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ABSTRACT
                Seventy-two sixth graders, stratified on the basis
of sex and two levels of IQ (high and low) were randomly assigned to
one of three treatment groups: (1) Group I (success only); (2) Group
II (failure only); and (3) Group III (success and failure). These
subjects (Ss) were used to investigate the effects of verbally
controlled success and failure conditions on three aspects of
learning behavior: (1) the level of Ss' performance during
conditioning; (2) the number of times each S voluntarily performed
the task after training; and (3) the level of Ss' performance
following training where they are required to participate in the
tasks. Results tend to support the hypothesis that a combination of
verbal rewards and failures cause Ss to persist longer in involvement
on similar tasks following the termination of verbal conditioning
procedures. Female Ss' performance was found not to be differentially
affected by the various treatments or as a function of IQ while male
Ss' performance was so affected. (TL)

THE EFFECTS OF VERBALLY CONTROLLED SUCCESS AND FAILURE

CONDITIONS OF PERSISTENT BEHAVIOR

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The effects of verbal success and failure conditions on learner
performance in a meaningful learning task have been the subject of
a number of investigations. Many of the investigations have been
concerned with determining the effects of conditioning procedures on
the acquisition of meaningful learning materials (Buchwald, 1959;
Buss & Buss, 1956). In most of these investigations the results
would seem to indicate that a combination of a verbal reward and pun-
ishment condition is more effective than the exclusive use of reward
or punishment conditions.

A related question is concerned with the effects of verbal re-
ward and failure (punishment) conditions on the persistence behavior
of the learner, i.e., the number of times a $\underline{S}$ voluntarily performs
the task after conditioning. A relatively small number of investi-
gators have addressed themselves to this ques _.on. Of those who have
(Grosslight & Child, 1947; Holmes & Moore, 1969), their findings tend
to be consistent with the findings of those who have investigated the
problem of the acquisition of meaningful learning materials. Spe-
cifically, a learning condition which combines verbal reward and fail-
ure appears to be more effective in increasing the persistence be-
havior of learners than either reward or failure conditions.

An interesting question and one which has not been investigated

widely is: What are the effects of verbal reward and failure conditions on the level of $\underline{Ss}$' performance following training under conditions where the $\underline{Ss}$ are required to participate in a learning task?

This question along with a reconsideration of the question of the effects of verbal reward and failure conditions on a) the acquisition of meaningful learning task and b) learner persistence behavior represents the primary objective of the present investigation. Specifically, the present experiment was designed to investigate the effects of verbally controlled success and failure conditions on three aspects of learner behavior: 1) the level of $\underline{Ss}$' performance during training (conditioning of persistence Pc), 2) the number of times each $\underline{S}$ voluntarily performs the task after training (persistence, P), and 3) the level of $\underline{Ss}$' performance following training where the $\underline{Ss}$ are $\underline{required}$ to participate in the tasks (persistence of attention, Pa).

Method

Subjects.--The Ss were 72 sixth-graders, stratified on the basis
of sex and two levels of IQ (high and low), and randomly assigned to
one of three treatment groups: Group I (Success only), Group II
(Failure only), and Group III (Success and Failure).

Materials.--Fifty lists of anagrams, twenty items in length,
vere constructed using words randomly selected from second and third
grade word lists.[1] Four lists were presented on each of five train-
ing days. The remaining thirty lists were used to measure persis-
tence and persiscence of attention. The anagram task was selected
because it allowed control of the administration of particular types
of reinforcement while still permitting measures of actual performance.

Treatment.--Success and failure were defined in terms of verbal
comments administered by E after the completion of each anagram list.
Success consisted of comments such as: "You are doing better than
most people who try this." and "You are doing very well." Failure
consisted of comments such as: "You are not doing as well as most
people who try this." and "You are not doing well at all."

