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Influences on Classroom Interest

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Theories of interest and motivation give little specific advice to teachers regarding curriculum decisions about how to attract interest in classroom activities. Although educators should keep in mind the fact that attempts to enhance interest can be irrelevant to learning, and may even undermine learning, promoting interest can enhance learning if applied appropriately; therefore, educators could benefit from understanding factors that predict and enhance interest. In this article, I discuss individual and situational factors that influence interest. The individual factors are belongingness (which includes cultural value, identification, and social support), emotions, competence, utility–goal relevance, and background knowledge (which includes a hole in the schema). The situational factors are hands-on, discrepancy, novelty, food, social interaction (which includes visible author), modeling, games and puzzles, content, biophilia, fantasy, humor, and narrative. To the degree that teachers integrate these factors into their instruction, their students are likely to experience increased interest and learning.

A key aspect of fostering the acquisition and nurturance of appreciation for learning is catching the interest of students and holding it (Dewey, 1913; Mitchell, 1993). Interest has been defined in various ways. Prenzel (1992) pointed out that, as used in everyday life, interest "describes preferences for objects" (p. 73, where *object* is broadly defined); his more detailed definition includes positive emotions toward the object and autotelic, noninstrumental activity with the object. This is similar to the definition of intrinsic motivation suggested by Deci and Porac (1978): "An activity is generally said to be intrinsically motivated if there is no apparent external reward associated with the activity. In other words, the reward is said to be in the activity itself" (p. 150). Thus, the constructs of interest and intrinsic motivation have considerable overlap. The distinction is that interest refers "to a person's interaction with a *specific* class of tasks, objects, events, or ideas. Such specificity distinguishes individual interests from other psychological concepts such as intrinsic motivation, attention, arousal, curiosity and exploration" (Krapp, Hidi, & Renninger, 1992, p. 8). Bandura (1986) wrote that even though intrinsic interest and intrinsic motivation are often used to mean the same thing, "there is a major difference between a motive, which is an inner drive to action, and an interest, which is a fascination with something" (p. 243).

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Interest researchers often distinguish between interest that is person centered (individual or personal approach) and interest that is situation centered (situational approach; Krapp et al., 1992). The individual approach asks what dispositional preferences people hold, or what enduring preferences they have for certain activities or domains of knowledge. Thus, the individual approach asks, Given knowledge about a person's background knowledge and current interests, what content areas and activities would be most interesting to that person? In contrast, the situational approach investigates the content, activities, stimuli, or environmental conditions that tend to generate interest in many individuals. Thus, the situational approach asks, Can one predict what things will be interesting to most people? This article discusses both individual characteristics that influence interest as well as situational aspects of interest. Although both types of interest are relevant to educators, only situational interest is manipulable by educators, at least in short-term encounters.

One element of Schiefele's (1991) definition of individual interest is positive feelings. Positive affect is a component of the definition of interest primarily for individual interest researchers. Researchers who focus on situational interest are less likely to include positive affect as a necessary component of interest (Hidi & Anderson, 1992). For example, Iran-Nejad (1987) distinguished interest from liking by asserting that "A snake can be interesting without being liked, and a particular soft drink may be liked without being interesting" (p. 121). Situational interest thus may or may not include liking, because situational interest can be precipitated by curiosity, vio-

lation of expectation, or incongruity, none of which requires liking.

Theories of interest and motivation give little specific advice to teachers regarding curriculum decisions about how to attract interest in classroom activities. Krapp and colleagues (1992) pointed out in their review,

> the research to date has focused primarily on interest as an independent variable. As such, the variables studied, the questions posed, and the methodologies employed have been driven by a need to establish how interest affects achievement, cognition, vocational choices, and so on, rather than questions related to the nature, determinants, and functions of interest per se. (p. 19)

This does not mean, however, that there is little research on what causes interest. In fact, there is considerable research, but rather than using the term *interest*, this research often uses terms such as *attention*, *curiosity*, and *engagement*. In some areas, nevertheless, there is not a strong research base and this article becomes somewhat conjectural. Research on interest has not yielded comprehensive lists of interesting activities or comprehensive and mutually exclusive taxonomies of interest. Nor does this article propose such lists or taxonomies. Thus, this article relies upon constructs proposed by interest researchers in scattered domains, as well as upon my own reading of varied literatures that discuss interest without necessarily using that term.

