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Perceived Personal Control and Academic Achievement

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Perceived control of events is one motivational variable that appears to affect children's academic achievement. In this review the conceptualization and measurement of the control dimension is discussed from three theoretical perspectives: social learning theory, attribution theory, and intrinsic motivation theories. For each of these three perspectives evidence on the relationship between achievement and perceptions of control is summarized, and possible explanations for the relationship are discussed. Throughout this review similarities and differences among these orientations are pointed out. Specific recommendations are made for research which will advance our understanding of this relationship and which will provide the most useful information to educators.

Studies demonstrating a relationship between personality or motivational variables and school achievement have proliferated in psychological research over the past two decades. These studies are of great potential value to educators: If students' personality or motivation are more amenable to change than their ability, then achievement might be enhanced indirectly through educational practices that positively affect personality and motivational development.

Perceived control of events is one motivational variable that appears to affect children's academic achievement. In this review we attempt to integrate evidence on the relationship between achievement and perceptions of control from three theoretical perspectives: social learning theory, attribution theory, and intrinsic motivation theories. We discuss the conceptualization and measurement of the control dimension of each theory and summarize the evidence on the relationship between children's perceptions of control and academic achievement.

Researchers with these different theoretical orientations tend to employ different methods and to use different vocabularies in discussing their research. Consequently, similarities in concepts and findings from different theoretical orientations are frequently not recognized. Throughout this review we point out similarities and

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differences among these orientations in order to provide the most useful information to educators.

Social Learning Theory

Most research on perceptions of personal control is grounded in social learning theory. "Locus of control" (LOC) is defined as a generalized expectancy for internal or external control of reinforcements. "Internal control" refers to an individual's belief that an event or outcome is contingent on his or her own behavior or on relatively permanent characteristics such as ability. The belief that an event is caused by factors beyond the individual's control (e.g., luck, task difficulty, powerful other) has been labeled "external control." Rotter (1966) claims that if reinforcement is not seen as contingent on the subject's own behavior, then it will not increase the subject's expectancy that a particular behavior or event will be followed by reinforcement in the future. Rotter (1975) states further that, "expectancies in each situation are determined not only by specific experiences in that situation but also, to some varying extent, by experiences in other situations that the individual perceives as similar" (p. 57).

Social learning theorists suggest that children's behavior in achievement situations is influenced by their perceived locus of control. If the child believes that the outcome of a situation is contingent on his or her behavior (internal locus of control), then according to social learning theory, academic success will increase the likelihood of a child's instrumental behaviors such as attention or persistence at future tasks. Conversely, if there is no perceived contingency between outcome and behavior (external locus of control) then academic success will *not* increase the likelihood of such instrumental behaviors in the future.

Rotter (1975) has elaborated on this locus of control conceptualization, clarifying the proposed relationship between locus of control and academic achievement. He explains that a child's expectation that a particular behavior will bring a particular reinforcement is not the only predictor of the occurrence of that behavior. The *value* of the expected reinforcement is also important. A student who does not value a high grade, for example, may not study for a test, even though the student believes that the high grade is contingent on studying.

Rotter (1966) and other social learning theorists (see Rotter, Chance, & Phares, 1972, or Lefcourt, 1976, for a review) have always claimed that situational variables influence an individual's perceptions of the contingency of reinforcement as does a generalized expectancy that developed from past experiences in similar situations. Rotter (1975) comments that "the relative importance of generalized expectancy goes up as the situation is more novel or ambiguous and goes down as the individual's experience in that situation increases" (p. 57). Generalized expectancies should therefore be less predictive of achievement behavior for individuals who have had extensive experience in academic settings than for individuals who have had less experience.

Also, according to social learning theory, a broad measure of generalized expectancies should show modest correlations with a variety of behaviors; a more narrowly defined generalized expectancy measure should be highly correlated with specific behavior related to that domain of expectancy contained in the measure and should not correlate with behavior in other domains. A corollary of this principle is that a

measure of expectancy in academic situations is more predictive of achievement behaviors than is a general measure of expectancies.

Rotter (1975) points out that the relationship between generalized reinforcement expectancies and achievement is usually lower for college students than for younger children. He offers several explanations for the age difference. First, achievement situations are least novel and least ambiguous for college students. Consequently, the predictive power of generalized reinforcement expectancies should be lower for this group. Second, Rotter believes that those people whose achievement behavior is affected by external attitudes are less likely to go on to college. Rotter suggests that many college students who appear to believe that external factors affect the outcome of most situations are "defensive externals," that is, their claim that reinforcements are externally controlled is only a defensive mechanism and not a reflection of their true attitudes. These defensive externals are just as ambitious and competitive as "internals" and thus achieve at an equally high level. Because generalized reinforcement expectancies tend not to predict achievement for college students and because the relationship between expectancy beliefs and achievement, when it exists, may have unique characteristics (e.g., "defensive externality"), studies of college students are not reviewed in this paper.

More studies on the relationship between children's perceptions of personal control have been done from a social learning perspective than from any other theoretical orientation. These studies (reviewed below) share similar methodologies: They most commonly assess the relationship between children's scores on a questionnaire measure of locus of control and scores on some global measure of achievement. In a limited number of studies, the relationships between scores on a locus of control measure and children's specific behaviors in achievement contexts are examined. A few studies have examined the causal direction of the relationship between locus of control and achievement. The divergent content and designs of the different questionnaire measures used in this research necessitate a preliminary discussion of the measures themselves.

Questionnaire Measures

Table I summarizes characteristics of the most commonly used locus of control questionnaire measures for children.

The measures have essentially three kinds of formats: agree-disagree, choice of attribution, and open-ended, which are best described by example. The Children's Locus of Control Scale (Bialer, 1961) exemplifies the agree-disagree format. Children are presented with a series of belief statements with which they are asked to agree or disagree (e.g., "When somebody gets mad at you, do you usually feel that there is nothing you can do about it?"). The Intellectual Achievement Responsibility (IAR) Questionnaire (Crandall, Katkovsky, & Crandall, 1965) is the most widely used questionnaire measure with the choice-of-attribution format. Children respond to statements describing hypothetical outcomes by endorsing one of two causes for the outcome (e.g., "When you have trouble understanding something in school, is it usually . . . (a) because the teacher didn't explain it clearly, or (b) because you didn't listen carefully?"). The open-ended format is exemplified by the Stephens-Delys Reinforcement Contingency Interview (Stephens & Delys, 1973). Children are asked to reply to open-ended questions such as "What makes mothers smile?"

TABLE I

Questionnaire Measures of Children's Locus of Control

Measure	Age-Appropriate	Reliability		Format	Domain	Outcome			References
		Internal Consistency	Test-Retest			Pos.	Neg.	Neu.	
Academic Achievement Accountability (AAA)	Middle-elementary grades	.66	.67	Agree-disagree	School	6	6	3	Clifford & Cleary (1972)
Children's Locus of Control Scale (Bialer-Cromwell)	Grades 1–6	−.01 – .87	.22 – .84	Agree-disagree	General	15	4	4	Bialer (1961) Gorsuch, Henighan, & Barnard (1972)
Children's Nowicki-Strickland Internal-External Control Scale (CNSIE)	Ages 9–18	.24 – .63	.63 –. 71	Agree-disagree	General	17	12	11	Nowicki & Strickland (1973)
Children's Picture Test of Internal-External Control (Battle)	Elementary-school aged			Open-ended	General	1	5	0	Battle & Rotter (1963)
Fate Control	Adolescents & Adults			Agree-disagree	General	3	0	0	Coleman et al. (1966)
Gruen, Korte, Stephens Internal-External Scale (GKSIE)	Grades 2–6	.69 – .79	.83	Choice of attribution	School	19	19	0	Gruen, Korte, & Baum (1974)

Intellectual Achievement Responsibility Questionnaire (IAR)	Grades 3–12	.54 – .60	.47 – .74	Choice of attribution	School	17	17	0	Crandall, Katkovsky, & Crandall (1965)
Internal-External Locus of Control Scale (Rotter)	Adolescents & Adults	.65 – .79	.49 – .83	Agree-disagree	General	8	7	8	Rotter (1966)
Locus of Control Picture Test for Children (ETS)	Lower-elementary	.56 – .61	.43	Choice of attribution	School	10	10	0	Stipek (1980)
Preschool & Primary Nowicki-Strickland Internal-External Control Scale (PPNS-IE)	4–8 years		.79	Agree-disagree	General	14	3	1	Nowicki & Duke (1974)
Stanford-Preschool Internal-External Scale (SPIES)	3–6 years	.14 – .20	.21 – .72	Choice of attribution	General	6	8	0	Mischell, Zeiss, & Zeiss (1974)
Stephens-Delys Reinforcement Contingency Interview (SDRCI)	Preschool	.82	.62 – .69	Open-ended	General	20	20		Stephens & Delys (1973)
Tel Aviv Locus of Control Scale (Tel Aviv)	Grades 4–8	Past Scale: .31 – .61	Future Scale: .74 – .84	Choice of attribution	General	12	12		Milgram & Milgram (1975)

Note: References on primary source of psychometric information.

