.6
Keene	1933	500	38.1	57.7
Russell/Jenkins	1952	1008	42.9	62.2
Tresselt	1959	108	40.1	58.7
Koff	1961	122	40.2	59.2
Koff/Feldman[3]	1967	185	41.3	57.4

1. Average percentages based on a sample of 51 stimulus words from the Kent-Rosanoff list. Criterion for stimulus inclusion was the same as that employed by Koff (1965).

2. Rounded to nearest tenth of a per cent.

3. Sample consists of 185 education students divided as follows: 75 undergraduates who attended a large state college and 110 Master of Arts in Teaching graduates who attended a private university.

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