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THE CONCEPT OF INTRINSIC MOTIVATION: IMPLICATIONS FOR PRACTICE AND RESEARCH WITH THE LEARNING DISABLED

Howard S. Adelman

Many children and youth with learning disabilities manifest behavior problems in addition to various learning disorders. Historically, the major focus in the learning disability field has been on behavior modification while largely ignoring the construct of intrinsic motivation. A basic assumption of intrinsic motivation is the student's innate need for feeling competent and self-determining. Adelman reviews the basic constructs underlying intrinsic motivation and discusses their implications for assessment, intervention, and research activities in learning disabilities. – D.D.D.

A significant body of psychological literature discusses intrinsic motivation as an important influence on behavior. Although these works have major implications for understanding learning and learning problems, intrinsic motivation has been virtually ignored in the field of learning disabilities.

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It is interesting to speculate why the construct has been ignored by the field. One major reason for this probably stems from the fact that the widely accepted definitions of specific learning disabilities stress that such problems are *developmental* disabilities related to central nervous system dysfunctioning. Therefore, the natural thrust of the first works specifically dealing with learning disorders/disabilities was to focus on such developmental problems—their etiology, diagnosis, and treatment. However, as professionals set out to apply what the early textbooks advocated, it became clear that identifying a child's problem as a developmental disability did not eliminate the fact that many children with learning disabilities also manifested behavior problems. The need to deal with such behavior problems, regardless of whether they were a cause, result, or independent of the developmental disabilities, led to an additional focus in the field—an emphasis on “behavior control” techniques.

This emphasis on behavior control generally has been dominated by the school of psychological thinking known as behaviorism and, until recently, particularly by the extreme views usually attributed to its best known contemporary advocate, B. F. Skinner (1953, 1971; also cf. Mahoney, 1974). From this extreme position, the construct of motivation is seen as unnecessary. Thus, the focus in the LD field has been on behavior modification, and “motivation” has been seen as a matter of controlling contemporary reinforcement contingencies. This, then, is perhaps a second major reason for the fact that the LD literature so rarely discusses motivation systematically and almost completely ignores the concept of intrinsic motivation.

This state of affairs, of course, is not unique to the LD field. Behaviorism generally has dominated the experimental study of

motivation in psychology, and consequently, motivation and particularly intrinsic motivation as a topic has *only* slowly come to the forefront of scientific and practical inquiry in psychology. It is now time for the LD field to take account of organismic approaches to motivation in general, and particularly those views which suggest that thought and feelings can be determiners of behavior.

Why the Organismic Orientation to Motivation Is Important

This is not the place for an extensive discussion of the value of an organismic (as contrasted with a mechanistic) approach to explaining behavior. For such discussion, the interested reader is referred to any of a number of basic works (e.g., Atkinson, 1964; de Charms, 1968; Deci, 1975; Hunt 1965, 1971; Skinner, 1953, 1971; Staw, 1975; Vroom, 1964; Weiner, 1972). For purposes of this discussion, it will be sufficient to emphasize that, in essence, organismic approaches assume that humans act on their environments rather than being passively controlled by previous reinforcers and current environmental contingencies. Thoughts and feelings are seen as playing a primary role as determiners of behavior. It should be emphasized that this assumption is philosophical, and like the opposite assumption, which underlies behavioristic approaches, is not testable (Matson, 1973; Skinner, 1971).

Given the assumption that cognitive and/or affective processes are primary determiners of behavior, an understanding of the relationship of these processes to learning and problems in learning requires an understanding of the construct of motivation in general and intrinsic motivation in particular. In contrast to behavioristic approaches, this means that rather than ignoring subjective experiences (e.g., affective states, subjective interpretations of stimuli), such experiences must be studied.

The organismic orientation to the study of behavior raises such questions as: How does the way children perceive and think about a learning situation (e.g., tasks, materials, teacher, classroom) affect their learning and performance? How do children's views of the causes of their problems (or for that matter, a teacher's or parent's views of such causes) affect learning and performance? Such questions assume that the child's perceptions and thoughts play a key role, and thus, that significant aspects of the child's behavior are determined by factors inside the child.

