

Nancy Spencer-Cavaliere
Janice Causgrove Dunn
University of Alberta

and

E. Jane Watkinson
University of Manitoba

Is Recess an Achievement Context? An Application of Expectancy-Value Theory to Playground Choices

This study investigated the application of an expectancy-value model to children's activity choices on the playground at recess. The purpose was to test the prediction that expectancies for success and subjective task values are related to decisions to engage in specific recess activities such as climbing, playing soccer, or skipping rope. Participants included 242 children in grades 1-4 from five schools. Participation in playground activities was assessed using the Activities for Daily Living in Physical Play (ADL-PP) (Watkinson et al., 2001). Task-specific expectancies and values were measured on the playground activities contained in the ADL-PP. The results indicated that children's perceptions of competence were significantly higher on playground skills that they had identified as most important compared with least important ($p < .001$). Multivariate prediction analyses revealed that the data supported the predictions of the model ($p < .0001$) suggesting that recess can be an achievement context.

Ce projet de recherche porte sur l'application d'un modèle de la perception de la valeur sur le choix d'activités que font les enfants dans le parc de jeux à la récréation. L'objectif de la recherche était de tester la prédiction selon laquelle les perceptions relativement à la réussite et les valeurs subjectives sont liées aux décisions de participer à des activités spécifiques pendant la récréation telles que grimper, jouer au soccer, ou sauter à la corde. À l'étude ont participé 242 élèves de la 1^{re} à la 4^e année provenant de cinq écoles. La participation aux activités du terrain de jeux a été évaluée selon le Activities for Daily Living in Physical Play (ADLPP) de Watkinson et al., 2001 (Activités pour le quotidien dans les jeux actifs). On a mesuré les perceptions de la valeur qu'attribuaient les enfants aux activités nommées dans la liste de Watkinson et al. Les résultats indiquent que les enfants percevaient que leur compétence quant aux habiletés sur le terrain de jeux étaient bien plus élevée pour celles qu'ils avaient identifiées comme étant plus importantes par rapport à celles auxquelles ils attribuaient moins d'importance ($p < .001$). Des analyses de prédiction multivariées ont indiqué que les données appuient les prédictions du modèle ($p < .0001$), ce qui donne à penser que la récréation peut constituer un contexte de rendement.

Nancy Spencer-Cavaliere is an assistant professor in the area of active healthy children in the Faculty of Physical Education and Recreation.

Janice Causgrove Dunn is an associate professor in the area of adapted physical activity in the Faculty of Physical Education and Recreation.

E. Jane Watkinson is currently Dean of the Faculty of Kinesiology and Recreation Management, following a long career in the University of Alberta where her work on children's play was supported by the Social Sciences and Humanities Research Council of Canada.

Many researchers and professionals in the educational, social psychological, and health sciences have concerns about children's behavior in achievement contexts. An achievement context is one in which a child has concerns about his or her potential to meet the expected standards of performance in an activity (Duda, 1987). For children, academic school settings, physical education, and sport have each been demonstrated to be achievement contexts (Eccles & Harold, 1991; Eccles & Wigfield, 2002). One theory used to explain and predict children's behaviors in these contexts is expectancy-value theory. According to expectancy-value theorists, in achievement contexts children's beliefs about their ability to be successful in an activity and the values they hold for the activity will determine their achievement behaviors (Eccles, Wigfield, & Schiefele, 1998). These behaviors may include children's decisions to do particular tasks; to exert persistence, intensity and effort in pursuing these tasks; and their selection of strategies and measures to meet task goals.

The theory predicts that individuals' decisions to engage in achievement tasks are directly linked to their expectations for successful performance in these tasks and the values they hold for the various options perceived to be available. Expectancies for success help to answer the question *Can I do this task?* whereas task values help to answer the question *Do I want to do this task?* (Eccles et al., 1998). Expectancies and values are influenced by perceptions of the task; by the individual's goals, self-schemata, and other perceptions of the self; and by the child's affective memories. These personal beliefs and memories are influenced in turn by the child's interpretations of past events including related experiences in achievement settings and by the child's perceptions of socializers' beliefs, expectations, and attitudes including cultural, gender, and activity stereotypes. Perceptions of the beliefs of others arise from the cultural milieu in which the child is raised, by their behaviors, and by the aptitude of the child (Wigfield & Eccles, 2000).

Much of the work validating Eccles' model has focused on achievement in academic settings such as mathematics, language arts, and science (DeBacker & Nelson, 1999; Eccles, Wigfield, Harold, & Blumenfeld, 1993; Freedman-Doan et al., 2000; Jacobs, Lanza, Osgood, Eccles & Wigfield, 2002; Wigfield et al., 1997). However, the model has also been used to explain involvement in sports and physical education (Eccles & Harold, 1991; Eccles et al., 1993; Wigfield et al., 1997). Xiang, McBride, Guan, and Solmon (2003) found support for an expectancy-value approach in the study of elementary school children's motivations in physical education and in the specific activity of throwing. They used self-reports to determine children's expectancies for success and subjective task values for physical education and for throwing, as well as their intentions to take physical education in high school. Shapiro and Ulrich (2002) used a similar approach to study the motivations of children with learning disabilities in physical education. Both studies suggest that physical education is an achievement context in which this model may be useful. The latter study included the recess context, but did not address the question of whether expectancies and values actually influence choices in this context.

