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Creativity as an Educational Objective for Disadvantaged Students

Mark A. Runco, Ph.D.
California State University
Fullerton, California

March 1993
Number 9306

The University of Georgia

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RESEARCH-BASED DECISION MAKING SERIES

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In 1984 Professor Runco received his Ph.D. in Psychology from the Claremont Graduate School. In 1987 he joined the faculty at California State University at Fullerton, and in 1988 he founded the Creativity Research Center of Southern California and the *Creativity Research Journal*.

Professor Runco has published *Theories in Creativity* (1990), with Robert Albert; *Creativity and Affect* (1993), with Melvin Shaw; *Problem Finding, Problem Solving, and Creativity* (1993), *Eminent Creativity, Everyday Creativity, and Health* (in press), with Ruth Richards; and *Creativity: Theories, Themes, and Issues* (in press). He is currently compiling the *Creativity Research Handbook* and continuing his empirical research on creative and evaluative thinking, psychoeconomic theory, and giftedness.

Creativity as an Educational Objective for Disadvantaged Students

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ABSTRACT

There are several reasons to be optimistic about the creative potential of at-risk and disadvantaged students. One reason for optimism is simply that creative potential seems to be very widely distributed. Thus some students who earn only moderate grades or have difficulties in school may very well have high levels of creative potential. As a matter of fact, except in extreme cases, a student's creative potential cannot be inferred from his or her grades, IQ, verbal ability, or academic performance. Optimism is also warranted because of the significant role played by motivation in creative performances, and because creativity is expressed in such diverse ways. Because creativity is in part motivational, educators can do quite a bit with it simply by manipulating incentives and rewards. They do, however, need to ensure that they do not undermine the intrinsic motivation of students. This is one reason the diverse expressions of creative expression are so important. Children can be creative in many different ways, if they are allowed to follow their interests. Unfortunately, there are also several reasons to be concerned about the creativity of at-risk students. These are also noted herein, the assumption being that if educators, counselors, and parents are aware of the problems they can work to avoid them. One problem is that the traits which seem to be associated with creative potential (e.g., nonconformity, independence, persistent questioning) may not be all that easy to tolerate in the classroom. Not only should such traits be tolerated, encouraged, and rewarded; they should also be modeled. In other words, educators should themselves demonstrate independent thought, spontaneity, and originality.

Fourteen specific recommendations are offered at the end of this paper. Six of these describe behaviors to avoid (e.g., relying on verbal materials, communication, and rewards; over-emphasizing structure and curricula with predictable outcomes; prejudging students who are nonconforming and find their own way of doing things; and suggesting—even implicitly—that one's own way of doing something is the best or only way). The other eight recommendations describe objectives and suggestions (e.g., follow students' own interests part of each day; encourage independent work; discuss creativity with students; tell them why it is valuable; and be explicit about how and when to be original, flexible, and independent; monitor expectations; remember that the best creative thinking is at least partly unpredictable; work to valuate and appreciate what children find for themselves; give both helpful evaluations and supportive valuations; inform parents what you are doing, and why; read the creativity literature; and recognize that creativity is multifaceted and requires divergent and convergent thinking, problem finding and problem solving, self-expression, intrinsic motivation, a questioning attitude, and self-confidence). The rationale for each of these recommendations is discussed, and the conclusion of this paper describes why some of the recommendations apply to all

students and why several apply most directly to disadvantaged students. Keeping in mind that the target population is economically disadvantaged, the most directly applicable recommendations are those focusing on (a) stimulus rich environments, (b) nonverbal materials, and (c) independent and small group assignments.

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EXECUTIVE SUMMARY

Disadvantaged students may gain particular benefits from creative efforts. This is in part because creativity can be expressed in domains which are relatively free of verbal or cultural biases. It can therefore give disadvantaged students a means with which to excel and an area in which self-expression and one's own personal interests are all-important.

Many students are culturally, economically, and even cognitively disadvantaged. For the present paper, the charge given to me focused on the economically disadvantaged student. This group was specifically defined as representing students who may not have easy access to stimulating materials and experiences. There is research dealing with the creativity of these disadvantaged students, as well as pertinent research with other populations which has direct implications for this group. Both areas of research are represented below. The suggestions herein are intended for educators and other practitioners.

What to Do, What to Avoid

In *Gulliver's Travels,* Justice controls both penalties and rewards. Teachers can influence the creative behavior of students, but like Justice, they must strive for balance. They must give and take; they must do certain things and simultaneously avoid doing certain things. This may be true of many or even all educational objectives, but it is especially true of creativity. Creativity can easily be enhanced, but that same malleability means that it can also be easily damaged.

Educators should carefully monitor their expectations. Expectations have an enormous impact on the behavior of students—especially disadvantaged students. If an educator expects a particular level of performance from a student, he or she is likely to behave in a fashion which actually reinforces that particular performance.

Educators also need to provide opportunities for students to work independently. Educators might allow students to offer suggestions about assignments or topic areas. Examinations might even be written such that there is room for independent thought and creative insight.

One of the most important techniques for encouraging independence involves asking the right questions. Unfortunately, teachers apparently rarely ask questions which

require children to think divergently. Most often educators ask short questions which have brief and specific answers. This may be because they believe they are giving students a more reasonable task, or it may be because it makes their job easier. Certainly it is easier to judge a specific response than it is a divergent one. Put differently, valuation and appreciation are more difficult than evaluation and criticism.

Educators should actually discuss creativity with their students. They can be very explicit in such discussions, and they may need to focus on something their students can easily grasp. This is true in the sense of using concrete and meaningful problems and tasks—especially for disadvantaged students—but also in terms of describing meaningful procedures and solution strategies.

Demonstrations by educators themselves will probably help. Teachers need to show their students how to be creative, in part because the educator can act as a concrete and respected model, but also because implicit in modeling is the message that "being different or creative is acceptable." For some disadvantaged students, being unconventional may come naturally. The trick thus becomes one of showing them that it can be valuable to be this way—that it is not always inappropriate to be different, even in a structured academic setting.

There are several things to keep in mind about modeling. First is that the modeling of original problem solving should not be taken too far. Modeling is very powerful—in fact it can be too powerful. If teachers model a specific strategy, they should explicitly state that what they are doing is demonstrating one of several alternatives. They need to avoid implying that their way of doing things is the only way. Related to this is the idea that educators should have their students practice actual creative problem solving. The behavioral literature is helpful here because it describes how persistence—or in behavioral terms, maintenance—and generalization across settings can be virtually ensured. The former is encouraged through the careful scheduling of rewards and other contingencies. The latter is encouraged by having children practice new strategies (e.g., "giving ideas that no one else will think of") with several different kinds of tasks, in several settings, and with several different models and audiences, including teachers and parents.

What of the setting itself? It may be that the classroom—bulletin boards and the like—can influence the creativity of students. This is because a creative environment can suggest that creativity is acceptable, but also because the environment is itself a source for ideas. This is especially critical for economically disadvantaged students, given what was said above about their lack of experience with stimulating materials.

Students will try to be original and creative if they are motivated to do so. Educators do have an advantage here because children often like to try new things, and any task which allows them to "think of things no one else will think of" will probably be somewhat novel, being unlike the traditional academic tasks which involve finding the correct answer. Along the same lines, teachers have an advantage in that children like to play. Play and creativity go hand-in-hand; and teachers can introduce most creativity

exercises (including those with explicit directions to be original) as playful and game-like rather than as structured academic exercises. Not only will this suggest that students can be playful; it will also indicate that they do not need to concern themselves with grades, working quickly, competing with classmates, or details like spelling. Such opportunities can contribute to comfort and thereby encourage self-expression and divergent thinking.

Divergent Thinking

Success on spelling tests, most mathematics problems, a social studies question about the capital of California, or any task that has one correct or conventional answer requires convergent thinking. Certain open-ended tasks, in contrast, allow students to find divergent, unusual, and original ideas. Some divergent thinking tasks simply ask students "how are a potato and a carrot alike?" Others ask children to "list all of the round things you can think of."

Divergent thinking tasks are useful in part because they allow children to practice the strategies which lead to original ideas and solutions. Divergent thinking is not synonymous with creative thinking, but it appears to be strongly related. One way to look at it is that divergent thinking reflects the potential for creative thinking. Divergent thinking does not necessarily lead to a creative insight, but it can help.

If teachers carefully observe children's divergent thinking, they will see different kinds and patterns of ideas. Ideas can be categorized as reflecting originality, flexibility, and fluency. Originality is apparent when a child finds unique or unusual ideas. Flexibility is apparent when a child produces varied and diverse ideas. Ideational fluency parallels linguistic fluency, except it reflects a facility specifically with ideas. It is a kind of productivity.

Attention should be given to each of the indices of divergent thinking. Some children might be outstandingly fluent with ideas, while others give only a few ideas, each of which is highly original. Research has demonstrated that ideation is best understood in terms of individual profiles, and idiosyncratic patterns of divergent thinking have been reported for disadvantaged children at various grade levels. Research has also demonstrated how directions, reinforcement, and practice can all be used to enhance the various dimensions of divergent thinking.

Divergent thinking is often viewed as a problem-solving skill. There is a related but distinct skill which should be mentioned, especially because it is very important for many creative performances and can be targeted in the classroom. This is the problem finding skill. Recent research suggests that some very creative efforts are more closely tied to the finding of problems rather than to the solution of them. Often, once the problem is identified, most of the work is done; solutions are easily found. Moreover, if a problem is carefully constructed, it can guarantee creative solutions. Numerous problem finding exercises can be presented in the classroom.

