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The Development of Attributions, Expectancies and Persistence

Jacquelynne E. Parsons
University of Michigan

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Abstract

To investigate the attributional processes mediating between outcome and expectancies and persistence, children's expectancies, attributions and response latency were measured. Children, equally divided into three age groups (3-5, 6-8, 9-12) were shown figures to match and were provided with experimentally controlled feedback on outcome after every trial. In comparison to younger children, the older two age groups rated their abilities lower, the task as more difficult, and spent longer on the task. In addition, the older children's attributions , response times and expectancies were affected by the outcome while the younger children's were not affected to the same degree. In comparison to high expectancy children, low expectancy children in both the failure and success condition spent longer on the task, rated the task as more difficult and rated their ability as lower. Children in the failure condition spent longer on the task, rated their ability as lower and rated the task as more difficult. Implications of these results for our understanding of the development of achievement attributions are discussed.

The Development of Attributions, Expectancies and Persistence

A number of investigations have explored the relationship between expectancy for success and performance (Crandall, 1969; Diggory, 1966; Feather, 1966). A frequent conclusion of these studies is that the evaluation of one's likelihood for success can affect both persistence at a task and quality of performance. Recently, attention has turned to an examination of developmental determinants of variations in individuals' expectancies for success (e.g., Crandall, 1969; Heckhausen, 1967; Parsons & Ruble, 1972; Parsons, Ruble, Hodges, & Small, 1976). Consistent with this trend, the studies reported herein examined children's achievement-related expectancies as a function of age and previous successes or failures at a task. In addition, they examined developmental shifts in the relationship between attributions, expectancies and persistence (as a measure of performance).

Weiner, Frieze, Kukla, Reed, Rest & Rosenbaum (1971) suggested that achievement-related behaviors are mediated by attributions of causality. According to this model, individuals use two dimensions in making attributions of causality: locus of control and stability. The stability dimension is assumed to influence expectancies. That is, outcomes attributed to stable factors should affect expectancies while outcomes attributed to unstable factors should have a less marked effect on expectancies. Previous evidence supports the link between the stability of one's attributions and one's achievement-related expectancies in older children and adults. (Diggory, 1966; Montanelli & Hill, 1969; Weiner, 1975). However, since the stability attribution-expectancy link reflects a cognitive judgment based, in part, on the integration of one's history of previous outcomes, basic cognitive-developmental processes should influence the nature of this link in children of different ages. For example, younger children may not integrate temporally separated events in the same manner as older children or adults and therefore may respond quite differently than older children and adults to a series of successes or failures (Inhelder & Piaget, 1958). In support of this suggestion, both Diggory, (1966) and

Heckhausen, (1967) found that young children tend to respond optimistically to failure. However, neither of these studies varied age or sex systematically in their design.

In an attempt to investigate the impact of age on the relationship between cumulative experience and expectancy, Parsons and Ruble, (1972) exposed 3 groups of children (6, 8, and 10-11 year olds) to repeated success or failure experiences and then measured their expectancies for success. While they found that the 6 year olds had the highest expectancies in both the success and failure condition, all of the children in the failure condition had lower expectancies than the children in the success condition. These data suggest that, while younger children are more optimistic in their expectancies, failure influences their expectancies to about the same degree as it does older children. However, before concluding that the younger children do use serial outcome information in forming their expectations two issues need to be explored further. First, since the youngest children in this sample were already 6 years of age, they may have been too old to provide a sensitive test of the developmental hypothesis. Furthermore, all of the children may have been responding to their last failure experience rather than the series of experiences. A more accurate test of the developmental hypothesis requires a comparison of the impact of one failure experience to the impact of multiple failure experiences on the expectancies of preschool as well as older children. If children integrate their experiences accumulatively in forming expectancies, then their expectancies should vary monotonically with the number of success or failure trials.

Parsons and Ruble, 1977

To clarify these issues Parsons and Ruble (1977) conducted a second study with these modifications: (1) expectancies were taken before the task, following the first trial with feedback, and following three more trials with feedback, and (2) a

younger age group (3-5) was added. In addition, all children were given success feedback on the last trial and commended for their good performance on "this very difficult task".

Based on the theoretical consideration discussed above and on the results of previous research (Crandall, 1969; Nicholls, 1975 and Parsons & Ruble, 1972) the following developmental predictions were made: in the older but not the youngest age groups, expectancies should vary monotonically with the number of preceding outcome trials; expectancies should decline as a function of age; school age girls should have lower expectancies than their male peers. Since no developmental analyses have been made of the emergence of this sex differences, there are no empirical data available on which to base a developmental prediction. But since preschool children have been minimally exposed to peer expectancies and since parents appear to be encouraging achievements equally for preschool boys and girls (Maccoby & Jacklin, 1974, Parsons, Ruble, Hodges and Small, 1976), it is unlikely that sex differences will be evident in this age group.

