The role of value orientations in curricular decision making: A rationale for teachers' goals and expectations

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Abstract:

This research examined the role of value orientations in curricular decision making from the perspective of high school physical education teachers and students. Educational value orientations served as the theoretical base for the research. Teachers who exhibited one of two paired orientations, disciplinary mastery/learning process (DM/LP) or ecological integration/social reconstruction (EI/SR), were interviewed to examine the extent to which their value orientations influenced their stated (a) goals for student learning, and (b) expectations for academic performance and behavior. Students were also interviewed to investigate the extent to which they acknowledged these goals and expectations. Data were analyzed using constant comparison. Results suggested that goals and expectations of DM/LP and EI/SR teachers were distinctly different and that comments from students in the EI/SR teachers' classes did not reflect their teachers' goals and expectations. Dynamical system theory was used to conceptualize value orientations as attractors within the educational ecosystem. Teachers working from weak EI/SR value attractors may be limited by learner, instructional, and contextual constraints.

Keywords: value orientations | curriculum content | teacher beliefs | expectations | dynamical systems theory | chaos theory

Article:

Kliebard (1988) argued that, in curriculum, particular content strains develop that influence decision making. They then gradually fade into the educational background until revived again. Curriculum strains that come to dominate during particular time periods are not solely the "function of the force of a particular proposal alone but the interaction of curriculum ideas and sympathetic and antagonistic social conditions" (Kliebard, 1988, p. 30). In physical education a number of different value perspectives manifest in content strains compete continuously for attention and resources. Although these are often debated as options between sport or fitness

curriculum, concentrated analyses of operational physical education programs have suggested more deeply rooted divisions.

At the level of teacher decision making, many of the conscious and intuitive decisions appear to be between content strains that convey the disciplinary knowledge base using a series of progressive and developmental sequences (e.g., Rink, 1985) and the content strains associated with enhanced cooperation, student autonomy, positive social interactions, enjoyment, and participation (Hellison, 1985). These two sets of goals appear not only to be philosophically antagonistic, but also to directly compete for limited physical education contact time. For example, some school districts require only one semester of daily physical education during high school. Should this time be dedicated to assisting students to become knowledgeable about the effects of exercise on the body, or should it be designed to engage students in cooperative games and sport for the purpose of enhanced participation and social interaction?

Curriculum theorists have hypothesized that the value systems or orientations that teachers bring to the curricular decision-making process determine, in part, their goals for student learning and academic and behavioral expectations for success (McNeil, 1990). Value orientations constitute belief structures or philosophical positions that can be defined operationally in educational settings. They represent educational perspectives that influence the teachers' relative emphasis on the learner, the context, and the body of knowledge. Value orientations are pervasive factors that determine the characteristics of a "physically educated person" within alternative curricular perspectives.

This study was conducted to examine the role of value orientations in curricular decision making from the perspective of high school physical education teachers and students. Teachers who exhibited one of two paired orientations, disciplinary mastery/learning process (DM/LP) or ecological integration/social reconstruction (EI/SR), were interviewed to examine two research questions: To what extent do value orientations influence teachers' stated (a) goals for student learning, and (b) expectations for academic performance and behavior. A sample of students in the teachers' classes were interviewed to investigate the extent to which they acknowledged the goals and expectations stated by their teachers.

The significance of this research lies in the potential for conceptualizing curricular decision making within the parameters of educational value orientations. Although value inventories provide an opportunity to examine value perspectives across large samples of teachers, it is important to conduct detailed analyses of operational decision making within theoretical value parameters. Increased understanding of the ways in which value orientations influence preactive and interactive curricular decision making may suggest alternate avenues for curriculum development and implementation.

Value Orientations

Value orientations represent philosophical perspectives that can be operationalized as educational goals for student learning. Within the theoretical curriculum literature, scholars (i.e., Eisner & Vallance, 1974; McNeil, 1990) have hypothesized a number of value perspectives that may affect the curricular decision-making process. When these are conceptualized as goals for

student learning, they are thought to influence curricular, instructional, and evaluative decisions (McNeil, 1990). The examination of belief structures in the curriculum literature focuses on the value orientations of (a) disciplinary mastery, (b) self-actualization, (c) learning process, (d) social reconstruction, and (e) ecological integration.