While on the topic of presentations and exercises, several suggestions can be made specifically about materials which may facilitate students' creative efforts. In general, it is usually best to give students a variety of topics and materials with which they may be unfamiliar. A variety of topics should encourage cognitive integrations and comparisons. Even more certain is the impact of unfamiliar materials. Numerous studies have suggested that unfamiliar materials elicit more original thinking than familiar materials. Apparently the latter allow students to rely on rote associations and preconceived ideas, and these are rarely original or creative. Unfamiliar materials, on the other hand, force students to think of new ideas and possibilities.

For disadvantaged students, there may be particular value in working with nonverbal tasks. This is in part because of what was said above about unfamiliarity allowing originality—verbal tasks tend to ask about familiar topics—but it is also because these students may lack confidence when working with verbal problems.

Although nonverbal tasks have a clear rationale, there is good reason to believe that disadvantaged students can build their linguistic abilities if they receive at least occasional verbal assignments, especially if these are open-ended and game-like. Children learn when they are creative in the literal sense of discovering, inventing, or constructing things for themselves. The resulting understanding is personally meaningful and fully understood, and thus very useful. This notion of learning by being creative applies especially well to special populations, and it explains why children whose verbal skills are below average may develop confidence and a useful knowledge base (verbal and otherwise) when playing and creating.

Some disadvantaged children may need concrete reinforcement for their efforts. Concrete reinforcement is not, however, always best; too much emphasis on a concrete "extrinsic" reinforcer may detract from the task itself and lead students to work toward completion rather than towards self-expression. Rewards can make students think too much about the "ends" rather than the "means." In some cases (e.g., with children having difficulty being original or difficulty understanding strategies) educators may begin with concrete reinforcers, but even here they should quickly fade them out of the picture.

Balanced and Optimal Education

One of the claims in this paper is that educators should treat originality and creativity in such a manner as to encourage their generalization to the natural environment. An important strategy should be mentioned, for it will determine how well students do in fact apply their creative skills in the natural environment. I am again referring to knowledge, but knowledge of this sort can be divided according to its two distinct functions. Children need to be strategic about when as well as how to be original. It is not just a matter of showing students what it takes to be original. They also need to know when to be different and unusual and when not to. Originality is not always useful, and students need to know when to use it.

For this reason the curriculum should include both convergent and divergent tasks. Children should have the opportunities to be creatively unconventional, but they also need to develop the thinking skills which will allow them to respond to convergent tasks. Not only will they encounter both kinds of tasks in the natural environment, but the two kinds of thinking are not mutually exclusive. Instead, they work together. This is because children may need knowledge and information—some of which is best learned through convergent tasks—even when working on open-ended problems and tasks.

Along the same lines, an entirely unstructured classroom is not the most conducive to creativity. What is needed is a balance, with opportunities for divergence and opportunities for convergence. As a matter of fact, this idea of balanced or optimal instruction applies to many aspects of education for creativity. It applies to the notion of independence, for example, because students should not be left entirely on their own. Occasionally disadvantaged children should work in small groups, and clearly there are times when the teacher should work closely with children rather than leaving them entirely by themselves. Optimal instruction also applies to nonverbal tasks, because disadvantaged children may benefit from the occasional use of verbal tasks. The idea of educational balance even applies to nonconformity, because some rules are necessary. And again, it applies very well to divergent thinking, because it cannot lead to much without convergent thinking to support it.

Problems and Concerns

This paper opened with a brief list of reasons for optimism about the creativity of disadvantaged students. There are several concerns and potential problems which should be mentioned. If educators are aware of the problems they can work to avoid them.

One problem is that the traits which seem to be associated with creative potential may be difficult to tolerate in the classroom (e.g., nonconformity, independence, persistent questioning). To make matters worse, these traits should be not merely tolerated, encouraged, and rewarded; they should also be modeled. In other words, educators should themselves demonstrate how to be nonconforming, independent, and unpredictable or spontaneous.

The second problem is related to the first, but arises specifically because of the need to valuate students' divergent thinking. Put simply, an educator will not know which specific original ideas children will produce if they are given the opportunity. This can create problems because it precludes detailed planning. Divergent thinking can be very unpredictable, especially if the educator is trying to grasp the divergent thinking of a (young) student. To borrow a term from the literature, children are cognitive aliens; they think differently from the way adults think. That makes true understanding and communication very difficult. This problem may be the most trying in the case of creativity, given that the best divergent thinking is literally the most divergent. It moves to remote topics and ideas, and again, these are difficult to predict. One might even say that predictable divergent thinking is not really divergent at all.

Another problem involves attenuated flexibility. This occurs because the adoption of alternative ideas is costly for the teacher (or for any individual with a great deal of experience and a large knowledge base). The cost reflects a depreciation in existing knowledge as it is supplanted by new knowledge. Not only can this kind of depreciation influence reactions to students; it can also influence the teacher's adoption of new techniques or incorporation of current ideas from the education research literature. The adoption of new methods is costly in that it lowers the value of the teacher's existing knowledge base. If this psychoeconomic model is accurate, teachers should be especially careful to avoid falling into ruts in the way they do things and in their curricular objectives. Practically speaking, educators should read the educational and creativity literature, attend conferences, and enroll in inservices. There are data which suggest that inservices were especially helpful.

Implications and Recommendations

These ideas about creativity can be condensed into a short list of educational recommendations. Fourteen of these are given below. The first six recommendations describe behaviors for educators to avoid. These are given first because they may be less intuitive than the last eight recommendations, which describe things to be done. The concluding section of this paper describes why some of the recommendations apply to both disadvantaged and more typical students and why some apply only to the disadvantaged.

Recommendation One: Avoid relying on verbal materials; use a variety of materials; tap various domains (e.g., music, crafts, mathematics, language arts, physical education).

Discussion: Creativity can be expressed in many different ways, not just in the arts. Disadvantaged children may be the most capable with concrete materials (Platt & Janeczko, 1991) and the most creative in nonverbal domains (Goor & Rapoport, 1977; Torrance, 1971).

Recommendation Two: Avoid relying on verbal rewards. Concrete reinforcers may be best for many disadvantaged students.

Discussion: It is not just verbal products which are potentially biased against disadvantaged students. It is also verbal descriptions, explanations, requests, and reinforcers. Ideally concrete reinforcers will be used early on, with schedules of reinforcement eventually thinned.

Recommendation Three: Avoid over-emphasizing structure and curricula with predictable outcomes. Ask questions that allow students to follow their own (potentially divergent) logic and thinking, even if unpredictable. Plan to follow students' own interests part of each day.

Discussion: Creativity is by definition spontaneous; hence lessons and activities need to be flexible to allow the unpredictable. The results are often novel, unusual, divergent, and remote, and when thinking in a creative fashion students might find something the teacher did not foresee. Moreover, students may be the most motivated and personally involved if they have some say about topics and activities. Intrinsic motivation is critical for creative expression, and it is by definition maximized when individuals follow their own interests.

Recommendation Four: Avoid prejudging students who are nonconforming and students who find their own way of doing things.

Discussion**:** Some of the characteristics and tendencies of creative students may not fit the mold of the "ideal student" (Cropley, 1992; Runco Johnson, & Baer, 1992). Creativity is, after all, an expression of individuality.

Recommendation Five: Avoid suggesting (even implicitly) that your own way of doing something is the best or only way.

Discussion: Modeling is very important (Belcher, 1975), but it can easily misdirect students and imply that they should ignore their own natural inclinations. Spontaneity and divergent thinking need to be modeled; "the right way" to do something should not.

Recommendation Six: Avoid going overboard—strive for a balance between structure and unstructured tasks, between independence and working in small groups, between rich and open stimulus environments, and between convergent and divergent tasks.

Discussion: Creativity requires some divergent thinking, but it also requires that the student makes certain choices (e.g., for the most original idea or solution). Both independent and conventional thinking need to be encouraged.

Recommendation Seven: Allow independent work, and <u>not</u> just where it is easy, (e.g., while working on crafts or art projects).

Discussion: As noted just above, the intrinsic motivation which contributes to creative expression is maximized when an individual follows his or her own interests. Additionally, the heterogeneity of the disadvantaged population suggests that the best way to utilize intrinsic interests is through independent work. Occasional small group activities, with 4-5 children in each group, are also desirable for the disadvantaged (Torrance, 1968).

Recommendation Eight: Discuss creativity with students; tell them why it is valuable. Be explicit about how <u>and</u> when to be original, flexible, and independent.

Discussion: Students need opportunities to be creative, and they need encouragement. But some of what they need to be creative can be given or at least reinforced through

unambiguous discussion. Discussion will of course also allow students to express their ideas about and choices for assignments and independent work.

Recommendation Nine: Monitor your expectations; and be aware of potential halo effects—general, unjustified, and often unreasonable expectations.

Discussion: Expectations are extremely powerful and often influenced by something simple, such as a student's verbal ability or appearance. Expectations are often implicit in a teacher's reactions and responses (Rosenthal & Jacobson, 1968). They need to be examined on a regular basis.

Recommendation Ten: Recognize the multifaceted nature of creativity.

Discussion: Creativity involves both divergent and convergent thinking, problem finding, problem solving, and self-expression. It may be seen in the fluency, originality, and flexibility of ideation; and it is more than just intellectual skill, requiring intrinsic motivation, a questioning attitude, and self-confidence. Each of these can be encouraged.

Recommendation Eleven: Recognize that creativity is a sign of and contributor to psychological health.

Discussion: It can be difficult to tolerate the individuality and nonconformity of highly creative students, but it helps to remember that creativity is an important personal asset.

Recommendation Twelve: Work to appreciate what children find for themselves; give both helpful evaluations and supportive valuations.

Discussion: It is easier to be critical than it is to be appreciative and supportive. It requires more work to uncover the logic supporting a student's own discovery than it does to point out why that logic might be flawed. Valuation encourages students and is important for their self-esteem. At least stop and consider a student's idea before reacting. The idea in question may not be the one expected, but how did the student find it? What was he or she thinking?

Recommendation Thirteen: Inform parents of what you are doing, and why.