As predicted, the relationship between past experience and subsequent expectancies did vary as a function of age. (See Parsons and Ruble, 1977 for details of results. Figure 1 is included here for discussion.) The pre-school-age children did not use the outcome feedback systematically in forming their expectancies, perhaps due to cognitive immaturity and limited social experience. The nature of the limitation placed on the children's response to this task by cognitive immaturity is unclear. A monotonic relationship between expectancies and outcome history depends on at least two skills: memory and integration of serial information. The preschool children could differ from the older children on either or both of these cognitive skills. Additionally, the preschoolers might have these skills but fail to see the relevance of past outcomes for future performance.

Further, the various significant interactions indicated that expectancies varied as a function of age, sex, and outcome. First, sex differences did not emerge in the preschool age group. Second, while the boys and girls in the 6 1/2-8 year old group started with equal expectations, the girls' expectancies dropped more in response to failure. This finding is consistent with previous studies reporting a more marked effect of failure on females than on males (Crandall, 1969; Nicholls, 1975; Veroff, 1969). Perhaps, as Nicholls, (1975) found, the girls in this age group make more stable attributions for their failures than the boys. Also consistent with other studies (Crandall, 1969; Parsons, Ruble, Hodges, Small, 1976), the girls in 9 1/2 - 11 year old groups began the task with lower expectancies than the boys. A comparison of the response of the 9 1/2 - 11 year old boys to failure with that of the 6 1/2 - 8 year old girls suggested that these older boys may be responding to failure as the younger girls did. An implication of this comparison is that the incorporation of failure into one's self-concept may begin earlier developmentally in females than in males. That is, boys may remain "eternal optimists" longer than females, or alternatively, girls may become "doubting realists" sooner than boys.

The expectancies of males and females on trial 5 in the success condition for the two older groups were not significantly different from one another. Perhaps, while girls may approach a new task with lower expectancies, subsequent success at the task can overcome the initial sex difference. Unfortunately, in the oldest group, the decrease in sex differences in expectancies following success was not due to an accelerated response to success among the females as appears to be the case in the 6 1/2 - 8 year old group. Instead, it was the joint result of a slight, non-significant increase in females' expectancies coupled with no significant increase in the males' expectancies. Consequently while the final expectancies of boys and girls in this age group were equal, they were both less certain of success than their counterparts in either of the younger two groups.

Finally, there was a general decline in expectancies with age. There are several possible explanations for this result. Since expectancies are related to one's concept of one's own abilities, perhaps the older children's expectancies reflect a lower estimate of their own general abilities. In support of this suggestion, Ruble (1975) found that older children rated their ability on a specific task as lower than did younger children. This developmental decline in expectancies might also reflect an increase in a child's response to failure with age coupled with a decline in response to success. The pattern of data suggests a developmental trend toward an increasing response to failure with the girls preceding the boys. Further support for this interpretation is provided by Ruble, Parsons, and Ross (1976). They found that older children both lowered their estimates of their ability more and reported feeling worse in the face of failure than did younger children. Alternatively, the older children may have learned that it is either more ego protective and/or more socially acceptable to express less rather than more certainty of success.

Neither attributions nor persistence were measured in the Parsons and Ruble (1977) study. Thus, while we have established the development of the relationship between outcome and expectancies, the mediating role of attributions and the resultant behavioral patterns have not been explored. The next study was designed to investigate the effects of outcome on attributions and persistence and the mediating role of attributions for both expectations and persistence.

Outcome, Attributions, Expectations and Persistence

Overview

To investigate the attributional processes mediating between outcome and expectancies and persistence, children's expectancies, attributions and response latency were measured. Seventy-two children equally divided into three age groups

(3-5, 6-8, and 9-12) were shown figures to match and were provided with experimentally controlled feedback on outcome after every trial; half of the children were told they had failed and half were told they had succeeded. The child's response time was recorded for each picture as a measure of effort or persistence. Low response latency was assumed to reflect low effort or persistence and high latency, to reflect high persistence. Expectancies on a six point scale were taken prior to Trial 1, Trial 3, Trial 5, and Trial 7. Several attributional questions were also asked of each child prior to the final experimental trial (Trial 7). The children rated on a nine point scale the difficulty of the task, his own effort, and ability, and his ability relative to his peers. In addition, the 3-5 and the 9-12 year olds were given the Stanford Preschool Internal-External Scale. This scale is heavily loaded with choices which could be classified as unstable in the Weinerian system.

Based on the Parsons and Ruble study and attributional theory and research, it was predicted that children in the success condition would have higher expectancies for success than those experiencing failure, and this would hold least for the preschoolers. Cumulative outcome was predicted to have an effect such that the children in both success and failure conditions in each age group would have similar expectancies for success prior to the first and second trials and thereafter, the lines would diverge. The divergence was expected to be least for preschoolers. Expectancies were expected to decline as a function of age.