Questionnaire measures also differ in the kind of situations or domains described by the items. While most measures include items concerning many different areas of reinforcement, a few (e.g., the IAR) concentrate on school situations. Another important difference in measures concerns the relative number of positive and negative outcomes described in the items. Only a few of the measures provide separate subscores for perceptions of control of positive and negative outcomes.

Many other differences in format and content of children's locus of control measures are discussed in detail elsewhere (Weisz & Stipek, Note 1). We consider below only those differences that may affect findings on relations between locus of control and achievement.

Locus of Control and Academic Achievement

Most studies on locus of control and academic achievement report correlations between questionnaire scores and scores on one or more achievement measures. In a few studies, children are classified as either "internal" or "external" on the basis of median splits, and the academic achievement of the two groups is compared, usually by analysis of variance. Table II summarizes the results of published studies.

Most of the published studies have resulted in a significant relationship between locus of control questionnaire scores and achievement, at least for some of the groups of children studied. In the following section, we will examine factors that seem to influence the results, such as characteristics of the locus of control measures, type of achievement measure used, and type of children sampled. The causal direction of the relationship between locus of control and achievement will also be considered.

Questionnaire Characteristics and the Locus of Control Construct

Reliability. The low reliability which is characteristic of many of the questionnaire measures (see Table I) can both attenuate and undermine the consistency of an observed relationship between scores on the locus of control measure and any other dimension assessed, including academic achievement. Additionally, if the locus of control measure is more reliable for some children than for others, the relationship between locus of control and achievement will be obfuscated. Evidence from Gorsuch, Henighan, and Barnard (1972) suggests that reading ability may affect the reliability of some locus of control measures. To be sure, most scales of this type are probably more reliable for good readers than for poor readers. This is important to keep in mind for our present purposes because differences in a scale's reliability across a range of levels of ability on another measure, such as verbal ability, may lead to spurious correlations between the scale and the ability measure.

Domain. Rotter (1975) claims that a narrow, specific generalized expectancy measure should allow greater prediction of behavior in a situation of the same subclass than would a broad generalized expectancy measure. Following this reasoning, one might expect school achievement to be more highly correlated with perceptions of control in achievement situations than with perceptions of control in diverse situations. Questionnaire measures concerning only academic achievement situations (IAR, AAA, GKS-IE, ETS) have consistently yielded positive relationships between internality and achievement. However, the studies do not directly contrast the relationship between achievement and school-related versus nonschool-related measures of locus of control. The only study that compared a school-based measure (IAR) to a general measure (Bialer-Cromwell) found, counter-intuitively, that the

general measure was more highly correlated to GPA than the school-based measure (Powell, 1971).

Positive versus negative outcomes. Crandall et al. (1965) argue that responsibility for success develops independently of responsibility for failure and that these two kinds of responsibility may be differentially related to school achievement. Indeed, a child may attribute success to high ability, but quite logically maintain that it makes no sense to attribute his or her failure to low ability. Thus, if achievement is differentially related to responsibility for positive and negative outcomes, the observed relationship will depend, in part, on the relative number of positive and negative outcomes included in the scale. The correlations between achievement and responsibility for positive versus negative outcomes (IAR^- and IAR^+) can be compared 17 times (see Table II). The correlations are usually significant and in the same direction for both IAR^+ and IAR^-. Perhaps these two subscales would predict different achievement behaviors following a success or a failure experience. However, the expectation that the two subscales would be differentially related to school achievement is not borne out by the cumulative evidence.

Achievement Measures

Inspection of Table II reveals some evidence that locus of control questionnaire scores predict grades more strongly than they predict standardized achievement test scores (McGhee & Crandall, 1968 [for older children]; Messer, 1972; Nowicki & Segal, 1974 [for girls]). McGhee and Crandall suggest that teachers' grades are likely to directly reflect factors such as effort, persistence, and initiative, all of which figure directly in children's responses to measures of locus of control. Achievement tests reflect such factors only indirectly by measuring the child's acquired skills.

Person Variables

Age. Rotter (1975) suggests that a measure of generalized reinforcement has the greatest predictive power for behavior in unfamiliar, novel situations. Consequently, a general LOC measure should be more highly related to younger children's than to older children's achievement because younger children have had less experience in achievement situations than older children. Seven studies compare the relationship between locus of control and school achievement for children of different ages (Bartel, 1971; Clifford & Cleary, 1972; Kifer, 1975; Lessing, 1969; McGhee & Crandall, 1968; Nowicki & Strickland, 1973; Reimanis, 1973). There is some evidence (Bartel, 1971) that scores on the Bialer-Cromwell scale might be more highly correlated with achievement among older children than younger children. But because of the superior reading ability of the older children, this pattern might be an artifact of the relation between scale reliability and reading ability (see Gorsuch et al. 1972). Otherwise, no consistent age differences emerge from the findings of these seven studies.

Sex. Some researchers, most notably Nowicki and his colleagues, claim that the relationship between internal locus of control and achievement is stronger for boys than it is for girls. An overview of the studies in which the results of boys and girls are reported separately provides support for this belief only when the CNS-IE scale is used. The stronger relationship for boys frequently found by Nowicki and colleagues with the CNS-IE might be explained by a mediating variable: social desirability. Nowicki and Walker (1973) found a significant relationship between

TABLE II

Summary of Studies on the Relationship Between Locus of Control and School Achievement

Study	Sample	Achievement Test	Locus Measure	Results				
				Surburban			*Inner-City*	
Alker & Wohl (1972)	N = 375 Grade: 11 & 12 Suburban & Inner-city	GPA	Rotter's I-E Scale	$r = .09$			$r = .26$	
				Boys			*Girls*	
Barnett & Kaiser (1978)	N = 138 Grades: 4, 6, & 8 Middle class	IQ	IAR I^{Tot}	$p < .05$			n.s.	
		Achievement Tests (Metropolitan & SRA)		$p < .05$			n.s.	
		GPA		$p < .01$			n.s.	
				Grade	*1*	*2*	*3*	*4*
Bartel (1971)	N = 431 Grades: 1, 2, 4 & 6 Lower and middle class	Metropolitan Reading Readiness (from grade 1)	Bialer-Cromwell	Lower-SES	$r = .13$	$r = .13$	$r = .23$	$r = .14$
				Middle-SES	$r = .31$	$r = .30$	$r = .52^{**}$	$r = .39^{*}$
		Iowa Test or Metropolitan Achievement Test (from grades 2 & 4)		Lower-SES	n.d.	$r = -.04$	$r = .36^{**}$	$r = .32^{*}$
				Middle-SES	n.d.	$r = .36^{*}$	$r = .49^{**}$	$r = .48^{**}$
Bottinelli & Weizmann (1973)	N = 23 Age: 7–10 Rural	GPA	GKSIE			$p < .05$		

				Boys	*Girls*
Buck & Austrin (1971)	N = 50 Ages: 14–16 SES: Low	Iowa Test of Basic Skills (matched group, adequate & underachievers)	IAR I^{+} I^{-} I^{Tot}	$p < .01$ n.s. $p < .01$	$p < .01$ $p < .01$ $p < .01$
Clifford & Cleary (1972)	N = 99 Grades: 4, 5 & 6	Achievement: Spelling Vocabulary Math	AAA	 $r = .47^{***}$ $r = .44^{**}$ $r = .24$	 $r = .03$ $r = .30^{*}$ $r = .16$
Coleman et al. (1966)	N = 356, 860 Grades: 6, 9 & 12 National sample	ETS: Sequential Tests of Educational Progress Series (& others)	Fate Control	Regression analyses showed Fate Control score to predict achievement better than most family & school variables.	
				Boys	*Girls*
Crandall, Katovsky, & Preston (1962)	N = 40 Grades 1, 2, & 3 All SES	California Achievement Test: Reading Arithmetic	IAR I^{Tot}	 $r = .51^{*}$ $r = .38^{*}$	 $r = -.03$ $r = -.13$
DeCharms & Carpenter (1968)	N = 214 Grades: 2, 6, 7 Black, disadvantaged	Spelling test Math test	Bialer-Cromwell	n.s. n.s.	$p < .05$ $p < .05$
Finch, Pezzuti, & Nelson (1975)	N = 48 Mean age: 11 years Emotionally disturbed	Standard achievement test (unspecified)	CNS-IE	$r = .45^{**}$	