Current theories of motivation are highly useful for designing global learning environments, but not so useful for making specific tasks interesting. It is clear that the task is a crucial component of motivation and learning (Blumenfeld & Meece, 1988; Blumenfeld, Mergendoller, & Swarthout, 1987; Doyle, 1983). Although theories of motivation have much to say about the atmosphere or ambiance of the classroom, the things that teachers should say and how they should say them, how to set goals, and the global goals that teachers should emphasize (Ames, 1992; Ames & Archer, 1988; Anderman & Maehr, 1994; Bandura, 1997; Covington, 1992; Csikszentmihalyi, 1990; Deci & Ryan, 1987; Dweck, 1986; Ford, 1992; Lepper & Greene, 1978; Locke & Latham, 1990; Maehr & Midgley, 1996; Meece & Holt, 1993; Nicholls, 1989; Zimmerman, 1989), they say little about how to design interesting tasks for classroom use. The dominant current theories of motivation—attribution theory (Weiner, 1985), goal orientation theory (Ames, 1992; Anderman & Maehr, 1994; Nicholls, 1989), Expectancy × Value theory (Eccles [Parsons] et al., 1983; Wigfield & Eccles, 1992), flow theory (Csikszentmihalyi, 1990), and self-efficacy theory (Bandura, 1997), to name a few—are not primarily concerned with designing tasks that catch the interest of students or with explaining why people faced with two activities choose one and not the other even if they have equal perceptions of competence or of value for each. For example, several theories suggest that optimal level of challenge is a key factor for creating and maintaining interest and motivation (e.g., Csikszentmihalyi, 1990; Malone & Lepper, 1987). However, the mere fact that a task is optimally challenging is unlikely to attract interest. People are surrounded by thousands of tasks that vary in their degree of challenge. Experiencing a match between challenge and perceptions of competence for a task that one perceives as boring is not likely to result in interest. It is not solely the degree of challenge that attracts interest but rather a combination of several factors, one of which is challenge. Most theories of motivation focus on one or two major constructs, whether they are attributions or goals or perceptions of competence, and do not fully integrate other influences on motivation.

Although this article does not examine the influence of interest on actual learning, I write under the assumption that interest generally, but not always, enhances learning (Hidi, 1990). It is critical to understand that the relation between interest and learning is complex and that attempts by teachers to capture attention and interest can backfire and actually undermine interest or learning. Baker, Herman, and Yeh (1981) pointed out that fun learning activities are often assumed to

> contribute not only to skill development but to affective consequences as well. Such assumptions would seem to be dependent on a given set of premises: (1) that the adjuncts have incentive value for the learner, (2) that the practice they provide is pertinent to learning, and (3) that the adjuncts themselves have demonstrated effectiveness and do not have distracting elements. (p. 84)

Many tasks that are intended to be interesting do not conform to those three premises. For example, Lepper and Malone (1987) described computer games and simulations that allow or even encourage users to achieve "success" without accomplishing instructional goals. Lepper and Malone used the example of software for which "a mindless repetition of even a modestly successful strategy, entered as fast as one's fingers can fly, will allow one to amass a considerably greater fortune than a thoughtful search for some more optimal strategy" (p. 276). Zahorik (1996) pointed out that hands-on activities advocated by teachers for attracting interest are often devoid of instructional content. Blumenfeld and Meece (1988) found that students could be highly involved and apparently interested in classroom tasks without being cognitively engaged and without learning what was supposed to be learned.

In their review of text-based interest, Hidi and Anderson (1992) suggested that "it is quite possible that interesting episodes do not contribute to the learning of important, but marginally related ideas" (p. 226). In fact, there is evidence that drawing attention to irrelevant but interesting features of instruction does little to facilitate learning and can even detract from learning. This has been demonstrated by text-based research on seductive details, which are statements in text that present interesting but unimportant information (Garner, Alexander, Gillingham, Kulikowich, & Brown, 1991; Garner,

Brown, Sanders, & Menke, 1992; Garner, Gillingham, & White, 1989; Wade, Alexander, Schraw, & Kulikowich, 1995; Wade, Schraw, Buxton, & Hayes, 1993). However, researchers are not unanimous about the influence of seductive details on learning (Goetz & Sadoski, 1995a, 1995b; Wade et al., 1995).

It is important to recognize that personal or individual factors always interact with situational factors to create interest, or lack of interest. It is not useful or accurate to claim that a particular factor is purely personal or purely situational. Thus, what is an exciting filmed chase scene for most people may be boring to the jaded film critic who has seen too many chase scenes. A fascinating magazine account of a war escape may be old news, and inaccurate to boot, to the teen war aficionado who has already read several detailed book-length accounts of the escape.

Exposure is, of course, necessary for the development of interest. People cannot become interested in things they have never encountered. Although *experience* with the domain is not necessary for interest to develop, *exposure* to or *awareness* of the domain is necessary. Youth who have never scuba dived but who have seen it in movies could become interested in diving. On the other hand, students who have never heard of Black cowboys and believe there were none could not become interested in learning about them.

Freedom to choose to study topics that are already of interest tends to facilitate interest (Deci, 1992; Malone & Lepper, 1987). For example, McPhail and colleagues (McPhail, Pierson, Freeman, Goodman, & Ayappa, 1997) allowed sixth-grade students to choose topics to study from four options: drama, science, animals, and movement. Using affect and activation scales adapted from Csikszentmihalyi and Larson (1984), they found that students who studied their first-choice topic were higher on affect and activation than students who studied their second choice. In addition, students in the different groups showed marked differences in how they preferred to learn from among the 20 ways of learning that were listed (e.g., taking notes, building models, doing experiments, watching movies, and so forth).