With respect to response latency, it was predicted that children in the failure condition would increase their response time up to a point and then would drop their response latencies. This drop should coincide with the emergence of stable attributions for failure. Since the youngest children do not integrate cumulative outcomes into an underlying stable dimension, they may not be aware of the connection between effort and outcome, and have short attention spans, their

response times might not vary as a function of outcome, and should be lower than the response times of the older children.

With respect to the attributions, it was predicted that children in the failure condition would rate the task as more difficult than those in the success condition. Similarly, the success group should rate their ability as greater than the failure group. Further, given both the high expectancies and lower cognitive maturity of younger children, children in the youngest age group should rate the puzzles as less difficult and their ability as high regardless of condition. Also, since expectancies decline with age, the older children might perceive the task as more difficult and their ability as lower than the younger children. No specific predictions were made for effort.

With respect to the relationship between attributions and expectancies, children in success conditions who make internal, stable attributions for success should increase their expectations and their response times should remain constant children in the failure conditions who make internal, stable attributions should have lower expectancies and their response times; children in the failure condition who make internal, unstable attributions should increase their response time.

Results and Discussion

A 3 x 2 x 2 x 4 (age x sex x outcome x trial) ANOVA was used for the expectancies; a 3 x 2 x 2 x 6 ANOVA was used for the response times; a 3 x 2 x 2 (age x sex x outcome) ANOVA was used for the scaled attributions; x^2 and ANOVAs were used for the categorical attributions and the children's scores on the Stanford Preschool I-E scale. In the ANOVAs the following attributional categories were included as independent variables: in separate analyses - Success I-E, Failure I-E, Internality and Stability; in each analysis - age, sex, outcome. Using these ANOVAs the dependent measures of response times and expectancies were analyzed separately. The results will be summarized by unit of analysis. In

addition, only a select portion of the results directly related to the predictions will be presented.

3 x 2 x 2 x 4 ANOVA for expectancies. As expected, there were significant main effects for outcome (F = 55.91, df = 1, 72, $p < .0001$), age (F = 10.55, df = 2,72; $p < .0001$) and trials (F = 14,85, df = 3,216, $p < .0001$) and a significant three way interaction of age x outcome x trial (F = 4.07, df = 6,216, $p < .001$). As predicted subjects in the success group had the higher expectations for success (M failure = 3.30, M success = 4.96); children's expectancies decreased with age (M 3-5 = 4.85, M 6-8 = 3.93, M 9-12 = 3.63). The means for the three way interaction are given in Table 1. These results essentially replicate the findings of Parsons and Ruble.

INSERT TABLE 1 HERE

However, no sex differences emerged in this study.

3 x 2 x 2 x 6 ANOVA for response time. There were significant main effects for age (F = 10.42, df = 2,72, $p < .0001$), outcome (F = 4.87, df = 1,72, $p < .04$) and trials (F = 10.92, df = 5,360, $p < .0001$). Significant interactions were found for age x trials (F = 3.97, df = 10,360, $p < .0001$) and for outcome x trials (F = 6.11, df = 5,360) $p < .0001$). Children's responses increased with age (M 4-5 = 7.16 seconds, M 6-8 = 22.95 seconds, M 9-12 = 25.66 seconds) and were longer in the failure condition (M success = 14.79, M failure = 22.39). The means for the two interactions are shown in Table 2. The younger children's response times did

INSERT TABLE 2 HERE

not change over trials while the times for older two groups did. The response times for the children in the failure condition increased over trials while the response times for the children in the success condition did not change. Taken together these results probably reflect the older children's awareness

of the need for increased effort in response to failure. Contrary to our predictions, the responses to failure do not decrease at any point. Even though their expectancies were decreasing, they continued to increase their efforts. Apparently, as a group, these children had not given up hope of success, even though they reported that they expected to fail. This suggests that stated expectancies may reflect more than one's estimations of the probability of success. Perhaps, the children did not want to appear over confident or perhaps they wanted to defend against failing when they had publically stated that they thought they were going to succeed. But, whatever the reason for the low expectancies, we did not find evidence of a low-expectancy-failure cycle. Individual analyses and increased exposure to failure might reveal the low expectancy-failure cycle.

3x2x2 ANOVA for Task Difficulty Ratings. Age emerged as a significant variable affecting the perceived difficulty of the task ($F=5.66$, $p < .005$). The youngest children, aged 3-5, rated the difficulty as 3.8 on the average, while the two older groups had means of 5.4 (6-8 year olds) and 5.8 (9-12 year olds). Although none of the groups perceived the task as extremely easy or extremely difficult, the preschoolers perceived the task as significantly easier than either of the two older grops . The outcome manipulation also produced a significant effect ($F=44.75$, $p < .001$). The success group rated the puzzles as moderate to easy (3.2) while the failure group rated the puzzles as difficult (6.8).

3x2x2 ANOVA for Ability Ratings. Only the outcome manipulation produced a significant effect ($F=26.22$, $p < .001$). Subjects who had succeeded rated their ability as significantly greater than those who had failed ($M=6.92$ vs $M=3.71$). But neither group rated themselves at the extremes of their range.