Eccles and Harold (1991) examined the relationships among expectancies for success, subjective values, and free time involvement in math, English, and sport in children from grades 6 and 7. The results of correlational and path

analyses were compared across the three domains (i.e., mathematics, English, sport), leading the researchers to state that “the Eccles et al. model holds for sport as well as, if not better than, it does for academic subjects” (p. 28). The authors explained that because young students’ decisions about participation in sport are less constrained than in mathematics and English, “there will be more variation in the participation rates [in sport], and this variation should be more highly tied to the types of individual differences in beliefs, self-perceptions, and social experiences outlined in the model” (p. 29). In other words, because this expectancy-value model was developed to explain individuals’ choice behaviors, it is better suited to contexts that afford more choices or decisions. One setting that has received little attention from expectancy-value theorists is recess. This context appears not only to afford more choices, but may also be perceived by children as an achievement context similar to physical education and sports.

Free time on the playground during the school day is perhaps the most universal opportunity for children in Canadian elementary schools to be vigorously active in a social setting. The typical 15-minute recess breaks from classroom activity in the morning and afternoon, coupled with other opportunities at lunch, and before and after school, provide children the time to take part in active play with friends and classmates. Recess affords opportunities to engage in various activities and games such as climbing on and jumping off equipment, swinging, sliding, running, and playing sports. In the recess context children may be faced with numerous activity engagement challenges involving physical performance. School-related free time on the playground provides children with more than just an opportunity to run around. Educators suggest that these daily breaks in the school day can facilitate social and cognitive development in ways that are not possible in the classroom (Bjorklund & Brown, 1998; Pellegrini, 1987, 1995; Pellegrini & Bjorklund, 1997; Pellegrini & Smith, 1998). For boys in particular, the daily breaks also provide as much (or more) time for the development of fitness and motor skill learning as typical physical education classes (Kraft, 1989; Sarkin, McKenzie, & Sallis, 1997; Sleaf & Warburton, 1992). Of concern, therefore, are research findings that some children do not take an active part in free-time on the playground (Bouffard, Watkinson, Thompson, Causgrove Dunn, & Romanow, 1996; Smyth & Anderson, 2000).

Although the physical environment and formal and informal rules may provide structure to the recess context, it is unstructured in the sense that activity is primarily child-directed and children can make decisions about what to do or not do at this time. In the development of an instrument to identify children’s activity choices at recess, Watkinson et al. (2001) found that although some recess activities were common to children in grades 1-4, there were also differences between grades, classrooms, and gender in activity choices. Some studies have found that girls are less likely to be vigorously active (Sarkin et al., 1997), whereas others have found that children with movement difficulties are less likely to be fully engaged in the recess activities of their peers (Bouffard et al., 1996; Smyth & Anderson, 2000). It is interesting, however, that although these findings reflect general trends in the data, the above-mentioned studies

also demonstrated that some young girls and children with movement difficulties are physically and socially active at recess and some young boys are not.

Like the classroom, the less structured setting of recess may be an achievement context in which a number of factors interact to determine a child's behavioral choices. The unique features of recess that afford choice make it an ideal setting for examining the application of expectancy-value theory and for furthering our understanding of children's activity behaviors. Given that the expectancy-value model was developed to explain individuals' choice behavior, and given Shapiro and Ulrich's (2002) study of children's intentions at recess, it may be that Eccles' model is also an effective predictor of children's participation in playground activities during school-related free time. The playground may be an achievement setting based on the high value children place on movement competence in this setting (Evans & Roberts, 1987) and the subsequent concern that children might have in this context for meeting the standards of performance expected by peers.

The purpose of this study was to examine the extent to which children's choices for physical activity engagement at recess could be predicted by components of an expectancy-value model of achievement motivation developed by Eccles and her colleagues (Eccles et al., 1983; Eccles et al., 1998; Eccles, Barber, & Jozefowicz, 1999; Wigfield, 1994; Wigfield & Eccles, 1992, 2000). Recess engagement decisions were investigated from an expectancy perspective using children's perceptions of competence and from a value perspective using the importance value held by children for specific recess activities.

Expectancies for Success

As indicated above, Eccles et al. (1983) conceptualized expectancies for success as influenced directly by task-specific perceptions of ability and difficulty. Nonetheless, research in a number of domains has demonstrated that perceptions of ability (or competence) are not empirically distinguished from expectancies for success in school-aged children (Eccles et al., 1993; Wigfield, 1994; Wigfield & Eccles, 1992, 2000). Moreover, perceptions of task difficulty are not strong predictors of choices at younger ages (Wigfield, 1994). As a result, researchers have adopted perceived competence as a measure of expectancy for success in school-aged children (DeBacker & Nelson, 1999). Perceived competence is an individual's interpretation of his or her success in domain-specific skills (Markus, Cross, & Wurf, 1990).