In the remainder of this article, I discuss individual factors that influence interest and then discuss situational factors that increase the probability that people will find tasks interesting. The placement of some factors could be considered somewhat arbitrary. For example, cognitive discrepancy, which is categorized as a situation factor, could also be listed as an individual factor, because the existence of a discrepancy depends upon the background knowledge of the individual. I use the situation category because I am focusing on stimuli or tasks that are discrepant for most people and thus can be depended upon by teachers in typical classroom settings. The rule of thumb that I have used for categorization is that factors that are largely under teacher control (like using hands-on activities) are situation factors, whereas factors that are difficult to change (like background knowledge) or nearly impossible to change (like students' cultural background) are individual factors.

INDIVIDUAL FACTORS THAT INFLUENCE INTEREST

Belongingness

Humans are social beings, and social interaction functions as a need, incentive, or goal (Deci, Vallerand, Pelletier, & Ryan, 1991; Ford, 1992; Maehr & Braskamp, 1986). I discuss belongingness as it applies to interest in the following sections: cultural value, identification, and social support.

Cultural value. Except in unusual instances, people become interested in things that are culturally valued, whether in the culture at large or in some subculture (Deci, 1992; Voss & Schauble, 1992). As Deci put it, "Out of the need for relatedness, people are motivated to find a satisfying place in the social milieu. Doing this requires sharing at least some of the values and practices of the others in that milieu" (p. 55). Thus, it is not mere stereotyping to note that basketball is valued in many American inner cities or that deer hunting is valued in many American rural areas. Activities that involve basketball or deer hunting are likely to attract the interest of youth, particularly male youth, in their respective communities. Culture influences what is valued and practiced by specific groups, and the values and practices influence the interests of children and adults. To the degree that a group of students share the same culture and subcultures, this factor could be considered a situational rather than individual factor, because teachers could count on most if not all students being interested in the same things relevant to the culture.

Identification. As people grow up, they come to identify with certain groups and to see themselves as part of some groups and outsiders from other groups. Brophy (1999) developed a similar idea. Identification can be based upon gender, ethnicity, religion, geographic region, and so forth, and is related to cultural value as discussed previously. Like cultural value, to the degree that a group of students share identification, this factor could be considered a situational rather than individual factor.

As part of labeling themselves, people develop schemata around the labels. For example, if a youth labels himself a White, male, middle-class, suburban athlete (let's say he actually plays basketball, football, and baseball) and he is exposed to hunting, it is less likely that he will be interested in hunting because it is not part of his schema for himself. On the other hand, if he is exposed to golf, it is more likely that he will pursue it because, though not yet part of his self-schema, it is closer to his self-schema than is hunting and because it is more valued and more high profile in the wider culture.

Golfers are featured on Sunday television every week and on the sports page every day, and they make a lot of money. There have been two recent major films featuring golf: *Happy Gilmore* and *Tin Cup*. In addition, we have experienced in 1997 the coming of Tiger Woods, who won the Masters Tournament at age 21. Mr. Woods seems to have changed the golf-related self-schema of some African Americans. For example, a letter from a self-identified African American to *The Sporting News* (May 5, 1997) stated "I'm 32, and I now want to take up golf. I've had these leanings before I ever heard of Tiger Woods, but after his phenomenal performance at Augusta, my drive has become reinforced." Hunters, on the other hand, are seldom featured as personalities on television, are seldom mentioned in the sports page, and do not make much money. No recent major films feature hunting as a sport, and there are no major international hunting heroes. There is not widespread identification with hunters.

Consider another example. A Black man from Toledo, Ohio, who enjoys playing and watching basketball and who is a Detroit Pistons fan is likely to pay more attention to Jimmy Jackson's travels across the NBA (Jackson is from Toledo and played college ball at Ohio State) than to Jamal Mashburn's. If he hears Mashburn's name mentioned in casual conversation, it may not generate nearly as much interest as Jimmy Jackson's. Neither plays on the team he prefers, but one is from his hometown—his own neighborhood even—and the other is not. He is thus more likely to identify with Jackson than with Mashburn.

Girls who are highly sex typed in their activities may reject sports because they think sports are not for their kind of people. Low-income students may reject "high culture" like opera because it is for another kind of people. High-income urban students may reject activities like hunting and bowling because such activities are for another kind of people.

Ethnic identity is relevant to the development of interest. For example, identity as manifest in fictive kinship and collective identity makes some African Americans not become interested in domains that they reject as "*not appropriate* for them because those behaviors, events, symbols, and meanings are characteristic of white Americans" (Fordham & Ogbu, 1986, p. 181). Behaviors that might mark one as "acting White" include "speaking proper" (speaking standard English), listening to White music like classical, heavy metal, or rock, working to get good grades, dressing like a "preppie," dating White people, and so forth (Bergin & Cooks, 1995; Fordham & Ogbu, 1986). Black youth in the immersion stage of ethnic identity (Cross, 1991) might be highly interested in all topics related to Black history and Black identity and uninterested in "White" topics.