TABLE II—*Continued*

Study	Sample	Achievement Test	Locus Measure	Results			
				Boys		*Girls*	
Gordon (1977)	N = 113 Grade: 4 Lower-middle to upper-middle	Iowa Test of Basic Skills	CNS-IE	n.s.		$r = .27^{*}$	
		GPA		$r = .25^{*}$		n.s.	
Gruen, Korte & Baum (1974)	N = 50 Grade: 2 White	GPA	GKSIE		$r = .34^{*}$		
				Southern		*Northern*	
				Boys	*Girls*	*Boys*	*Girls*
Jorgensen (1976)	N = 725 Grade: high school Black	Vocabulary	Social	$r = .22$	$.27^{***}$	.22	$.28^{***}$
		Achievement Test	Reaction	$r = .16^{*}$	$.17^{*}$	$.20^{*}$	$.26^{**}$
		GPA	Inventory	$r = .17^{*}$	$.15^{*}$	.15	$.27^{***}$
Karmos (1978)	N = 42 Grade: 6	Stanford Reading Test	Bialer-Cromwell		$p < .05$		
Kennelly & Kinley (1975)	N = 49 Grade: 6 Boys	Iowa Test of Basic Skills:	IAR^{Tot}				
		Vocabulary			$r = .48^{**}$		
		Reading Comprehension			$r = .47^{**}$		
		Language Skills			$r = .40^{**}$		
		Work Study Skills			$r = .41^{**}$		
		Arithmetic Skills			$r = .33^{*}$		
		GPA			$r = .40^{**}$		

Kifer (1975)	N = 214 Grades: 2, 4, 6, & 8 Top & bottom 20% of class in GPA	GPA	IAR^{Tot}	$p < .001$	
	N = 206 Grades: 5 & 7	GPA	IAR I^{Tot}	*Grade 5* $r = .26$* (N = 91)	*Grade 7* $r = .31$** (N = 115)
Lessing (1969)	N = 558 Grades: 8 & 11 Black & White	GPA	Personal Control Scale (7 items patterned after Rotter's I-E scale)	*Grade 8* $p < .01$	*Grade 11* $p < .01$
				Boys	*Girls*
McGhee & Crandall (1968)–Study 1	N = 923 Grades: 3, 4, 5, 6, 8, 10 & 12	Iowa Achievement Test (grades 3–5)	IAR I^+ I^- I^{Tot}	n.s. $p < .10$ $p < .10$	$p < .01$ $p < .001$ $p < .001$
	White	California Achievement Test (grades 6, 8, 12)	IAR I^+ I^- I^{Tot}	n.s. n.s. n.s.	n.s. n.s. n.s.
		GPA (grades 3, 5, 6, 8, 10 & 12)	IAR I^+ I^- I^{Tot}	$p < .01$ $p < .01$ $p < .01$	$p < .01$ $p < .01$ $p < .01$
Study 2	N = 134 Grades: 3, 7, 10 White	GPA	IAR I^+ I^- I^{Tot}	n.s. $p < .01$ $p < .05$	n.s. n.s. n.s.

TABLE II—*Continued*

Study	Sample	Achievement Test	Locus Measure	Results		
Messer (1972)	N = 78 Grade: 4	GPA	IAR I^+	$p < .001$		n.s.
			I^-	n.s.		$p < .05$
			I^{Tot}	$p < .001$		$p < .05$
		Stanford Achievement Test	IAR I^+	$p < .10$		n.s.
			I^-	n.s.		$p < .10$
			I^{Tot}	n.s.		n.s.
Milgram & Milgram (1975)	N = 298 Grades: 4–8	Levy & Chan Achievement Test (grades 4, 5 & 6)	Tel Aviv:	$r = .27^{**}$		n.s.
			Past Scale	$r = .20^{*}$		n.s.
			Positive	$r = .22^{*}$		n.s.
			Negative	n.s.		$r = .28^{*}$
			Future Scale	n.s.		$r = .23^{*}$
			Positive	n.s.		$r = .20^{*}$
			Negative			
Naditch & DeMaio (1975)	N = 316 Grade: 9	GPA (grades 7 & 8) Achievement Test (not specified)	Rotter		$r = -.12$ $r = -.15$	
				Boys	*Grade*	*Girls*
Nowicki & Strickland (1973)	N = 1017 Grades: 3–7, 10, 12 White	Achievement Test (not specified)	CNS-IE	$r = .28$	3	$r = .18$
				$r = .12$	4	$r = .20$
				$r = .40^{*}$	5	$r = .25$
				$r = .27$	6	$r = .11$
				$r = .34^{*}$	7	$r = .31$
				$r = .44^{*}$	10	$r = .03$
				$r = .45$	12	$r = .00$

Nowicki & Duke (1974)	N = 240 Ages: 5–8 White	Iowa Test of Basic Skills: Verbal Math	PPNS-IE			
				$r = .17$		$r = .34^*$
				$r = .20$		$r = .45^*$
				Boys		*Girls*
Nowicki & Segal (1974)	N = 112 Grade: 12 Lower-middle class White	GPA Iowa Test of Basic Skills Composition Reading Math	CNS-IE	$r = .28^*$		$r = .29^*$
				$r = .35^{**}$		$r = .01$
				$r = .32^*$		$r = .12$
				$r = .32^*$		$r = .10$
					Social Desirability	
Nowicki & Walker (1973)	N = 78 Grade: 3	Stanford Achievement Test (Crandall's Social Desirability Scale)	CNS-IE	n.s. n.s.	Low High	$p < .01$ n.s.
Nowicki & Walker (1974)	N = 63 Grades: 5 & 6 Black & white	Metropolitan Achievement Test	CNS-IE		$p < .05$	
Ollendick & Ollendick (1976)	N = 45 Boys Juvenile delinquents Lower-middle to low SES	Peabody Individual Achievement Test	CNS-IE		$r = .37^{**} - .50^{**}$ (on subtests)	
Powell (1971)	N = 51	GPA	IAR I^+		$r = .10$	
			I^-		$r = .24$	
			I^{Tot}		$r = .19$	
			Bialer-Cromwell		$r = .43^*$	

TABLE II—*Continued*

Study	Sample	Achievement Test	Locus Measure	Results			
					Boys	*Girls*	
Prawat, Grissom, & Parish (1979)	N = 499 Grades: 3–11	GPA	CNS-IE	Grades 3–5 Grades 6–8 Grades 9–12	$R^2 = .11^*$ $R^2 = .10^*$ n.s.	n.s. $R^2 = .22^{***}$ $R^2 = .13^{**}$	
Reimanis (1973)	N = 201 Grades: 3–6	Teacher Rating of Achievement	Bialer-Cromwell Battle IAR I^+ I^- I^{Tot}	grade 5 $p < .05$ (all other grades n.s.) 3 & 6 4 — 3		— 3 & 5 5 4	
					White	*Black*	
St. John (1971)	N = 957 Grade: 6 Black & White	Metropolitan Achievement Test-Reading GPA	3 Agree/disagree statements (2 from Coleman 1966)	$r = .30^{**}$ $r = .29^{**}$		$r = .19^{**}$ $r = .20^{**}$	
					Success		*Failure*	
					Ability	*Effort*	*Ability*	*Effort*
Schultz & Pomerantz (1976)	N = 93 Grade: 9	Comprehension Test of Basic Skills GPA	IAR (divided into subscales on basis of particular attribution)	$r = .35^{**}$ $r = .47^{**}$	$r = .35^{**}$ $r = .44^{**}$	$r = .10$ $r = .19$	$r = .00$ $r = -.14$
				(Partial correlations with achievement motivation & remaining internal causal ascriptions controlled.)			
Shaw & Uhl (1971)	N = 211 Grade: 2 Lower & middle class Black & white	Reading achievement (Stanford Achievement Test)	Bialer-Cromwell	$r = .31^{**}$ for upper-middle class white group, no significant correlations for other groups.			

