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The purpose of this study was to obtain validity evidence for the Physical Activity and Healthy Food Efficacy Scale for Children (PAHFE). Construct validity evidence identifies four subscales: Goal-Setting for Physical Activity, Goal-Setting for Healthy Food Choices, Decision-Making for Physical Activity, and Decision-Making for Healthy Food Choices. The scores on each of these subscales show a moderate to high degree of internal consistency ($0.59 \leq \alpha \leq 0.87$). The Decision-Making for Healthy Food Choice subscale and the Decision-Making for Physical Activity subscale scores show significant convergent validity evidence. These results provide support for using this self-efficacy scale to measure children's perceived confidence to make decisions about healthy eating and physical activity. The PAHFE may be considered to be a useful predictor of both physical activity and eating behaviors.

Keywords: *self-efficacy; validation; goal and decision making*

Childhood obesity and overweight children continue to be one of the greatest public health threats in the United States because of the epidemic proportions of the health problem and the serious physical and psychosocial consequences (U.S. Department of Health and Human Services, 2001; Visscher & Seidel, 2001). During the past 30 years, the obesity rates among U.S. children ages 2 to 5 and adolescents ages 12 to 19 have more than doubled, and for children ages 6 to 11, the rate has tripled (Ogden, Flegal, Carrol, & Johnson, 2002). Children who become overweight in early childhood have an increased risk of being overweight as they move into adolescence and adulthood (Dietz, 1998; Whitaker, Wright, Pepe, Seidel, & Dietz, 1997). These results suggest that a critical window of opportunity exists for effective prevention and intervention initiatives to decrease or reverse these trends.

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It is well documented that physical activity and healthy eating can play a significant protective role against obesity (Berkey et al., 2000; Maffeis, Pinelli, & Schutz, 1996; Trost, Kerr, Ward, & Pate, 2001). Despite this evidence, current estimates for physical activity and healthy eating among youth fall well below the recommended levels. Key findings from the National Youth Risk Behavior Survey (Centers for Disease Control and Prevention, 2003) indicate that less than two thirds of youth report participating in vigorous physical activity 3 or more days per week, and approximately 14% report no recent physical activity. Other key findings show that as age increases, levels of physical activity decline. According to these national estimates, the greatest reductions in physical activity occur during adolescence (Sallis, 2000). The poor dietary behaviors among youth indicate insufficient daily servings of fruits, vegetables, and dairy and an excess of the recommended intake in total fat, saturated fat, and sugar (Centers for Disease Control and Prevention, 2003; Munoz, Krebs-Smith, Ballard-Barbash, & Cleveland, 1997).

Cognitive and behavior theories can play an important role in explaining, predicting, and initiating health behavior change applied to community-based interventions. A prominent theoretical model used in health promotion is the Social Cognitive Theory (SCT; Bandura, 1998; Sheeshka, Woolcott, & MacKinnon, 1993). Self-efficacy, a central construct of SCT, has been shown to be a strong predictor of physical activity and food-related behavior (Bernier & Avard, 1986; Kelder, Perry, & Klepp, 1993; Marcus, Eaton, Rossi, & Harlow, 1994; Sallis, Prochaska, & Taylor, 2000). Self-efficacy refers to an individual's perceived confidence in his or her ability to perform a task or specific behavior (Bandura, 1997). Personal goal setting and decision making are also psychosocial skills that have been shown to be important for both controlling and changing behavior (Bandura, 1989; Bandura & Cervone, 1983; Locke & Latham, 2002). These self-regulation skills can be integral to the motivation, attentiveness, and behavior attainment of young people (Cullen, Baranowski, & Smith, 2001; Hamrick, Anspaugh, & Smith, 1980; Howison, Neidermyer, & Shortridge, 1988). Moreover, goal-setting and decision-making skills are identified as content standards to be taught in the K-12 health and physical education curricula as defined by the Joint Committee on Health Education Standards (1995) and the National Association for Sport and Physical Education (2004).