The Ss in Group I were given verbal success without regard for
their actual performance, after the completion of each task during
the training period. Similarly, Ss in Group II were given verbal fail-
ure regardless of their actual performance after each training task.
The Ss in Group III were provided success on a random half of the
anagram lists and failure on the other half, again without regard
for their actual performance.

The E met individually with each S for approximately 15 minutes on each of 5 training days. Each S was given 2 minutes to unscramble as many words on each list as possible. At the end of each list E administered the appropriate reinforcement. Conditioning of persistence was measured in terms of the number of anagram solutions on each training day.

Immediately following training on the fifth day, the remaining two persistence measures were taken. The Ss in each of the three experimental groups were randomly assigned to one of two groups: a) persistence or b) persistence of attention. The Ss in the first group were told that their work was finished but that if they would like to try more lists they could. The E administered no verbal comments and recorded the number of additional lists each S attempted as a measure of persistence. The Ss in the second group were required to attempt ten additional lists. The E again withheld verbal comments and recorded the number of anagram solutions on each list as a measure of persistence of attention.

Results

Three ANOVA's were completed to test the hypothesis involving the effects of the three experimental conditions on a) the total number of anagram solutions on the twenty lists presented during training (conditioning of persistence), b) the number of lists attempted under extinction conditions following training (persistence) and c) the total number of anagram solutions on the ten required lists presented, under extinction conditions, following training (persistence of attention).

The F-ratios and mean squares of the first analysis, comparing
the total number of anagram solutions completed during training, are
presented in Table 1.

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Insert Table 1 about here
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The means for the various treatment groups are presented in
Table 2.

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As can be observed in Table 1, significant F-ratios were obtained
for the sex and IQ variables ($p<.001$). An inspection of the means
of the respective groups indicates that female $\underline{S}s$ solved more anagrams
than male $\underline{S}s$ and high IQ $\underline{S}s$ solved more anagrams than low IQ $\underline{S}s$. Fur-
ther, a significant F-value was obtained for the sex x IQ x treatment
interaction ($p<.05$). Figure 1 is a graphical representation of the
interaction of sex, IQ and treatment in terms of the Pc variable.

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Insert Figure 1 about here
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A Newman-Keuls analysis of the significant interaction between
treatment, sex and IQ indicated that there was a significant difference
between th' mean number of anagram solutions completed by high IQ male
$\underline{S}s$ under success conditions, and the mean number of anagram solutions
completed under failure or the success-failure conditions ($p<.01$).
The mean for the high IQ success group was greater than either of the
other two means. Low IQ male $\underline{S}s$' performance under failure conditions
was significantly different from low IQ male $\underline{S}s$' performance in either
the success or success-failure treatment groups ($p<.01$). In this case

the performance of $\underline{S}$s under failure conditions was greater.

High IQ female $\underline{S}$s' performance did not differ as a function of treatment, nor was there a difference in low IQ female $\underline{S}$s' performance. However, high IQ female $\underline{S}$s in the failure group did solve a significantly different number of anagrams than did low IQ female $\underline{S}$s regardless of treatment ($\underline{p}<.0\underline{1}$), with high IQ females solving the larger number. High IQ female $\underline{S}$s in the success-failure group tended to perform better than low IQ female $\underline{S}$s. However, these differences were significant only in the case of the low IQ female $\underline{S}$s in the failure group ($\underline{p}<.01$). No significant differences in performances were observed between high IQ female $\underline{S}$s under the success condition and low IQ female $\underline{S}$s in any treatment. High IQ male $\underline{S}$s' performance under success conditions differed significantly from all low IQ female $\underline{S}$s' performance ($\underline{p}<.01$). In this case the performance of the high IQ males was greater. No other significant differences between high IQ male and low IQ female $\underline{S}$s were observed.

High IQ female $\underline{S}$s' performance under the success-failure and the failure conditions differed significantly from high IQ male $\underline{S}$s' performance for the same respective treatment groups ($\underline{p}<.01$) with performance of the females being greater in both comparisons. High IQ female $\underline{S}$s' performance under success conditions did not differ significantly from high IQ male $\underline{S}$s' performance on any condition.