Discussion: Parents may be able to contribute to the generalization of creative skills if they do some of the same things as teachers. They may also wonder why their child's classroom is unconventional.

Recommendation Fourteen: Read the creativity and educational literature and work with others who study and value creativity.

Discussion: Many specific ideas about creativity can be found in the literature. Goor and Rapoport (1977), for example, described a number of games which they used to enhance the creativity of disadvantaged students enrolled in a summer camp. Divergent thinking

tests (e.g., Wallach & Kogan, 1965) can also be used as games or exercises, as can the puzzles described in books on problem solving (e.g., Adams, 1979). Also, remember what was said above about avoiding ruts: Even if an educator finds something which works in the classroom, it should be re-examined and modified on a regular basis.

Concluding Remarks

Many of the suggestions and recommendations in this paper may appear to apply to all students and not just the disadvantaged. This is in part because some of them were inferred from the mainstream creativity literature. These inferences are justified by the wide distribution of creativity, which implies that children at virtually all levels of ability have creative potential. No wonder that some methods are widely applicable.

A close inspection of the recommendations will show that in some cases the targeted process may apply to all students but the actual level or content differs among populations. For example, the expectations of teachers may have a significant impact on all students, but the suggestion here is for educators to monitor their behavior to ensure that their expectations are specifically appropriate for disadvantaged students.

Furthermore, there are several recommendations which do not apply to all students. At least three apply most directly to disadvantaged students. Keeping in mind that the target population is the economically disadvantaged, the most specific recommendations are those focusing on (a) stimulus rich environments, (b) nonverbal materials, and (c) independent and small group assignments.

The first of these is justified by the fact that economically disadvantaged children may have tremendous potential, but may also have little experience with challenging materials. In addition, rich stimulus environments are informational and can thereby compensate for experiences that disadvantaged students have never had. Granted, some of the time children may need to be away from environmental cues in order to improvise. Environmental cues can be helpful, but only some of the time. When cues are absent, children have the opportunity to improvise and use their imagination.

The recommendation about nonverbal materials also applies most directly to disadvantaged students. There are many available verbal creativity exercises, but again, given their background, these may be biased against economically disadvantaged children. And as noted above, nonverbal tasks may be the easiest with which to elicit truly original thinking.

The recommendations about individual work and small group activity also are most applicable to disadvantaged children. This is clearly suggested in the literature, and is probably fairly obvious because disadvantaged children may have their own areas of interest and special needs. Working with students individually or in small groups may make an educator's task more difficult, but clearly they too must utilize their creative potential.

References

Adams, J. (1979). *Conceptual blockbusting* (2nd ed.). New York: Norton.

Belcher, T. L. (1975). Modeling original divergent response: An initial investigation. *Journal of Educational Psychology, 67*, 351-358.

Cropley, A. J. (1992). *More ways than one: Fostering creativity*. Norwood, NJ: Ablex.

Goor, A., & Rapoport, T. (1977). Enhancing creativity in an informal educational framework. *Journal of Educational Psychology, 69,* 636-643.

Platt, J. M., & Janeczko, D. (1991). Adapting art instruction for students with disabilities. *Teaching Exceptional Children,* Fall, pp. 10-12.

Rosenthal, R., & Jacobson, L. (1968). Teacher expectations for the disadvantaged. *Scientific American, 218* (4), 19-23.

Runco, M. A., Johnson, D., & Baer, P. (1992). *Parents' and teachers' views of creativity, and correlations with children's views*. Manuscript submitted for publication.

Torrance, E. P. (1971). Are the Torrance Tests of Creative Thinking biased against or in favor of "disadvantaged" groups? *Gifted Child Quarterly, 15,* 75-80.

Torrance, E. P. (1968). Finding hidden talents among disadvantaged children. *Gifted Child Quarterly, 12,* 131-137.

Wallach, M. A., & Kogan, N. (1965). *Modes of thinking in young children*. New York: Holt, Rinehart & Winston.

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Creativity as an Educational Objective for Disadvantaged Students

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There are several reasons to be optimistic about the creative potential of disadvantaged students. One reason for optimism is simply that creative potential seems to be very widely distributed (Milgram, 1990; Nicholls, 1983; Walberg & Stariha, in press). Creativity is not, then, characteristic only of individuals who have advantaged backgrounds or intellectual strengths in conventional areas.[1] Indeed, creativity is unrelated to IQ and academic achievement at all levels except the very lowest (Chambers & Barron, 1978; Runco & Albert, 1986). Thus disadvantaged students may very well have high levels of creative potential even if they are having academic difficulties or earn only moderate grades (Torrance, 1968b).

Educators can also be optimistic about the creativity of disadvantaged students because of the extremely important role played by motivation. Educators must be very careful about the specific motives they target, especially for creative behavior, but there are methods for ensuring that students are interested in being original. Educators can, for example, allow students some choice in their assignments. If students work on tasks of their choosing, they will be intrinsically motivated, and this often guarantees individual involvement and effort and the spontaneity which begets originality.

This idea about student choice is directly related to the next reason for optimism, namely that creativity is expressed in such diverse ways. Creativity can be expressed in just about anything, from drawing a portrait to serving a ping-pong ball. Even in the traditional classroom, students can be creative in language arts, mathematics, music, or leadership. Just as conventional academic performance says little about creative potential, so does originality in one domain say little about the potential for originality in other domains. This diversity of creative expression may take some of the pressure off students—and off educators.

This is not to say that students need no guidance for their creative activities. Students will need certain skills; but here again we can be optimistic because many of the relevant skills are easily enhanced. A great deal of research suggests that students can be taught specific strategies for originality and creativity. Much of what follows is a discussion of these strategies and the instructional techniques that can be used to enhance them.

Benefits of Creativity

Before those strategies are described, it is reasonable to ask about the need for and benefits of creativity. There are numerous benefits to both the individual student and to

society at large. For example, creativity seems to be related to general psychological health (Runco, Ebersole, & Mraz, 1991; Runco & Richards, in press), as well as adaptability, resilience, and the capacity for effective coping (Cohen, 1989; Richards, 1990). It is also related to specific problem-finding and problem-solving abilities (Runco, in press-d). Given how frequently most of us encounter problems in our day-to-day lives, efficient problem solving skills can be extremely useful. Evidence for this is given by the correlation between creativity and the quality of achievement and success in the natural environment (Okuda, Runco, & Berger, 1991; Wallach & Wing, 1969).[2]

Creativity was at one time thought to reflect some kind of abnormality or deficiency. This may have been because so many people know that van Gogh cut off his ear and Hemingway took his own life.[3] It may also reflect the fairly common stereotype of absent-minded scientists and eccentric artists. But "mad scientists" and unpredictable artists are exceptions. For most of us, creativity reflects an adaptability which helps us to get by in day-to-day life.

Disadvantaged students may gain particular benefits from creativity. This is in part because creativity is involved in domains which are relatively free of verbal or cultural biases (Chambers & Barron, 1978). It can therefore give them a means with which to excel and an area in which self-expression and one's own personal interests are all-important.

The societal and cultural benefits of creativity are fairly obvious, given that creativity contributes to the arts and underlies innovation and technological advance. What may not be as obvious is that society as a whole benefits when the individuals within it are healthy and creative (Rubenson & Runco, 1992; Simonton, 1991; Walberg & Stariha, in press). As Toynbee (1964) and Renzulli (1973) pointed out, creativity is a natural resource. If we take advantage of this resource, everyone will benefit.

Before leaving the topic of benefits I should mention the recent theory that creativity is tied to morality and ethics (Gruber, in press). Those concerned about the ethical status of our citizens might therefore look to creative skills to maintain cultural responsibility and vision (Haste, in press). This is of course another way of saying that society as a whole will benefit from creativity.

The argument here is, then, that educators and other practitioners can be optimistic about the creativity of disadvantaged students, the tenable premise being that there are obvious benefits to enhanced creativity. The benefits are at least as great for disadvantaged individuals as the general population, but who exactly is disadvantaged or at risk?

Who Is At-Risk?

Many students may be culturally, economically, and perhaps even cognitively disadvantaged.[4] For the present paper the charge given to me focused on the economically disadvantaged student.[5] This group was specifically defined as

representing students who may not have easy access to stimulating materials and experiences. This view of the economically disadvantaged is detailed by Renzulli, Reid, and Gubbins (1992) in their report, *Setting an Agenda: Research Practices Through the Year 2000.*

As we shall see, there is research specifically dealing with the creativity of these disadvantaged students, as well as pertinent research with other populations which has direct implications for that group. Both areas of research are represented below. By now it is probably clear that the suggestions herein are intended for educators and other practitioners. In further accord with the charge given to me, this paper is not intended to be a scholarly critique of the literature, but is instead an exploration of research implications.

What to Do, What to Avoid

In *Gulliver's Travels,* Justice is portrayed as controlling both penalties and rewards.[6] Teachers can influence the creative behavior of students, but like Justice, they must strive for balance. They must give and take; they must do certain things and simultaneously avoid doing certain things. This may be true of many or even all educational objectives, but it is especially true of creativity. Creativity can easily be enhanced, but that same malleability means that it can also be easily damaged.

As a matter of fact, for years it appeared that traditional education was doing more harm than good. There were reports of a "fourth grade slump" (Torrance, 1968a), for example, and one explanation for that unfortunate trend was that children were conforming—to pressures in the classroom, and then also in their thinking—at about 8-10 years of age. An easy explanation of conformity involves the expectations of adults. Too often, educators expect students to conform to classroom rules and appropriate behavior, to color all apples red, and to raise a hand before asking a question.

More recent research suggests that the slump in creativity may also result from newly developed cognitive abilities (Runco, 1991b), emotional tendencies (Smith, 1983; Urban, 1991), or even biological maturation (Gardner, 1982). Too much pressure and unrealistic expectations are certainly undesirable, but they do not completely explain the fourth-grade slump—nor any developmental slump, for that matter.