In discussing intrinsic motivation, then, data regarding perceptions and thought are considered indispensable in understanding behavior; theorizing about the relationship of such perceptions and thoughts to intrinsic motivation is of central importance. As the following discussion emphasizes, such theorizing appears to have great heuristic value.

Intrinsic Motivation Defined

As a broad psychological definition, Deci (1975) has suggested the following: Intrinsically motivated behaviors are behaviors in which a person engages to feel competent and self-determining. They are of two general kinds: (a) the seeking of stimulation and (b) the conquering of challenges or reducing incongruity/dissonance. By emphasizing feelings of competence and self-determination, Deci is stressing that the primary needs being met are those of the central nervous system. Further, the definition characterizes such needs as being met by the organism engaging in *seeking* and *conquering* behaviors, i.e., seeking out optimal stimulation (challenges) and dealing effectively with challenges created or encountered (reducing incongruity, uncertainty, or dissonance, etc.). Such needs are viewed as being innate, i.e., all humans are seen as being "born with the basic and undifferentiated need for feeling competent and self-determining" and as being "active

organisms in continual interaction with their environment" and with the basic interest need providing "much of the motivation for this interaction" (p. 65).

Intrinsic Motivation and Current LD Concepts and Practices

The literature focusing on intrinsic motivation has been reviewed by Hunt (1965), Deci (1975), and Staw (1975), among others. While the findings from various research studies are limited in terms of the generalizations which should be made, the data and theorizing related to intrinsic motivation do raise some concerns regarding widely adhered to psycho-educational concepts and practices. Since it is not possible here to discuss all the relevant concerns, the discussion in this and the following section will be restricted to what appear to be the most significant implications for current practices and research activity in LD. In particular, the focus is on the topics of etiology, assessment, and intervention.

Etiology. In understanding the causes of learning problems, one classic view is that the process of learning is an interactive (probably, more accurately, a transactional) process. That is, whatever learning occurs is a complex product of what the learner brings to the situation and what the situation brings to the learner and the nature of their interactions over a period of time. (With reference to the application of this view to understanding the causes of learning problems see Adelman, 1970-71 and Adelman and Taylor, 1976.)

More specifically, as various theorists have stressed, the individual's interaction with the environment can be viewed as resulting in development from undifferentiated to differentiated states. The development of intrinsic motivation is seen as depending on an individual's cognitive capabilities, and as proceeding through various stages (Hunt, 1971; Mischel, 1971), eventually differentiating into such specific intrinsic motives as achieve-

ment, self-actualization, etc.

Further, intrinsic motivation is seen as influencing all other facets of development. As discussed at greater length elsewhere (Adelman, 1972), Piaget states that development is the result of the complementary processes of assimilation and accommodation which result in the organism assimilating an increasingly differentiated adaptive schemata. Deci (1975) notes that implicit in such a view is the idea that the individual is intrinsically motivated to encounter and engage in activities requiring some assimilation and accommodation and thus to develop schemata. An optimal situation is seen as one which involves a moderate discrepancy between the individual's existing schema and the demands of the situation encountered. Problems in development and motivation arise when the organism must deal for prolonged periods with discrepancies which are too great and thus are not assimilable or with situations which result in so little discrepancy that they are completely assimilable (Adelman, 1972). Such circumstances delay/disrupt growth (development, learning), and because they interfere with intrinsic motivation, such circumstances can affect current performance and require the use of extrinsic motivators if it is necessary to sustain activity.

From this perspective, a child's level of intrinsic motivation with regard to reading and math (or school learning in general) is viewed as an important determinant of learning and performance in such areas. That is, if a child has a low level of intrinsic motivation (for whatever reasons), that child is unlikely to instigate, energize and direct behavior toward such areas (and, indeed, may instigate, energize and direct behavior away from such areas). Therefore, the low level of intrinsic motivation may be seen as being related to poor learning and performance in the area.

The next question to be raised is: What produces a low level of intrinsic motivation?

Cognitive evaluation theory (Deci, 1975) suggests that some areas (e.g., reading) are perceived by the child as not being potentially satisfying. This would be the case, for example, if the child has not yet come to perceive an area/activity as one which can be expected to meet the need for feeling competent and self-determining or has come to perceive it as one which will not meet this need (perhaps even one which produces opposite feelings). It also would be the case when a stimulus is associated with negative affect such as anxiety, e.g., if the child perceives an activity as one which can be expected to produce even more of the negative affect being experienced.