Social support. People may be interested in a topic because of their social integration goals (Ford, 1992) to help and support loved ones. Social support can be distinguished from socializing with friends, which is discussed later. Consider a teen who notices a new book by a particular author. She knows that this author is her best friend's favorite. She is likely to manifest the "catch" form of interest and notify her friend of the book's availability. She may even experience the "hold" form of interest and read the book to show support for and solidarity with her friend or because the content sounds interesting. Another example is parents who respond to interests of their children. Let's say a girl is interested in drama, and there will be a special workshop on acting at the local university. It is likely that the parents will be interested on behalf of the daughter. For this sort of situation to affect interest, the person must be developmentally capable of intimacy in the sense that the term is used in research on intimacy and friendship (Steinberg, 1996). That is, the person must be capable of inferring the friend's or child's needs and goals, as well as responding to those needs and goals.

Emotions

Emotions have a strong influence on the development of interest. In fact, interest itself is often considered to be an emotion (Ekman, 1994; Ellsworth, 1994; Izard, 1994). People often link emotions with certain content in an idiosyncratic way that is dependent upon personal experience. Students who have been repeatedly criticized for their performance in math, science, or sports are likely to experience emotional wounds that make them determined to avoid the domain at all costs. In contrast, feelings of happiness or euphoria during a task are likely to foster interest when the task is reencountered. For example, children and adults who have pleasant memories of visiting a museum with their parents may have pleasant emotions regarding museums. The holiday refrain "Over the river and through the woods, to grandmother's house we go" may not be so pleasant for those whose memories of grandmother's house are memories of anger, conflict, and recrimination.

Emotions toward content do not have to be positive to foster interest in learning. For example, anger can be linked with interest. Consider youth whose families hate the U.S. government. The families rail against Washington, interpret news stories from their stance that the government is a conspiracy to gain power and money, and become particularly angry during political campaigns. When such youth hear about government corruption or about plans to establish a trade treaty, they are likely to have an immediate negative emotional response but also to be interested in the information. Their interest is based on the fact that they might be able to use this information to support their beliefs about the government. Likewise, students may dislike the writing style of William Faulkner but may become interested in analyzing his writing if encouraged to vent their distaste through documenting how "badly" he wrote.

Competence

People are more likely to be interested in a task or topic if they perceive that they will be competent at it or that their incom-

petence will not be publicly highlighted. Consider a girl who swims competitively but has never played a ball sport. The odds that she will take up softball or basketball in high school are slim, because she will not want to display her ineptitude while learning. However, if she were offered a chance to build up competence in private, outside the public gaze, she might become interested. One could sketch this concern (following Middleton's models [1995] with public perceptions of competence as follows:

Is the activity public?
If Yes, How will I look? (or, How good will I be at it?
and How good are other people at it?)
If I will look bad,
disengage
If I will look ok, Does it look interesting?
If Yes, engage.
If No, disengage.
If not public, Does it look interesting?
If Yes, engage.
If No, disengage.

This pattern is mediated by the goal orientation of the situation. Situations that emphasize competitive, ego-involving goals are more likely to result in disengagement if a person perceives a lack of ability (Ames, 1992; Anderman & Maehr, 1994; Bergin, 1995). Situations that emphasize task mastery and the development of competence without concern for appearance relative to others are more likely to result in people engaging a task even if they lack competence.

Utility–Goal Relevance

Students are likely to become interested in a topic if it is relevant to achieving some goal that they hold. Thus, a junior high school *Star Wars* fan might be computer ignorant, but when he hears that codes (secret ways to cheat) for *Star Wars* games can be found on the Internet, he might become quite interested in learning more about computers, or at least how to use the Internet. To use a personal example, I am typically oblivious of the various car models, their attributes, their cost, and so forth. When our aged diesel-converted-to-gasoline station wagon was about to die, I became highly interested in every sort of information about cars: their cost, reliability records, where to buy them, how to finance them, and so forth. After we bought a vehicle (my then 3-year-old constantly reminded me "that's a van, not a car"), my level of interest remained higher than it had been initially but far lower than during the flurry of buying interest. Means, Jonassen, and Dwyer (1997) investigated the effect of students studying text about a topic relevant to their course work and students studying a nonrelevant topic but with comments added to the text that showed relevance to life. They found that both types of relevance enhanced interest and learning compared to control conditions.