Task Value

According to expectancy-value theory (Eccles et al., 1983; Wigfield, 1994; Wigfield & Eccles, 1992), the value one has for succeeding in a particular task is also an important motivator for choosing that task. Subjective task values are influenced by past affective experiences and the affective memories they elicit and because they relate closely to goals and the cultural econiche in which the child resides. Described as how a task meets diverse needs of individuals (Wigfield, 1994), task values are the basis of the attractiveness of certain activities. Research suggests that task values influence initial decisions to engage in an activity rather than influencing behavior (e.g., effort or persistence) during task performance (Eccles et al., 1998).

Four components of subjective task values have been proposed in Eccles' model: attainment value, intrinsic value, utility value, and cost (Wigfield, 1994;

Wigfield & Eccles, 1992). Attainment value (importance) refers to the importance of doing well at a task or the degree to which the task will contribute to feelings about the self. Intrinsic value (or interest) is the enjoyment one gets from the task. Utility value (or usefulness) is the valuing of a task because it relates positively to future goals. Finally, cost refers to the negative aspects of doing or not doing the task. Each of these task values, either alone or in combination, may contribute to the increasing or declining likelihood that an individual will choose a particular task or activity.

Research indicates that children and adolescents are not always able to differentiate among the four components of value identified by expectancy-value theory (DeBacker & Nelson, 1999; Eccles et al., 1993; Wigfield & Eccles, 1992). DeBacker and Nelson reported factor analytic results suggesting that students in grades 9 and 10 did not differentiate between utility and attainment values, given that the items collapsed into a single factor. In addition, items intended to measure cost did not load together to create a distinct factor. Of more importance to the current study perhaps, Wigfield and Eccles (1992) reported that in early elementary school-aged children, only interest and importance emerged as salient factors in children's values for sport and other domains. Moreover, interest and importance are likely to be highly correlated during this time, indicating that children may not clearly distinguish between these two constructs (Wigfield, 1994; Wigfield & Eccles, 1992).

Expectancies for success and task values are assumed to be differentiated, albeit related constructs. Even at young ages children have been shown to hold distinct beliefs about what they are good at and what they value in the domains of sports, reading, and math (Eccles et al., 1993; Wigfield, 1994). Children have higher perceived competence on tasks that they value than on tasks they do not value, and this relationship becomes more pronounced as children grow older (Wigfield & Eccles, 1992; Wigfield et al., 1997). As yet the causal order driving this relationship is unknown. Children may increasingly value the activities they are good at as they age, or they may increasingly engage in (e.g., practice) activities that they value, resulting in corresponding increases in perceived competence. A third alternative is that both of the above may be true.

The applicability of Eccles' model of achievement-related choices to children's participation decisions on the playground was assessed through examination of the following question: Are children's activity choices on the playground predicted by their perceptions of competence on specific activities and their perceptions of value, specifically importance, associated with these activities? The model predicts that expectancies for success and task values exert independent influences on activity choice (Eccles et al., 1993). If a child expects to do well in a valued task, then he or she is likely to choose to engage in it. If the individual's expectancy in the same task is low, engagement is still likely because decisions to engage are more closely tied to values than expectancies (Eccles et al., 1998). Engagement is less likely in situations where an individual's expectancy is high but value is low, whereas avoidance is predicted when success expectancy is low in an activity that has little subjective value. Therefore, it was predicted that: (a) an activity would be engaged in if a child rated both competence and value as high; (b) an activity would not be engaged in if a child rated both competence and value as low; (c) an activity

would not be engaged in if a child perceived competence as high but value as low; and (d) an activity would be engaged in if a child perceived competence as low and value as high.

Method

Participants

Participants were from five elementary schools in a Canadian city. A total of 242 children (grade 1=23 boys, 20 girls; grade 2=29 boys, 49 girls; grade 3=32 boys, 50 girls; grade 4=15 boys, 24 girls) were included in the study. Ethics approval for this study was granted by two University research ethics boards. Permission was also obtained from the school district, principals and teachers at the schools from which the children were recruited, as well as the parents and children themselves. Only children for whom informed consent was received took part in this study.