Still, it behooves all educators to monitor their expectations. Expectations have an enormous impact on the behavior of students—especially disadvantaged students (Rosenthal & Jacobson, 1968). If an educator expects a particular level of performance from a student, he or she is likely to behave in a fashion which actually reinforces that particular performance. Selective expectations may help explain the Matthew Effect (Walberg & Stariha, in press) wherein differences among students increase as they move along their education paths. Clearly, differences among students are relatively small in the early years. Indeed, Solomon (1974) pointed out that "disadvantaged children have a

margin of success over advantaged children in many areas of creative thinking in the early years of school" (p. 293, emphasis added).

Opportunity may be as important for creativity as expectation, and educators need to ask themselves, "How frequently am I providing the opportunity for independent thought and behavior?" If a student has the opportunity to work independently, by definition he or she is not conforming. Eysenck (in press) recognized this when he described how creative children

> will be particularly difficult to deal with, because they will be troublesome, unusual, difficult to reach, behaving in possibly odd ways that may not appeal to the teacher, or their peers; their very originality may upset the even running of the classroom and may produce difficulties for the teacher trained to insist on standard responses. Getzels and Jackson (1962) noted that their creative children were not particularly popular with teachers...Possibly more important than special methods of educating original and creative children would be special ways of educating their teachers in the appreciation of the value of originality and creativity, and in ways that creative children are likely to behave (and misbehave!). Essentially such children go their own way, and in a culture geared to uniformity this is a pattern not easily accommodated at school. All the more important, then, that teachers should make allowances, and should learn to value the independence shown by such children. (pp. 47-48, emphasis added)

Lopez, Esquivel, and Houtz (in press) recently argued that independence is especially important for linguistically and culturally diverse students.

Educators thus need to provide opportunities for students to work independently. Educators might also allow students to offer suggestions about assignments or topic areas. Examinations might even be written such that there is room for independent thought and creative insight.

One of the most important techniques for encouraging independence involves asking the right questions (Shaw & Cliatt, 1986; Torrance, 1971). Unfortunately, Shaw and Cliatt found that "fewer than 10 percent of teachers' questions required children to use divergent thinking" (p. 82). Apparently, educators typically ask short questions which have brief and specific answers. This may be because they believe they are giving students a more reasonable task, or it may be because it makes their job easier. Certainly it is easier to judge a specific response than a divergent one. Put differently, valuation and appreciation are more difficult than evaluation and criticism (Elkind, 1981; Runco, 1991b). More will be said below about valuating and evaluating children's ideas, but for now the point is that independence can be encouraged by using the right assignments, examinations, and questions.[7]

Educators should actually discuss creativity with their students. They should be very explicit in such a discussion, and they may need to focus on something their students can easily grasp. This is true in the sense of using concrete and meaningful problems and

tasks—especially for disadvantaged students (Platt & Janeczko, 1991)—but also in terms describing meaningful procedures and solution strategies.

Students can easily grasp the idea of originality. They can, for example, be directed to "think of ideas and solutions that no one else will think of" (Harrington, 1975; Runco & Okuda, 1988, 1991). Some students may not be very confident with a concept like "creativity," but they do know what it is to "give an idea that no one else has given" or better yet, to "be different." Originality, a critical facet of creativity, is a matter of being different.

Although I found no research using explicit instructions with the disadvantaged, we can infer a probable benefit from the research showing that nongifted students react especially well to explicit directions like those described just above. Gifted and talented students also become more original after explicit instructions, but their improvement is not as dramatic as that of nongifted students (Runco, 1986). This may be because gifted and talented students have their own strategies for finding original ideas and solutions, or at least they use strategies spontaneously (Davidson & Sternberg, 1984). Nongifted students, on the other hand, may lack these strategies, or may not know when to use them. The same may describe disadvantaged students.

Note the simplicity of the strategies. With just a few words, virtually any student can begin to consider original ideas. Strategies like "looking to ideas that no other student will think of" are easily learned. They lead to "know-how," but know-how is just a kind of useful information (Runco, in press-b). It can be communicated to students with very little effort.

Demonstrations by educators themselves will probably help. Teachers need to show their students how to be creative, in part because the educator can act as a concrete and respected model, but also because implicit in modeling is the message that "being different or creative is acceptable." For some disadvantaged students, being unconventional may come naturally. The trick thus becomes one of showing them that it can be valuable to be this way—that it is not always inappropriate to be different, even in a structured academic setting.

What of the setting itself? It may be that the classroom—bulletin boards and the like—can influence the creativity of students. This is because a creative environment can suggest that originality is acceptable, but also because the environment is itself a source for ideas. Dudek and Verreault (1989), for example, interpreted their empirical results as indicating that a stimulus-rich environment enhances divergent thinking, and Runco, Okuda, and Thurston (1991) demonstrated that some children use "environmental cues" when thinking about the problems they face.

Consider a child who is asked to "list all the things you can think of that are square." Some children might look around the room to find square objects: a window, a book, a desk-top, and so on. This may take some of the originality out of the ideas, but that is not necessarily the case because ideas often follow one after another. The initial

idea, suggested by something in the classroom, may itself be unoriginal (and a teacher may recognize this if several children think of the exact same idea) but subsequent ideas that are associated with that first idea may themselves be highly original. Furthermore, environmental cues can be manipulated, with teachers first suggesting to students that they use them, and later explicitly calling for ideas which are not suggested by the immediate environment. This would allow practice with particular strategies.

As mentioned briefly above, educators need to model creativity (Belcher, 1975; Runco, 1991a, chap. 20; Runco & Okuda, in press); there are, however, several things to keep in mind. First is the caveat that the modeling of original problem solving should not be taken too far. Modeling is very powerful—in fact it can be too powerful. If teachers model a specific strategy, they should explicitly state that what they are doing is demonstrating one of several alternatives. They need to avoid implying that their way of doing things is the only way. Several alternatives might be modeled, for somehow children need to understand that they can explore and try things which were not a part of the teacher's demonstrations. Exploration is critical for creativity.

Related to this is the idea that educators should have their students practice actual creative problem solving. The behavioral literature is especially helpful here because it describes how persistence—or in behavioral terms, maintenance—and generalization across settings can be virtually ensured (see Stokes & Baer, 1977). The former is encouraged through the careful scheduling of rewards and other contingencies. When a child is initially learning a behavior or strategy, rewards have to be given very consistently and predictably. In time, the schedule of rewards should be "thinned," so that a child must do more to earn them. Rewards can be made somewhat unpredictable through so-called "intermittent schedules," meaning that a child must maintain the behavior in question, not knowing exactly when the reward will be awarded, and only knowing that it will eventually be given. Unpredictable rewards contribute to both maintenance and generalization.

Generalization is further encouraged by having children practice a new strategy (e.g., "giving ideas that no one else will think of") with several different kinds of tasks, in several settings, and with several different audiences, including teachers and parents (cf. Albert, 1981). The child should learn that creative strategies and behaviors can be used in various situations, with various problems, and while under the supervision of various adults, or even in the company of their cohorts, friends, and siblings.

Students will try to be original and creative if they are motivated to do so. Educators do have an advantage here because children often like to try new things, and any task which allows them to "think of things no one else will think of" will probably be somewhat novel, being unlike the traditional academic tasks which involve finding the correct answer. Along the same lines, teachers have an advantage in that children like to play. Play and creativity go hand-in-hand (Ayman-Nolley, 1992; Smolucha, 1992); and teachers can introduce most creativity exercises (including those with explicit directions to be original) as playful and game-like rather than as structured academic exercises.

Torrance (1971) placed a great deal of emphasis on the usefulness of games specifically for disadvantaged students.

> Many exercises can be given with directions something like the following: This task is unlike your other school work. There are no incorrect answers here, and spelling isn't important. This is not a test; it's more of a game. It is important that you give as many ideas as you can. Again, your work on this will not be graded. Take your time and have fun....(cf. Runco, 1986; Wallach & Kogan, 1965)

Not only will these suggest that students can be playful; they will also indicate that they do not need to concern themselves with grades, working quickly, competing with classmates, or details like spelling. This kind of opportunity can contribute to comfort and thereby encourage self-expression and divergent thinking. What exactly is divergent thinking? Why is it important?

Divergent Thinking

Convergent thinking is required for success on spelling tests, most mathematics problems, a social studies question about the capital of California, or any task that has one correct or conventional answer. Certain open-ended tasks, in contrast, allow students to be original. They allow children to find divergent and unusual ideas. Some of these divergent thinking tasks are very simple and ask students "how are a potato and a carrot alike?" Others ask children to "list all of the round things you can think of" (Guilford, 1968; Wallach & Kogan, 1965). The thinking required by these tasks seems to reflect the same ideational skills which are important in the real world (Runco, 1991a; Wallach & Wing, 1969).

If teachers carefully observe children's divergent thinking, they will see different kinds and patterns of ideas. Ideas can be categorized as reflecting originality, flexibility, and fluency. Originality is apparent when a child finds unique or unusual ideas. Flexibility is apparent when a child produces varied and diverse ideas. Ideational fluency parallels linguistic fluency, except it reflects a facility specifically with ideas. It is a kind of productivity. Solomon (1974) found idiosyncratic patterns of divergent thinking for disadvantaged children at various grade levels, the implication being that ideation is best understood in terms of individual profiles.

Attention should be given to each of the indices of divergent thinking. Some children might be outstandingly productive or fluent with ideas, while another gives only a few ideas, each of which is highly original. Glover and Gary (1976) demonstrated how directions, reinforcement, and practice can each be used to enhance the various dimensions of divergent thinking.