Goal relevance is particularly problematic in school, because few of the subjects that students study or the tasks they are asked to do are clearly relevant to students' current concerns and goals. Brahier (1995) described the motivation of 203 eighth-grade algebra students who went through considerable effort to take algebra a year earlier than normal in their schools. The students' goals were focused on getting ahead in high school or getting ready for high school, rather than interest in math or a desire to understand it. Few of the students' parents thought that algebra would be useful in any way other than to teach logic and thinking processes (which research on transfer shows is not even true) and to make students eligible for future courses. Seven of 24 parents were quite negative in their evaluation of the usefulness of algebra:

> Joe's mother, who was a Registered Nurse working in a school setting, said, "I don't think my life would be less fulfilled without algebra!" Similarly, Samantha's father, who was a high school English teacher, remarked that "the calculator is the only math I need." Even Amira's father, who worked as an electrical engineer for 15 years, insisted that algebra was not useful in and of itself, remarking that "you don't use it in the real world." Tom's mother, who was teaching algebra at the time this study was being conducted, said, "It's a discipline. It develops thinking skills." I asked her if she believed that the algebra she taught had real world applications. She answered, "No! Most people can learn grocery store arithmetic and get through life, but don't quote me on that!" (p. 127)

Results of Mitchell's (1993) focus groups with first-year algebra and geometry students also showed that "Typically students did not see the content of mathematics as important or related to their daily lives irrespective of how well they were doing in their mathematics class" (p. 427).

Teachers need to be constantly aware of the goal-directed nature of human behavior and the ways that students reconstrue or subvert academic tasks to satisfy their goals or needs. Students always have goals, some active, some dormant, and some dormant but easily aroused. For example, students frequently hold a goal to seek stimulation. Consider two students who are supposed to be studying molecule models to understand states of matter (Anderson, Holland, & Palincsar, 1997):

> Tara showed some interest in the molecule models, but it centered more on fantasy play involving the dog-shaped ethanol models than on using the models as a tool for understanding. Juan, with his references to oxygen and to the minuscule size of actual molecules, showed an interest in understanding the models as representations of actual models, an interest that Tara did not share. (p. 369)

When Tara was not engaged by the instructional intent of the lesson, she took the hands-on materials for the lesson and used them to satisfy her goal to be stimulated. Both students

were interested in some sense, but one was engaged in the academic task and the other was not.

Rewards can function as goals and can be highly successful at attracting interest, yet they can also undermine *intrinsic* interest (Lepper, Keavney, & Drake, 1996). Most teachers who have used prizes, stickers, points, or free time as rewards for academic work are familiar with the refrain, "How many points is this worth?" or "If we're quiet, do we get to watch a video?" Academic work can become an exchange for a prize rather than an activity that has inherent value or interest. Rewards are particularly problematic when they are used with students who are already highly interested in a topic or activity (Lepper, Greene, & Nisbett, 1973; Lepper et al., 1996). Nevertheless, rewards can be highly effective at attracting interest to a task where there is no prior interest in the task. Sometimes, as students engage a task for the rewards it earns, they develop competence at the task and actually develop intrinsic interest in the task.

People's goals can be represented in a hierarchy that ranges from ultimate goals or values that are ongoing and are not expected to be "achieved" in the sense of closure (have a good marriage, be successful in a career, enjoy one's children) through immediate goals that are the objectives of daily activity (Winell, 1987). Goals of a more intermediate temporal nature have been described as life tasks (Cantor & Langston, 1989) and as personal projects (Little, 1983). Unfortunately, short-term survival and hedonistic goals often take precedence over long-term goals and prevent the delay of gratification that often is required to make possible the achievement of long-term goals (Wadsworth [Winell] & Ford, 1983). Instructors who are trying to influence interest should pay attention to whether the goals they are attempting to engage are short term or long term. For example, students who are in calculus classes to satisfy their parents may be interested in different things than students who are in calculus classes to prepare for a long-term, satisfying career in engineering. The less personally committed students might enjoy exogenous embellishments because their goal is not primarily to master the content of the course, whereas committed students might be annoyed by exogenous attempts to attract their interest because they are already interested in the content.

Background Knowledge

People are often interested in things that they already know about (Alexander, Jetton, & Kulikowich, 1995; Alexander, Kulikowich, & Jetton, 1994; Alexander, Kulikowich, & Schulze, 1994; Tobias, 1994). There appears to be a reciprocal relation between knowledge of a domain and interest in the domain. That is, we pursue learning about things that we are interested in, and the more we know about something, the more interested we become in it. Thus, students who know a lot about physics, radiation, and energy are more likely to be interested in a *Time* magazine article about the Chernobyl nuclear accident than are other students.

A hole in the schema. Interest will be likely in situations in which a person has a high level of knowledge in a domain but perceives a lack of knowledge about the information being presented. For example, children are sometimes surprised and interested in things that their parents or grandparents did when younger. They think that they know about the person but then discover that their schema has a big hole. An expert in Old English who believes that he or she knows of every existing Old English manuscript would likely be highly interested in a newly discovered manuscript. A Toledo, Ohio, fan of Nancy Drew mysteries might be surprised, delighted, and interested to learn that the first writer of Nancy Drew mysteries lives in Toledo.

A hole in the schema would only be likely to attract interest for domains in which a person already holds goals or prior interest. For example, math-phobic graduate students are unlikely to ask their statistics professors to clarify holes in their schemata unless they fear the material will be on an exam.