Measures

Playground activity choices. Playground activity choices were assessed using the Activities of Daily Living—Physical Play (ADL-PP, Watkinson et al., 2001). This self-report instrument comprises illustrations of 59 activities (see Figure 1) frequently seen on elementary school playgrounds (e.g., running, swinging on a swing, climbing a ladder, catching a ball, playing soccer). Of the 59 activities, 55 are representative of all-weather activities, and four illustrate snow activities. Each illustration is labeled and depicts a male or female child performing the specific activity. Illustrations are randomly placed on an 11"x17" piece of paper with a place for the child's name and grade. The report form also includes extra space for children to draw activities that are not illustrated. The illustrations facilitate reporting by children with limited reading skills and make the reporting process more enjoyable. Children were asked, "What did you do at recess at recess today?" and used colored pens, stickers, or other markers to identify the desired information. Evidence of validity and reliability for this instrument have been reported in the forms of content relevance and content representativeness (Watkinson et al.). Earlier results indicate that of the activities illustrated on the report form 94% were selected by grade 1 or 2 students and 80% by grade 3 or 4 students as activities engaged in during recess. Only 3% of children in this original study identified additional activities beyond those represented on the report form. The accuracy of children's reports relative to those of expert observers (individuals trained to observe and record children's activities) was from 75% to 86% and was calculated by dividing the number of agreements by the number of disagreements and agreements and then multiplying the result by 100. Interrater reliability agreements between observers ranged from 85% to 100%. The data support the use of this instrument to assess activity choices on the playground of children in grades 1-4.

Perceptions of competence. Perceived competence on playground activities was assessed using an activity-specific measure based on the ADL-PP instrument (Watkinson et al., 2001). Children were presented with a complete list of the 59 illustrated playground activities included on the ADL-PP and asked to rate their own competence. Specifically, participants responded to the instruction *How good are you at this skill?* using a 5-point scale: 1=*really bad*, 2=*bad*, 3=*OK*, 4=*good*, to 5=*really good*. A sixth response option *never tried it* was also



Figure 1. Sample of activities from the Activities of Daily Living—Playground Participation (ADL-PP).

included to allow children to respond accurately based on their perceptions of competence as influenced by past experience. Descriptors used in the scale, along with the illustrations, were pilot tested with children of a similar age to those included in the present study to ensure that the language used was culturally relevant and appropriate and that children were able to understand and complete the questionnaire. Although we recognized the psychometric limitations of using single-item indicators to rate perceived competence on playground activities, earlier studies involving children of similar ages as the participants in this study have successfully used single-item indicators of perceived competence (Causgrove Dunn, Dunn, & Bayduza, 2007; Eccles et al., 1993; Elliot & Harackiewicz, 1996; Lubbers, Van Der Werf, Kuyper, & Offringa, 2006; Senko & Harackiewicz, 2002; Vallerand & Reid, 1984; Xiang et al., 2003). For example, Causgrove Dunn et al. reported strong test-retest reliability of a single-item self-rating of athletic ability with a sample of 55 children (26 boys, 29 girls) from grades 4-6. With an average time delay of 3.91 days between test administrations ($SD=1.76$), an intraclass correlation coefficient of .86 ($p<.001$) was obtained, suggesting that this is a reliable method of assessing perceived competence. Moreover, we were concerned about the potential time (and fatigue) implications associated with asking children to rate their competence on all 59 ADL-PP items using multiple indicators.

Activity value. The value of specific playground activities was assessed in terms of perceived importance. Using a report form containing the same illustrations as the ADL-PP and the perceived competence measure, participants were instructed to circle the three most important and the three least important activities among the 59 illustrations. Given the large number of activities on the

report form it was decided to examine only the three most and three least important activities. Activities could be chosen regardless of whether they had actually been done. *Important* was defined as *important for you to be able to do*, which allowed respondents to interpret importance from an individual perspective. Because activities can be important for their attainment value, utility value, or cost, importance and interest are likely to be highly correlated (Wigfield, 1994), the task value of importance was investigated.

Procedure

Data collection took place over five days during one school week for each classroom. Participants' perceived competence ratings were gathered during the first data-collection session. The instrument was simultaneously administered to all children in a classroom by a research assistant before the recess break, and before participants' first exposure to the ADL-PP report form. General instructions about how to complete the instrument were provided, and participants were led through the instrument by the research assistant activity by activity. Completion of the perceived competence instrument took approximately 30 minutes for grade 1 classrooms and 20 minutes for classrooms at higher grade levels. In a subsequent data-collection session, the activity value of importance was assessed. Children were asked to circle the three most important and the three least important activities to be able to do from among the 59 illustrated.

To determine the activity choices made by the children, data were collected following three recess periods. According to Sarkin et al. (1997), repeated measures of recess activity are needed because the stability of the activities done from day to day is low to moderate. The ADL-PP self-report forms were administered simultaneously to all children in the classroom immediately following morning or afternoon recess periods. Participants were instructed to circle any of the activities that were done during the preceding recess period. A research assistant led the children through the report form activity by activity, using a variety of cues to aid recall (Watkinson et al., 2001). Following completion of the ADL-PP self-reports, participants were provided the opportunity to draw pictures or write the names of any activities they had engaged in at recess, but did not see on the report form. Such additions were infrequent and reflected playground-specific child-invented games (e.g., super-heroes). Because of this, and because the specific activities comprising the games (e.g., running, tag, and playing a game with friends, in the case of super-heroes) were circled on the ADL-PP by the participants, these activities were not identified as separate games for the analyses. Completion of the ADL-PP self-report took each classroom of students approximately 10 minutes.