Divergent thinking tasks are useful in part because they allow children to practice the strategies which lead to original ideas and solutions. Divergent thinking is not synonymous with creative thinking, but it appears to be strongly related. One way to

look at it is that divergent thinking reflects the potential for creative thinking. Divergent thinking does not necessarily lead to a creative insight, but it can help.

Divergent thinking is a special kind of problem-solving. There is a related skill which should be mentioned, especially because it is very important for many creative performances and because it can be targeted in the classroom. This involves problem finding. Recent research suggests that some very creative efforts are more closely tied to the finding of problems rather than to the solution of them (Getzels & Smilansky, 1983; Okuda et al., 1991). Often, once the problem is identified, most of the work is done; solutions are easily found. Moreover, if a problem is carefully constructed, it can guarantee creative solutions. Problem discovery and definition are very important.

Several tasks have been developed to assess problem finding skill, and like the divergent thinking tasks mentioned above, these can be used for practice (in the classroom) and are not just for assessment. Okuda et al. (1991), for example, administered several tasks that allowed students to choose a topic and define a problem before giving ideas and solutions. Two of these tasks are given below. The first is a presented problem and the second is a discovered problem.

> Presented Problem. Your friend Teddy sits next to you in class. Teddy likes to talk to you a lot and often bothers you while you are doing your work. Sometimes the teacher scolds you for talking, and many times you don't finish your work because he is bothering you. What are you going to do? Remember to give as many answers as you can.
>
> Discovered Problem. Now think of different problems in school that are important to you. You may write down problems about school, teachers, rules, or classmates. Take your time, and think of as many problems as you can.

Okuda et al. compared responses to problems like these with response that were elicited by the standard divergent thinking tests which are used in the literature (and which are not very realistic). They confirmed that problem-finding performances were more indicative of creative achievement than problem-solving performances.

Okuda et al. also found that children gave more original ideas when they worked on realistic problems. This is no surprise, for the children were undoubtedly more intrinsically motivated when working on realistic problems (Renzulli, 1982). Realistic problems are simply more meaningful to the individual than are unrealistic problems. When students themselves find define a task, problem ownership becomes a motive (Basadur, in press).

For children to be intrinsically motivated, they need to feel comfortable and secure in their explorations and inventions. This comfort reflects an affective or emotional condition, and in part self-confidence. Such affect is very important for divergent thinking and for the risk taking which can be required by the sharing of an original idea.

Input from students (e.g., task choice and problem definition) and opportunities for play will contribute to intrinsic motivation. They may not, however, suffice. Some individuals may need some concrete reinforcement for their efforts. Indeed, three studies have reported improved performance of disadvantaged students after receiving clear and concrete reinforcers (Milgram & Feingold, 1977; Moran & Liou, 1982; Ward, Kogan, & Pankove, 1972). Moran and Liou (1982), for instance, found that concrete reinforcers enhanced the performance of children whose verbal skills were below average. The performance of above average students was inhibited by the concrete reinforcers. Milgram and Feingold (1977) reported similar results in their work with disadvantaged Israeli students. In fact, both concrete (i.e., candy) and verbal (i.e., praise) reinforcers contributed to increased divergent thinking.[8]

Granted, concrete reinforcement is not always best; too much emphasis on a concrete "extrinsic" reinforcer may detract from the task itself and lead students to work toward completion rather than towards originality or interest (Hennessey, in press). Rewards can make students think too much about the "ends" rather than the "means." In some cases (e.g., with children having difficulty being original or difficulty understanding strategies) educators may begin with concrete reinforcers, but even here they should quickly fade them out of the picture. Recall here what was said above about the need to "thin schedules."

Materials for Creativity

Several additional suggestions can be made specifically about materials which may facilitate students' creative efforts. In general, it is usually best to give students a variety of topics and materials with which they may be unfamiliar. A variety of topics should encourage cognitive integrations and comparisons, and perhaps even the challenge of disequilibrium (Runco, in press-a). This simply means that when children find a discrepancy, they may be challenged into thinking about it until they discover or construct an understanding. A child, might, for example, spend a great deal of time wondering how valuable objects can be desirable but at the same time burdensome.[9]

Even more certain is the impact of unfamiliar materials. Numerous studies have suggested that unfamiliar materials elicit more original thinking than familiar materials (e.g., Runco & Albert, 1985). Apparently the latter allow students to rely on rote associations and preconceived ideas, and these are rarely original or creative. Unfamiliar materials, on the other hand, force students to think of new ideas and possibilities.

For disadvantaged students, there may be particular value in working with nonverbal tasks (Goor & Rapoport, 1977; Holguin & Sherrill, 1990; Torrance, 1971). This is in part because of what was said above about unfamiliarity allowing originality—verbal tasks tend to ask about familiar topics—but it is also because these students may lack confidence when working with verbal problems.

Wakefield (1985) described a nonverbal divergent thinking task—or more specifically, a problem finding task—which could easily be used with disadvantaged students. His procedure first requires that students receive a nonverbal task, like the Pattern Meanings or Line Meanings tasks from Wallach and Kogan (1965). Children are asked to "list all of the things that the figure could be." Explicit instructions can of course be used, asking children to give ideas that no one else will think of, and children can be reminded that spelling doesn't matter and that there are no incorrect responses. After they have worked on these for as long as they would like, they are asked to draw their own figure—a figure which suggest to them many possible interpretations. Unlike the presented problems, here they can define a task for themselves. (It is, then, best viewed as a problem definition task rather than a problem finding or discovery task.) This kind of problem definition activity avoids verbal biases and capitalizes on problem ownership. It also seems to facilitate original divergent thinking.

Although nonverbal tasks have a clear rationale, there is good reason to believe that disadvantaged students can build their linguistic abilities if they receive at least occasional verbal assignments, especially if these are open-ended and game-like. Children learn when they are creative in the literal sense of discovering, inventing, or constructing things for themselves. The resulting understanding is personally meaningful and fully understood, and thus very useful. This notion of learning by being creative applies especially well to special populations, and it explains why children whose verbal skills are below average may develop confidence and a useful knowledge base when playing and creating.

Balanced and Optimal Instruction

One of the claims in this paper is that educators should treat originality and creativity in such a manner as to encourage their generalization to the natural environment. An important strategy should be mentioned at this point, for it will determine how well students do in fact apply their creative skills in the natural environment. I am again referring to know-how, but knowledge of this sort can be divided according to its two distinct functions. Children need to be strategic about <u>when</u> as well as <u>how</u> to be original. It is not just a matter of showing students what it takes to be original. They also need to know when to be different and unusual and when not to. Originality is not always useful, and students need to know when to use it.

For this reason the curriculum should include both convergent and divergent tasks (Isaksen & Parnes, 1985). Children should have the opportunities to be creatively unconventional, <u>but they also need to develop the thinking skills which will allow them to respond to convergent tasks</u>. Not only will they encounter both kinds of tasks in the natural environment, but the two kinds of thinking are not mutually exclusive. Instead, they seem to work together. This is because children may need knowledge and information—some of which is best learned through convergent tasks—even when working on open-ended problems and tasks.

Consider the divergent thinking question, "Name all of the things you can think of that are round" (Wallach & Kogan, 1965). It will certainly help if students can generate a large number of responses to this question, but some convergent thinking may be needed to choose the best ideas (Runco, 1991b). The best ideas will be both unusual and fitting, and the fit or appropriateness of ideas will require convergent or critical thinking.

Along the same lines, an entirely unstructured classroom is not the most conducive to creativity. What is needed is a balance, with opportunities for divergence and opportunities for convergence (Cropley, 1992). As a matter of fact, this idea of balanced or optimal instruction applies to many aspects of education for creativity (Runco & Okuda, in press). It applies to the notion of independence, for example, because students should not be left entirely on their own. Torrance (1968b) specifically suggested small groups for disadvantaged children, and clearly there are times when the teacher should work closely with children rather than leaving them entirely by themselves. Optimal instruction also applies to nonverbal tasks, because disadvantaged children may benefit from the occasional use of verbal tasks. The idea of educational balance even applies to nonconformity, a correlate of creative behavior, because some rules are necessary. And again, it applies very well to divergent thinking, because it cannot lead to much without convergent thinking to support it.

Potential Problems

This paper opened with a brief list of reasons for optimism about the creativity of disadvantaged students. To be fair, I should describe some of the potential problems in this area. If educators are aware of the problems they can work to avoid them.

One problem is that the traits which seem to be associated with creative potential may be difficult to tolerate in the classroom (e.g., nonconformity, independence, questioning). To make matters worse, these traits should not be merely tolerated, encouraged, and rewarded; they should also be modeled. In other words, educators should themselves demonstrate how to be nonconforming, independent, and spontaneous.

Many teachers seem to have trouble with the very attitudes and traits which are related to creativity. Cropley (1992), for example, described how the conformity and politeness which characterize teachers' views of an "ideal student" are antithetical to creativity, and Runco, Johnson, and Baer (1992) found that 67% of the traits listed by teachers as characteristic of creative children were "socially unfavorable." Dettmer (1981) suggested that educators value creativity but do not value the specific behavioral tendencies which may be necessary for creativity.

Teachers may appreciate behaviors like conformity (and convergent thinking, for that matter) and other traits from the "ideal student" profile precisely because these can contribute to a smooth-running classroom. They can be troubled by behaviors like intrinsic motivation because these make it difficult to work with the students in a group. But as Eysenck (in press) suggested in the quotation given earlier, educators must

recognize that creative students may need to be nonconforming, questioning, unconventional, and expressive—at least once in a while.

Teachers of disadvantaged students may have an advantage in this regard. I say this because Swensen (1978) found that teachers of disadvantaged students defined "creative behaviors in disadvantaged children [with] heavy emphasis on originality in class work, art, and anti-social behavior" (p. 341). Perhaps such teachers are prepared for the unconventional tendencies required by original, divergent, and creative thinking. Incidentally, Swenson (1978) suggested that the creative thinking of disadvantaged students may actually keep them from earning high test scores.