SITUATIONAL FACTORS THAT INFLUENCE INTEREST

In the previous section, I discussed individual factors that influence interest and that are generally not under teacher control. The situational factors that I discuss in this section are generally under the control of the teacher.

Hands-On

People seem to be interested in so-called hands-on activities, that is, activities in which they manipulate materials, move around, and engage learning in a physical way. Middleton (1995) found that both students and teachers rated hands-on aspects of the curriculum as facilitating motivation. Zahorik (1996) reported that, for his sample, the technique most commonly reported by elementary and secondary teachers for attracting interest was hands-on activities. However, he also noted that

> Of the interesting activities that were described, at least one-third were hands-on activities that seemed gratuitous in whole or in part. They probably generated much interest, but whether they led to the acquisition of important learning is unclear. Hands-on activities appeared to be only loosely related to content objectives.... The hands-on activities of the 1950s units were to sing Elvis songs, impersonate Elvis, write essays speculating on whether Elvis was still alive, and critique Elvis movies. (p. 556)

Discrepancy

When faced with evidence that what they believe to be true is in fact false and a misconception, people often manifest interest in resolving the discrepancy. This approach is sometimes referred to as cognitive conflict, cognitive dissonance, or disequilibrium. Although discrepancy could also be classified as an individual factor, here I am emphasizing discrepancies or misconceptions that are common across many people. This means teachers can assume that most of their students hold them, and revealing the discrepancy is under the teacher's control. Common misconceptions include beliefs about what causes the seasons, what causes the phases of the moon, what happens to money that children deposit in a bank, and what the Romantic poets are.

Research on conceptual change has used the discrepancy approach—activate prior knowledge and then refute the misconception—though understanding rather than interest is typically the measured outcome variable (Guzzetti, Snyder, Glass, & Gamas, 1993). Evidence of a discrepancy can take the form of refutational text, a hands-on demonstration, a verbal explanation, or some combination of those three. It is, however, important to recognize that misconceptions are difficult to change, and people sometimes dismiss discrepancies rather than experiencing interest in resolving cognitive dissonance. In addition, even if they come to reject their misconception immediately after instruction, delayed posttests often reveal the return of misconceptions (Guzzetti et al., 1993).

Novelty

Novel stimuli are likely to attract attention (Berlyne, 1960). However, stimuli that were once novel obviously become not novel after they have been around for a while. Berlyne pointed out that attention is not necessarily strongest with maximum novelty, but rather with

> an intermediate degree of novelty, with a stimulus that is rather like something well known but just distinct enough from it to be "interesting." We are indifferent to things that are either too remote from our experience or too familiar. (p. 21)

What counts as novel depends, of course, on the situation. Loud music in a math class would be novel, whereas loud music in band class would be normal.

If the novel stimulus has motivational attributes other than novelty, the initial extremely high rate of attention may fade, but students will continue to be attentive. For example, one study of computers in the classroom found that even after the novelty effect wore off, students still tended to be engaged, presumably because the computer has characteristics other than novelty that attract interest (Bergin, Ford, & Hess, 1993). If the stimulus does not have additional motivational attributes, it will lose effectiveness. For example, Middleton (1995) quoted a seventh-grade teacher who stated, "I used to do a problem of the day, which seemed to be a motivator to get them into it and get them started.... But it ended up getting real routine."

Even though novel *tasks* also attract interest, teachers should use them with care, because "Although novel task forms may heighten student interest, they are likely to lead to student confusion and greater demands for teacher assistance, and may actually interfere with the students' attainment of the learning objective" (Blumenfeld et al., 1987, p. 142).

Food

Interest can be triggered by food. That is, people show preferences for food and positive affect toward food, especially in the classroom where food may be unusual. Although there appears to be virtually no research on food generating interest, parents and teachers will agree with me that food grabs children's (and adults') interest above and beyond any novelty effect. Alleman and Brophy (1994) studied college students' recollections of elementary and junior high school classroom activities and found that activities that involved making or sampling food were particularly memorable.

Social Interaction

Students often hold strong social interaction goals (Allen, 1986; Bergin, 1989; Csikszentmihalyi & Larson, 1984; Mitchell, 1993; Wentzel, 1991). To the degree that students perceive that a task or activity will allow them to socialize, especially with friends, they will tend to be interested in the task. The social dimension may be one reason for the success of cooperative learning approaches, though cooperative learning researchers seldom refer to it, preferring to talk about peer norms for achievement (or lack of achievement), social status, and reward structures (Cohen & Lotan, 1995; Slavin, 1990). It is clear to the casual observer that students will be more interested in group work that allows them to be with their friends. This can be an example of a situation in which the teacher's instructional goals may conflict with the students' goals for socializing and fun. If young people just mess around with their friends during group work, they are unlikely to accomplish mastery of the material. For that reason, teachers sometimes separate friends during group work. However, Zajac and Hartup (1997) reviewed evidence that when groups are composed of friends, the students experience enhanced performance. Most of the studies that they reviewed used groups of only two students, however.