If there is no awareness of potential satisfaction related to stimulus inputs such as reading tasks, it is unlikely that behaviors will be directed toward achieving goals related to them. Thus, skill in performing these and other tasks highly correlated with them is unlikely to develop very well. This is not to say that no development will occur; after all, there is a great overlap in the skills involved in the variety of tasks a child encounters every day in and out of school.

Given activities of learning and discovery which are rewarding because they allow a child to feel competent, intrinsic motivation will probably be maintained and even enhanced. Using rewards (and punishment) to encourage this learning may be interfering with the learning because it will make it dependent on the reward and lead to behavior directed at getting the reward (avoiding punishment) in the easiest way (Deci, 1975).

Ironically, despite the widespread acceptance of the interactional view of the determinants of behavior, it is all too common for intrinsic motivation, its relationship to environmental factors, and its implications for understanding learning problems to be ignored. Perhaps the implications can be better

highlighted by starting with a simple statement of Lewin's (1951) paradigm: $B = f(P, E)$, i.e., behavior is a function of the person and the environment. In this context, a learning problem can be seen as primarily the result of something being wrong with the person or primarily the result of something being wrong with the environment or an interaction of the two. The preponderance of the literature on learning problems, however, clearly presents the locus of such problems as being within the person, usually stemming from some form of minimal brain dysfunction or emotional problem. Even those writers who suggest that the problem may have originated in factors outside the person, such as faulty child-rearing practices, quickly point out that these factors probably have produced developmental problems — deficits in response capabilities — which are the immediate, direct cause of current problems (and thus, should be the primary focus of treatment). In general, environmental and interactional causes tend to be minimized and, when discussed, their implications tend not to be drawn out.

In summary, from the perspective of the theories related to intrinsic motivation, environmental variables can result in learning problems whenever a person has insufficient opportunities to behave in ways which produce feelings of competence and self-determination. In this connection, an environment may be (a) passive, e.g., simply not offering opportunities, (b) subtly undermining, e.g., overemphasizing extrinsics, or (c) actively hostile, e.g., making demands which the person is expected, but is unlikely to want and/or be able to fulfill at the time the demands are made. Such environmental circumstances interact with person variables (including, but not limited to, any major developmental deficits and disorders). In turn, this interaction produces thoughts and/or feelings which lead to goal-directed behavior either toward or away from a prescribed learning ac-

tivity in the classroom. (Of course, even when the behavior is directed toward a certain activity, the response capabilities which the learner has developed to date may be so inadequate for coping with the task that failure will occur.)

Assessment. The above discussion may seem to imply that in some ways the causes of learning problems have been empirically established. This is not the case. Empirically, few factors (person or environment, regardless of their complex interaction) have been validly demonstrated to have a specific cause-effect relationship with reference to the wide variety of learning problems diagnosed in practice as LD. Thus, despite claims to the contrary, currently available assessment procedures cannot validly detect the factors which led to the problem. (That is, such assessment procedures have very poor postdictive validity.) The situation is not much better for efforts to identify the critical current contributing factors. In this connection, it is suggested that it is not so much one's ability to assess as one's theory of causal and contributing factors which are primary shapers of intervention approaches.

Based on the above view of etiology, it is hypothesized that the overall (sum total) performance of children (e.g., on tests) will be relatively poor in areas where they have had low motivation. However, it is further hypothesized that the more complex the area being assessed, such as reading, intelligence, and so forth, the more likely it is, that specific facets of the child's performance will be relatively good as long as the youngster is highly motivated to perform well on the immediate task. This hypothesis is based on the view that the child has developed many skills required to perform on tests and activities in the area while pursuing other (overlapping) areas where he/she had high motivation.

For such reasons, in the absence of gross pathology (e.g., *severe cerebral dysfunction*,

extreme emotional disturbance), currently available assessment procedures are unable to provide the data needed to arrive at valid differential diagnoses. That is, despite the intriguing patterns of such data, they do not allow for valid interpretations with reference to whether the cause of a youngster's poor performance is due to (a) neurological dysfunctions which interfere with the development of certain skills or (b) low motivation which led to the youngster not working to develop such skills, e.g., simply not putting in the time and effort needed for learning and/or practicing certain skills.