There was a significant difference in performance of female $\underline{S}$s, without regard for treatment or IQ level, from low IQ male $\underline{S}$s' performance in both the success and success-failure treatment groups ($\underline{p}<.01$). In all comparisons the females' performance was greater. Comparison of the performance of high IQ female with the performance

.of the low IQ male failure group yielded significant differences be-
tween the respective success-failure and failure groups of the high
IQ females ($p<.01$), but did not differ significantly from the per-
formance of high IQ females in the success group. In the comparisons
where the differences were observed, the high IQ females' performance
was greater.

The second analysis measured the effects of training on persis-
tence by the number of lists attempted under extinction conditions.
Significant treatment differences were obtained ($p<.10$). A Newman-
Keuls test indicated that the number of lists attempted by the success-
failure group and the failure group differed with the number of lists
attempted by the success-failure group being greater. The number of
lists attempted by the success group did not differ significantly
from the other two groups, although in number attempted it was near
the midpoint between the respective groups. The results of this
analysis and the mean number of lists attempted by each treatment
appears in Tables 3 and 4 respectively.

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          Insert Table 4 about here
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In the last analysis, the number of anagram solutions on the ten
required lists presented under extinction conditions was compared.
Significant differences in performance as a function of IQ and treat-
ment were observed. An inspection of the means indicated that high
IQ $\underline{S}$s completed a greater mean number of anagrams correctly than did
low IQ $\underline{S}$s. A Newman-Keuls analysis indicated that the mean number of

anagram solutions completed by the failure treatment group differed significantly from the mean number completed by the Ss in the success treatment group (p<.05). Of interest was the observation that the number completed by the failure group was greater than the number completed by the success group. Although the success-failure group solved an intermediate number of anagrams in comparison to the other two groups, the number completed did not differ significantly from the other treatment groups. A comparison of low IQ male Ss' performance with a) high IQ male performance and b) female (both high and low IQ) performance resulted in significant differences (p<.05).

The low IQ males solved a smaller number of anagrams than any of the other groups. These data are presented in Tables 5 and 6.

                Insert Table 5 about here

                Insert Table 6 about here

Using a Least Squares Analysis, the slopes of the lines of best fit for the mean number of solution for the success, failure, and success-failure groups were calculated. Figure 2 presents the lines of best fit for the experimental treatment group.

                Insert Figure 2 about here

Discussion

The significant (p<.05) sex, IQ, and treatment interaction obtained, in terms of the number of anagrams solved during training suggests, particularly for males, that any broad generalization concerning

the effects of types of verbal reward or punishment on performance

must be given careful consideration. Specifically, high IQ males per-

formed best under success conditions, while low IQ males performed

best under failure conditions. Treatment differences, on the other

hand, did not affect females of either high or low IQ.

One possible explanation for this observation is that the ob-

served interaction reflects past experience of the Ss with the systems

of success and failure operating in school and in the homes. Males

may receive both greater rewards and harsher punishment than females

and thus may be more susceptible to present treatment differences.

In addition, low IQ males most likely have experienced failure more

frequently than high IQ males and so perform better under those con-

ditions, while high IQ males, more used to success experiences, per-

form better under conditions of success.

These findings are only partially consistent with the findings of

Buchwald (1959) and Buss and Buss (1956). In these investigations

it was found that the combination of a reward and punishment condition

was more effective for maximizing the conditions for meaningful learn-

ing than reward or punishment conditions.

The finding that learning experiences which combine success and

failure increased Ss' voluntary test involvement more than learning

experiences under failure conditions is consistent with the findings

of the earlier Holmes and Moore investigation (1969) and Grosslight

and Child (1947).

One of the more interesting observations and one not consistent

with the original predictions, was that Ss who were trained under

perceived failure conditions performed at a higher level (Significant $p<.01$)' on the required lists after training than the success group.