Specific results from Swensen's (1978) study of teachers' views of the creativity of disadvantaged students are summarized below. She found that a creative disadvantaged student will often:

1. repeat activities so that he or she can do them differently;
2. invent imaginative lies;
3. show that he or she sees hidden meanings and cause and effect relationships that are [looking back] obvious;
4. write and illustrate stories without being asked to do so;
5. use free time to make up games or objects from paper and material scraps;
6. find many answers to "situational problems";
7. let imagination run when writing a story;
8. decorate the border of his or her paper when doing assignments;
9. ask unusual questions; does not let classroom events go unnoticed—questions them;
10. not copy the art of other children;
11. risk friendship to express his or her feelings;
12. suggest to the teacher alternative ways of doing an activity;
13. try original ways to get out of work that he or she does not want to do; and
14. find new ways to get attention. (pp. 339-340)

Sadly, the questionnaire Swensen constructed from the ideas of teachers elicited creativity ratings which were significantly correlated with achievement test scores. This may have resulted from a so-called "halo effect" whereby children who stand out in any manner are viewed by teachers as outstanding in all areas. Runco (1984, 1989; Runco et al., 1992) developed creativity rating measures that elicited judgments which were unrelated to IQs, but these were not specifically designed for disadvantaged students.

One thing to keep in mind is that the traits, attitudes, and tendencies described by Swensen (1978) and Runco et al. (1992) may only influence behavior in certain situations. A student may be quiet, reserved, and shy in most situations, but quite the opposite when interested or in a familiar setting. Similarly, a child who is interested in music may show great enthusiasm while that is the topic of discussion, but may then say virtually nothing when the topic is mathematics, physical education, or literature. Additionally, what was suggested earlier about domains (e.g., art vs. mathematics vs.

ping pong) implies that creative students are a heterogeneous group, and they therefore cannot be described in terms of a few traits. Not all children who tend to conform will be uncreative, nor will all nonconformists be creative (Runco, in press-c). Incidentally, this heterogeneity is entirely consistent with the definition of giftedness from the Javits Gifted and Talented Students Education Act of 1988 (Public Law 100-297-4003).

The second problem in this area is related to the first, but arises specifically because of the need to valuate students' divergent thinking. Put simply, an educator will not know which specific original ideas children will produce if they are given the opportunity. This can create problems because it precludes detailed planning. Divergent thinking can be very unpredictable, especially if the educator is trying to grasp the divergent thinking of a (young) student. It is similar to the situation described by Elkind (1981) in which children are cognitive aliens; they think differently from the way adults think. That makes true understanding and communication very difficult. This problem may be the most trying in the case of creativity, given that the best divergent thinking is literally the most divergent. It moves to remote topics and ideas, and again, these are difficult to predict. One might even say that predictable divergent thinking is not really divergent at all.

Research with parents and teachers confirms that they have difficulty grasping the divergent thinking of their children or students (Runco & Vega, 1990). This is because children are "cognitive aliens," but also because they make judgments using different criteria from those which are used by adults. They may suggest something because it is conceptually entertaining,[10] while an educator may wonder about relevance or usefulness. Like other populations, disadvantaged children may have their own idiosyncratic criteria for what constitutes a "good idea."

Another related problem was described by Rubenson and Runco (1991) as one of attenuated flexibility. In their words,

> classrooms are apt to be structured such that teachers are in authority positions....[teachers] undoubtedly have more experience and a larger knowledge base than their students. While this is usually beneficial for the learning process, it also implies that flexibility, in the form of adopting alternative ideas, is apt to be costly for the teacher. In behavioral terms, a teacher may unintentionally inhibit the creativity of his or her charges when one of them approaches with a novel idea. That novel idea may be inconsistent with the expectations or lesson plan of the teacher. In this case, the teacher may accept the idea (and therefore diminish the value of some of his or her existing knowledge), or reject it (thereby missing the opportunity to reinforce the student's creative expression).

Attenuated flexibility thus occurs because the adoption of alternative ideas is costly for the teacher (or for any individual with a great deal of experience and a large knowledge base). The cost reflects a depreciation in existing knowledge as it is supplanted by new knowledge.

Not only can this kind of depreciation influence reactions to students; it can also influence professional studies. Rubenson and Runco (1991) suggested that "similar psychoeconomic logic applies to the teacher's adoption of new teaching techniques or incorporation of current ideas from the education research literature. Adoption of new methods is apt to be costly to the extent that it lowers the value of the teacher's existing knowledge base." If this psychoeconomic model is accurate, teachers should be especially careful to avoid falling into ruts in the way they do things and in their curricular objectives. Practically speaking, educators should read the educational and creativity literature, attend conferences, and enroll in inservices. Isaksen and Parnes (1985) presented data suggesting that inservices were especially helpful.

The last problem is a societal one. In concise terms, the problem is that our society under-allocates resources for the development of creativity (Rubenson & Runco, 1992). Many educational outcomes are widely appreciated, as indicated by employers including a diploma as a "minimum qualification" for a job. But how often do employers ask for "creative experience?" Outside of the arts, the answer is "just about never." Think back on the benefits of creativity and the idea that creativity is a natural resource (Renzulli, 1982; Toynbee, 1964). Surely creativity should be widely appreciated, by educators and by society as a whole.

Implications and Recommendations

The practical implications of this review can be condensed into a list of educational recommendations. Fourteen of these are given below. The first six recommendations describe behaviors for educators to avoid. These are given first because they may be less intuitive than the last eight recommendations, which describe objectives and behaviors. The concluding section of this paper describes why some of the recommendations apply to both disadvantaged and more typical students and why some apply only to the disadvantaged.

Recommendation One: Avoid relying on verbal materials; use a variety of materials; tap various domains (e.g., music, crafts, mathematics, language arts, physical education).

Discussion: Creativity can be expressed in many different ways, not just in the arts. Disadvantaged children may be the most capable with concrete materials (Platt & Janeczko, 1991) and the most creative in nonverbal domains (Goor & Rapoport, 1977; Torrance, 1971).

Recommendation Two: Avoid relying on verbal rewards. Concrete reinforcers may be best for many disadvantaged students.

Discussion: It is not just verbal products which are potentially biased against disadvantaged students. It is also verbal descriptions, explanations, requests, and reinforcers. Ideally concrete reinforcers will be used early on, with schedules of reinforcement eventually thinned.

Recommendation Three: Avoid over-emphasizing structure and curricula with predictable outcomes. Ask questions that allow students to follow their own (potentially divergent) logic and thinking, even if unpredictable. Plan to follow students' own interests part of each day.

Discussion: Creativity is by definition spontaneous; hence lessons and activities need to be flexible to allow the unpredictable. The results are often novel, unusual, divergent, and remote, and when thinking in a creative fashion students might find something the teacher did not foresee. Moreover, students may be the most motivated and personally involved if they have some say about topics and activities. Intrinsic motivation is critical for creative expression, and it is by definition maximized when individuals follow their own interests.

Recommendation Four: Avoid prejudging students who are nonconforming and students who find their own way of doing things.

Discussion**:** Some of the characteristics and tendencies of creative students may not fit the mold of the "ideal student" (Cropley, 1992; Runco et al., 1992). Creativity is, after all, an expression of individuality.

Recommendation Five: Avoid suggesting (even implicitly) that your own way of doing something is the best or only way.

Discussion: Modeling is very important (Belcher, 1975), but it can easily misdirect students and imply that they should ignore their own natural inclinations. Spontaneity and divergent thinking need to be modeled; "the right way" to do something should not.

Recommendation Six: Avoid going overboard—strive for a balance between structure and unstructured tasks, between independence and working in small groups, between rich and open stimulus environments, and between convergent and divergent tasks.

Discussion: Creativity requires some divergent thinking, but it also requires that the student makes certain choices (e.g., for the most original idea or solution). Both independent and conventional thinking need to be encouraged.

Recommendation Seven: Allow independent work, and <u>not</u> just where it is easy (e.g., while working on crafts or art projects).

Discussion: As noted just above, the intrinsic motivation which contributes to creative expression is maximized when an individual follows his or her own interests. Additionally, the heterogeneity of the disadvantaged population suggests that the best way to utilize intrinsic interests is through independent work. Occasional small group activities, with 4-5 children in each group, are also desirable for the disadvantaged (Torrance, 1968b).

Recommendation Eight: Discuss creativity with students; tell them why it is valuable. Be explicit about how and when to be original, flexible, and independent.

Discussion: Students need opportunities to be creative, and they need encouragement. But some of what they need to be creative can be given or at least reinforced through unambiguous discussion. Discussion will of course also allow students to express their ideas about and choices for assignments and independent work.

Recommendation Nine: Monitor your expectations; and be aware of potential halo effects—general, unjustified, and often unreasonable expectations.

Discussion: Expectations are extremely powerful and often influenced by something simple, such as a student's verbal ability or appearance. Expectations are often implicit in a teacher's reactions and responses (Rosenthal & Jacobson, 1968). They need to be examined on a regular basis.

Recommendation Ten: Recognize the multifaceted nature of creativity.

Discussion: Creativity involves both divergent and convergent thinking, problem finding, problem solving, and self-expression. It may be seen in the fluency, originality, and flexibility of ideation; and it is more than just intellectual skill, requiring intrinsic motivation, a questioning attitude, and self-confidence. Each of these can be encouraged.

Recommendation Eleven: Recognize that creativity is a sign of and contributor to psychological health.

Discussion: It can be difficult to tolerate the individuality and nonconformity of highly creative students, but it helps to remember that creativity is an important personal asset.

Recommendation Twelve: Work to appreciate what children find for themselves; give both helpful evaluations and supportive valuations.