While it may be possible to rule out low motivation in the immediate situation, it is not possible to do so with regard to previous activity in the area. Besides, it is by no means a simple matter to overcome low motivation in the immediate situation. This last point leads to another implication for assessment related to efforts to prescribe specific program plans based on current test/task performance. When a youngster refuses to do a task, the level of motivation for doing the task can be considered evident and performance findings can be judged accordingly. However, when a child does the work, it is extremely difficult to judge whether the youngster's behavior is directed toward performing up to the fullest capabilities or toward simply satisfying what appear to be the technical requirements of the situation. In this connection, Bruner (1966) has suggested that many children who have experienced problems in school have learned a variety of defensive coping strategies for dealing with the demands of adults. Many of these coping strategies are incompatible with performing up to one's fullest capabilities. Thus, it is likely that efforts to assess the capabilities of such children will over-identify deficits, i.e., many skills which the youngster has developed will appear undeveloped as assessed by test/task performance. Obviously, prescriptions based on such performance

will prescribe unnecessary instruction.

A similar concern can be raised regarding performance in experimental studies. It has been pointed out that participants in research will come to the situation curious about the purpose of the experiment (Schultz, 1969; Taub & Dollinger, 1975). A study by Taub and Dollinger (1975) provides some data indicating that perceptions of purpose and reward may be significant factors influencing performance in experimental (testing/assessment) situations. Further, these findings suggest an interaction of such variables with differences in locus of control expectancies. That is, persons with external locus of control appear to be less curious (than internals) about such situations, and thus, their performance seems to be more affected by such variables.

Extrapolating from this line of thinking, the question arises whether or not children who have had problems in school come to perceive most test-like tasks and situations (e.g., the demand characteristics, Orne, 1962) as threatening and thus expect to do poorly. If so, it can be hypothesized that they might perceive the purpose of such tasks and situations, while important to them, as being beyond their control and not be motivated to put forth their best effort. However, as mentioned before, differences in performance for a given youngster (and among a group of learning problems) can be anticipated whenever tasks are perceived as within their control. In this connection, the studies by Lefcourt (1976) and Taub and Dollinger (1975) provide data suggesting that some of the avoidance behavior of persons who tend to make external attributions might be eliminated by providing explicit information regarding the purpose of and methods for succeeding at a given task.

Another related line of theorizing and investigation suggests that motivational variables may be biasing the perceptions of

assessors. Jones and Nisbett (1971) hypothesize that "there is a pervasive tendency for actors to attribute their actions to situational requirements, whereas observers tend to attribute the same actions to stable personal dispositions" (p. 80). The professionals who assess learning disabilities, of course, are "observers" in this sense. In addition, such professionals generally begin their assessment activity with the hypothesis that a youngster's learning (school) problems are due to some disorder/deficit, i.e., they are guided by a disordered child or developmental deficit model (Adelman, in press). Thus, their conceptual-perceptual-motivational predispositions may present additional biasing factors which increase the likelihood of making false positive errors by attributing etiology and current problems to the personal deficiencies of clients.

Intervention. As has already been suggested, any discussion of the relationship of motivation to LD raises a number of major implications for intervention. For example, the child with low motivation will perform without using full response capabilities. Interventions which primarily emphasize the improvement of performance, either by facilitating development in areas of weakness or by developing compensatory skills, may prove to be wasteful and not as effective as they might have been if the first emphasis had been on *systematically* addressing the motivational "deficit". That is, many of the objectives prescribed to remedy a youngster's developmental deficits might be found to be superfluous once the child is highly motivated, especially intrinsically motivated, to perform in an area. Efforts to facilitate intrinsic motivation need to focus on ways for stimulus inputs around important areas for learning to be perceived by the child as indicating a strong possibility that feelings of competence and self-determination can be increased and negative feelings already

associated with the area can be reduced.