This study was part of a larger ongoing investigation to improve healthy food choices and physical activity levels in overweight upper elementary grade students. The purpose and design of this larger study required that baseline levels of goal-setting and decision-making efficacy be assessed and then repeated for comparison purposes to determine a treatment effect. At the time of this study, there were no validated measures for assessing personal goal setting and decision-making efficacy related to physical activity and healthy food choices in fourth- and fifth-grade students. Therefore, this study focused on designing a measure to assess efficacy beliefs related to personal goal setting and decision making in overweight upper elementary children. Moreover, this study obtained content, criterion-related, and construct validity evidence on this measure, Physical Activity and Healthy Food Efficacy Scale for Children (PAHFE).

METHOD

As previously mentioned, this study was part of an ongoing investigation. The larger study used a nonequivalent control group pretest-posttest design in which participants in the treatment group underwent a 10-week mentoring intervention. A nonrandom sample of fourth- and fifth-grade students identified as overweight according to their age-gender specific BMI values (95th percentile or higher) was obtained from five public elementary schools located in a Midwest community. The dependent variables in the larger study were eating behavior, physical activity levels, and perceived self-efficacy. Each of these variables was assessed using various instruments, and these were also used in this study.

Instruments

For this study, there were four instruments administered: the PAHFE; the School Physical Activity and Nutrition (SPAN) questionnaire, by Hoelscher, Day, Kelder, and Ward (2003); the Barrier Self-Efficacy Questionnaire (BSEQ; Marcus, Selby, & Niaura, 1992); and the Child Dietary Self-Efficacy Scale (CDSE; Parcel et al., 1995). Each of these will be discussed in turn below.

PAHFE. The PAHFE questionnaire was developed to fill a gap that was not addressed by the SPAN. The SPAN assesses physical activity and eating behaviors of upper elementary children but does not assess fourth- and fifth-grade students' confidence toward their ability to set personal goals and make decisions related to physical activity and healthy food choices. In addition, the authors were unable to find a validated instrument in the research literature that addressed this gap.

The PAHFE is an 18-item instrument designed to assess personal goal-setting and decision-making efficacy for physical activity and healthy food choices for children ages 8 to 10. The items on the PAHFE were developed based on the current relevant literature and interviews with children of the appropriate ages. In addition, face validity was established using an expert panel in self-efficacy appraisals. Respondents answered on a 5-point Likert-type scale ranging from 1 = *not sure at all* to 5 = *completely sure*. The questionnaire was piloted with fourth- and fifth-grade children including cognitive interview testing of the questionnaire. The items on the PAHFE represent the impediments or challenges children may experience when attempting to improve physical activity and eating behaviors. A sample question from the Decision-Making Physical Activity Efficacy subscale reads as follows: "How sure are you that you can be physically active in cold weather?" A sample question from the Decision-Making Healthy Food Choice Efficacy subscale reads as follows: "How sure are you that you can choose a healthy food to eat when watching TV or video movies?" Higher item scores indicate higher self-efficacy than do lower scores.

SPAN. The SPAN is a 54-item questionnaire developed for fourth-grade students. The instrument uses 2-, 3-, or 4-point multiple choice response formats to assess students' eating behaviors and physical activities. At the time of the study, the SPAN's reproducibility information for elementary school–aged children was not available. However, a form of the SPAN questionnaire for eighth- and eleventh-grade students has shown Spearman correlations from .66 to .97 on food choice items and from .75 to .92 on activity items (Hoelscher et al., 2003).

Because the SPAN contains questions for assessing nutrition knowledge, physical activity, and eating behaviors, three subscales for assessing physical activity behavior (2 items), eating behavior (14 items), and nutrition knowledge (4 items) were constructed. The various SPAN subscales were used to provide both criterion-related validity evidence as well as discriminant validity evidence. Specifically, the SPAN Physical

Activity Behavior subscale was used for establishing criterion-related validity for the PAHFE Decision-Making Physical Activity Efficacy subscale. Similarly, the SPAN Eating Behavior subscale was used as a criterion for the PAHFE Decision-Making Healthy Food Choice subscale.

In regard to discriminant validity evidence, the SPAN Physical Activity Behavior subscale was correlated with the PAHFE Healthy Food Choices subscale. The third SPAN subscale, Nutrition Knowledge, was used for obtaining discriminant validity information for the PAHFE Physical Activity Efficacy subscale. For Physical Activity Behavior, higher scores indicate greater physical activity, and lower scores indicate less physical activity. On the Eating Behavior subscale, higher scores also indicate healthier food choices, whereas lower scores indicate less healthy food choices. Similarly, higher scores on the Nutrition subscale indicate greater knowledge than did lower scores.