Discussion: It is easier to be critical than it is to be appreciative and supportive. It requires more work to uncover the logic supporting a student's own discovery than it does to point out why that logic might be flawed. Valuation encourages students and is important for their self-esteem. At least stop and consider a student's idea before reacting. The idea in question may not be the one expected, but how did the student find it? What was he or she thinking?

Recommendation Thirteen: Inform parents of what you are doing, and why.

Discussion: Parents may be able to contribute to the generalization of creative skills if they do some of the same things as teachers. They may also wonder why their child's classroom is unconventional.

Recommendation Fourteen: Read the creativity and educational literature and work with others who study and value creativity.

Discussion: Many specific ideas about creativity can be found in the literature. Goor and Rapoport (1977), for example, describe a number of games which they used to enhance the creativity of disadvantaged students enrolled in a summer camp. Divergent thinking tests (e.g., Wallach & Kogan, 1965) can also be used as games or exercises, as can the puzzles described in books on problem solving (e.g., Adams, 1979). Also, remember what was said above about avoiding ruts: Even if an educator finds something which works in the classroom, it should be re-examined and modified on a regular basis.

Concluding Remarks

Many of the suggestions and recommendations in this paper may appear to apply to all students and not just the disadvantaged. This is in part because some of them were inferred from the mainstream creativity literature. These inferences are justified by the wide distribution of creativity. The wide distribution implies that children at virtually all levels of ability have creative potential, and similar methods thus apply.

A close inspection of the recommendations will show that in some cases the targeted process may apply to all students but the actual level or content differs among populations. For example, the expectations of teachers may have a significant impact on all students, but the suggestion here is for educators to monitor their behavior to ensure that their expectations are specifically appropriate for disadvantaged students. These expectations will undoubtedly differ from those which are appropriate for other students. The concept of optima in education applies very well here: Each of the recommendations that require a balance will have one optimum for disadvantaged individuals and another for the general population.

Furthermore, there are several recommendations which do not apply to all students. At least three apply most directly to disadvantaged students. Keeping in mind that the target population here is the economically disadvantaged (see Renzulli et al., 1992), the most specific recommendations are those focusing on (a) stimulus rich environments, (b) nonverbal materials, and (c) independent and small group assignments.

The first of these is justified by the fact that economically disadvantaged child may have tremendous potential, but may also have little experience with challenging materials. In addition, stimulus rich environment are informational and can thereby compensate for experiences that disadvantaged students may have never had. Granted, some of the time children may need to be away from environmental cues in order to improvise (Torrance, 1971). Earlier I described how environmental cues can be helpful, but only some of the time. When cues are absent, children have the opportunity to improvise and use their imagination.

The recommendation about nonverbal materials also applies most directly to disadvantaged students. Many verbal creativity exercises are available (e.g., Donaldson, 1990; Timberlake, 1982), but again, given their background, these may be biased against economically disadvantaged children. And as noted above, nonverbal tasks may be the easiest with which to elicit truly original thinking.

The recommendations about individual work and small group activity are also especially applicable to disadvantaged children. This is clearly suggested in the literature (e.g., Lopez et al., in press; Torrance, 1968b), and is probably fairly obvious because disadvantaged children may have their own areas of interest and special needs. Working with students individually or in small groups may make an educator's task more difficult, but clearly they too must utilize their creative potential.

Notes

[1]There is controversy about the distribution of creativity. It is a bit complicated, however, for some of those suggesting that research focus on "unambiguous cases" of creativity (e.g., Gruber, 1988) seem to do so for methodological reasons. They might accept the view of a wide distribution, but they believe that research will benefit the most by examining only clear-cut instances of creativity.

[2]There is an interesting parallel here because some disadvantaged students learn survival skills and develop "street smarts" at very early ages, and these adaptive skills can easily be viewed as a kind of real-world creativity.

[3]Cognitive research indicates that people have a tendency to remember salient examples like van Gogh or Hemingway, even if many counter-examples are encountered (Nisbett & Ross, 1980).

[4]Readers interested in specific exceptional populations can consult Eisen (1989), Fortner (1986), or Holguin and Sherrill (1989) concerning learning disabled children; Gold and Houtz (1984) or Johnson (1990) concerning "mentally retarded" individuals; Johnson (1990) or Marschark and Clark (1987) on hearing-impaired children; or Masten (1989) concerning ethnic minorities.

[5]Incidentally, there is surprisingly little research on socioeconomic (SES) background and creativity. This is especially surprising because SES is a widely recognized factor in the research on IQ and other expressions of intelligence, and because there is a great deal of research on other family background factors, such as birth order, family size, and age intervals between siblings (e.g., Gaynor & Runco, 1992; Runco & Bahleda, 1987). Dudek, Strobel, and Runco (1992) have a project under way, with several thousand children participating, and measures specifically of SES.

[6]See Chapter 6, on the "learning, laws, and customs of Lilliput," in Jonathan Swift's (1734), *Gulliver's Travels.*

[7]This works two ways: Students can think divergently while asking questions (and use their "problem definition" skills), and their divergent thinking can be encouraged when educators ask the right questions.

[8]This work is germane because cultural values can lead directly to particular experiential advantages or disadvantages. Interested readers should consult Aviram and Milgram (1977), Bruch (1975), Cropley (1970), or Masten (1989). Bruch described how some tests are verbally and culturally biased, and Aviram and Milgram reported significant differences in the dogmatism, locus of control, and creativity of children educated in the Soviet Union, the United States, and Israel. Significant differences were found between the Soviets (or those who were Soviets at that point—the world has changed since 1977!) and the other two. These differences were explained in terms of educational pressure.

Notes *(continued)*

[9]My seven-year-old daughter recently asked about the diamonds embedded in her tennis shoes and was disappointed that they were fakes. However, she responded with numerous ideas when I asked her to think of ways that the fake diamonds might be better than real diamonds (at least for tennis shoes). I believe she was intrigued by the fact that expensive things are not always best.

[10]This is similar to what occurs as children's appreciation of humor develops. School children can be amused by jokes, riddles, and simple conceptual tricks (e.g., "how many balls of string would it take to reach the moon? One, but it must be a very big ball of string!") which does nothing for most adults.

References

Adams, J. (1979). *Conceptual blockbusting* (2nd ed.). New York: Norton.

Albert, R. S. (1981). Special programs require special people. *Roeper Review, 4,* 2-4.

Albert, R. S., & Runco, M. A. (1989). Independence and cognitive ability in gifted and exceptionally gifted boys. *Journal of Youth and Adolescence, 18*, 221-230.

Aviram, A., & Milgram, R. M. (1977). Dogmatism, locus of control, and creativity in children educated in the Soviet Union, the United States, and Israel. *Psychological Reports, 40*, 27-34.

Ayman-Nolley, S. (1992). Vygotsky's perspective on the development of imagination and creativity. *Creativity Research Journal, 5*, 101-109.

Basadur, M. (in press). Managing the creative process. In M. A. Runco (Ed.), *Problem finding, problem solving, and creativity*. Norwood, NJ: Ablex.

Belcher, T. L. (1975). Modeling original divergent response: An initial investigation. *Journal of Educational Psychology, 67*, 351-358.

Bruch, C. B. (1975). Assessment of creativity in culturally different children. *Gifted Child Quarterly, 19,* 169-174.

Chambers, J. A., & Barron, F. (1978). The culturally different gifted student: Identifying the ablest. *Journal of Creative Behavior, 12*, 72-74.

Cohen, L. 1989). A continuum of creative adaptive behaviors. *Creativity Research Journal, 2,* 169-183.

Cropley, A. J. (1970). Creativity and culture. *Educational Trends, 1*, 19-27.

Cropley, A. J. (1992). *More ways than one: Fostering creativity*. Norwood, NJ: Ablex.

Davidson, J. E., & Sternberg, R. J. (1984). The role of insight in intellectual giftedness. *Gifted Child Quarterly, 28*, 58-64.

Dettmer, P. (1981). Improving teacher attitudes towards characteristics of the creatively gifted. *Gifted Child Quarterly, 25*, 11-16.

Donaldson, K. E. (1990). Creative interest in words with literature. *Childhood Education,* 220-225.

Dudek, S., Z., Strobel, M., & Runco, M. A. (1992). *Cumulative and proximal social influences on creative potential* . Submitted for publication.

Eisen, M. L. (1989). Assessing differences in children with learning disabilities and normally achieving students with a new measure of creativity. *Journal of Learning Disabilities, 22,* 462-451.

Elkind, D. (1981). *Children and society.* New York: Oxford University Press.

Eysenck, H. J. (in press). Creativity and personality: Suggestions for a theory. *Psychological lnquiry.*

Fortner, V. L. (1986). Generalization of creative productive-thinking training to LD students' written expression. *Learning Disability Quarterly, 9,* 274-284.

Gaynor, J.R., & Runco, M. A. (1992). Family size, birth order, age-interval, and the creativity of children. *Journal of Creative Behavior, 26,* 108-118.

Gardner, H. (1982). *Art, mind, and brain.* New York: Basic Books.

Getzels, J., & Jackson, P. (1962). *The creativity-intelligence distinction: Explorations with gifted students.* New York: Wiley.

Getzels, J. W., & Smilansky, J. (1983). Individual differences in pupil perceptions of school problems. *British Journal of Educational Psychology, 53,* 307-316.

Glover, J., & Gary, A. L. (1976). Procedures to increase some aspects of creativity. *Journal of Applied Behavior Analysis, 9,* 79-84.

Gold, J. B., & Houtz, J. C. (1984). Enhancing the creative problem-solving skills of educable mentally retarded students. *Perceptual and Motor Skills, 58,* 247-253.

Goor, A., & Rapoport, T. (1977). Enhancing creativity in an informal educational framework. *Journal of Educational Psychology, 69,* 636-643.

Gruber, H. E. (1988). The evolving systems approach to creative work. *Creativity Research Journal, 1*, 27-51.