Results

Expectancies for Success

Participants' perceptions of competence on playground activities were initially examined using descriptive statistics. The percentages of participants in each grade who used all five descriptors (from *really bad* to *really good*) in their self-assessments were 58.1% ($n=25$) in grade 1, 55.1% ($n=43$) in grade 2, 48.8% ($n=40$) in grade 3, and 66.7% ($n=26$) in grade 4. Overall, 55.4% ($n=134$) of the participants used each of the descriptors in rating their competence over the 59 playground activities. A further 21.9% of participants ($n=53$) used four of the

descriptors, and 18.6% used three. Few participants (1.7%, or 4 children) made no distinction between what they were good at and what they were not good at.

Activity Value

A variety of activities were identified by children as most important, with most boys selecting games (soccer, hockey, football, basketball, and baseball), running, and playing on climbing equipment or the zip line (a moving piece of equipment from which children hang). The girls tended to select a wider variety of activities as important, including relatively quiet activities with friends (playing, talking, walking, handclapping games) along with more vigorous choices of running; soccer; wrestling; playing on the swing, slide, and bars; and playing with skipping ropes.

Relationship Between Expectancies and Value

An average perceived competence score was calculated for each child who completed the perceived competence measure and identified his or her three most and three least important activities. Differences in mean perceived competence on least important and most important activities were compared across grades using a 2 (importance rating) X 4 (grade) ANOVA. The results indicated a significant main effect for importance, Wilks' Lambda=.636, $F(1, 219)=125.40, p<.001$. In general, children's perceived competence was higher on activities identified as most important ($M=4.65$) than on those identified as least important ($M=3.80$). The Importance Rating X grade interaction approached significance, Wilks' Lambda=.966, $F(3, 219)=2.56, p=.056$. Table 1 reveals that mean perceived competence over the activities chosen as *least important* decreased as grade level increased, whereas mean perceived competence on activities selected as *most important* remained constant. Effect sizes were large for importance rating (partial $\eta=.36$), and small for grade (partial $\eta=.02$) and the Importance Rating X grade interaction (partial $\eta=.03$) (Cohen, 1977).

Predicting Engagement in Playground Activities from Expectancies and Value

A multivariate prediction analysis of cross classification of qualitative variables (Hildebrand, Laing, & Rosenthal, 1977) was used to test the applicability of the theory to children's recess activity choices. Hildebrand et al.'s *del* (V) is a proportionate reduction in error (PRE) measure. Such measures are interpreted as the proportion of error reduction in predicting the dependent variable given the known state of the independent variables. In other words, PRE measures assess the percentage of reduction in error in the prediction of the dependent variable by the independent variables compared with simply guessing the state of the dependent variable. This is similar to R^2 in the linear model, which measures the reduction in squared prediction errors when the fitted linear model ($y = \beta_0 + \beta_1X$) is compared with the null hypothesis that the criterion (y) is equal to the population mean (Hildebrand et al.). The advantage of using V is that it enables the researcher to make and test a priori predictive statements based on theory.

Following Eccles, four predictions were made about children's engagement decisions. It was predicted that: (a) an activity would be engaged in if a child rated both competence and value as high; (b) an activity would not be engaged

Table 1
Mean Perceived Competence Ratings in Playground Activities Selected as
Most Important and Least Important

Grade	n	Most important		Least important	
		M	SD	M	SD
1	36	4.67	.59	4.13	.80
2	72	4.63	.51	3.77	1.14
3	77	4.57	.58	3.77	.94
4	38	4.82	.34	3.59	1.13

in if a child rated both competence and value as low; (c) an activity would not be engaged in if a child perceived competence as high but value as low; and (d) an activity would be engaged in if a child perceived competence as low and value as high. The latter two predictions follow the assumption that value predicts choices and decisions, whereas expectancy for success has more influence on effort and persistence. Perceived competence ratings of 4 (*good*) or 5 (*really good*) were defined as high, whereas ratings of 1 (*really bad*), 2 (*bad*), or 3 (*OK*) were defined as moderate/low. Because perceptions of competence ratings are generally high in children of this age and in the light of the range of scores being used by the children in this study, the descriptors high and moderate/low were most appropriate.