Shore, Milgram, & Malasky (1971)	N = 196 Grades: 1 & 6	Metropolitan Reading Readiness Test (grade 1) Iowa Test of Basic Skills (grade 6)	Locus of Control Interview (16 open-ended questions)	$r = .15$* (partialling out grade & SES)

Note. All correlations and significant differences represent a positive relationship between internality and achievement. (Negative correlations were changed to positive if the locus of control or achievement measure was scaled so that high scores represented externality or low achievement.

If p-value is given, Analysis of Variance or a t test was the statistical test employed; r is given for correlational analyses.

* $p < .05$

** $p < .01$

*** $p < .001$

internal locus of control and school achievement for girls low in social desirability, but not for girls high in social desirability. The girls who were high in social desirability might have been responding to the questions in the locus of control scale according to their perceptions of the social acceptability of the response rather than according to their "true" beliefs. If this was the case, the scale was not measuring locus of control, and these girls' scores on the locus of control scale should not be expected to correlate with achievement.

Causal Direction

The correlation between school achievement and locus of control is frequently interpreted to mean that an internal locus of control affects school achievement. However, because the research is correlational and cross-sectional, the evidence does not clearly justify the conclusion of causality. An alternative conclusion, that children's school performance affects their perceptions of locus of control, is equally plausible. Ames, Ames, and Felker (1976); Fitch (1970); Friend and Neale (1972); and Frieze and Weiner (1971), for example, report that children tend to take more responsibility for their successes than for their failures. Thus, the relationship between locus of control and achievement might merely demonstrate that students who do well in school take responsibility for their performance and students who do poorly attribute responsibility to external causes. The relationship between locus of control and achievement could also be spurious; shared variance with some third variable such as MA, socioeconomic status, or IQ might account for the relationship.

To test for the influence of IQ, several studies have examined the relationship between locus of control and achievement with IQ partialed out (Clifford & Cleary, 1972; Gruen, Korte, & Baum, 1974; Lessing, 1969; Messer, 1972; Ollendick & Ollendick, 1976; Shaw & Uhl, 1971). In all of these studies, with the exception of Ollendick and Ollendick, the significant relationship between locus of control and achievement remained even after IQ was controlled. Lessing, found that the significant relationship remained for eighth graders but was lost for eleventh graders when she held IQ constant in an analysis of covariance.

When broad age ranges are included in the study, MA would be a more meaningful variable to hold constant than IQ. If the children in the sample vary in chronological age, MA, not IQ, reflects their cognitive-developmental level. Two children of different ages might have the same IQ, but the older child's intellectual development is nevertheless superior to that of the younger child. This difference would be reflected in their MA's.

Two studies have attempted causal analyses of the relationship between locus of control and achievement. Calsyn (1973) reanalyzed data from two large studies done by Sears and Bachman. Sears twice measured achievement (using the California Achievement Test) and internality on a school-specific locus of control measure patterned after the IAR (see Hess, 1969) on a sample of 192 fourth-grade children. The cross-lagged panel correlation analyses indicated that the total locus of control scale, as well as the success and failure subscales, causally predominated over the verbal achievement score in males; there was no pattern of causal predominance for females. Although significant correlations were found, no systematic pattern of causal predominance between arithmetic achievement and locus of control emerged for any of the samples.

Calsyn also analyzed data from 959 of the male adolescent participants in Bachman's (1967) *Youth in Transition* study. Twelve items from Rotter's I-E Scale were given, and grade point averages were collected four times, the first being when the participants entered tenth grade and the last being 4 years later when most of the participants had been out of high school for 1 year. The results of cross-lagged panel correlational analyses revealed that for the noncollege sample, internal control was a predominant cause of grade point average for all three comparisons made. Two of the three comparisons were statistically significant. In the college sample, locus of control causally predominated in two of the six comparisons made. In the remaining comparisons, neither locus of control nor grades predominated causally.

Stipek (1980) measured 89 first graders at the beginning and the end of the school year on the Wide Range Achievement Test and the ETS measure of locus of control (Shipman, 1970). Results of both path and cross-lagged panel correlation analyses suggested that locus of control caused achievement rather than the reverse. Children's locus of control scores at the beginning of first grade predicted achievement at the end of first grade significantly better than achievement at the beginning of first grade predicted locus of control at the end.

The few causal analyses that have been done point to locus of control as a cause of achievement rather than the reverse. Conclusions must be made cautiously, however, as the data offer only tenuous support for locus of control as the cause rather than the effect. Future tests of causal models should include possible mediating variables such as MA and socioeconomic status. Such possible confounds have not been examined as fully as their potential importance merits.

Locus of Control and Achievement Behavior

Studies of the relationship between locus of control and global measures of achievement contribute little to our understanding of *why* such a relationship exists, that is, what kinds of behaviors internal children exhibit that lead to their overall higher achievement. Studies based on Atkinson's (1964) theory of achievement motivation have demonstrated that, if given a choice, individuals high in resultant achievement motivation (motivated more by the hope of success than the fear of failure) as compared with individuals low in resultant achievement motivation (motivated more by the fear of failure) are more likely to voluntarily approach achievement situations, perform tasks with greater intensity, persist in the face of failure, and select tasks of intermediate difficulty (see Weiner, 1972, for a review of the evidence). All of these behaviors should maximize learning in an achievement situation.

These four achievement behaviors mentioned above have been investigated by researchers interested in the effect of perceived control on behavior in achievement contexts. Crandall, Katkovsky, and Preston (1962) report a relationship for boys, but not for girls, between responsibility for achievement outcomes (measured by the IAR) and both time spent in achievement-related, free-play activities and intensity of striving (concentration and effort) in those activities. Evidence for a relationship between an internal locus of control and persistence in task situations is provided by James (1965, reported in Lefcourt, 1976), and Thurber, Heacock, and Peterson (1974) for adults, and by Gagné and Parshall (1975), and Gordon, Jones, and Short (1977) for children. Researchers have also examined the relationship between children's locus of control and task selection. Bialer (1961), and Dweck (1975) provide evidence

that children who perceive the contingency between their behavior and outcomes are more likely to select an uncompleted task over a previously completed one.

Delay of gratification is another variable that might explain why children who accept responsibility for academic success and failure are generally high achievers. The ability to defer gratification is frequently necessary for achievement-related behaviors. Rewards for hard work or good performance are often delayed until long after the task-related behavior is completed. Achievement behavior often requires denying immediate reinforcements (e.g., playing) for deferred reinforcement (e.g., good grades). Among studies indicating that children with an internal locus of control are more likely to delay gratification than children with an external locus of control are Bialer (1961), Gozali and Bialer (1968), Mischel, Zeiss, and Zeiss (1974), Strickland (1972, 1973), and Walls and Smith (1970). Only one study of ninth-grade children (Zytkoskee, Strickland, & Watson, 1971) found no relationship between locus of control and preference for a delayed reward.

Several task behaviors which have been studied in adults have, for the most part, not been included in studies of children. For example, there is considerable evidence suggesting that internal adults are more reflective in task situations than external adults (Gozali, Cleary, Walster, & Gozali, 1973; Julian & Katz, 1968; Rotter & Mulry, 1965). In the only study done with children (Massari, 1975), such a relationship was not found. Similarly, adult evidence suggests that if presented with the same environmental situation, internals search more actively for information and retain, process, utilize, recall, and reproduce that information better than externals (Davis & Phares, 1967; Lefcourt & Wine, 1969; Phares, 1968; Pines, 1973; Prociuk & Breen, 1977; Seeman, 1963; Seeman & Evans, 1962). In only one study have such information-processing differences been explored in children. Crandall and Lacey (1972) report that compared with external children, 6- to 12-year-old internal children (as measured by the IAR) identified more embedded figures correctly. The authors claim that performance on the EFT is relevant to information processing skills because it requires close stimulus scanning and sorting out of relevant from irrelevant stimulus information.

There remain many other potentially important behavioral variables related to task situations that have not been studied at all. One such variable is attention. A large portion of a child's academic day involves attending to the teacher's explanations and directions. Accordingly, performance on most school tasks depends on how well the child attends to the teacher. One might expect children who perceive themselves to be in control of academic outcomes to attend more than children who believe that academic outcomes are caused by external factors. Other potentially important academic-related behaviors should be examined. For example, are internal children (internal with respect to success) more likely to seek assistance when they are having difficulty completing a task than external children? Do internal children spend more time doing academic work (e.g., reading) outside of school? Do internal children take greater pains to understand assignments, ask more questions, and volunteer more answers in class discussions, or show better memory for details of assignment work? Studies of such questions could provide teachers with specific and immediate behavior objectives.