Further, it was observed that $\underline{Ss}$ who had experienced failure performed at a relatively constant level on each of the ten lists after training, while $\underline{Ss}$ experiencing success and failure tended to solve fewer anagrams as the number of lists increased after training.

One explanation for these observations is that the failure condition during training may have acquired the character of a negative reinforcer. Thus by its removal following training, the $\underline{Ss}$ in this group may have been in fact reinforced, resulting in a corresponding increase in performance. Conversely, in the success and success-failure groups, the removal of the reinforcer following training would result in the predicted decrement in performance.

Another explanation is that avoidance of failure may be a stronger motivation for $\underline{Ss}$ than obtaining success. Applying this explanation to the data it would follow that one might expect the $\underline{Ss}$ trained under failure conditions tend to avoid the task when given a choice and if required to participate, seek to avoid failure in the task by solving the greatest number of anagrams possible.

In summary, the results of the present experiments tend to support the hypothesis that a combination of verbal rewards and failures tend to cause $\underline{Ss}$ to persist longer in involvement on similar tasks following the termination of verbal conditioning procedures. Support was not obtained for the hypothesis that $\underline{Ss}$ who had been trained under conditions where a combination of verbal rewards and failure would perform at a higher level on such tasks in which their involvement was required and

no form of verbal reward of failure was given. Rather, it was observed that Ss trained under verbal failure conditions performed at the highest level under these conditions. Finally, the analysis of the results of the treatment effects on performance during training suggests that female Ss' performance is not differentially affected by the various treatments or as a function of treatment of IQ while male Ss' performance is affected.

Footnote

[1]Words were selected from the following sources: Benthul, Herman, et al. _Spell Correctly._ (2) (Morristown, New Jersey: Silver Burdett Co., 1968). O'Donnell, Mabel. _Harper Row Basic Speller 3._ New York: Harper & Row, 1965.

TABLE 1

Summary of the Analysis of Variance of the Total Number

of Anagram Solutions during Training (Pc)

TABLE 1

Source	df	MS	F
A (sex	1	8,955.68	11.78***
B (IQ)	1	16,653.10	21.91***
C (treatment)	2	93.18	0.12
AB	1	1,521.68	2.00
AC	2	871.18	1.14
BC	2	467.79	0.61
ABC	2	2,964.18	3.90*
error	60	759.14	

***$p<.001$

*$p<.05$

TABLE 2

Mean Number of Anagram Solutions during Training with the
Three-way Interaction Effect of Sex, IQ, and Treatment (Pc)

TABLE 2

Treatment	Males		Females		
	Hi IQ	Lo IQ	Hi IQ	Lo IQ	Total
Success	9.46	5.98	8.45	7.90	7.95
Failure	7.61	7.18	9.56	7.66	8.01
Success-failure	8.00	5.48	9.02	8.26	7.82