Visible author. The way that students interact with a text could be considered to be an aspect of social interaction. Paxton (1997) studied the influence of author's voice on in-

terest and found that six high school sophomores preferred a history text in which the author was "visible" over one in which the author was "anonymous." By *visible*, he meant written in the first person and providing comments that "establish a personal relationship between author and reader" (p. 238). Nolen (1995) also studied author visibility. Like Paxton, she found that author visibility increased reader interaction with the text; however, in her study the interaction was not necessarily more positive. This principle of visible author could presumably be applied to the way that instructors lecture and interact with their students. Instructors might be more effective if they established a personal relationship with the class through appropriate personal disclosure and through learning details about their students' lives like what music and movies they like, what they do for vacations, what hobbies they pursue, and so forth.

Modeling

People's interest in a topic may be influenced by the models they observe and the treatment of the models. As Bandura and other social cognitive researchers point out (Bandura, 1997; Schunk, 1991), people are more likely to imitate models who are reinforced, who are high status, and who are competent. These same processes operate in influencing interest. That is, observing someone else receive a valued reward, observing a high-status person, and observing a model who is competent at a valued behavior are all likely to catch interest. This modeling effect is a primary basis for advertising in which an attractive, high-status person endorses a product about whose performance he or she knows little or nothing, like fashion models endorsing cars or athletes endorsing sports drinks. Of course, expert models also endorse products and attract interest in those products, like mountaineers in documentaries displaying logos of outdoor gear manufacturers, or professional athletes wearing specific brands of shoes. There is some evidence that teachers can attract interest if they model enthusiasm about topics that they teach (Pintrich & Schunk, 1996, p. 171).

Games and Puzzles

Games and puzzles are often successful methods of catching interest (Mitchell, 1993). Schoenfeld (1989) described mathematical puzzles like magic squares as attracting and holding interest, though he focused more on the problem-solving aspects of puzzles than on interest. For example, he described a problem (Schoenfeld, 1994) that asks what you would see if a concrete wheel 100 miles in diameter rolled past your 20-square-foot window at the speed of 100 miles per hour. The problem apparently engages the interest of some students despite its apparent lack of "relevance" to anything they might experience.

Content

Some content is more interesting than other content for most people. Zahorik (1996) pointed out that the teachers he studied did not report often using specific content to generate interest, yet it seems that teachers sometimes do choose specific content for its interest value, such as when they choose to study dinosaurs, rain forests, and sea mammals. Our local zoo's exhibits show recurring themes of babies, bugs, and dinosaurs, apparently to capitalize on children's interest in these content areas. Wade et al. (1993) claim that "topics related to injury, sex, and scandal are clearly of high interest to readers almost without exception. In other words, such topics do appear to have absolute, or inherent, interest across readers, evoking a kind of emotional interest" (p. 106). They cite Schank (1979) on this point; he writes that death, unexpected events, and danger are typically interesting, especially if they occur to someone with whom one has a personal relationship.

Biophilia

There exists a hypothesis that humans experience biophilia, which Kahn (1997) defined as "A fundamental, genetically based, human need and propensity to affiliate with life and lifelike processes" (p. 1). The hypothesis asserts that people prefer environments that include natural features like water, trees, and other vegetation and a lack of built features. Although the evidence is sketchy, biophilia could be one reason why youngsters like to have animals in the classroom.

Fantasy

Malone and Lepper (Malone, 1981; Malone & Lepper, 1987) proposed fantasy as an important element of intrinsic motivation and interest. They proposed that endogenous fantasy is preferable to exogenous fantasy. An exogenous fantasy provides a fantasy context that is unrelated to the content being learned and can be used with nearly any content. For example, "spelling baseball" could also be "multiplication baseball" or "social studies facts baseball." An endogenous fantasy links the skill being learned with the fantasy such that the fantasy could not be used with many different content domains. Malone and Lepper (1987) used a darts game simulation as an example of endogenous fantasy. In the game, balloons appear at random spots on a number line, and students must understand fractions and number lines to be successful at popping the balloons with simulated darts; the fantasy context could not easily be used with other content like spelling or history facts. Several computer-based studies have shown that simple fantasy embellishments can foster motivation and learning and that there are large gender differences in what serves

as an interesting fantasy (Lepper & Cordova, 1992; Parker & Lepper, 1992).

Humor

Most people seem to assume that humor facilitates positive emotions and learning, though there is little research on whether humor actually does improve learning (Bryant & Zillmann, 1989; Powell & Andresen, 1985). Wyer and Collins (1992) provided a theory of what might elicit humor. One theory of why humor would facilitate learning has to do with attention; it suggests that humor grabs the attention of inattentive students, and this higher level of alertness lasts long enough to facilitate learning things that otherwise would have been missed (Zillmann, Williams, Bryant, Boynton, & Wolf, 1980). Zillmann et al. embedded slapstick routines and one-liners into short instructional television sequences that were viewed by kindergarten and first-grade children. Although the humorous segments were completely unrelated to the educational presentations, the humor conditions resulted in more learning than the control conditions. Teachers should avoid humor that includes belittling students, incomprehensible in-jokes, or sarcasm.