The contemporary perspective on the *disciplinary mastery* orientation can be traced to the mid-nineteenth century work of Herbert Spencer. Spencer (1860) proposed that the knowledge of most worth was science and argued persuasively for the mastery of this body of knowledge. Disciplinary mastery has evolved to incorporate a strong emphasis on the transmission of a wide range of theoretical and practical knowledge. Currently in physical education advocates of disciplinary mastery may define the discipline as (a) the research-oriented scientific focus on the enhancement of fitness and skill (e.g., Newell, 1990), (b) the traditional sport base rep resented as a mastery of a variety of performance skills and the ability to compete successfully in sport (Siedentop, 1990), or (c) the health-related fitness programmatic base in which students learn to engage in an active, healthy lifestyle across the lifespan (e.g., Hoeger, 1988). These three definitions are a source of controversy for decision makers. At base they are different responses to the question, "What knowledge is of most worth?" within a disciplinary mastery perspective.

Spencer's (1860) emphasis on science was a direct attack on the humanistic studies or child-centered curriculum that was popular at the time. The humanistic perspective is often described in the curriculum literature as the *self-actualization* value orientation because of the influence of Maslow (1979) and Rogers (1983). Self-actualization focuses on nurturing the personal growth of the student. Appropriate content may include any knowledge or experience that is meaningful to the learner. In physical education, this may consist of sport, fitness, cooperation, or participation if perceived as contributing to growth. Traditional content, however, is viewed as the *means* to accomplish personal growth. In some situations, proficiency in sport or fitness may be less valued than goals of involvement, self-responsibility, and caring (Hellison, 1985).

Kilpatrick (1918) expanded the conceptualization of the self-actualization orientation to emphasize the role of an active learner in the curricular decision-making process. Of critical importance in the *learning process* orientation is the concept of "learning how to learn." Kilpatrick argued for student initiative and active involvement in the systematic solution of real problems. In physical education, the curricular alternative proposed by Lawson and Placek (1981) exemplified this perspective. Steinhardt and Carrier (1989) utilized the learning process orientation in adult fitness programming.

Kliebard (1988) explained that advocates of the *social reconstruction* orientation in the 1930s found the "child centered curriculum ... too romantic, too concerned with the child as an individual and lacking in the social concern that would lead to a curriculum directly tied to the social, political, and economic conditions that the country faced" (p. 29). Within present day social reconstruction curricula, students are encouraged to ask questions and develop strategies to change the society of the classroom and the school. Advocates of the social reconstruction orientation in physical education focus on equity issues associated with access to opportunities necessary to develop and enhance skill and fitness. Griffin (1985) and Dewar (1987) examined physical education programs from this perspective.

The *ecological integration* orientation has been articulated most persuasively by Dewey (1916) and further examined and elaborated by Colwell (1985) and Jewett and Ennis (1990). Advocates of this perspective endeavor to balance the curriculum by providing relatively equal consideration for the needs of the learner, the limitations or opportunities available in the educational context, and the traditional demands of the subject matter. The perspective encourages individuals to create their own futures through mastery of the knowledge base and sensitivity to the setting in which they live. Jewett and associates (Jewett & Bain, 1987, Jewett & Mullan, 1977) have integrated this perspective within the personal meaning curriculum approach.

Although a number of scholars have traced the development of educational value orientations within the theoretical curriculum literature, it is considerably more challenging to identify and examine value orientations in operational settings. It is unlikely that orientations are manifest as pure perspectives on educational decision making. Instead, because of the constant struggle among perspectives for credibility and resources, it is more likely that compromise positions have been forged among two or more orientations to accomplish objectives within the educational process. Therefore, value structures should not be represented as the dominance of one perspective over others, but as the relative contribution or strength of each value orientation within the teacher's value profile.