The contingency table for the analysis can be seen in Figure 2. The predictor variable is composed of the four possible combinations of high and moderate/low perceived competence and most and least perceived importance. The number written in each cell indicates the number of times an event (i.e., choice to engage in or not engage in an activity) was observed. Each participant contributed a maximum of three events to each column (i.e., selected three activities as most important and three activities as least important). The shaded cells in Figure 2 are error cells, or errors according to the a priori predictions. The results supported the predictions from the model, with ($\nabla=.676, p<.0001$). That is, given knowledge of the state of the independent variables, perceived competence, and importance, there was a 68% reduction in error predicting the dependent variable, engagement in the activity. Partial ∇ s were also calculated to provide information about the predictive value of each independent variable over and above the predictive value of the other independent variable. The addition of importance to the prediction of playground activity engagement, given knowledge of perceived competence, resulted in a 63% reduction in prediction error (partial $\nabla=.629, p<.0001$). In contrast, perceived competence added on average no additional predictive value beyond that achieved by knowledge of importance (partial $\nabla=.0, p=.50$).

Discussion

The expectancy-value model developed by Eccles and her colleagues for the purpose of predicting and understanding the academic choices and performances of children and adolescents (Eccles et al., 1983) has since been successfully applied to a wide range of school-aged children in a variety of school subjects (DeBacker & Nelson, 1999; Eccles & Harold, 1991; Eccles et al., 1993; Freedman-Doan et al., 2000; Jacobs, et al., 2002; Wigfield et al., 1997). In addi-

	Most Important High Competence	Most Important Moderate/Low Competence	Least Important High Competence	Least Important Moderate/Low Competence
Engaged	47	20	230	130
Not Engaged	355	10	64	10

Figure 2. Contingency table used in multivariate prediction analysis. Numbers in each cell represent the number of event decisions corresponding to each state of the independent variables. For example, 47 activities rated as most important and corresponding with high perceived competence were not done. Shaded cells contain events that are considered errors in prediction according to a priori hypotheses.

tion, the model has been used to explain the educational, recreational, and occupational choices of men and women (Eccles et al., 1999), as well as the social and sport involvement of children in elementary and junior high schools (Eccles & Harold; Wigfield & Eccles). It has also been used to examine the motivations of children in physical education (Shapiro & Ulrich, 2002; Xiang et al., 2003). The current study examined aspects of Eccles' model in the context of school-related free time on the playground in an effort to further understand the activity choices of elementary-school aged children in this setting.

Overall, the results support the application of Eccles' expectancy-value model to the playground setting. The multivariate prediction analysis revealed that knowledge of perceived competence and subjective importance ratings for specific playground activities resulted in a significant reduction (68%) in activity engagement prediction errors. Importance was shown to contribute significantly to the prediction of playground activity engagement over and above the predictive value of perceived competence. In contrast, perceived competence did not contribute any additional predictive value beyond the predictive value of importance. This is not to say that perceived competence in itself is of no value in predicting activity engagement (e.g., absolute independence), but rather that perceived competence contributed no information beyond that contained in the importance ratings for the prediction of engagement (e.g., conditional independence, Hildebrand et al., 1977). Considering that children engage in an average of only 5-6 activities during one 15-minute recess break (Watkinson et al., 2001), children in the current study expressed high competence beliefs in many more activities than they could perform during the three recess periods of interest. Figure 2 reveals that out of the 427 activities that were not performed, 277 were identified as activities in which children felt competent. In contrast, few of the activities were selected or performed if children lacked competence in them (i.e., only 20 out of 439 activities). It is apparent, therefore, that competence beliefs did influence children's playground activity selections. However, with so many high-competence activities to choose from during the limited time available, subjective importance played a key role in decisions about which of the many high-competence activities children should do in the limited time available. This is consistent with earlier research findings from other domains that suggest that subjective task values are more influential in initial decisions to engage in an activity, whereas expectancies are more influential in persistence, effort, and performance (Eccles et al., 1998; Wigfield & Eccles, 1992).

Important was defined as *important for you to be able to do*, which is typically assumed to reflect attainment value. However, children may have interpreted *important* as attainment value (e.g., contributing to the child's sense of worth), or utility value (e.g., to facilitate engagement with friends). In a study of children's values for playground activities, affiliation emerged as a goal for which specific activities were perceived to have utility value (Watkinson, Dwyer, & Nielsen, 2005). Children frequently reported choosing particular activities *just to be with friends*. Therefore, despite the fact that Eccles and her colleagues originally conceptualized utility value as relating to future goals, in the context of playground activities it may also refer to more immediate goals related to affiliation.

In general, children's perceived competence ratings were higher on playground activities that they valued (e.g., selected as one of the most important) than on those they did not value (e.g., selected as one of the least important). Based on earlier research indicating an increasingly positive relationship between perceived competence and value with age (Wigfield & Eccles, 1992; Wigfield et al., 1997), it was expected that differences in perceived competence ratings between valued and nonvalued skills would increase from grades 1-4. No statistically significant differences were detected, although examination of mean perceived competence scores revealed a trend toward increasing differences with age. Perceived competence scores in least valued skills tended to decrease from grades 1-4 whereas perceived competence scores in most valued skills tended to stay approximately the same (or increased slightly). However, these latter values were high, beginning in grade 1 (4.67), so the opportunity for improvement was limited (e.g., potential ceiling effect).