Narrative

Preachers, teachers, parents, and public speakers all know the value of a story for gaining and keeping the interest of an audience. The rise of interest in qualitative research combined with interest in how people think and interpret life has led to increased attention to the power of stories and narrative (e.g., Howard, 1991; Vitz, 1990). It appears that narratives and stories are more interesting than analytic, expository discourse. Although there is not a lot of evidence on this point, Hidi and Anderson (1992) cite a study that showed that narrative texts were rated as more interesting than expository or mixed (narrative and expository) texts.

CONCLUSIONS

In this article, I have discussed individual and situational factors that influence interest. The individual factors are belongingness (which includes cultural value, identification, and social support), emotions, competence, utility–goal relevance, and background knowledge (which includes a hole in the schema). Teachers should consider individual factors when planning instruction so that the instruction can be as congruent as possible with existing individual interests. In addition, teachers could attempt to change individual factors where possible. For example, if lack of background knowledge for a topic inhibits some students' interest, the teacher could teach relevant background knowledge in an interesting way. If some students have negative feelings toward a content area like fractions, the teacher could provide experiences that attempt to improve those feelings. The situational factors are hands-on, discrepancy, novelty, food, social interaction (which includes visible author), modeling, games and puzzles, content, biophilia, fantasy, humor, and narrative. These are factors that are more easily manipulated by teachers and should be considered when designing and planning instructional tasks.

The factors that affect interest that have been developed in this article could be used by teachers to enhance student interest in their instruction. For example, let's say that Mrs. Vargas is a teacher who wishes to teach what causes the phases of the moon. This is a topic that would be tough to make relevant to the personal goals of most children. Nevertheless, there are ways to make it interesting. A common misconception that Mrs. Vargas could elicit from nearly any class is that the darkened part of the moon is the shadow of the earth. She could plan ahead enough to schedule such a lesson for a time when students could look out the window and see a crescent moon during the day—and be lucky enough that clouds do not obscure the sun or moon. She could ask the students to look out the window. This should produce a *discrepancy* in the minds of children because there can be no shadow of the earth if the sun and the moon are both in the sky at the same time. Mrs. Vargas could provide a *hands-on* experience that is also *novel* by placing a powerful shadeless bulb in the center of the room and giving each child a large round bead on a toothpick. The bead represents the moon, the toothpick serves as a handle, the light represents the sun, and the student's head is the earth. By holding the bead at arms-length and observing the shadow, the children could simulate the phases of the moon (Hamilton, 1998).

I tried this with an inner-city sixth-grade classroom of 20 students. I felt some trepidation about handing out beads and toothpicks and then turning the lights out, but the event went quite smoothly. The students generally seemed interested and paid attention as long as I directed questions to them, and they even seemed to learn the content. I had been concerned that task complexity might overwhelm learning from the task (Blumenfeld & Meece, 1988). The next day, our review of the topic suggested that at least some students continued to understand.

Mrs. Vargas could review the list of situational and individual factors that influence interest and consider whether there are others that might be useful for her purposes with her specific group of students. She might try to generate some fantasy story, puzzle, or game for which it would be important to understand what causes the phases of the moon. Thus, the interest embellishment would be endogenous to the instructional goal. She should be cautious not to provide the students with irrelevant but possibly interesting tasks like coloring instructional diagrams. Coloring is not an instructional intervention for understanding what causes the phases of the moon. Neither should she use a long, complex task if some-

thing short and simple would teach the content with equal success. Conservation of resources—time, money, and energy—is important.

Although most teachers aspire to increase the interest of their students, they should keep in mind the fact that interest enhancement does not necessarily lead to learning enhancement. For example, research on seductive details shows that drawing attention to irrelevant but interesting features of instruction may attract interest without facilitating learning (Garner et al., 1991; Garner et al., 1992; Garner et al., 1989; Wade et al., 1995; Wade et al., 1993; for a critique of this position, see Goetz & Sadoski, 1995a, 1995b). On the other hand, one study of humor placed irrelevant humorous clips in an educational television program and found enhanced results (Zillmann et al., 1980). There are situations (unfortunately, seldom in K–12 schools) where people really want to know, even need to know, material as quickly and as efficiently as possible. People in that situation may not want anything extraneous to take up their time or divert their attention. In such situations, attempts to enhance instruction through interest embellishments might backfire. Educators need these questions answered: Under what circumstances might instructionally irrelevant but interesting segments of instruction facilitate or undermine learning? Can teachers design instruction that takes advantage of interesting, but not central, content without drawing undue attention to it? If so, should they? The most central question for researchers and educators, however, is how to plan instruction that responds to individual interest, creates situational interest, and also increases learning.

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