BSEQ. The BSEQ is a 12-item questionnaire designed to assess self-efficacy to overcoming barriers to exercise. The BSEQ has shown an internal consistency of .82 and a test-retest reliability of .90 using a 2-week period (Marcus et al., 1992). Nigg and Courneya (1998) added five items to the original BSEQ applicable to adolescents. This resulted in an alpha value of .85; the modified version of the BSEQ was used in this study. Participants chose 1 of 11 possible responses ranging from "no confidence at all" (0%) to "completely confident" (100%) in 10% increments. The BSEQ scores were used for establishing convergent validity information for the PAHFE Physical Activity Efficacy subscale scores. Higher scores indicated greater self-efficacy, and lower scores indicated less self-efficacy.

CDSE. The CDSE consists of 15 Likert-type items designed to assess self-efficacy to make healthy food choices. Participants chose one of three responses ranging from "not sure" (1) to "very sure" (3). Analysis of this scale's properties indicated high internal consistency levels, acceptable levels of test-retest reliability, and evidence for construct and concurrent criterion-related validity. The CDSE scores were used for establishing convergent validity information for the PAHFE Snacking Efficacy subscale scores. As was the case with the BSEQ, higher scores indicated greater self-efficacy, whereas lower scores indicated less self-efficacy.

To summarize the use of the above instruments, convergent construct validity information for the PAHFE Physical Activity Efficacy subscale scores was obtained by correlating its scores with the BSEQ scores. For the PAHFE Healthy Food Choices Efficacy subscale, convergent validity evidence involved a correlational analysis of these scores with those from the CDSE scores. For both of these situations, it was expected that strong positive correlations would be observed. With respect to discriminant construct validity evidence, the PAHFE subscale scores were correlated with those from instruments for which there were no a priori justifications for believing that strong associations would be observed. Specifically, discriminant construct validity evidence for the PAHFE Physical Activity Efficacy subscale scores was obtained by correlating the subscale scores with those of the SPAN subscale for assessing nutrition knowledge. To obtain discriminant validity evidence for the PAHFE Healthy Food Choices Efficacy subscale, the SPAN Physical Activity Behavior subscale scores were correlated with the Healthy Food Choices Efficacy subscale scores. For both of these last situations, it was expected that weak correlations would be observed. With respect to criterion-related validity, the PAHFE Healthy Food Choices Efficacy subscale was used to predict the SPAN Eating Behavior subscale and the PAHFE Physical Activity Efficacy subscale was used to predict the SPAN Physical Activity Behavior subscale scores. These criterion variables were selected because according to Bandura (1997), self-efficacy judgments are specific to a particular action or task and the situation in which the action occurs. In other words, the construct self-efficacy is domain specific and should not be generalized to other tasks or situations.

Data Collection

The PAHFE and the SPAN were administered at the beginning of the mentoring intervention and again after the intervention. The CDSE and BSEQ were administered to participants in both treatment and control groups following the 10-week intervention of the larger study. The SPAN and the PAHFE were administered to participants in the treatment group by their college mentor, and the school nurse administered the instruments to those students in the control group. Mentors and nurses were given instructions as to how to administer the measures. Participants were not timed but took an average of 20 minutes to fill out the measures. Following the 10-week mentoring intervention, participants were administered the SPAN and the PAHFE a second time as well as the BSEQ and CDSE. All measures were coded so that they could be matched across administrations while maintaining confidentiality of the children. Participants in the treatment group completed the four measures in their home with the assistance of their college mentors. Those in the control group completed these same measures in school with the assistance of the school nurse.

Analysis

Content validity information was provided by having two experts in self-efficacy review the PAHFE to determine if it displayed adequate representation of self-efficacy. The PAHFE was also reviewed by a special education teacher to ensure that the wording was appropriate for fourth- and fifth-grade students.

Criterion-related validity evidence was obtained by using linear regression. Separate regression analyses were conducted for pretest and posttest measures. The SPAN Physical Activity Behavior subscale was regressed on the PAHFE Decision-Making Physical Activity efficacy items as well as the Goal-Setting Physical Activity efficacy items. In addition, the SPAN Eating Behavior subscale was regressed on the PAHFE Decision-Making Healthy Food Choices efficacy items and the Goal-Setting Healthy Food Choices efficacy items.