Classroom Interventions

Some of the most impressive and educationally relevant research examining the relationship between locus of control and achievement comes from classroom intervention studies. Matheny and Edwards (1974) trained teachers in 25 classrooms to implement a contingency management educational program. Teachers were specifically instructed to give students more responsibility for their own learning experiences. Remarkable improvement in reading achievement was observed for the children in the experimental program, particularly for those children who had teachers judged to be successful in implementing the experimental techniques. Differences on pretest and posttest scores on the CNS-IE were not statistically significant, although these scores shifted in the direction of internality. Students in the third-grade classroom evidencing the most dramatic achievement gains did show a significant shift toward greater internality. Also the correlation between the locus of control scores and reading achievement was significant.

The positive effect of student control was also demonstrated by Wang and Stiles (1976). Children in a second-grade classroom were given complete control over when they did their assignments. The assignments were determined by the teacher, but each student was allowed to complete the day's tasks in any order. The children completed a significantly higher percentage of their assignments under this arrangement than when the teacher determined the order of completion. Interviews revealed that children had a stronger sense of control over the school learning environment when they were allowed to determine the order of tasks than they did when the teacher had total control. The children's perceptions of control were also significantly correlated with their task-completion rates.

These two classroom interventions gave children greater control over their behavior (i.e., choice of tasks) and enhanced their perceptions of control over outcomes. Further evidence for the effect of self-management in the classroom on perceived control is provided in a study by Arlin and Whitley (1978). Results of a cross-lagged panel correlation analysis suggest that perceived self-management contributed to an internal locus of control for fifth, sixth, and seventh graders. It is impossible to determine whether the children's reinforcement expectancies mediated the effect of the educational intervention on achievement behavior. Nevertheless, the intervention studies do demonstrate that an educational environment that encourages students to take responsibility for their learning can positively influence learning.

Conclusions

Questionnaire measures of children's locus of control vary greatly in both content and form. There is also wide variation in characteristics of the children tested. It is consequently difficult to make specific conclusions regarding the relationship between locus of control and achievement. An overview of the studies revealed very little support for two common assumptions about this relationship: (1) that locus of control measures concerning only achievement situations are more highly correlated with achievement than are more general measures, and (2) that the relationship between locus of control and achievement is stronger for boys than for girls.

The studies using questionnaire measures of locus of control provide evidence for a relationship between some aspect of children's perceptions of personal causality or

responsibility and achievement. Our understanding of this relationship would be enhanced by greater specificity of the measures used. For example, the few measures that limit items to one domain (school achievement) differ in other respects (e.g., length, question format, relative number of positive and negative outcomes) from more general measures. Thus, it is difficult to obtain good evidence comparing the relationship between academic achievement and locus of control for achievement outcomes with the relationship between academic achievement and locus of control for nonachievement outcomes. We urge developers of new measures of children's perceptions of locus of control to include items that allow subscores for different reinforcement domains, in the same way that the IAR and several other measures provide subscores for locus of control for positive versus negative outcomes. This will allow more systematic study of the importance of "domain." We also recommend studies investigating developmental changes in locus of control. For example, it should be determined when children develop beliefs regarding personal control in achievement situations and whether this requires several years of experience in academic settings.

Attribution Theory

In contrast to Rotter's (1966) generalized expectancy model, recent attribution models emphasize situational determinants of perceptions of personal causality. Weiner, Frieze, Kukla, Reed, Rest, & Rosenbaum, (1971) argue that an individual's perceptions of the causes of success or failure are determined primarily by variables specific to the situation in which the causal attribution is made (e.g., consistency of performance, knowledge of others' performance). Attribution theorists seek lawful relationships between various situational characteristics and consequent causal attributions made in those situations.

Weiner (1979) identifies three dimensions of causality: locus of causality, control, and stability. Locus of causality can be either internal or external. An internal attribution reflects perceived contingency of the outcome on the subjects' own characteristics or behavior. Weiner argues that some internal causes are typically under the control of the subject and some are not. He distinguishes between internal, controllable (e.g., effort) and internal, uncontrollable (e.g., ability) causal factors. Thus, in Weiner's most recent formulation, contingency (locus of causality) and control are considered independently. The stability dimension characterizes causes as either stable (invariant) or unstable (variant). Intelligence or task difficulty are examples of causes that may be considered stable, whereas mood or effort are causes that are more often (but not always) considered unstable.

Two comments on Weiner's taxonomy are in order. First, the dimensions of locus of causality, control, and stability might not be orthogonal. For example, few external causes are controllable by the subject. Furthermore, the control and stability dimensions are highly related. Unstable causes (e.g., effort) are more likely to be under the control of the subject than stable causes (e.g., ability).

Second, Weiner stresses that a subject's categorization of a cause is based on the factor's subjective meaning to the subject. Although there tends to be general agreement regarding the classification of some causes, there is variation both across individuals and across situations. The subject might consider luck as a stable characteristic of the individual in some cases (she is a lucky person) and a variable cause of performance in others (she was lucky today). The phenomenal aspect of

Weiner's taxonomy is particularly important where children are concerned. Ability would be classified by most adults as an internal, stable, uncontrollable cause. For a young child, whose ability to do tasks changes daily, ability may appear much less stable. Accordingly, while adults who attribute failure to lack of ability generally have low expectations for future performance, children may continue to hold high expectations for future success because they expect their ability to change.

Measuring Attributions

Attribution theorists' emphasis on situational determinants is reflected in their methods for measuring perceptions of control. Children are typically asked to make a causal attribution for their own or another child's hypothetical or real performance on a task. The subject is asked to indicate the importance of each of four or more causal factors—for example, ability, effort, luck, and task difficulty—by such methods as: (1) taking a number of poker chips from a cup which represents each causal factor according to how much the factor contributed to the performance outcome (Ames et al., 1976); (2) ranking cards on which ability and skill, effort, task difficulty, or luck are written (Friend & Neale, 1972); (3) choosing the most influential causal factor in sets of six paired comparison questions—all possible pairings of the four attributional factors (McMahon, 1973); or (4) responding to an open-ended question, such as, "Why isn't the task completed?" (Young & England, 1976).

Reliability

Because attributions are believed to be primarily situation-specific, there have been few attempts to examine reliability in children's responses. However, there is some indirect evidence that responses might not be very reliable. Studies with both adults (Elig & Frieze, Note 2) and children (Stipek & Hoffman, Note 3) have shown that attributions vary greatly as a function of the question format. Whereas attributions appear to predict achievement behaviors, it is disconcerting that individuals' attributions depend to a considerable degree on how the attribution question is asked.

Attribution Theory and Need for Achievement

Weiner's attributional analysis of the relationship between locus of causality and achievement behavior is related to Atkinson's (1964) theory of achievement motivation (see Weiner et al., 1971). Weiner and Kukla (1970) suggest that a capacity to experience pride in accomplishment (Atkinson's "motive for success") or shame in failure (Atkinson's "motive to avoid failure") is directly related to the perceived locus of causality for achievement outcomes. These affective responses are greatest for individuals who tend to take personal responsibility for success or failure. The heightened pride in success for persons who attribute success to their own ability or effort results in greater resultant achievement motivation and thus a greater likelihood of approaching subsequent task situations. Weiner and Kukla (1970) further propose that the reward value of success (or the affective response to success) is related to the difficulty of the task, presumably because an internal attribution (e.g., ability or effort) is more likely to be made for difficult than for easy tasks. Thus, Weiner argues that success on a difficult task is more apt to increase the likelihood of approaching subsequent achievement tasks than is success on an easy task.

It is noteworthy that internal attributions for success, but not failure, are hypothesized to be linked with high achievement needs. In the case of failure, children's achievement needs (and thus their behavior in achievement situations) would be a function of the *stability* of their attributions (Weiner, 1977b). Children who attribute failure to ability or task difficulty (stable factors) are less likely to approach achievement tasks than children who attribute their failures to luck or effort (unstable factors). The stability dimension is important because it affects individuals' expectations for future success. Failure that is ascribed to stable factors (e.g., low ability, task difficulty) decreases the expectation for future success more than failure that is ascribed to unstable causes (e.g., bad luck, poor effort). Weiner reasons that if the conditions or causes of an outcome are perceived as remaining unchanged, then the same outcome should be anticipated, and the individual's behavior in the subsequent task situation should reflect that expectation.