The results of this study were generally consistent with the predictions based on the theoretical model developed by Eccles and her colleagues. Nevertheless, the study is not without limitations. In addition to our above comments about the use of single-item indicators to assess participants' perceived competence ratings on specific playground activities, the reliance on self-report data of young children has been questioned (Mellor, 2004). Concerns about children's self-reports generally center on their reactivity and lack of reliability. However, the ADL-PP self-report instrument and data collection procedure used in this study demonstrated low reactivity and adequate levels of test-retest reliability with children of similar ages (Watkinson et al., 2001), thereby increasing our confidence in the present findings. Nevertheless, future research may be strengthened if activity choices are also assessed by independent observers.

Whereas the current study examined the predictive value of the task value of importance, future research may also consider examining all task values (importance, interest, utility, and cost) and their predictive value for recess activity engagement. A more in-depth examination of the differences and similarities between task values at an individual level may also prove fruitful in understanding children's recess decisions. For example, understanding why children think certain activities are *important to be able to do* may reveal significant information about their choices. Children may perceive an activity as important to be able to do because it allows them to be with friends (utility), prevents them from being excluded (avoiding cost), or because they enjoy the

activity (intrinsic). Watkinson et al. (2005) found that for some children specific activities had utility value when associated with affiliation goals of being with friends. Exploring children's interpretations of task values and the reasons for associating specific activities with specific task values may be useful in understanding achievement behaviors in the recess context.

In summary, young children's self- and task-related beliefs about playground activities are influential in choices about engagement in playground activities. Based on the theoretical model and the findings presented here, it is likely that the between-person differences in playground activity choices of school-aged children reported by Watkinson et al. (2001) correspond and are at least partly due to differences in competence and task-related beliefs. Given that task values appear to be important predictors of engagement and that recess participation is largely child-determined, further investigation into their predictive value and composition as perceived by children in this setting is warranted.

Note

Correspondence about this article should be addressed to Nancy Spencer-Cavaliere, PhD, Assistant Professor, Faculty of Physical Education and Recreation, E-488 Van Vliet Centre, University of Alberta, Edmonton AB T6G 2H9 Tel: (780) 492-9615; Fax: (780) 492-2364; E-mail: ncavali@ualberta.ca

Acknowledgment

This research was supported by the Social Sciences and Humanities Research Council of Canada.

References

- Bjorklund, D.F., & Brown, R.D. (1998). Physical play and cognitive development: Integrating activity, cognition, and education. *Child Development, 69*, 604-606.
- Bouffard, M., Watkinson, E.J., Thompson, L.P., Causgrove Dunn, J.L., & Romanow, S.K.E. (1996). A test of the activity deficit hypothesis with children with movement difficulties. *Adapted Physical Activity Quarterly, 13*, 61-73.
- Causgrove Dunn, J., Dunn, J.G.H., & Bayduza, A. (2007). Perceived athletic competence, sociometric status, and loneliness in elementary school children. *Journal of Sport Behavior, 30*, 249-269.
- Cohen, J. (1977). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- DeBacker, T.K., & Nelson, R.M. (1999). Variations on an expectancy-value model of motivation in science. *Contemporary Educational Psychology, 24*, 71-94.
- Duda, J.L. (1987). Toward a developmental theory of children's motivation in sport. *Journal of Sport Psychology, 9*, 130-145.
- Eccles, J.S., Adler, T.F., Futterman, R., Goff, S.B., Kaczala, C.M., Meece, J., et al. (1983). Expectancies, values and academic behaviors. In J.T. Spence (Ed.), *Achievement and achievement motives* (pp. 75-146). San Francisco, CA: W.H. Freeman.
- Eccles, J.S., Barber, B., & Jozefowicz, D. (1999). Linking gender to educational, occupational, and recreational choices: Applying the Eccles et al. model of achievement-related choices. In W.B. Swann, J.H. Langlois, & L.A. Gilbert (Eds.), *Sexism and stereotypes in modern society: The gender science of Janet Taylor Spence* (pp. 153-192). Washington, DC: American Psychological Assoc.
- Eccles, J.S., & Harold, R.D. (1991). Gender differences in sport involvement: Applying the Eccles' expectancy-value model. *Journal of Applied Sport Psychology, 3*, 7-35.
- Eccles, J.S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology, 53*, 109-132.
- Eccles, J.S., Wigfield, A., Harold, R.D., & Blumenfeld, P. (1993). Age and gender differences in children's self- and task perceptions during elementary school. *Child Development, 64*, 830-847.
- Eccles, J.S., Wigfield, A., & Schiefele, U. (1998). Motivation to succeed. In W. Damon & N. Eisenberg (Eds.), *Handbook of child psychology* (5th ed., vol. 3, pp. 1017-1095). New York: Wiley.
- Elliot, A.J., & Harackiewicz, J.M. (1996). Approach and avoidance achievement goals and intrinsic motivation: A mediational analysis. *Journal of Personality and Social Psychology, 70*, 461-475.