Construct validity information involved three separate analyses. The first involved determining the instrument's factor structure, whereas the second and third were concerned with obtaining convergent and discriminant validity evidence, respectively. The PAHFE's factor structure was determined by using MPlus (Muthen & Muthen, 2005) to perform confirmatory factor analyses for two-, three-, and four-factor structures. For the two-factor structure, all items concerned with healthy food choices were specified to comprise one factor, whereas the second factor consisted of all physical activity items. That is, for both factors, whether the items were concerned with goal setting or decision making was ignored. The three-factor structure treated the personal goal-setting items as distinct from the decision-making items. For this analysis, one factor consisted of all the personal goal-setting items, a second factor consisted of physical activity decision-making items, and the third factor contained the healthy food decision-making items. The last model contained a personal goal-setting physical activity factor, a personal goal-setting healthy food choices factor, a physical activity decision-making factor, and a healthy food choice decision-making factor.

Convergent validity was obtained by conducting a correlational analysis of the PAHFE subscales with instruments that measured the same constructs as the PAHFE subscales. Because the CDSE is a measure of healthy eating self-efficacy, its scores were correlated with the PAHFE Healthy Food Choices Efficacy subscale scores. A large positive correlation between these two measures would be indicative of convergent validity for this construct. The BSEQ provides an assessment of physical activity self-efficacy. A large positive correlation between the BSEQ scores and the PAHFE Physical Activity Efficacy subscale scores would provide supporting evidence of convergent validity for this factor.

To be consistent with Bandura's specificity dimension of self-efficacy, it was hypothesized that physical activity efficacy would not be strongly associated with nutrition knowledge or eating behavior. (Support for Bandura's specificity dimension of self-efficacy has been found by researchers such as Hofstetter, Sallis, and Hovell [1990].) Therefore, the discriminant validity analysis was predicated on the belief that the PAHFE subscales should not be highly related to instruments that do not measure the same constructs as the PAHFE subscales. In this regard, the PAHFE Decision-Making Healthy Food Choices Efficacy subscale and the SPAN Physical Activity Behavior subscale scores were correlated. In addition, the PAHFE Decision-Making Physical Activity Efficacy subscale scores were correlated with the SPAN Nutrition Knowledge subscale. The reliability estimates for the scores on each of the instruments were obtained.

RESULTS

The average age of the participants (N = 131) was 9.89 (median 10 years old), with a range from 8 to 14, with 85.6% of the sample falling between the ages 9 and 11. Sixty-seven (54%) of the participants were female and 57 (46%) were male. Racial/ethnic analysis showed that overall, 68.9% of the participants were Caucasian (non-Hispanic), 11.3% were African American, 3.8% were Latino/a, 4.7% were Asian American, and 1.9% were Native/Alaskan American; 9.4% did not provide their racial/ethnic identification.

To establish content validity, two individuals who had conducted research in self-efficacy theory for most of their respective academic careers were used. Moreover, a special education teacher was used to review the appropriateness of the instrument's wording. The self-efficacy experts reviewed the PAHFE and reported that the items on the scale were clear and contained adequate content validity. The special education teacher suggested that the word *confident* be replaced by the word *sure* because it was more appropriate for fourth and fifth graders.

Parallel analyses were conducted on pretest and posttest data using all participants in both treatment and control groups. The results of the confirmatory factor analyses are presented in Table 1. MacCallum, Widaman, Zhang, and Hong (1999) have shown that it is possible to perform factor analyses with small sizes provided that the true communalities are large. In this regard, factor analyses were conducted with the understanding that these results would simply be indicative of the PAHFE's potential factor structure because of the "smallish" sample size. Three models were examined and compared. The two-factor model consisted of Healthy Food Choices and Physical Activity subscales. The three-factor model contained three subscales: Goal-Setting for Physical Activity and Healthy Food Choices, Decision-Making Physical Activity subscale, and the Decision-Making Healthy Food Choices subscale. The third model separated the