Results of value orientation research conducted by Ennis, Chen, and Ross (in press) and Ennis and Zhu (1991) using the Values Orientation Inventory (VOI; Ennis & Hooper, 1988) suggested that two pairs of value orientations may lead to pronounced differences in curricular decision making in operational settings (Note. 1). In the Ennis and colleagues (in press) study, significant moderate positive correlation coefficients *(P* < .0001) were found between the disciplinary mastery (DM) and learning process (LP) orientations (*r*= .48) and the ecological integration (EI) and social reconstruction (SR) orientations (*r*= .4 7). All other correlations between value orientations in the matrix were negative or very low, suggesting that DM/LP and EI/SR pairs reflected different, and perhaps contradictory, perspectives from each other and from other value orientations. Likewise, in the Ennis and Zhu (1991) research, a similar significant, moderate positive coefficient was found between DM and LP (*r* = .49), though the correlation between EI and SR was very low (*r* = .13). Other coefficients in the matrix were also negative or very low. Because correlation coefficients between value orientations on the VOI are expected to be negative due to the forced-choice or ipsative nature of the instrument format, moderate positive correlations are noteworthy and should be examined further.

The present research was conducted to examine the curricular preferences of teachers within the DM/LP and the EI/SA value pairs. The VOI data from 117 experienced secondary physical educators (Ennis et al., in press) were examined to identify teachers exhibiting either of the two value orientation pairs. Interviews were conducted with a sample of 10 teachers demonstrating these value orientation pairs and 70 of their students to investigate their goals for student learning and expectations for academic performance and student behavior.

Method

Subjects

Subjects were 10 high school physical education teachers from a large metropolitan school district in the Washington, D.C., area (enrollment= 108,000). Six of the teachers were white, three were black, and one was Hispanic. The teachers averaged 20.3 years of teaching experience, and six were female. The subjects were selected from a sample of 117 middle and high school physical educators who had completed the Values Orientation Inventory. T-scores from 27 teachers indicated a high priority for either the DM/LP *(n* = 5) or EI/SR (*n* = 22) pair. T-scores less than 36.3 7 for DM and 37.9 for LP placed subjects in the DM/LP category. T-scores less than 42.69 for EI and 50.77 for SR classified subjects into the EI/SR pair. The five DM/LP teachers and five EI/SR teachers with the lowest scores (high priority) on the EI and SR categories of the VOI agreed to participate in the study.

Seven students enrolled in each of the teachers' physical education programs *(N* = 70) were interviewed individually to examine their perspectives on their teacher's goals for learning and expectations for academic performance and student behavior. Students were selected in a random, stratified sample consistent with the demographic data from the school district. Specifically, the students were 69% black, 25% white, and 5% other minority, primarily Asian and Filipino. Students were selected from 9th to 12th grades, with approximately 25% from each grade. They ranged in age from 14 to 19 and were 54% male. Ninth-grade students were required to take one semester of daily physical education. Students could elect to take daily physical education during 10th through 12th grades. Informed consent was received from both teachers and students prior to their interviews.

Value Orientation Inventory

Data from the Value Orientation Inventory (Ennis et al., in press) were used to screen and select teachers for the current study. The VOI was developed by Ennis and Hooper (1988) to examine physical education teachers' value profiles. The inventory was described in detail by Ennis and Zhu (1991). The VOI is a 75-item inventory consisting of 15 sets of 5 items reflecting each of five value orientations. Each of the items represents possible goals, teaching strategies, and tasks from the perspective of one of the five value orientations. Items are unlabeled and placed randomly in the sets. The subject ranks items within each set from 1 (highest priority) to 5 to reflect his or her preference. The value profile consists of the composite scores from each of the five value orientations. Raw scores are converted to T-scores and divided into high and low priority based on .6 *SD* above and below the sample mean. Because the inventory is based on a forced-choice format, the data are ipsative in nature and consistently violate the assumption of independence (Hicks, 1970). In other words, once the subject has assigned the highest ranking to one of the items in the set, the remaining items are forced into other, less valued positions. Therefore, the data represent relative findings or the ranking of an item when compared to others within the set. The ipsative nature of the data often results in negative correlations among the value orientations attributed to the format of the instrument.