Most of the studies testing these hypotheses have been done with adults. The adult data tend to support Weiner and his associates' proposal that individuals who attribute success in achievement contexts to themselves are higher in resultant achievement motivation than are individuals who attribute success to external factors (see Kukla, 1970; Weiner & Kukla, 1970, Experiment V; Weiner & Potepan, 1970). The evidence on the relationship between attributions and resultant achievement motivation for children is sparse and inconsistent (see Weiner & Kukla, 1970, Experiment IV).

Evidence that affect is greatest when success or failure is attributed to internal factors (e.g., on difficult tasks) is also found primarily in studies of adults (see Beckman, 1970; Eswara, 1972; Kaplan & Swant, 1973; Lanzetta & Hannah, 1969; Leventhal & Michaels, 1971; Weiner & Kukla, 1970, Experiments I–III; Zander, Fuller, & Armstrong, 1972). Nicholls (1975), however, found that fourth-grade children who attributed success on a task to internal causes claimed to feel more "pleased" than children who attributed success to external causes.

One study which is believed to provide evidence on the relationship between attributions for performance and the affective response of children was done by Ruble, Parsons, and Ross (1976). The children, aged 6, 8, 10, and 11, were asked to indicate how happy or sad they felt following a contrived success or failure experience by moving a mouth on a cardboard clown's face. Results indicated that even for the 6-year-olds, affect ratings were more extreme when the subject's own outcomes were inconsistent with what had been indicated to be the social norms (a situation that should produce an internal attribution). This finding did not occur in a second experiment when task difficulty rather than social norm information was supplied (Ruble et al., 1976). We propose an alternative interpretation of the first experiment, which may explain the inconsistency in the findings. When social norm information was provided, children's pleasure in success may not have been enhanced by a resulting internal attribution, but because they had "beaten" most other children. (Note that they were asked to indicate how they "felt" about their performance, not how proud they were.) Thus, the results do not necessarily provide support for the proposed relationship between affective response to success and failure and locus of causality.

Cook (1970) found that the fifth- and sixth-grade boys in her sample rewarded themselves for success at difficult tasks more than for success on easy tasks; no

relationship was found between self-punishment behavior and task difficulty. If it can be assumed that difficult tasks produced internal attributions, this study provides support for Weiner's hypothesis for success but not failure.

Weisz (1978a) studied children's choices of symbolic rewards (certificates or name tags with the wording, "Halloween Great Costume Award") versus material rewards (e.g., marking pens, party horns) at a Halloween party and in private homes. The findings confirmed his hypothesis that subjects with greater personal investment in the design of their costumes (i.e., those who had helped to design or make their costumes) would choose symbolic rewards more often than subjects with less personal investment (i.e., those who wore ready-made costumes). Weisz suggests that the choice of a symbolic, rather than a material reward, reflects pride in accomplishment. Accordingly, his findings provide evidence that, for children, pride in success is greater when personal causality is perceived.

The relationship between causal attributions and expectancy of success have been confirmed in many studies of adults (see Weiner, 1974; Weiner, Nierenberg, & Goldstein, 1976). MacMahon (1973) found that for children as young as sixth grade, expectancy disconfirmation led to higher attributions to effort and luck (unstable factors) and lower attributions to ability (stable factor).

In summary, while there is some support for Weiner and associates' hypothesized relationships for adults, the evidence on these relationships for children is limited. There might be important developmental differences in how the difficulty of the task affects children's perceptions of responsibility and their affective response to success or failure. Ruble et al.'s (1976) finding that children's affective ratings were related to normative information but not to difficulty ratings suggests that for children, the perceived cause of the outcome might be less important than characteristics of the outcome itself (i.e., how their performance compares with other children's). An alternative explanation is that children use evaluative or comparative information differently than adults. Nicholls (1978) provides evidence suggesting that young children are not always able to identify the most difficult task and therefore do not necessarily associate greater incentive value with more difficult tasks. Developmental differences have not been sufficiently explored to draw conclusions regarding the applicability of Weiner's model to young children. Moreover, the existence of a relationship between resultant achievement motivation and locus of causality attributions for success and failure is not necessarily relevant to achievement *behaviors*. Results reviewed below suggest that the stability and control dimensions might be more important in predicting actual behavior in achievement situations than is locus of causality.

Attributions and Task Behavior

Attribution theorists have examined some of the task behaviors that have been studied in the locus of control research and the related attributions for the causes of success and failure. Children's task selection was investigated by Young and Egland (1976), for example. They found that first-, fourth-, and seventh-grade boys who took responsibility for an experimentally induced failure experience were more likely to elect to repeat the failed task over a task they had successfully completed than boys who did not blame themselves for the experimentally induced failure. Unfortunately, Young and Egland do not report whether the self-blaming responses

concerned lack of ability or lack of effort. Considering Weiner's (1977b) claim that the stability dimension is a more important predictor of task behavior following failure than the locus of causality, one would expect that the self-blamers attributed their failure to lack of effort. An ability attribution should lead the child to predict future failure on the task, and thus to select the completed task on which success was assured.

The importance of the stability dimension was demonstrated by Hoffman and Weiner (1978) in a study of trainable mentally retarded adults. Performance on a coding task was enhanced for individuals whose previous success experience was attributed by the experimenter to ability compared with those whose success was attributed to effort or who received no attribution.

The achievement behavior that has been most closely examined from an attributional perspective is persistence at tasks. Dweck and Goetz (1978) note that some children persist and actively pursue alternative solutions to a task when they encounter failure; the performance of others undergoes marked deterioration in persistence or quality, evidencing "learned helplessness." The active problem-solving behavior of some children is predictable from Brehm's (1972) reaction theory. Individuals are believed to be motivationally aroused when their freedom is threatened (including unwanted and unexpected failure). The helpless behavior evidenced by other children is consistent with research by Seligman (see Maier & Seligman, 1976), in which the detrimental effect of failure on animals has been found to be greatest when the animal has no control over the outcome.

Dweck and Goetz summarized research findings on children's helpless reactions to failure as follows:

> Learned helplessness in achievement situations exists when an individual perceives the termination of failure to be independent of his responses. This perception of failure as insurmountable is associated with attributions of failure to invariant factors, such as a lack of ability, and is accompanied by seriously impaired performance. In contrast, mastery-oriented behavior—increased persistence or improved performance in the face of failure—tends to be associated with attributions of failure to variable factors, particularly to a lack of effort. One would think that persistence following failure would be related to one's level of ability or to one's history of success in that area. Yet our research with children has shown that, compared to achievement cognitions, these variables are relatively poor predictors of response to failure. (p. 2)

This relationship between task persistence and attributions for failure was first demonstrated in a study by Dweck and Reppuci (1973). A group of fifth-grade children were given solvable block designs by a "success" experimenter and insolvable block designs by a "failure" experimenter. When the failure experimenter began to give solvable problems, some of the children failed to complete them, even though they were almost identical to the tasks they had mastered when given by the success experimenter.

The subjects who showed performance decrements took less personal responsibility for the outcomes of their actions. When these subjects did accept responsibility, they attributed success and failure to the presence or absence of ability rather than to expenditure of effort. Children who persisted at the task administered by the failure

experimenter tended to place more emphasis on the role of effort in determining the outcome of their behavior.

Dweck (1975) also provides evidence that task behavior following failure can be changed by altering children's attributions for failure. She selected a sample of children who exhibited helpless behavior in response to failure and randomly assigned them to two treatment groups; half of the children received only success experiences, the other half received attribution retraining. In the attribution retraining group failure experiences were explicitly attributed by the experimenter to insufficient effort. At the end of 25 daily sessions, both groups were again tested for the effects of failure on their performance. While no improvement was shown by the success-only training group, all of the children in the attribution-retraining group showed greater persistence following failure than they had before the training program. Further evidence that children can be trained to make effort attributions for failure and that such training will result in greater persistence in the face of failure is provided by Chapin and Dyck (1976), and Andrews and Debus (1978).

It is noteworthy that Dweck and others have focused exclusively on training *effort* attributions. In Weiner's model, effort is internal on the locus of causality dimension; it is also an unstable factor over which the individual has control. Weiner et al. (1971) propose that stability of the causal attribution for failure is a more important determinant of persistence behavior than is the causality dimension. If failure at an achievement task is believed to be caused by a low level of ability (a stable factor), future failures will be anticipated. Conversely, attributions to the unstable elements of effort or luck imply that inconsistencies between past and future behaviors could occur, and accordingly lead to persistence in the face of failure.