Table 1. Confirmatory Factor Analyses

Model	χ^2	*df*	BIC	Adjusted BIC	CFI	SRMR	RMSEA
Pretest							
Four factors	277.083	129	6,556.566	6,366.843	.756	.088	.096
Three factors	287.146	132	6,552.169	6,371.932	.745	.090	.097
Two factors	333.990	134	6,589.372	6,415.459	.671	.097	.110
Posttest							
Four factors	235.959	129	5,848.027	5,658.396	.894	.065	.086
Three factors	242.161	132	5,840.047	5,659.898	.891	.066	.086
Two factors	286.850	134	5,875.281	5,701.453	.849	.069	.100

NOTE: BIC = Bayesian Information Criterion; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation; Two factors = Healthy Food Choices subscale and Physical Activity subscale; Three factors = Goal-Setting Physical Activity and Healthy Food Choices subscale, Decision-Making Physical Activity subscale, and Decision-Making Healthy Food Choices subscale; Four factors = Goal-Setting Physical Activity subscale, Goal-Setting Healthy Food Choices subscale, Decision-Making Physical Activity subscale, and Decision-Making Healthy Food Choices subscale.

goal setting subscale into its constituent components: a Physical Activity subscale and a Healthy Food Choices subscale. All three models were found to be acceptable according to Kline's (1998) recommendation of a cutoff value of .10 for Standardized Root Mean Square Residual (SRMR), although the Comparative Fit Indexes (CFIs) are smaller than the typically accepted convention of .95 (Hu & Bentler, 1999). Moreover, the root mean square error of approximations (RMSEAs) are larger than the recommended .06 criterion (Hu & Bentler, 1999).

As can be seen, the overall models' χ^2 test of fit to the data were all significant. Because the three-factor model is nested within the four-factor model and the two-factor model is nested within the four-factor model, chi-square difference tests were conducted. The chi-square difference between the three- and four-factor models showed that the four-factor model fit significantly better than did the three-factor model for the pretest data, $\chi^2(3) = 10.06$, $p < .025$, but not for the posttest data, $\chi^2(3) = 6.20$, $p > .05$. In short, for the posttest data, the three-factor model was preferred to the four-factor model, but the four-factor model was preferred to the three-factor for the pretest data. For both the pretest and posttest data, the two-factor model fit significantly poorer than did the four-factor model, $\chi^2(5) = 56.91$, $p < .005$, and $\chi^2(5) = 50.89$, $p < .005$, respectively. The Bayesian Information Criterion (BIC) index adjusted for sample size (adjusted BIC) showed that the four-factor model should be preferred to the three-factor model for both the pretest and posttest data, although the difference between the four- and three-factor models' adjusted BICs was quite small for the posttest data.

Statistically, the magnitudes of the SRMRs, CFIs, RMSEAs, the Adjusted BICs, and the chi-square difference tests indicate that the PAHFE appears to consist of four factors, although a three-factor solution also appears to be reasonable. The four factors or subscales may be interpreted as Goal-Setting for Physical Activity Efficacy (two items), Goal-Setting for Healthy Food Choices Efficacy (two items), Decision-Making for Physical Activity Efficacy (seven items), and Decision-Making for Healthy Food Choices Efficacy (seven items); in the three-factor model, the goal-setting items were combined to form one factor.

The PAHFE Decision-Making for Physical Activity Efficacy subscale yielded coefficient αs of .78 (pretest) and .86 (posttest). The PAHFE Decision-Making for Healthy Food Choices Efficacy subscale produced values of .74 (pretest) and .87 (posttest). Because a scale's estimated reliability is influenced by the number of items it contains, for comparative purposes, these alpha coefficients were adjusted using the Spearman-Brown formula (Nunnally & Bernstein, 1994). Specifically, the Spearman-Brown formula was used to estimate the reliability of each measure as if each measure were of the same length as the longest instrument in the study, the 15-item CDSE. Adjusted αs of .88 (pretest) and .93 (posttest) were obtained for the Decision-Making for Physical Activity Efficacy subscale and .86 (pretest) and .93 (posttest) for the Decision-Making for Healthy Food Choices Efficacy subscale. With respect to the goal-setting subscales, the internal reliabilities were .59 (pretest) and .78 (posttest) for Goal-Setting for Physical Activity Efficacy and for Goal-Setting for Healthy Food Choices Efficacy coefficient α was .69 (pretest) and .75 (posttest). These two subscales were two items long, and adjusting these αs for their length resulted in adjusted αs for Goal-Setting for Physical Activity Efficacy of .92 (pretest) and .96 (posttest) and for Goal-Setting for Healthy Food Choices Efficacy of .94 (pretest) and .96 (posttest). The reliability estimates for the SPAN Physical Activity Behavior subscale were .19 (pretest) and .21 (posttest). Adjusting for the subscale's length, the αs for the "15-item" SPAN Physical Activity Behavior subscale increased to .63 (pretest) and .67 (posttest). The SPAN Nutrition Knowledge subscale scores showed coefficient αs of .44 (pretest) and .46 (posttest); adjusted αs of .74 (pretest) and .76 (posttest). Alpha coefficients for the BSEQ and the CDSE were .88 and .80, respectively. An adjusted coefficient α for the BSEQ yielded a value of .90 (Table 2).