Data Collection

Formal structured interviews constituted the primary method used for data collection in this study. Formal interviews were conducted with each of the 10 teachers in the final sample and

seven of their students. Teacher interviews were conducted at the teacher's convenience and lasted approximately 60 min. Student interviews were conducted individually during the students' physical education class and lasted approximately 20 min. Both teachers and students were asked to describe the characteristics of the students and any special circumstances that should be considered when teaching (or learning) in their school. Specific questions then followed regarding goals for student learning and expectations for academic performance and behavior. For example, teachers were asked to describe the (a) goals they considered when planning and teaching students in their classes, (b) student performance levels consistent with their goals, and (c) expectations for student behavior. Students were asked to describe the (a) content they liked and disliked in physical education, (b) content that they learned in class, and (c) the teacher's expectations for behavior. All interviews were audiotaped and transcribed for analysis. The primary focus of this research was on the self-reports of teachers as verified by their students and the VOI. The triangulation of these three data sources focused on participant perspectives on curriculum and instruction.

Data Analysis

Transcript data from interviews were analyzed using constant comparison (Goetz & LeCompte, 1984). Constant comparison is a four-step process that consists of (a) scanning the data to locate common categories, (b) identifying properties or common themes in the data, (c) positioning data within categories based on properties, and (d) developing explanatory theory. In this study a number of questions were asked of both teachers and students focusing on each of the research questions. Data from each teacher interview were first scanned independently by three judges to identify subcategories. In the second stage the data from the 10 teachers were compared to determine critical properties associated with each subcategory. These two steps were then repeated with the student data. In the third stage, the teacher and student data were compared by subcategory for each research question. Consistencies and inconsistencies were noted and examined from the perspective of the curriculum literature. Findings from Stages 1-3 are reported in the Results section. Stage four, developing explanatory theory, will be presented as Discussion.

Results

Results of teacher and student interviews suggested distinct differences between the stated goals and expectations for DM/LP and EI/SR teachers. It is important to note that statements of goals and expectations presented in this section are from teacher and student self-report and may not represent events enacted in class.

Goals for Student Learning

Disciplinary Mastery/Learning Process. Teachers exemplifying a paired DM/LP focus on the VOI reported an emphasis on traditional physical education goals for student learning. They indicated they encouraged students to learn basic skills and knowledge necessary for performance. Statements from the transcripts indicated their classes were structured to develop skill and fitness. They stated their instruction was often teacher directed with students allowed to

pursue their own goals only after completing the teacher's required objectives. Comments from two of the teachers demonstrated the emphasis on the disciplinary knowledge base.

> In my classes I teach all weight training. My basic objective, naturally, is physical fitness and strength. My lifts include bench, curl, triceps, and military. So we're working pretty much upper body three days a week. Then the other two days, we work the legs and back. If they want to get into more muscle groups, that's fine. Every period we give them time to do that after they have completed the required lifts. (Tom)

> In the physical training program they learn all the basic bones and muscles of the body, and then they learn how to exercise each part. Once they have learned about 35 of the basic bones, then we teach them the muscles that are attached to the particular bones in the area of the body and then we talk about origin, insertion, and action. (Nan)

When students in Tom and Nan's classes were asked the question, "What do you learn in physical education?" they were able to articulate specific content goals. One 10th grader in Tom's weightlifting class said, "You are supposed to know the different kinds of lifts and about the muscles that you develop. You learn lifts for each muscle group and how to use the weights properly." Nan's students also discussed content in a way similar to her own description. A 9th grader reported, "You learn about certain parts of the body ... about muscles that you probably never heard of. You learn how you can develop them, and how you can use them in sport." The consistency of the teacher and student descriptions of the content goals suggested teachers had explained their goals for learning to students (probably a number of times).