For the variable of relative ability, only the outcome manipulation

yielded a significant main effect ($F=5.92$, $p<.05$). The success subjects rated themselves higher ($M=6.2$) in relative ability than did the failure subjects ($M=4.8$). Thus, subjects who had failed felt they did about the same as their friends on the task, while those who had succeeded rated their performance as slightly better than their friends. It is interesting to note that the failure group did not see themselves at the bottom in relation to their friends, but as almost identical in ability with them.

The interaction of age and sex also reached significance for the variable of relative ability ($F=4.72$, p .01), although neither age nor sex yielded main effects. Table 3 presents the means for male and female subjects in the three

Insert Table 3

age groups. With increasing age, males came to rate their abilities as better than their friends' while females came to rate their ability as equal to their friends'.

Table 3 also presents the means for the age x outcome interaction ($F=2.73$, p .07). Failure seems to affect the older children's ratings of their relative ability more than it affects the ratings of the younger children. Thus, it seems likely that the ratings of the oldest groups contributed more to the overall main effect of condition. These results support the interpretation made of the age effect in Parsons and Ruble, 1977. Older children lower their estimations of their ability more in response to failure than do preschoolers, suggesting that they are incorporating failure more into their self concept than the preschoolers.

3x2x2 ANOVA for Effort Ratings. Only the sex variable yielded significant results (F4.24, $p<.05$). On the average, females rated their effort as greater ($M=7.85$) than the males ($M=6.90$) did, although both sexes felt that they had tried quite hard. But, in fact, using response time as a measure of effort, the girls in this study did not try any harder than the boys. Taken together, these data support the finding in other studies (see Parsons, 1977) that females attribute their

outcomes more to effort than do males.

A tendency for the youngest children to rate their effort as less than the older groups ($F=2.7$, $p=.07$) also emerged. However, all age groups felt that they had tried hard on the task. In contrast to the sex difference, this effect coincided with the response time differences reported earlier. Older children do put more effort into this task.

Chi-Square Analyses of Forced Choice Attributions. The frequency counts for the four attributions as a function of age and outcome are presented Table 4. Table 5 is a summary of the Chi-square analyses. Collasping across the ages,

Insert Tables 4 and 5

success is most likely to be attributed internally and unstably,i.e. to effort, while failure is most likely to be attributed externally and stably, i.e. to task difficulty. But when testing within age this differential pattern is found only in the two older groups. The attribution of success to effort increases with age. Attributional patterns for failure do not change with age. Collapsing across outcomes, effort increases with age while the use of luck decreases with age.

Discussion of Attributional Analyses. With respect to the attributional data, several of the hypotheses were supported. Subjects in the failure condition did rate the task as significantly more difficult than children in the success condition. An age effect was also found, with the 3-5 year olds perceiving the task as less dificult than the older groups. This finding, coupled with the higher expectancies of the 3-5 year olds in the failure condition, suggests that preschoolers did not integrate cumulative outcome into a stable underlying dimension. The higher difficulty ratings found in the older groups might reflect their stable attributions for failure coupled with a greater sensitivity to the low social norm for the task. An analyses of the ability attribution did yield a

significant outcome effect, with subjects exposed to continued failure perceiving their ability as less, yet still in the 'pretty good' range. Perhaps the ability ratings failure children gave to themselves is average and not lower because subjects making stable attributions during the experiment preferred to view their outcome as due to task difficulty and not to an internal attribute like ability.

With respect to effort, the predicted outcome difference was not found. Success and failure subjects succeeded rated their efforts similarly. This result is in contrast to the difference predicted and found with respect to the outcome effect for response time. If response time is an index of effort, then subjects who failed did try harder than success subjects. Perhaps the absence of a significant difference between the conditions is due to an overestimation of their efforts by the success subjects coupled with an underestimation of their efforts by the failure subjects. The fact that success subjects attributed their succeses to effort so frequently supports the first hypothesis. There are no data available in this study that are relevant for the second hypothesis. But it does seem possible that failure subjects would underestimate their efforts so as to leave room for the conclusion that they could have succeeded if they had only tried harder. This conclusion would not only serve a defensive function for their own sense of competence but would also help to 'save face' in the eyes of the experimenter.

Sex emerged as a significant effect in relation to the effort ratings. But there was no sex difference in either the attributions of outcome to effort (12 males and 10 females attributed their outcome to effort) or on the response time measure.

The hypothesis that children in the success condition would rate their ability in relation to their friends significantly higher than those in the failure condition was supported. However, the prediction that preschoolers would evidence this least was not supported. A sex x age interaction emerged which was not anticipated. Generally, boys rated their relative ability higher with increasing age,

while girls showed the reverse pattern. It is interesting that this interaction was not found for the subjects ratings for their absolute ability. Perhaps this inconsistency reflects an awareness of the differential values assigned to each sex by the society at large. Since boys are viewed as more competent, it could be expected that as they get older and become aware of this value, they would come to see themsleves as slightly better than the other children (especially since girls are included in the others). Girls, however, seem to become more pessimistic-realistic with age and see themselves as about the same as their friends, but not worse. However, if the latter explanation is true, then one might expect only females' expectancies for success to decline with age. In fact, both sexes' expectancies declined with age. In addition, the boys should have been more likely than the girls to attribute their successes to their ability. This alao was not the case (2 boys and 6 girls attributed their successes to ability). Instead then, perhaps females' lower estimations of their relative ability reflects the ethic of modesty that is differentially adhered to by boys and girls.