It is recognized that such perceptions are not essential to motivating behavior, *per se*. The use of extrinsic rewards will suffice to increase the likelihood of a response and even to improve performance under some circumstances, however, such extrinsics do not appear to enhance intrinsic motivation and, indeed, appear to diminish it. This unintended, apparent consequence of extrinsic rewards seems too great a price to pay for getting a child to perform a current task. Thus, for example, memorizing vocabulary words is not the same as becoming interested in reading, and if the price to be paid for getting the child to memorize words is to diminish intrinsic motivation (and increase negative affect, e.g., dislike, anxiety, fear) with regard to reading, the cost is too great. This example is to be contrasted with situations where an extrinsic reward may be used briefly to elicit a behavior so that the child becomes aware of intrinsic motivation in the area. Such a brief use of rewards can be conceptualized as a process by which an activity can be made vivid (salient), i.e., the use capitalizes on the informational aspects of rewards. However, the continuing use of such a strategy to maintain performance has been criticized on conceptual and ethical grounds (e.g., Bruner, 1966; Robinson, 1974). For example, as Bruner (1966) has stated: "external reinforcement may indeed get a particular act going and may lead to its repetition, but it does not nourish, reliably, the long course of learning by which (one) slowly builds in (one's) own way a serviceable model of what the world is and what it can be" (p. 128).

It is recognized that rote learning and the development of many skill-habits requiring practice can be shaped and made more palatable by the use of extrinsics. However, along with whatever degree of skill students acquire, they may also acquire a pronounced distaste for that particular area of learning.

For every person for whom the use of extrinsics seems to have worked, there appears to be a great number of other persons for whom it may have produced negative consequences, e.g., those who learn to add, subtract, multiply, and divide but fear and hate math. Moreover, it is doubtful that very many persons who have become very skillful and satisfied over the years with reading, math, playing a musical instrument, etc. went through the many hours of practice needed to develop such skills simply because they were extrinsically rewarded or threatened with punishment. The use of extrinsics related to such activities often is justified by implicitly or explicitly equating such activities with unrewarding jobs, chores, etc. Such comparisons are misleading. Unfortunately, many students and teachers are led to equate learning opportunities with drudgery and deemphasize the potential role of intrinsic motivation.

Given the above concerns and a commitment to a primary emphasis on intrinsic motivation in intervention activity in LD, it becomes necessary to understand some of the major factors which enhance or diminish intrinsic motivation and influence facilitative affect (or increase nonfacilitative affect). As already suggested, one of the most critical factors appears to be the negative relationship between extrinsic rewards and intrinsic motivation. A number of reviewers (Deci, 1975; Levine & Fasnacht, 1974; Notz, 1975) have emphasized that not only may the use of extrinsic rewards produce mostly token learning, but such rewards may also mask and undermine a student's intrinsic motivation. Conversely, it has been suggested that insufficient extrinsic rewards may increase intrinsic motivation (Deci, 1975). Thus, while it is clear that extrinsics can be used to produce certain desired behaviors, they are not seen as adding to intrinsic motivation, and the possibility of unintended consequences such

as diminishing intrinsic motivation needs to be considered.

In general, research related to cognitive dissonance theory (Festinger, 1957), inequity theory (Adams, 1965), and cognitive evaluation theory (Deci, 1975) reemphasizes the role played by a person's perceptions of personal causality and personal responsibility (e.g., self-determination, choice) in enhancing and diminishing intrinsic motivation. In this context, intrinsic motivation is seen as being enhanced when a person feels personally responsible for a consequence, e.g., has chosen to work on a task which results in a specified consequence. In contrast, intrinsic motivation is seen as negatively effected when persons feel they do not have choice (and thus have no responsibility for consequences) or are unaware of the specific consequences and subsequently come to view them as inequitable (and then become focused on the extrinsics related to behavioral outcomes and direct behavior toward establishing equity by changing inputs or outputs rather than establishing feelings of competence and self-determination). Whatever the theoretical explanation, experimentally it has been demonstrated that even the mere illusion of choice and control can facilitate performance, while the opposite perception can have a debilitating effect (Perlmutter & Monty, 1977).