FIGURE 1

Graphical Representation of the Interaction of Sex,

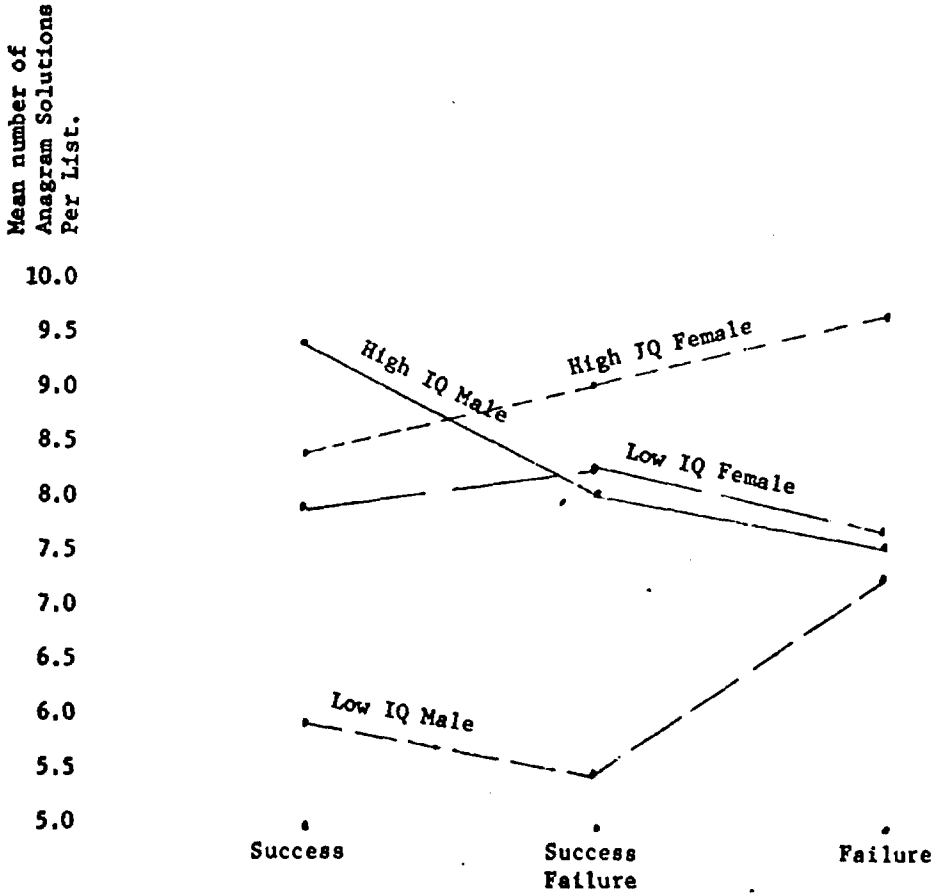IQ, and Treatment in Terms of Conditioning of Persistence

FIGURE 1

TABLE 3

Summary of the Analysis of Variance of the Mean Number

of Lists Attempted under Extinction Conditions (P)

TABLE 3

Source	df	MS	F
A (sex)	1	5.44	0.08
B (IQ)	1	160.44	2.38
C (treatment)	2	175.53	2.53
AB	1	152.11	2.25
AC	2	.53	0.01
BC	2	119.53	1.77
ABC	2	40.19	0.59
error	24	67.53	

TABLE 4

Mean Number of Anagram Lists Attempted per Treatment

Group under Extinction Conditions (P)

TABLE 4

Success	Failure	Success-failure
7.67	3.25	10.25

TABLE 5

Summary of the Analysis of Variance of the Number of

Anagram Solutions Under Extinction Conditions (Pa)

TABLE 5

Source	df	MS	F
A (sex)	1	164.69	0.65
B (IQ)	1	2,193.36	6.78**
C (treatment)	2	961.19	3.85*
AB	1	1,332.25	5.33*
AC	2	310.86	1.24
BC	2	288.86	1.16
ABC	2	829.03	3.32
error	24	249.86	