Internality x Age x Outcome ANOVAs. 24 of the children in the youngest and oldest age groups were given the Stanford Preschool I-E Scale in a separate session approximately one week after participation in the expectancy attribution session. These children were divided at the median for their age group into internal and external groups. The effects of internality on expectancies and response time were tested with separate ANOVAs within each age group. Since not enough subjects were available to allow for a test of sex effects, sex was not included in the analysis.

Internality had no effect on the expectancies of the youngest children. It had a marginally significant interactive effect with outcome in the oldest group ($F=3.62$, $p=.069$). The outcome effect was more marked in the internal subjects

(M success=5.0, M failure = 2.2) than in the external subjects (M success = 4.4, M failure = 3.0).

In contrast, internality affected the response times of both age groups. In the youngest age group, there was a significant main effect for internality ($F=5.36$, $p < .05$) and a significant outcome x internality interaction ($F=4.82$, $p < .05$). The external subjects in the success condition ($M=5.25$ seconds) spent less time than their internal, success peers ($M=6.81$) while the external, failure subjects ($M=10.47$) had longer response times than their internal, failure peers ($M=6.94$). In the oldest age group, there was a trial x internality interaction ($F=2.31$, $p < .05$). Internal subjects increased their response times over the trails to a greater extent than did external subjects (see Table 6a). It is interesting to note the

Insert Table 6

similarity between the internality x trial effect and the outcome x trial effect in this age group. Both failing and internal subjects increase their response times over the trial. This suggests that the internal subjects in the failure condition should have the longest response times and they do (see Table 6b). Thus, it appears that internal subjects respond to failure with increased effort over the number of trials given in this study. Thus, for situations in which effort can alter one's outcome, internal subjects appear to have the most adaptative response to failure.

Stability and Internality Analyses. ANOVAs using the subjects' attributions to internal vs external and stable vs unstable factors were planned. However, there were not a sufficient number of subjects in each experimental cell to allow for reliable statisical tests.

Correlations between Dependent Measures. The relationships amongst internality, response time, expectancies and the attributional ratings were assessed through correlational analyses done within outcome group collapsing across age. All correlations presented are significant at the .05 level or better.

As presented in Table 7, all the expectancies obtained from children in the

Insert Table 7

success condition correlated with each other. Thus, if a child initially expected success, he would continue to expect to succeed on subsequent trials. If a child's initial expectancy was low, it remained low on later expectancy trials despite success. For the failure subjects, the initial expectancy correlated only with the expectancy taken (second trial). This correlation was relatively low. All other expectancies for the children in the failure condition correlated with each other. Thus, ff a child had a high (or low) expectancy for success on the second trial (after he had had failure feedback), he would continue to have a high (low) expectancy for success on subsequent trials.

As illustrated in Table 8, all response times correlated positively with each other for children in both the success and failure conditions. Thus,

Insert Table 8

if a subject in either outcome condition had a high (low) response time relative to other subjects on the first trial, he would continue to have a relatively high (low) response time on subsequent trials.

Table 9 presents the correlations for each expectancy measure with each response time trial for children in the different experimental outcome conditions. Response time correlated negatively with success subjects' initial expectancies, such that a child with high initial expectancies for success spends less time than a child with low initial expectancy. Only the first two time trials correlated with success subjects' second expectancy measures, while all but the last correlated with their third expectancy measure. None of the response times correlated with the success children's last expectancy. For failure subjects, expecancies 2, 3, and 4 were negatively correlated with nearly all response times. However, initial expectancies were not significantly correlated with any response times. Thus, for

failure children, while the initial expectancy was not related to how long they spent responding, the other expectancies were. Subjects in the failure condition who had the lowest expectancies on any of the last three expectancy trials spent the longest time before selecting the puzzle match. Children who had the highest expectacies for success after the first trial with failure feedback had the shorter response times.

Correlations were also computed for success and failure subjects with respect to internality scores obtained from the SPIES. Total I-E scores for both success and failure children correlated positively with puzzle difficulty (success r=.30, failure r=.38). Subjects with the highest I-E scores rated the puzzles as the most difficult while subjects with lower I-E scores rated them less difficult. With the exception of one trial for each condition, total I-E did not relate consistently to either response time or expectancy. Within the success condition, a positive correlation was found for total I-E and relative ability (r=.314).