Gruber, H. E. (in press). Creativity in the moral domain: Ought implies can implies create. *Creativity Research Journal.*

Guilford, J. P. (1968). *Intelligence, creativity, and their educational implications.* San Diego, CA: Knapp.

Harrington, D. M. (1975). Effects of explicit instructions to "be creative" on the psychological meaning of divergent thinking test scores. *Journal of Personality, 43,* 434-454.

Haste, H. (in press). Moral education and creativity for citizenship. *Creativity Research Journal*.

Hennessey, B. A. (in press). Immunizing children against the negative effects of reward: A further examination of intrinsic motivation techniques. *Creativity Research Journal*.

Holguin, O., & Sherrill, C. (1990). On motor creativity, age, and self-concept, in young learning disabled boys. *Creativity Research Journal, 3,* 293-294.

Isaksen, S. G., & Parnes, S. (1985). Curriculum planning for creative thinking and problem solving. *Journal of Creative Behavior, 19,* 1-29.

Johnson, R. A. (1990). Creative thinking in mentally retarded deaf adolescents. *Psychological Reports, 66,* 1203-1206.

Lopez, E. C., Esquivel, G. B., & Houtz, J. C. (in press). The creative skills of gifted culturally and linguistically diverse students. *Creativity Research Journal*.

Marschark, M., & Clark, D. (1987). Linguistic and nonlinguistic creativity of deaf children. *Developmental Review, 7*, 22-38.

Masten, W. G. (1989). Creative self-perceptions of Mexican-American children. *Psychological Reports, 64,* 556-558.

Milgram, R. M. (1990). Creativity: An idea whose time has come and gone? In M. A. Runco & R. S. Albert (Eds.), *Theories of creativity* (pp. 215-233). Newbury Park, CA: Sage.

Milgram, R. M., & Feingold, S. (1977). Concrete and verbal reinforcement in creative thinking of disadvantaged students. *Perceptual and Motor Skills, 45,* 675-678.

Moran, J. D., & Liou, E. Y. Y. (1982). Effects of reward on creativity in college students of two levels of ability. *Perceptual and Motor Skills, 54*, 43-48.

Nicholls, J. C. (1983). Creativity in the person who will never produce anything original or useful. In R. S. Albert (Ed.), *Genius and eminence: A social psychology of exceptional achievement* (pp. 265-279). New York: Pergamon.

Nisbett, R., & Ross, L. (1980). *Human inference: Strategies and shortcomings*. Englewood Cliffs, NJ: Prentice Hall.

Okuda, S. M., & Runco, M. A., & Berger, D. E. (1991). Creativity and the finding and solving of real-world problems. *Journal of Psychoeducational Assessment, 9,* 45-53.

Platt, J. M., & Janeczko, D. (1991). Adapting art instruction for students with disabilities. *Teaching Exceptional Children,* pp. 10-12.

Renzulli, J. S. 1973). Talent potential in minority group students. *Exceptional Children,* 437-444.

Renzulli, J. S. (1982). What makes a problem real: Stalking the illusive meaning of qualitative differences in gifted education. *Gifted Child Quarterly, 26,* 147-156.

Renzulli, J. S., Reid, B. D., & Gubbins, E. J. (1992). *Setting an agenda: Research priorities for the gifted and talented through the year 2000.* Storrs, CT: The University of Connecticut, The National Research Center on the Gifted and Talented.

Richards, R. (1990). Everyday creativity, eminent creativity, and health: Afterview of special CRJ issues on creativity and health. *Creativity Research Journal, 3,* 300-326.

Rosenthal, R., & Jacobson, L. (1968). Teacher expectations for the disadvantaged. *Scientific American, 218*(4), 19-23.

Rubenson, D. E., & Runco, M. A. (1991, October). *Why Kelly isn't more creative*. Presented at the Summit Meeting of the Institute for Creative Intelligence, in Portland, OR.

Rubenson, D. E., & Runco, M. A. (1992). The psychoeconomic approach to creativity. *New Ideas in Psychology, 10,* 131-147.

Runco, M. A. (1984). Teachers' judgments of creativity and social validation of divergent thinking tests. *Perceptual and Motor Skills, 59,* 711-717.

Runco, M. A. (1986). Maximal performance on divergent thinking tests by gifted, talented, and nongifted children. *Psychology in the Schools, 23,* 308-315.

Runco, M. A. (1989). Parents' and teachers' ratings of the creativity of children. *Journal of Social Behavior and Personality, 4,* 73-83.

Runco, M. A. (Ed.). (1991a). *Divergent thinking*. Norwood, NJ: Ablex.

Runco, M. A. (1991b). The evaluative, valuative, and divergent thinking of children. *Journal of Creative Behavior, 25,* 311-319.

Runco, M. A. (1992). Children's divergent thinking and creative ideation. *Developmental Review, 12,* 233-264.

Runco, M. A. (in press-a). Creativity and its discontents. In M. Shaw & M. A. Runco (Eds.), *Creativity and affect*. Norwood, NJ: Ablex.

Runco, M. A. (in press-b). Creativity, cognition, and their educational implications. In J. C. Houtz (Ed.), *The educational psychology of creativity*. New York: Fordham University Press.

Runco, M. A. (in press-c). Moral creativity: Intentional and unconventional. *Creativity Research Journal*.

Runco, M. A. (Ed.). (in press-d). *Problem finding, problem solving, and creativity*. Norwood, NJ: Ablex.

Runco, M. A., & Albert, R. S. (1985). The reliability and validity of ideational originality in the divergent thinking of academically gifted and nongifted children. *Educational and Psychological Measurement, 45,* 483-501.

Runco, M. A., & Albert, R. S. (1986). The threshold hypothesis regarding creativity and intelligence: An empirical test with gifted and nongifted children. *Creative Child and Adult Quarterly, 11*, 212-218.

Runco, M. A., & Bahleda, M. D. (1987). Birth order and divergent thinking. *Journal of Genetic Psychology, 148,* 119-125.

Runco, M. A., Ebersole, P., & Mraz, W. (1991). Self-actualization and creativity. *Journal of Social Behavior and Personality, 6,* 161-167.

Runco, M. A., Johnson, D., & Baer, P. (1992). *Parents' and teachers' views of creativity, and correlations with children's views*. Manuscript submitted for publication.

Runco, M. A., & Okuda, S. M. (1988). Problem-discovery, divergent thinking, and the creative process. *Journal of Youth and Adolescence, 17,* 211-220.

Runco, M. A., & Okuda, S. M. (1991). The instructional enhancement of the ideational originality and flexibility scores of divergent thinking tests. *Applied Cognitive Psychology, 5,* 435-441.

Runco, M. A., & Okuda, S. M. (in press). Reaching creatively gifted children through their learning styles. In R. M. Milgram & R. Dunn (Eds.), *Teaching the gifted and talented through their learning styles*. New York: Praeger.

Runco, M. A., Okuda, S. M., & Thurston, B. J. (1991). Environmental cues and divergent thinking. In M. A. Runco (Ed.), *Divergent thinking* (pp. 79-85). Norwood, NJ: Ablex Publishing Corporation.

Runco, M. A., & Richards, R. (in press). *Eminent creativity, everyday creativity, and health*. Norwood, NJ: Ablex.

Runco, M. A., & Vega, L. (1990). Evaluating the creativity of children's ideas. *Journal of Social Behavior and Personality, 5,* 439-452.

Shaw, J. M., & Cliatt, M. J. P. (1986). A model for training teachers to encourage divergent thinking in young children. *Journal of Creative Behavior, 20,* 81-88.

Simonton, D. K. (1991). Political pathology and societal creativity. *Creativity Research Journal, 3,* 85-99.

Smith, G. J. W. (1983). Creativity in the early and middle school years. *International Journal of Behavioral Development, 8,* 167-195.

Smolucha, F. (1992). The relevance of Vygotsky's theory of creative imagination for contemporary research on play. *Creativity Research Journal, 5,* 75-82.

Solomon, A. O. (1974). Analysis of creative thinking of disadvantaged children. *Journal of Creative Behavior, 8,* 293-295.

Stokes, T. F., & Baer, D. M. (1977). An implicit technology of generalization. *Journal of Applied Behavior Analysis, 10,* 349-367.

Swensen, E. V. (1978). Teacher-assessment of creative behavior in disadvantaged children. *Gifted Child Quarterly, 22,* 338-343.

Timberline, P. (1982). 15 ways to cultivate creativity in your classroom. *Childhood Education*, pp. 19-21.

Torrance, E. P. (1968a). A longitudinal examination of the fourth-grade slump in creativity. *Gifted Child Quarterly, 12*, 195–199.

Torrance, E. P. (1968b). Finding hidden talents among disadvantaged children. *Gifted Child Quarterly, 12,* 131-137.

Torrance, E. P. (1971). Are the Torrance Tests of Creative Thinking biased against or in favor of "disadvantaged" groups? *Gifted Child Quarterly, 15,* 75-80.

Toynbee, A. (1964). Is American neglecting her creative minorities? In C. W. Taylor (Ed.), *Widening horizons of creativity*. New York: Wiley.

Urban, K. K. (1991). On the development of creativity in children. *Creativity Research Journal, 4,* 177–191.

Wakefield, J. F. (l985). Towards creativity: Problem finding in a divergent-thinking exercise. *Child Study Journal, 15,* 265-270.

Walberg, H., & Stariha, W. (in press). Productivity factors in creativity. *Creativity Research Journal*.

Wallach, M. A., & Kogan, N. (1965). *Modes of thinking in young children*. New York: Holt, Rinehart & Winston.

Wallach, M. A., & Wing, C. (1969). *The talented student*. New York: Holt, Rinehart & Winston.

Ward, W. C., Kogan, N., & Pankove, E. (1972). Incentive effects in children's creativity. *Child Development, 43,* 669-676.

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