- Evans, J., & Roberts, G.C. (1987). Physical competence and the development of children's peer relations. *Quest*, 39(1), 23-35.
- Freedman-Doan, C., Wigfield, A., Eccles, J.S., Blumenfield, P., Arbretton, A., & Harold, R.D. (2000). What am I best at? Grade and gender differences in children's beliefs about ability improvement. *Journal of Applied Developmental Psychology*, 21, 379-402.
- Hildebrand, D., Laing, J., & Rosenthal, H. (1977). *Prediction analysis of cross classification*. New York: Wiley.
- Jacobs, J.E., Lanza, S., Osgood, D.W., Eccles, J.S., & Wigfield, A. (2002). Changes in children's self-competence and values: Gender and domain differences across grades one through twelve. *Child Development*, 73, 509-527.
- Kraft, R.E. (1989). Behavior of children at recess. *Journal of Physical Education, Recreation, and Dance*, 60, 21-24.
- Lubbers, M.J., Van Der Werf, M.P.C., Kuyper, H., & Offringa, G.J. (2006). Predicting peer acceptance in Dutch youth: A multilevel analysis. *Journal of Early Adolescence*, 26(1), 4-35.
- Markus, H., Cross, S., & Wurf, E. (1990). The role of the self-system in competence. In J.R. Sternberg & J. Kolligian (Eds.), *Competence considered* (pp. 205-225). New Haven, CT: Yale University Press.
- Mellor, D. (2004). Furthering the use of the strengths and difficulties questionnaire: Reliability with young child respondents. *Psychological Assessment*, 16, 396-401.
- Pellegrini, A.D. (1987). Children on playgrounds: A review of "what's out there." *Children's Environments Quarterly*, 4, 2-7.
- Pellegrini, A.D. (1995). A longitudinal study of boys rough-and-tumble play and dominance during early adolescence. *Journal of Applied Developmental Psychology*, 16, 77-93.
- Pellegrini, A.D., & Bjorklund, D.F. (1997). The role of recess in children's cognitive performance. *Educational Psychologist*, 32, 35-40.
- Pellegrini, A.D., & Smith, P.K. (1998). Physical activity play: The nature and function of a neglected aspect of play. *Child Development*, 69, 577-598.
- Sarkin, J.A., McKenzie, T.L., & Sallis, J.F. (1997). Gender differences in physical activity during fifth-grade physical education and recess periods. *Journal of Teaching in Physical Education*, 16, 99-106.
- Senko, C., & Harackiewicz, J.M. (2002). Performance goals: The moderating roles of context and achievement orientation. *Journal of Experimental Social Psychology*, 38, 603-610.
- Shapiro, D.R., & Ulrich, D.A. (2002). Expectancies, values, and perceptions of physical competence of children with and without learning disabilities. *Adapted Physical Activity Quarterly*, 19, 319-334.
- Sleap, M., & Warburton, P. (1992). Physical activity levels of 5-11-year-old children in England as determined by continuous observation. *Research Quarterly for Exercise and Sport*, 63, 238-245.
- Smyth, M.M., & Anderson, H.I. (2000). Coping with clumsiness in the school playground: Social and physical play in children with coordination impairments. *British Journal of Developmental Psychology*, 18, 389-413.
- Vallerand, R.J., & Reid, G. (1984). On the causal effects of perceived competence on intrinsic motivation: A test of cognitive evaluation theory. *Journal of Sport Psychology*, 6(1), 94-102.
- Watkinson, E.J., Causgrove Dunn, J., Cavaliere, N., Calzonetti, K., Wilhelm, L., & Dwyer, S. (2001). Engagement in playground activities as a criterion for diagnosing developmental coordination disorder. *Adapted Physical Activity Quarterly*, 18, 18-34.
- Watkinson, E.J., Dwyer, S., & Nielsen, A.B. (2005). Children theorize about recess engagement: Does expectancy-value theory apply? *Adapted Physical Activity Quarterly*, 22, 179-197.
- Wigfield, A. (1994). Expectancy-value theory of achievement motivation: A developmental perspective. *Educational Psychology Review*, 6, 49-78.
- Wigfield, A., & Eccles, J.S. (1992). The development of achievement task values: A theoretical analysis. *Developmental Review*, 12, 265-310.
- Wigfield, A., & Eccles, J.S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology*, 25, 68-81.
- Wigfield, A., Eccles, J.S., Yoon, K.S., Harold, R.D., Arbretton, A.J.A., Freedman-Doan, C., et al. (1997). Change in children's competence beliefs and subjective task values across the elementary school years: A 3-year study. *Journal of Educational Psychology*, 89, 451-469.
- Xiang, P., McBride, R., Guan, J., & Solmon, M. (2003). Children's motivation in elementary physical education: An expectancy-value model of achievement choice. *Research Quarterly for Exercise and Sport*, 74, 25-35.