Internality scores were also broken down into component scores - internality for positive outcomes and internality for negative outcomes - and correlated with the other dependent measures within success and failure conditions. For subjects in both conditions, positive I-E correlated with total I-E (success, r=.73; failure, r=.76). This is the only correlation involving positive I-E found to be significant in the failure condition. However, for the success children, significant positive correlations were found for positive I-E and initial expectancy (r=.35) and comparative ability (r=.51). This suggests that children who are high internal for positive outcomes and are in a condition with success have high initial expectancies for success and rate their relative ability as high.

Negative I-E scores correlated with more measures for failure subjects than for success children. For both success and failure subjects, negative I-E correlated with total I-E (success, r=.73; failure, r=.82). No other correlations involving negative I-E in the success condition were significant. For children in the failure condition, negative I-E correlated with expectancy 2 (r= -.40), all

response time trials (range: r=.31 to r=.41), and with puzzle difficulty (r=.31). Failure children who were high internal for failure have low expectancies for success on the first trial after the negative feedback has been given. Failure children who are internal for failure also have the longest response times on all trials and perceive the task as the most difficult. But they do not rate their efforts as the highest or their abilities as the lowest.

As with the other correlations reported, some similarities and difference emerged between success and failure children for variables with which puzzle difficulty correlated. For children in both outcome conditions, ratings of puzzle difficulty correlated positively with response time trials (range: success, r=.32 to r=.44; failure, r=.33 to r=.38). Thus, children, regardless of outcome condition, who rated the puzzles as themost difficult had had the highest response times for all trials. All expectancies except one correlated negatively (range; r= -.36 to r= -.39) with puzzle difficulty for children in the success condition, indicating that children who rated the puzzles to be easy had had the highest expectancies. For failure subjects, expectancies were not related to rated puzzle difficulty but puzzle difficulty correlated with negative I-E (see above), effort (r=.52), ability (r= -.42) and relative ability (r= -.30). Children who rated the puzzles as hard rated their efforts as high and their abilities as low.

The attributions of ability and relative ability correlated positively with each other in both conditions (success, r=.63; failure, r=.55). For children in the success group, ability correlated with all expectancies (range; r=.58 to 5=.74), indicating that subjects who had succeeded and had high expectancies for success rated their ability as high. A similar finding emerged for success subjects with respect to relative ability and expectancies, although here, the initial expectancy was not significantly related (range: r=.58 to r=.62). For failure subjects, both

ability and comparative ability ratings correlated with puzzle difficulty, as mentioned above. In addition, comparative ability correlated with the three response time trials immediately preceeding the questioning (number 3, $r = -.35$; number 5, $r = -.33$; number 6, $r = -.40$). Thus, subjects who had the longest response times on the last several pictures rated their abilities as the lowest.

The attribution of effort correlated with few variables for subjects in either outcome condition. For failure subjects effort correlated negatively with the last expectancy ($r = -.50$) and with puzzle difficulty (see above). Children exposed to failure who rated their efforts as the highest had the lowest final expectancies. For success children, effort correlated only with initial expectancies ($r = -.31$) such that children who initially expected failure rated their efforts as the highest.

Discussion of Individual Difference Analyses. Several correlations found to be signifanant reflected consistency within subjects, and as such, can be viewed as lending validity to the measurements in question. For example, relative ability ratings correlated with ability ratings for both success and failure children. Within both these attribution ratings, there seems to be a common core of "ability." Similarly, for children in both outcome conditions, all response time trials were positively correlated. This is interesting because it suggests that there were certain consistencies within individuals, even though the response times changed markedly across trials.

The positive correlations between the different expectancies also reflect within subject consistency. In the failure condition, all expectancies taken after the first failure feedback were positively correlated, while the initial expectancy correlated only with the second measure taken. The failure of the initial expectancies of these children to correlate with subsequent expectancies probably reflects the impact of outcome feedback; once the subjects were told they had failed to find the correct match, they lowered their

expectancies. Furthermore, the effect of failure on their expectancies was not related very highly to their initial expectations. The initial expectancies of these children probably reflected their initial self-confidence. In support of this conclusion, the initial expectancies of the failure children did not correlate significantly with any response time trials. However, significant negative correlations did emerge for each subsequent expectancy with most time trials. Only the first time trial was inconsistently related to the expectancies taken after feedback had been provided. This suggests that children in the failure condition adjusted both their expectancies and their persistence in response to the negative feedback given on their performance.

In success, only the first and third expectancies related to response trials. The correlation between the first expectancy measure and all time trials could reflect a relationship between self-confidence and effort. This coincides with other data (Crandall, 1969) which suggests a relationship between self-esteem and performance. The negative correlation of the second expectancy with only the first two time trials suggests that, at this point, cumulative outcome feedback was not yet being used to adjust persistence and that self-confidence was still the primary basis for effort output. With the third expectancy trial, however, there was a re-emergence of a correlation between expectancies and response time trials. Perhaps by the third trial, all subjects had received sufficient cumulative feedback to "trust their performance record" and use it in conjunction with self-confidence to adjust their effort output with their expectancies. The failure of the fourth expectancy to correlate with any response time trials does not weaken this hypothesis because the intervention involving attribution responses which preceded it could have upset the outcome-expectancy-effort link. Because the subjects were required to examine their performance and provide explanations for their behavior at that point, the consistency and fluidity needed for expectancy, effort,

and outcome to become and remain linked on the task had been broken.