A third teacher in the DM/LP classification acknowledged frustration with her students' resistance to her attempts to create a disciplinary based learning environment. Karen was an experienced teacher who had recently been transferred to a high school in which "recreation rather than education" had been the primary focus of the physical education program:

> They are very opinionated and I constantly had to explain to them why it is was necessary to take physical education, not only for credit to graduate, but to learn about lifetime sport so they could participate in games like tennis. Most of my students are black and they have never had opportunities to learn many individual sports. I believe one of my jobs is to expose them to these skills and activities so later they will have a real choice, rather than only playing team games they learned in their neighborhoods (Karen).

The teachers in the DM/LP group felt that sport and fitness was the content of physical education. They reported they consistently divided each topic into steps or progressions and then taught in a way that they hoped would assist students to learn efficiently. Students were encouraged to develop their own performance goals, but only after they had demonstrated proficiency on the teacher-designated content. (Karen)

Ecological Integration/Social Reconstruction. Teachers who exemplified a strong paired EI/SR value profile on the VOI stated learning goals associated with social interaction, cooperation, and enjoyment. These teachers reported an emphasis on positive student interactions and worked to increase each student's ability to demonstrate a positive attitude toward other students, the

teacher, and the physical education content. Several teachers mentioned the importance of student freedom to "mingle, do what they want to, and be with people that they would like to be with" as important goals for physical education. Comments from EI/SR teachers focused on these goals:

> I think a major part of a physical education curriculum is allowing the students to get along with each other, and sometimes it doesn't have to be closely monitored or supervised. Sometimes they need a little bit of space .... they can experience some freedom and I think that's an important part of the program. (John)

> The number one thing that I want them to learn is socialization. Getting along with every one. I feel that if we can get them mingling with all kinds of people that the skill and the fun will come later. That's the number one thing ... I want them [to be] friends. (Carol)

Teachers in the EI/SR group emphasized the importance of teaching students to respect the teacher, to follow the rules, and to demonstrate a good attitude as the primary focus of content in physical education. Although they commented on skill development, they usually deemphasized its importance relative to socialization goals.

> You can talk about skills, don't get me wrong. I'm a skill oriented person or I wouldn't be coaching. But I think there's a limit to that too. I think you have to provide opportunities for people to enjoy themselves then you can teach skills while you teach the activity. I don't feel that you should overemphasize the skills, that will take the fun out of it. (Oscar)

Students in these classes had difficulty answering the question, "What do you learn in physical education?" One 9th grade student in Oscar's class responded, "I don't know ... you learn to play on a team." A student in John's 11th grade said, "I guess to run around and stay healthy." Several students in Carol's class seemed to have a better understanding of her goals for student learning. One 11th grader reported, "You learn how to play, no matter whether you win or lose you still have to play." A 12th grade student responded, "You learn how to be athletic. You learn different games. You get a better feeling of yourself. You learn your weaknesses and your strong points."

Disciplinary Mastery/Learning Process. Teachers in the DM/LP group stated expectations for skill and fitness improvement far more often than expectations for behavior. When asked specifically about behavioral expectations, they mentioned dressing and participation as a means to skill and fitness development but did not perceive it to be an acceptable learning goal for physical education. Susan stated that one of her primary expectations for students in her aerobic conditioning class was for them to use the knowledge presented in class to improve their lives.

> I get them in front of a mirror as often as I can and have them look at themselves. Once they've realized that through diet and exercise they can change the way they look or enhance the way they already look, then I try to transfer that into life. (Susan)

Bill mentioned primarily content and work-ethic expectations. He responded first with a statement related to what students are expected to do when they come to class and then mentioned consequences for not following instructions.