The evidence for a relationship between effort attributions for failure and persistence at a task is persuasive. However, children's task behavior following luck attributions has not been examined. Children's understanding of luck may be so poorly developed that persistence behavior cannot be predicted from luck attributions. Indeed, young children may never spontaneously attribute success or failure to luck. Thus, there is no evidence with children that permits an unambiguous assessment of the relative importance of the locus of causality and stability dimensions in determining persistence behavior.

Conclusions

The attribution model has several advantages over the social learning model of children's perceptions of control. Because attributions are usually assessed in specific situations there is less ambiguity in what children's responses represent. Such distinctions as domain (achievement versus nonachievement) and success versus failure are more easily made with attribution measures than with the questionnaire measures typically used in studies based on social learning theory.

The distinction made in the attribution model between contingency and control is particularly important for predicting achievement behavior. A child who believes that he or she fails because of lack of ability is certain to behave differently in achievement situations than a child who believes that he or she fails because of not trying, even though in social learning theory both attributions represent an internal locus of control. The importance of this distinction is demonstrated in Dweck's findings that persistence in future task situations is more likely to occur when past failures are attributed to lack of effort than when they are attributed to lack of ability.

Bandura (1977) also makes the distinction between contingency and control. He argues that "[I]ndividuals can believe that a particular course of action will produce certain outcomes [contingency], but if they entertain serious doubts about whether they can perform the necessary activities such information does not influence their behavior [control]" (p. 193). Bandura refers to the conviction that one can successfully execute the behavior required to produce the desired outcome as "efficacy expectations."

Additionally, some attribution methods allow subjects to indicate the degree to which each of several factors contributed to a particular outcome. Because most outcomes are caused by multiple factors, such a technique provides scores which more closely represent the subjects' real perceptions of causality than do the forced-choice options typically presented in locus of control-type scales.

The usefulness of the attribution model to educators could be considerably enhanced. First, there is a dearth of evidence on the proposed relationships between children's causal attributions and their achievement. The evidence that does exist comes primarily from highly contrived experiments. Attribution researchers have rarely ventured out of experimental settings and into real classrooms. Children are typically asked to make attributions about hypothetical people doing hypothetical tasks. Until the relationships that have been found in experimental settings are tested in classrooms, the validity of the findings for natural educational environments will remain in question.

Second, attribution research has focused primarily on situational determinants of attributions; little attention has been given to "generalized attributions." Surely cumulative experiences in achievement settings lead children to make generalizations about the causes of outcomes. Indeed, there is evidence that mentally retarded children (Chan & Keogh, 1974; Weisz, 1979) and girls (Dweck & Reppucci, 1973; Dweck, Davidson, Nelson, & Enna, 1978; Nicholls, 1975) tend to attribute failure to lack of ability and to attribute success to external causes such as luck. Stipek and Hoffman (1980) found that low-achieving boys in first and third grades were more likely to attribute failure to lack of ability than were high-achieving boys. Optimal academic performance of these groups of children may be significantly hindered by their perceptions of the causes of academic outcomes. Studies that attempt to identify the kinds of experiences that contribute to children's generalized attributional tendencies would be very useful.

In future research, attribution theorists might also examine consistency in children's attributions for success or failure *across* task situations. An example of a question that might be addressed is: Do children consistently make internal attributions for success or failure in some academic areas, and external attributions for success or failure in others? This question has important educational implications. If children's attributional tendencies vary from subject to subject in school, intervention designed to increase effort attributions might need to be directed at the specific subject in which the child is making maladaptive attributions. Alternatively, if children are consistent in their attributional tendencies across subjects, subject-specific attribution training would be unnecessary.

Intrinsic Motivation Theories

Intrinsic motivation is believed by many to stimulate children's initial efforts to

achieve and strive for success (Deci, 1975). Intrinsic motivation may be affected in turn by the outcomes of these efforts and children's perceptions of the causes of the outcomes. Thus, the studies of intrinsic motivation and of perceived control seem intimately related to one another. Indeed, references to the concept of personal control are found throughout the literature on intrinsic motivation. However, within this literature, the concept of control takes on several different meanings. In this section, we discuss several perspectives on the relation between perceptions of personal control and children's intrinsic motivation.

Competence Motivation

Competence motivation theory assumes that humans naturally strive for effective interactions with their environment and that successful mastery of a problem produces feelings of efficacy, or competence (see White, 1959). This motive for competence is central to theories of intrinsic motivation because the pleasure produced by mastery of tasks is believed to act as a reinforcer of the mastery behavior. Stated simply, the person is intrinsically motivated to master tasks, and thus finds successful mastery attempts reinforcing (see Deci, 1975).

Harter (1978) claims that in order for children to experience a feeling of efficacy, they must perceive themselves as responsible for their successful performance. She reasons that success attributed to an external factor, such as luck, should not lead to a feeling of competence as would success attributed to an internal factor such as effort or ability. Weiner, Kun, and Benesh-Weiner (1980) similarly propose that covariation of perceived effort expenditure with a desired outcome provides evidence that personal control has been attained and that perceived effort-outcome covariation produces feelings of mastery. Thus, Harter's analysis is similar to Weiner's attributional approach in that perceptions of personal causality are believed to enhance the affective response to success. However, attribution theorists consider feelings of competence as just one of many types of affective response to success, whereas for mastery motivation theorists who posit a basic motive for mastery, feelings of competence are critical.

Harter provides some evidence suggesting that pleasure in mastering a task is greatest when the subject accepts responsibility for success (Harter, 1974; Note 4). However, she does not explain how feelings of mastery and pleasure, in turn, enhance intrinsic mastery motivation. One could argue that feelings of mastery or competence lead to higher expectations for future success which in turn lead to achievement-related behaviors. Harter's assumption that greater pleasure is experienced in accomplishing a goal perceived to be internally caused also fits nicely into Weiner's analysis. Although Weiner discusses the "pride-evoking" potency of success, feelings of competence might also contribute to the incentive value of success, and thus the likelihood of engaging in future mastery-oriented activities.

Recasting Harter's analysis into an attributional framework, however, ignores an important component in her discussion: competence motivation. Harter assumes an underlying "motive" for feeling competent, which leads the subject to seek out and attempt to master tasks. She implies that internally attributed success in some way (and the "way" is not clear) enhances the individual's intrinsic mastery motivation. Harter (1978) states explicitly that internal perceptions of control serve as important mediators by "maintaining if not increasing the child's effectance motivation" (p.

57). The nature of the relationship between internal attributions for the cause of success and mastery motivation remains to be specified.

Another question that needs further investigation concerns the ways that attributions for *failure* affect mastery motivation. White (1959) focuses almost exclusively on successful mastery attempts in his theoretical formulation of competence motivation. Empirical workers in this area have likewise focused their attention on the effects of success experiences. Harter (1978) speculates that failure perceived to be caused by a lack of competence could lead to anxiety in mastery situations and thereby decrease the child's mastery motivation. Whatever the effect of failure, it is clear that the child's perceptions of the *cause* of that failure will be important. Thus, as in the case of success, the outcome of the child's mastery attempts might be a less important determinant of future mastery motivation and behavior in achievement contexts than are the child's perceptions of responsibility for that outcome.

Self-Determination

Deci (1975) defines intrinsically motivated behaviors as behaviors which a person engages in to feel competent and self-determining. The motive for self-determination is also contained in de Charms' (1968a) claim that, "Man strives to be a causal agent, to be the origin of his own behavior; he strives for *personal causation*" (p. 393). Deci and de Charm's concept of self-determination is quite different from the concepts of personal causation discussed in the first two theoretical perspectives. Studies based on social learning and attribution theories examine individuals' perceptions of who controls the outcome of events; "self-determination" concerns individuals' perceptions of who controls their behavior. Accordingly, self-determination theorists measure children's perceptions of control over the achievement *context* (i.e., do they have control over the selection of tasks); attribution theorists focus on perceptions of control over the factors affecting the achievement *outcome.*

De Charms distinguishes between individuals who perceive themselves as "origins" from individuals who perceive themselves as "pawns." An "origin" is someone who feels that "what he is doing is the result of his own free choice; he is doing it because he wants to do it" (de Charms, 1968b, p. 381). This conception of the control dimension is related to Weiner's only inasmuch as de Charms believes that a consequence of becoming an "origin" is taking more responsibility for outcomes. De Charms believes further that children's perceptions of themselves as "pawns" or "origins" is influenced by their educational environment.