Not only are intrinsic and extrinsic motivation seen as being non-additive, they are viewed as probably motivating behaviors directed to different goals (e.g., Calder & Staw, 1975; Deci, 1975; Notz, 1975). According to cognitive evaluation theory, overreliance on rewards and punishments has resulted in school learning often becoming directed toward getting rewards. Indeed, learning sometimes gets redefined as something that gets rewards. In contrast, Bruner (1962) suggests "to the degree that one is able to approach learning as a task of

discovering something rather than 'learning about' it, to that degree there will be a tendency for the child to work with the autonomy of self-reward or, more properly, be rewarded by discovery itself" (p. 88). This statement emphasizes the importance of providing school learning opportunities which can capitalize on intrinsic motivation and thus maintain and enhance motivation of behavior directed toward learning for its own sake.

Consequently, as long as a person does not intrinsically value and expect to succeed in a learning activity, learning and performance will be less than optimal. This point is given a great deal of verbal recognition, but is almost systematically ignored by those who interpret test data, as well as by many instructors. If there is to be anywhere near optimal performance and learning, there must be motivational readiness—not in the old sense of waiting until a youngster is interested, but in the contemporary sense of providing stimulating environments in which students can choose new learning experiences and perform to their fullest capacities. This implies that the wider the range of choices perceived by the student as worthy of attention, the more likely he/she is to find an experience resulting in learning. While others may feel they know what the student needs to learn, it seems reasonable to suggest that only the student can decide what he/she wants to learn and can accomplish. This point alone seems to make unsound any over-reliance on extrinsic rewards and the notion that teachers can motivate students misleading.

Teachers can help develop learning opportunities and provide information and support as needed. In particular, as the studies by Lefcourt (1967) and Taub and Dollinger (1975) suggest, information about the purpose of the methods for succeeding at a given task might help to overcome avoidance motivation. Moreover, according to Adelman and Taylor (1977), such information is

necessary for arriving at a mutually agreeable set of commitments which, in turn, result in feelings of personal responsibility which can enhance intrinsic motivation (Deci, 1975).

It may also be noted that information about learning and performance (e.g., feedback about success and failure) can strengthen intrinsic motivation, while rewards which are controlling (not perceived just as information) can have a negative effect on such motivation. Along with the other points discussed above, this raises serious concerns about token reinforcement programs which are quite prevalent in the field of LD.

An interpretation of the literature on engineered and token reward approaches to learning problems suggests that such programs reduce disruptive behavior and increase orienting behaviors toward tasks while the youngsters are in the reinforcement programs. When the tasks have involved rote learning, task improvement has been found (O'Leary & Drabman, 1971). Critics have pointed out that improvements in behavior have not generalized to situations involving no rewards and have consequently been concerned that the objectives of such programs seem limited to controlling behavior rather than to training children to develop cognitive structures and problem-solving abilities. This concern has been voiced most loudly by those who feel that problems manifested by many children are caused by aspects of current educational practices, e.g., students having to deal with motivationally and developmentally inappropriate demands (Bruner, 1966; Illich, 1971; Schrag & Divoky, 1975; Silberman, 1970).

"Surveillance" has also been suggested as affecting intrinsic motivation (Lepper & Greene, 1975). Research by Kipnis (1972), Kruglanski (1970) and Strickland (1958) points to an attributional cycle in which surveillance produces distrust of a subordinate's motivations, which then produces

further surveillance. The research of Lepper and Greene (1975) suggests that, in turn, the objects of surveillance may attribute surveillance as indicating that they are performing poorly (i.g., negative reinforcement) with the concomitant effects of such perceptions occurring.

A separate line of investigation, which focuses on the contrasting reinforcing effects of an experimenter's (teacher's, supervisor's) nonreaction to the achievement expectations of achievers and underachievers, indicates that surveillance effects may differ for LD. Since LD children usually have experienced consistently negative verbal feedback from teachers, they may interpret a surveillant's nonreaction, by contrast, as positive reinforcement (Adelman, 1969). Thus, it is suggested that not only overt extrinsic rewards but the mere presence of a formal surveillant can affect intrinsic motivation. While more research is needed to determine the specific effects on the perceptions and behaviors of children with learning problems, it is clear that such research should have major implications for schools and teaching.