> Our warm-up every day starts with a lap and then some kind of exercises and then I get them right into the lifts. I put things on the board and when they come in, I expect them to read it and just go to work. Then I can work individually with them. I don't expect them to be horsing around. The weight room is a dangerous place. If they don't do what I want them to do, one of my big things is running laps. If they're horsing around or if they're doing things and just won't listen, then we have a little lap or we might do push-ups or sit-ups ... just some kind of physical thing. I rarely send a student to the office. I pretty much deal with my own problems. (Bill)

Students in Bill and Susan's classes commented on the fact they were supposed to learn specific knowledge-based content. One 11th grade student in Bill's weight training class said, "He expects us to come in and do the warmup and then do the lifts that he puts on the board. You don't horse around. You just do what he says." One of Susan's 9th graders reported, "She expects you to be independent and mature ... to come to class, lift weights or watch a movie or dance or get ready for the fashion show. You learn a lot about how to make yourself more attractive and how to take care of your body."

Karen, the teacher who had transferred to her school in November, emphasized that her philosophy was different from the previous physical education teacher. As a result she taught her high school students components of the knowledge base she believed should have been mastered earlier in their physical education curriculum:

> I have learned that they really have to start at the basics. Sounds funny to say you take your feet together, step, and throw the ball. These are elements they are supposed to know. But I am seeing your stronger athletes, those who have participated, know the basics, but there are some young people for whatever reason, whether they are physically unable, too heavy, or whatever, never learned the basics. They still are uncoordinated and I don't find it to be convenient to anyone to start at the beginning, even if it is a one time trip to say it. (Karen)

Karen was especially concerned when students did not dress for class. When she first arrived earlier in the year, a large number of students refused to dress and had not purchased uniforms. Although she strongly believed skill and fitness were the content focus in physical education, she found she could not convey this information if students refused to dress and participate.

> That's been one of the most difficult things I have had to work with when I started in November. In my philosophy I felt it was necessary they dress out. If I got them to dress out and encouraged them every day maybe I could get them interested in moving. So I tried to be like a mother to them; I was always talking to them, trying to make sure they knew that you will succeed in my class if you dress out... because I felt if they dressed out then they would be more willing to participate and we could go from there. (Karen)

By April, when these interviews were conducted, most of Karen's students understood her expectations for dress and participation. One 9th grader said, "You are supposed to dress and run around the track and just participate." A second student responded, "She says if we respect her,

she'll respect us. We get dressed everyday, exercise, and play ball or do whatever we are supposed to do."

Ecological Integration/Social Reconstruction. Conversely, the EI/SR teachers responded to questions about student expectations by emphasizing social and behavioral expectations for their students. They emphasized dress and participation as an end product in physical education and central to the student's ability to enjoy class activities.

> I expect my students to come in here everyday dressed and prepared. As an incentive, I give them blow pops [bubble gum lollipops] at the end of each grading period for 100% dress. I put their names on a banner and put it up in the gym. I put their names in the school newsletter, so they know that dressing is a big part of physical education. (Carla)

> I'm not a believer in testing for improvement. Some students simply don't have the skills and the ability to improve at the rate we would like to think they should improve. I don't think kids should be penalized because they are not skilled. I think dress, participating, good attitude, getting along with their classmates [are] more reasonable expectation[s]. (Helen)

Students in these classes appeared to understand the importance of dressing out and cooperating. However, cooperation was usually directed toward the teacher rather than other students. Most students reported that if you came to class and cooperated with the teacher you could get an A. For example a 9th grader in Carla's class said:

> At the beginning of the year, she told us that every one of us are going to be treated equally. She expects us to dress every day and participate in class and be there on time and behave as if she was a parent or something. She told us if we do all that then we can get an A. But if we come in and act stupid, then we are going to get 0s.

An 11th grade student in Oscar's class responded, "Like any other teacher, he expects you to come and get dressed, follow his rules, and as long as you dress everyday and participate in class, that's all he asks." A student in John's 9th grade class said, "He puts guidelines down and you make the rules. He doesn't go out there and referee the basketball games. He'll put a ball out there and people will break up into groups and start playing basketball." Finally, a 10th grader in Helen's class responded:

She would like all of her students to cooperate with her. The majority of students take PE just to get an easy A, but usually don't because they don't cooperate with the teacher. She likes them to get dressed and come up and sit in the squads quietly for roll check."