**$p<.01$

*$p<.05$

TABLE 6

Mean Number of Anagram Solutions Per List

TABLE 6

Success	Failure	Success-failure
7.90	8.66	9.69

FIGURE 2

Slopes of the Lines of Best Fit for the

Mean Number of Solutions for the Respective Experimental Groups

FIGURE 2
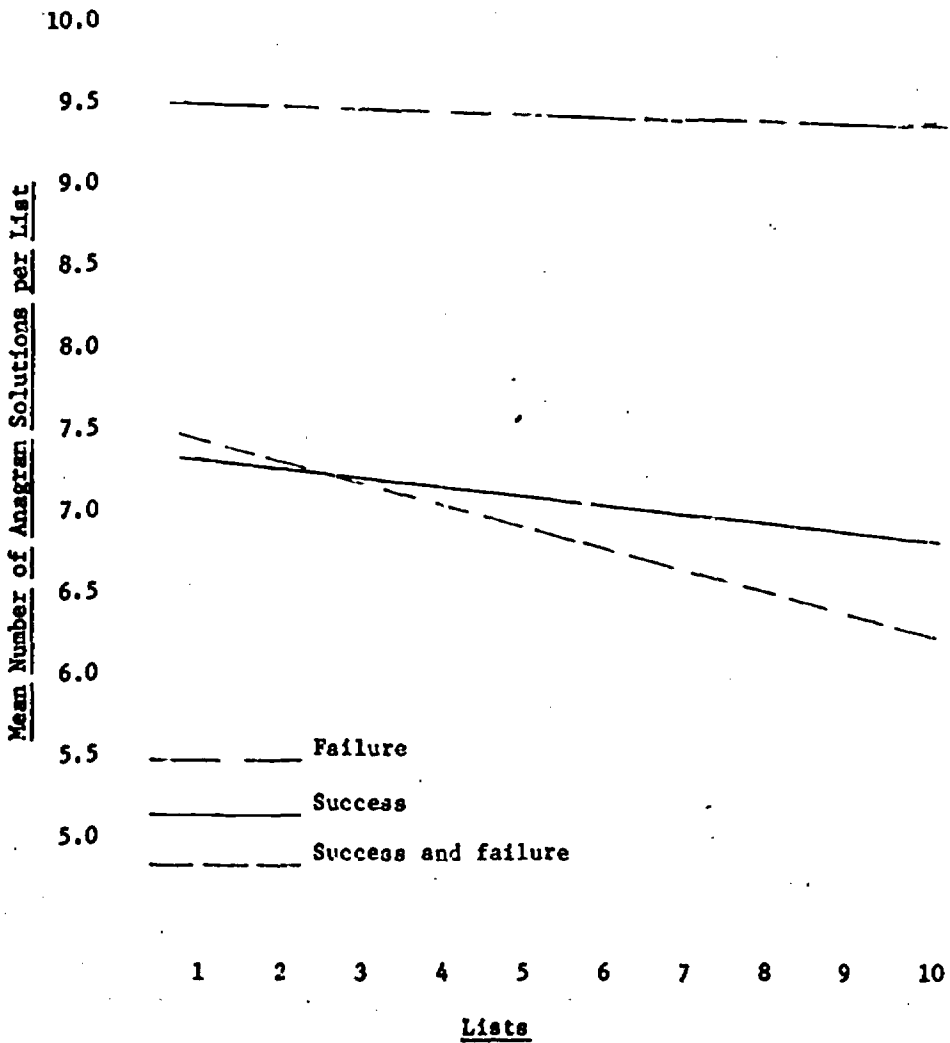
References

Atkinson, J. W. & Letwin, G. H. Achievement motive and test anxiety
conceived as motive to approach success and motive to avoid
failure. Journal of Abnormal and Social Psychology, 1960, 60,
52-61.

Buchwald, A. M. Experimental alterations in the effectiveness of
verbal reinforcement combinations. Journal of Experimental
Psychology, 1959, 57, 351-361.

Buss, A. H. & Buss, E. H. The effect of verbal reinforcement combinations
on conceptual learning. Journal of Experimental Psychology, 1956,
52, 283-287.

Feather, N. T. Persistence at a difficult task with alternative task
of intermediate difficulty. Journal of Abnormal and Social
Psychology, 1963, 66, 604-609.

Feather N. T. The relationship of persistence at a task to expectation
of success and achievement related motives. Journal of Abnormal
and Social Psychology, 1961, 63, 552-561.

Grosslight, J. H. & Child, I. L. Persistence as a function of previous
experience of failure followed by success. American Journal of
Psychology, 1947, 60, 378-387.

Holmes, S. E. & Moore, J. W. The effects of perceived success and
failure on persistence and performance. Unpublished study, 1969.

MacArthur, R. S. An experimental investigation of persistence in
secondary school boys. Canadian Journal of Psychology, 1955, 9,
42-54.