Intrinsic Motivation and LD Research

Based on the discussion to this point, it should be evident that there is a need to consider motivation, especially intrinsic motivation, as a major factor related to LD etiology, assessment, and intervention. Also, it is clear that very little research has focused specifically on these matters. This is not the place to detail the many questions and hypotheses that need investigation. Rather, the intent is to highlight a few of the major areas for study.

At the most preliminary level, there is need for studies aimed at simply describing intrinsic motivation in children with learning disabilities. For instance, it is important to learn whether LD children differ from non-LD children in perceptual and behavioral variables related to valuing and expectancies. For example, in specific areas of deficiency

such as the three R's, do LD children manifest weaker feelings of competence and self-determination, less challenge-seeking behaviors, less curiosity, more boredom, lower or unrealistic expectations of success and failure, etc.? By way of contrast, are there other specific areas where LD children show similar or greater feelings of competence and self-determination, challenge seeking, curiosity, etc.? The findings of such descriptive studies can pave the way for investigations of major motivational correlates of learning problems and ultimately to determinations of cause and effect.

At the next level, there is the need to investigate among groups of LD children: (a) the hypothesized negative impact of low levels of intrinsic motivation on performance in assessment and learning situations and (b) the hypothesized negative impact on intrinsic motivation of certain, widely used assessment and intervention practices. For instance, what part of the variance of LD children's poor performance on tests and tasks is attributable to motivational variables, e.g., child and professional intrinsic motivation, expectancies, etc? What factors predispose the child to perform well or poorly in such situations?.

At the most complex level, there is a need to investigate the hypothesized potential positive relationship between intrinsic motivation and the correction of LD. For instance, do LD children who feel personal responsibility for improving their learning and performance (and understand and accept responsibility for subsequent consequences related to their efforts) make better progress than those who do not make such decisions and have such feelings? Can a child's pursuit of areas of high intrinsic motivation, such as building airplane models, result in sufficient opportunities to learn and teach skills related to areas where the child is not intrinsically motivated to perform, such as in reading instruction groups? Does learning which stems from intrinsic

motivation for a specific area such as reading differ from learning in that area when it is elicited by manipulating extrinsics, e.g., in development of adaptive schemata, generalization and application, etc? How are additional areas of high intrinsic motivation acquired? When it is reluctantly decided that certain behaviors and skills must be elicited via the use of extrinsics, how can the negative consequences of such actions be minimized?

These areas of research relating LD and intrinsic motivation provide ample opportunities for creative and pioneering investigation. At the same time, it must be recognized that any new line of investigation is fraught with problems. For example, efforts systematically to investigate internal states give rise to serious measurement problems, such as a dearth of validated procedures and the need to rely on procedures which are particularly susceptible to biasing effects as well as the various motivationally-related assessment problems discussed above. The three typical approaches to measurement of intrinsic motivation are: (a) personality and motivational tests (e.g., projectives like the Thematic Apperception Test; inventories like the Ontario Test of Intrinsic Motivation and the Choice-Motivator Scale), (b) personal reports (e.g., self-ratings of enjoyment; teacher judgments of curiosity), and (c) to "hypothesize about personal knowledge and construct experiments very carefully in order to try to verify the hypotheses" (Deci, 1975, p. 20). This last approach usually accepts as a general operational definition that a behavior is intrinsically motivated when no extrinsic reward is apparent, i.e., when an activity seems to be undertaken as an end unto itself rather than as a means to an end. In this connection, beside personality/motivational tests and personal reports, experimenters have used time spent on activities and effects on performance as dependent variables, e.g., (1) amount of free-choice time spent working on

a specified activity as contrasted with other available activities in situations where there are no external rewards to be gained; (2) effects on performance, such as measures of recall, creativity, etc., related to a specific activity.

In addition to measurement problems, there is the confusion and haziness which results from the lack of precision in terminology, assumptions, and concepts in this area (Berlyne, 1971). The above discussion provides a concrete example of such problems while hopefully reflecting some progress in this regard. Whatever the problems, the inherent importance of research focusing on intrinsic motivation as it relates to LD is so great that it must no longer be ignored.

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FOOTNOTE

¹An earlier version of this paper (Adelman, 1976) presents additional theoretical and practical implications, as well as some pilot programmatic work in this area.