Discussion

An analysis of results suggested the self-reports of teachers in the DM/LP orientation and their students were consistent with the theoretical perspectives articulated in the literature on disciplinary mastery and learning process value orientations. Self-reports of teachers categorized as EI/SR on the VOI were incongruous with both the theoretical descriptions of these value

orientations in the curriculum literature and the reports of their students regarding learning goals and expectations. Dynamical systems theory may be helpful in interpreting these findings and in posing additional questions for future research.

Dynamical systems or chaos theory (i.e., Crutchfield, Farmer, Packard, & Shaw, 1986) provides a framework for the definition and examination of critical components within complex, evolving environments, such as those associated with education (Cziko, 1989; Sawada & Caley, 1985). The theory offers rich models and metaphors to guide the conceptualization of components within highly interdependent ecosystems. When this perspective is applied to the educational ecosystem, learning is thought to be influenced by a few strong attractors acting within a number of learner, instructional, and contextual constraints. Attractors are major variables that influence or attract a number of surrounding elements or behaviors. They can be conceptualized as bowls or basins that draw or attract elements within a sphere of influence, just as the selection of a direct or indirect teaching style predetermines many of the conditions for learning in physical education classes. Attractors may have narrow basins with high vertical sides that effectively limit the amount of variance that can occur. A strong outside force is necessary to perturb the attractor to the extent that the behavior is jarred out of the deep basin. For instance, a physical educator's teaching style may be so firmly entrenched it is difficult to implement instructional innovations requiring a more flexible repertoire. Conversely, other, less powerful attractors may represent shallow basins that permit extensive variations, while still remaining under the minimal influence of the attractor. In these instances, relatively weak forces may be adequate to lift the behaviors out of the shallow attractor basins to relocate in a different, perhaps unrelated, attractor basin. In dynamical systems theory, the extent to which an attractor can influence the ecosystem is restricted by a number of factors described as constraints (Newell, 1986). Constraints within the educational ecosystem may be manifest in limitations in the background knowledge or ability of the learner, inadequate or inappropriate pedagogical design, or restrictions within the economic, political, or social context.

When educational environments are reconceptualized as dynamical systems, value orientations may be envisioned as attractors that influence the curricular decisions of administrators and teachers (Ennis, 1992). The theoretical foundations for value orientations documented in the curriculum literature suggest that each can be conceptualized as a strong attractor effectively influencing the selection of content to be taught, the manner in which it will be sequenced and presented to students, and expectations for student performance. In reality, value orientations, like other attractors, may be constrained by a number of factors that limit the extent to which they can control the learning environment. The relative strength or weakness of the value attractor in relation to the perceived power of its concomitant learner, instructional, and contextual constraints may disturb or disrupt the educational ecosystem.

If dynamical systems theory is applied to the findings of the current research, the DM/LP and the EI/SR value orientations might be conceptualized as attractors in the planning-teaching-learning process. The DM/LP value attractors could be described as powerful, affecting many of the pedagogical decisions related to goals for learning and expectations for behavior and performance. The DM/LP physical educators interviewed in this study appeared to operate from a clearly articulated and consistent theoretical base. They were able to articulate their value orientation both on the VOI and in the interviews. Their students were aware of the most critical

elements and acknowledged their importance in the curriculum. Although the DM/LP educators could identify concerns and problems in their classes (most of which were also noted by EI/SR teachers), they did not suggest that these constraints justified major modifications in their goals or expectations for students. The DM/LP teachers indicated that they expected their students to master skill and fitness content consistent with the theoretical knowledge base.