De Charms (1976) has investigated the effect on children's achievement of programs designed to give children greater responsibility and control in their classroom environment. He trained teachers in largely black, innercity schools to teach children in grades six to eight to perceive themselves as the "locus of causality" (origins), rather than as the instrument of an outside source (pawns). When the children's responses on projective measures were compared, those in the experimental classrooms demonstrated more origin-like thinking than did those in the control group. Furthermore, de Charms found that the usual increasing discrepancy between performance by black innercity school chilren and national norms for achievement tests had been arrested for children who had participated in personal causation training. In contrast, achievement scores for the control group were increasingly behind the national norms, as is typically seen in innercity schools.

While it is not always explicitly stated in the educational literature, the idea that greater control over the selection of academic tasks leads to superior achievement underlies many recent educational reforms. The notion of individual choice was basic to the open classroom movement in the 1960's. It was believed that by limiting teacher control and allowing more student-control in the learning environment, pleasure in learning would be enhanced and consequently achievement would be improved. The value of self-directed learning is also claimed by Piaget (1969) who believes that children will naturally seek out those challenging (and thus intrinsically motivating) tasks which produce the greatest amount of learning. Self-determination theory is also consistent with what most of us experience in our daily lives. Think of the books that are so much more enjoyable when they are read because we *choose* to rather than because we are *required* to read them.

In the self-determination model, as in the other models discussed, the subject's *perceptions* of causality are more important than any "objective reality." There are undoubtedly many variables which affect individuals' perceptions of the causes of their behavior. Deci (1975), for example, reviews evidence suggesting that when external rewards are offered for behaviors, the individual's perceived locus of causality becomes external and intrinsic motivation is consequently reduced.

Empirical support for the relationship between perceived control in achievement settings and achievement behavior is not clear-cut. De Charms' teacher-training program probably influences teachers' classroom practices in many unspecified ways. Students' enhanced perceptions of control in the learning environment may be only one of many consequences of the program. Likewise, student control is only one of the many dimensions on which "open classrooms" differ from traditional classrooms. Consequently, it is difficult to isolate the control variable in research. Despite these problems we recommend greater research efforts in classrooms because the practical consequences are potentially significant.

Conclusion

The Models

This review of theory and research on the relationship between children's perceptions of personal control and school achievement has revealed that the construct "control" has different meanings for different theorists. Rotter's social learning theory focuses on the subject's belief in contingency, that is, that academic outcomes are contingent on the subject's own behavior. The subject may or may not *control* the academic outcomes. Weiner includes both the contingency and control dimensions in his attribution model of causal perceptions and attempts to measure them independently. The contingency dimension that social learning theorists label "locus of control" is labeled "locus of causality" by Weiner. Weiner's control dimension concerns the subject's perception of his or her ability to alter the factor that causes the outcome.

The concept of personal control also plays several different roles in theories of intrinsic motivation. Harter (1978), with White (1959) and others, believes that humans are intrinsically motivated to interact effectively with the environment. She claims that perceptions of personal control are essential for a sense of competence to result from successful mastery attempts. While her analysis is similar to Weiner's attributional approach in that perceptions of personal causality are believed to

enhance the affective response to success, Harter stresses the affect "feeling competent," more than Weiner. Harter also posits an underlying motive for competence which is not included in Weiner's attributional analysis of perceptions of causality.

The control variable proposed by de Charms and Deci is quite different from control as viewed by the other theorists discussed above. De Charms and Deci believe in an intrinsic motive for causing events. However, they are more concerned about individuals' perceptions of who controls their behavior than they are about their perceptions of control over the outcome of events. This concern with the child's perceptions of control in achievement situations is reflected in many recent educational reforms which attempt to increase students' control of their education through strategies identified with humanistic or deschooling movements.

Educational Implications

This review has discussed many important educational implications of research on children's perceptions of control in academic settings. These implications have been described throughout this review and will not be repeated here. We would, however, like to underline what we perceive to be the most important message of this research to teachers.

Success and failure experiences obviously have important and enduring effects on children's perceptions of their ability, their expectations for success, and many other cognitions that mediate their behavior in achievement settings. This notion is so compelling that few teachers require empirical evidence to justify their attempts to provide students with as many success experiences as possible. The research reviewed here extends this intuitively appealing notion one important step further. Evidence from these major theoretical perspectives converge on one point: Success or failure per se might be less important than a child's perceptions of the *causes* of the success or failure. Success enhances self-perceptions of competence only if the child accepts responsibility for that success. Or, as an attribution theorist might put it, the pride from success is undermined when attributed to external factors; the shame from failure is similarly diffused through external attributions. Thus, the effect of success or failure on children's subsequent behavior in achievement contexts depends on their perceptions of the cause of that success or failure.

The message to teachers is clear. Ensuring a certain number of success experiences for children is important, but teachers have the additional responsibility of teaching children the relationship between their behavior and their performance. Performance is optimized when children accept responsibility for their successes, and understand that effort and persistence can overcome failures. Evidence reviewed by Meyer (1979) suggests that teachers do this by praising most and blaming least the children who are perceived to have expended the most effort. However, certain groups of children, retarded children and females, might need to be taught these relationships more explicitly and encouraged to make attributions which will lead to optimal performance.

Researchers have already begun to turn their attention to examining classroom variables affecting the development of children's perceptions of control over academic outcomes. Dweck and others have demonstrated that children's cognitions about the causes of success and failure can be altered through explicit teaching. Social learning theorists have also demonstrated that perceptions of control and achievement can be

enhanced by giving children greater choice in their academic environments. As more studies are done in the classroom, other important variables affecting children's perceptions of the causes of achievement outcomes will undoubtedly be revealed.

Research Directions

For each model we have suggested several specific questions that merit attention by researchers. Two general research approaches that have been used too little in the literature reviewed here impress us as particularly useful to educators. The first involves a mixture of naturalistic and laboratory research; the second involves modifying children's perceptions of control.

Research on children's perceptions of control, for the most part, has been done in unnatural and highly constrained settings. While at least short-term, context-bound validity is usually demonstrated, the "transcontextual validity" (Weisz, 1978b) of the research findings is unknown. Do the same principles for making attributions in experimental, laboratory settings apply in regular school settings? What specific *classroom* behaviors do scores on questionnaire measures of locus of control predict? In what naturally-occurring classroom behavior is intrinsic motivation expressed?

We can begin to answer questions such as these by extending into naturalistic settings the methods currently employed to study children's perceptions of control in laboratory settings. Rather than asking children to explain the cause of a contrived success or failure experience, why not seek to learn why they believe they are in the bottom or the top reading group? Rather than observe children's persistence on an experimental task, why not observe their behavior on tasks given in their regular school classroom? While a certain amount of experimenter control, and thus clarity in findings is sacrificed by such naturalistic studies, the ecological validity of current findings concerning children's perceptions of control and academic achievement needs to be tested. This is not to say that experimental research has no value. Assuredly, both approaches are essential. However, since experimental paradigms have dominated research on children's perceptions of personal control, a major task in future research is to examine, in naturalistic achievement settings, the validity of the principles that have been discovered in laboratory settings.

Our second suggestion for research harkens to Bronfenbranner's (1977) reminder of Dearborn's injunction: If you want to understand something, try to change it. Among studies of children's perceptions of control and achievement we find several excellent examples of research following this principle. Dweck and others' successes in changing children's attributions of failure from lack of ability to effort and, consequently, increasing their persistence in task situations, powerfully demonstrates the relationship between perceptions of the causes of failure and achievement behavior. These findings are particularly meaningful for educators: Children's perceptions of the causes of failure influence their behavior in achievement situations. Moreover, these perceptions can be changed, and changes in achievement behavior can consequently be expected.

Bronfenbrenner's dictum is also reflected in the attempts of de Charms (1976), Matheny and Edwards (1974), and Wang and Stiles (1976) to change children's perceptions of control through teacher training and classroom intervention. These classroom intervention studies involve two characteristics we believe to be critically

important for future research: naturalistic, real-life settings and attempts to alter the variables under investigation.

Finally, we encourage vigorous efforts to integrate research based on different models and methodologies. While it may be unrealistic to expect researchers from different theoretical orientations to use a common terminology, attempts to examine the relationship between findings based on different models will be necessary if educators are ever to receive the full benefit of research findings.

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