Correlations of expectancy with other dependent measures differed for success and failure children.A fairly consistent pattern emerged for the success subjects. Children with high expectancies rated their ability and relative ability high, rated the task as moderately easy, and had relatively short response times. In contrast, children with low expectancies rated the task as easy, their abilities as low, and had longer response times. Similarly, subjects who were external on the SPIES rated the task as easy. These patterns support the attribution-expectancy-behavior link posited by Weiner and his associates. Children with high expectancies are making , stable, internal attributions for their successes and are behaving accordingly. Children with lower expectancies and children who are external for success make external attributions for their successes. The fact that the low expectancy children also have longer response times suggests that they are altering their efforts to coincide with their expectancies. That is, since they have longer expectancies, they may be increasing their efforts to increase the likelihood of success. It is also possible that both their expectancies and their efforts reflect a more generally cautious approach to tasks. The fact that the internal children (as measured with SPIES) have longer response times probably reflects the impact of the perception of a difficult task on subjects who are internal for success. Under this condition, internal subjects should increase their response time more than external subjects.

The patterns in the failure condition are less straight forward. The expectancies of these children dropped across trials suggesting the attribution of their outcomes to stable factors. Given the pattern for the success subjects and given Weiner's model of attribution, one would expect a correlation between expectations and one's perceptions of one's abilities. But this is not the case. Failure subjects did not seem to be integrating their repeated failures into an

internal, stable attribution. Perhaps, they were making a stable, external attribution. If this were the case, then expectancies ought to correlate with ratings of task difficulty. But this also was not true. Only the last expectancy measure correlated with puzzle difficulty ratings, such that a subject who rated the puzzles as difficult had the lowest expectancies on the final trial. This single correlation could be a function of the subjects' remembering the ratings just given and adjusting their final expectancies accordingly. Thus, it seems that expectancies were not clearly related to either internal or external Stable factors.

The picture is made even more confusing when one looks at the inverse relationship between expectancies and negative I-E. People who were internal for failure reported the lowest expectancies, suggesting again that low expectancies reflected the internalization of failure. But negative I-E correlated positively with ratings of task difficulty. The failure subjects who were highest on internality for failure seemed to be making external attribution in this situation. However, if one considers response time as reflecting the internal attribution of effort, then these subjects were making internal (although unstable) attributions, e.g. negative I-E was found to correlate positively with all the response time trials. Additionally, expectancies correlated negatively with response time. That is, subjects who were high internal for failure and whose expectancies were the lowest, spent longest on each puzzle. Thus it seems clear that the highly internal, failure subjects were acting as though they were making unstable attributions for their failures. Their task difficulty ratings probably reflected realistic assessments. After all, they were trying hard and still failing. But their response times indicated that they had not yet given up. Consequently, it could be inferred from their behavior that they had not yet made a <u>stable</u> attribution for their failure. The task was difficult but success was still within the range of possibility. It is only their verbal statements, the expectancies and task difficulty ratings, that would suggest

stable external attributions for failure. Maybe these children, while operating throughout the task as if they were making unstable, internal attributions for their failures, preferred to attribute their failure, when asked, more to external factors.

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Table 1

Means for the 3 x 2 x 2 x 4 ANOVA for Expectations:

Three Way Interactions

Age	Outcome	Trials			
		1	3	4	7
	Success	5.4	5.2	5.4	5.4
3-5					
	Failure	4.6	4.9	3.9	3.8
	Success	4.7	4.6	5.0	5.0
6-8					
	Failure	4.8	3.0	2.6	1.7
	Success	4.7	4.9	5.3	3.8
9-12					
	Failure	4.1	2.3	1.8	1.9

Table 2

Means for the 3 x 2 x 2 x 6 ANOVA at Responses Latencies: Age x Outcome x Trials

Age	Outcome	Trials 1	2	3	4	5	6
3-5	Success	8.5	6.0	6.5	6.8	7.1	6.4
	Failure	6.5	6.4	5.6	9.8	7.3	8.9
6-8	Success	9.8	14.8	11.8	14.1	16.8	14.8
	Failure	19.0	24.8	29.3	29.1	39.9	50.8
9-12	Success	15.9	22.0	28.2	28.9	26.4	21.1
	Failure	11.8	21.8	29.4	30.3	36.7	35.4

Table 3

Average Ratings of Relative Ability for the Different Age Groups for the Different Sexes and Different Conditions.