The EI/SR teachers also appeared to be attracted to a particular value perspective as articulated through the items on the VOI. They were able to consistently prioritize the EI and SR items when placed randomly in the inventory in exactly the same manner the DM/LP teachers prioritized items consistent with their philosophy. Yet interviews with the EI/SR educators revealed a number of learner and contextual constraints that they reported limited or constrained their ability to teach effectively. Specifically, they pointed out that learners were poorly motivated and did not always dress and participate in class activities. They expressed concerns that students did not have the performance and social skills necessary to learn a skill and participate in sport.

The context was also perceived as a constraint by the EI/SR teachers. Although these teachers repeatedly expressed concern for the welfare of their diverse student populations, they appeared overwhelmed by the dimensions of the diversity they faced in their classes. Specifically, they indicated that over their 20-30-year teaching careers in the school district the characteristics of the students in their classes had changed perceptibly. Although the racial, social, and physical characteristics of their students required special considerations, they reported that they had received little instruction in adapting their curriculum to their students' changing needs.

Instructional constraints may also have limited the EI/SR teachers' ability to convey their value perspectives in the classroom. Teachers in this group could not identify any of the indirect instructional strategies typically associated with EI and SR approaches. Instead they indicated that they used direct command/practice styles inconsistent with the student reflection strategies associated with these approaches (Bell, 1991).

Although both the DM/LP and the EI/SR teachers taught in the same school district, they responded to constraints in their environments in different ways. If dynamical systems theory is used as a rationale for the differences, it might be argued that the DM/LP teachers were making decisions from strong attractor basins that effectively limited the planning, teaching, and evaluating decisions to a small, carefully articulated set. Although substantial constraints were evident in the ecosystem, they were not sufficiently compelling to induce the teachers to leave the deep DM/LP attractor basin or be distracted from their goals for student learning. Conversely, if the EI/SR teachers in this study were operating from relatively weak or shallow attractor basins, they may not have had the theoretical understanding or the instructional tools necessary to articulate their own beliefs clearly or to communicate them to students. The learner, instructional, and contextual constraints in the environment could conceivably be a source of distraction that restricted their ability to present the EI/SR perspective when interviewed. In addition, perturbations to the routine, such as unusually difficult students, scheduling disruptions in the teaching routine, or an inability to secure necessary facilities or equipment, could encourage the teacher to discard an educational value perspective and revert to a recreational approach to physical education.

Examination of the interview transcripts suggested the EI/SR teachers perceived themselves as conforming to the beliefs and actions represented by the items in the EI/SR categories of the VOI. They reported that student participation in team sports was a form of group problem solving. However, when asked specifically about methods to implement this strategy, they were unable to identify strategies consistent with the indirect methods of teacher and student questioning, experimentation, problem posing, and group reflection typically associated with the EI and SR perspectives (i.e., Bell, 1991). Thus, although these teachers may have been attracted to philosophical beliefs espoused by advocates of the EI/SR value orientations, they may have been constrained by factors in their environment and lack of the theoretical knowledge and methodological expertise necessary to convey these perspectives in their teaching.

Additional research is required to better understand why teachers in the DM/LP value orientations were able to convey their philosophies to students despite constraints, whereas EI/SR teachers appeared to lose sight of the educational goals associated with their value perspectives. It may be hypothesized that strong value orientations with deep attractor basins influence curricular, instructional, and evaluative decisions, whereas weak value orientation attractors may have a minimal influence on curricular decision making but are unlikely to influence instructional or evaluative decisions. Future studies might investigate the relative strength of the DM/LP and EI/SR attractor basins in physical education. Other research might examine pedagogical constraints that appear to be particularly restrictive to certain value attractors. Value orientations may represent one of several powerful attractors in the physical education ecosystem. Research to examine value attractors and their respective constraints may serve to explain some of the decision-making patterns that appear to influence student learning.

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Note

1. Alpha coefficients for each value orientation on the VOI are as follows: Disciplinary Mastery, *r*= .91; Ecological Integration, *r*= .9l; Social Reconstruction, *r*= .84; Learning Process, *r*= .79; and Self Actualization, *r*= .77 (Ennis 8c Hooper, 1988).