		4-5 yrs.	6-8 yrs.	9-12 yrs.
Age By Sex	Males	4.9	6.1	6.2
	Females	6.9	4.4	4.5
Age By Condition	Success	5.7	6.6	6.3
	Failure	6.1	3.9	4.4

Table 4

Frequency Count for Attributions

Attribute	Outcome	Age 3-5	6-8	9-12
Ability	Success	3	1	4
	Failure	1	2	2
Effort	Success	1	9	10
	Failure	0	1	1
Task Difficulty	Success	5	1	0
	Failure	9	6	8
Luck	Success	5	3	0
	Failure	5	5	2

Table 5

Summary of Chi-Square Analyses

Test	Group	Significance
Internality x Age	Success	$p < .01$
Within Outcome	Failure	NS
Internality x Outcome	3-5	NS
Within Age	6-8	$p < .01$
	9-12	$p < .01$
Stability x Age	Success	NS
Within Outcome	Failure	NS
Stability x Outcome	3-5	NS
Within Age	6-8	$p < .05$
	9-12	$p < .01$
Ability x Age	Success	NS
Within Outcome	Failure	NS
Effort x Age	Success	$p < .01$
Within Outcome	Failure	NS
Task Difficulty x Age	Success	$p < .05$
Within Outcomes	Failure	NS
Luck x Age	Success	NS
Within Outcome	Failure	NS
Ability x Outcome	3-5	NS
Within Age	6-8	NS
	9-12	NS
Effort x Outcome	3-5	NS
Within Age	6-8	$p < .01$
	9-12	$p < .01$

Task Difficulty x Outcome	3-5	NS
Within Age	6-8	$p < .05$
	9-12	$p < .01$
Luck x Outcome	3-5	NS
Within Age	6-8	NS
	6-12	NS
Ability x Age		NS
Effort x Age		$p < .01$
Task Difficulty x Age		NS
Luck x Age		$p < .05$
Internality x Age		$p < .05$
Stability x Age		NS
Ability x Outcome		NS
Effort x Outcome		$p < .01$
Task Difficulty x Outcome		$p < .01$
Luck x Outcome		NS
Internality x Outcome		$p < .001$
Stability x Outcome		$p < .05$

Table 6

a: Mean Response Times as a Function of Internality, Age, and Trials

Age	Internality	Trials					
		1	2	3	4	5	6
3-5	Internal	6.7	5.0	5.6	6.1	5.6	7.2
	External	9.1	7.7	7.2	11.6	8.0	8.8
9-12	Internal	12.8	31.0	26.2	34.8	37.4	30.1
	External	11.5	17.4	18.9	17.6	21.8	22.2

b: Mean Response Times as a Function of Internality, Outcome and Trials with the 9-12 Year Old Group

Internality	Outcome	1	2	3	4	5	6
Internal	Success	11.3	17.3	20.5	30.7	29.7	21.3
	Failure	14.3	24.7	31.8	39.0	45.2	38.8
External	Success	15.3	16.8	12.7	13.0	13.6	13.0
	Failure	7.7	18.0	25.2	22.2	30.0	31.3

Table 7

Correlations of Expectancies with Each Other

Condition	Expectancy Number	1	2	3	4
Success	1	---	.545	.582	.536
	2	.545	---	.597	.510
	3	.582	.597	---	.865
	4	.536	.510	.865	---
Failure	1	---	.342	NS	NS
	2	.342	---	.467	.477
	3	NS	.467	---	.838
	4	NS	.477	.838	---

Table 3

Correlations of Response Times with Each Other

	Time / Trial	1	2	3	4	5	6
Failure	1	---	.686	.584	.487	.596	.484
	2	.686	---	.718	.527	.675	.650
	3	.584	.718	---	.840	.803	.824
	4	.487	.527	.840	---	.708	.769
	5	.596	.675	.803	.708	---	.606
	6	.484	.650	.824	.769	.606	---
Success	1	---	.906	.872	.827	.764	.767
	2	.906	---	.940	.941	.892	.915
	3	.872	.940	---	.931	.876	.891
	4	.827	.941	.931	---	.947	.950
	5	.764	.892	.876	.947	---	.977
	6	.767	.915	.891	.950	.977	---

Table 9

Correlations of Response Times with Expectancies

		Response Time Trial					
	Expectancies	1	2	3	4	5	6
Success Ss	1	-.657	-.628	-.628	-.571	-.508	-.549
	2	-.359	-.314	(-.299)[1]	(-.264)	(-.238)	(-.219)
	3	-.331	-.383	(-.281)	-.343	-.356	-.354
	4	(-.140)	(-.199)	(-.202)	(-.193)	(-.267)	(-.285)
Failure Ss	1	(-.068)	(-.115)	(-.010)	(-.010)	(+.010)	(-.073)
	2	(-.267)	-.500	-.520	-.423	-.440	-.580
	3	-.367	-.477	-.511	-.484	-.560	-.330
	4	(-.180)	-.388	-.395	(.294)	-.320	-.360

[1]Values enclosed in parentheses are not significant.

Figure 1

Means for the Age x Sex x Outcome x Trials Interaction