All regression analyses (Table 3) were performed separately for the pre- and post-intervention data. Diagnostic analysis did not reveal any assumption violations nor influential outliers. The SPAN Nutrition Knowledge subscale criterion correlated –.005 with the PAHFE Decision-Making for Physical Activity Efficacy factor on the pretest and .43 on the posttest. Therefore, with the pretest data, the PAHFE Decision-Making for Physical Activity Efficacy factor accounted for about 0% of the total variance of the SPAN Nutrition Knowledge scores; the regression coefficient for the pretest ($b = -.001$) was not significant ($t = -.055$, $p = .956$). Although there was a significant linear relationship between these two variables on the posttest ($r = .430$, $b = .068$, $t = 4.901$, $p = .000$), the PAHFE Decision-Making Physical Activity subscale was again not a very good predictor of the SPAN Nutrition Knowledge, accounting for only 18.5% of its variability. These results were consistent with expectations and provide the PAHFE Decision-Making for Physical Activity Efficacy with discriminant validity evidence.

Regressing the SPAN Physical Activity Behavior subscale on the PAHFE's Decision-Making for Healthy Food Choices Efficacy subscale showed no significant linear relationship on either the pretest or posttest data. Regardless of whether the pretest or posttest data were used, the PAHFE's Decision-Making for Healthy Food Choices Efficacy subscale was a very poor predictor of the SPAN Physical Activity Behavior scores, accounting for less than 3.6% of their variability. In short, the PAHFE's Decision-Making for Healthy Food Choices Efficacy subscale scores exhibited the expected discriminant validity evidence.

The regression of the BSEQ on the Decision-Making for Physical Activity Efficacy subscale showed a strong linear relation, with a correlation of .797. Approximately 63.5% of the variability in BSEQ scores was accounted for by the Decision-Making for Physical Activity Efficacy factor. It is not surprising that the regression coefficient was significant ($b = 3.530$, $t = 8.027$, $p = .000$), indicating that the Decision-Making for Physical Activity

Table 2. Reliability Estimates

Scale	Pretest	Posttest
PAHFE		
GS: Physical Activity[a]	.59	.78
GS: Healthy Food[a]	.69	.75
DM: Physical Activity[b]	.78	.86
DM: Healthy Food[b]	.74	.87
SPAN		
Physical Activity	.19	.21
Nutrition Knowledge	.44	.46
Eating Behavior	.16	.27
BSEQ[c]		.88
CDSE[c]		.80
	Spearman-Brown Adjusted Coefficient Alphas	
	Pretest	Posttest
PAHFE		
GS: Physical Activity[a]	.92	.96
GS: Healthy Food[a]	.94	.96
DM: Physical Activity[b]	.88	.93
DM: Healthy Food[b]	.86	.93
SPAN		
Physical Activity	.63	.67
Nutrition Knowledge	.74	.76
Eating Behavior	.17	.28
BSEQ[c]		.90
CDSE[c]		.80

NOTE: PAHFE = Physical Activity and Healthy Food Efficacy Scale for Children; SPAN = School Physical Activity and Nutrition; BSEQ = Barrier Self-Efficacy Questionnaire; CDSE = Child Dietary Self-Efficacy Scale.
a. PAHFE GS Physical Activity = PAHFE Goal-Setting: Physical Activity factor and GS Healthy Food = PAHFE Goal-Setting Healthy Food Choices factor.
b. PAHFE DM Physical Activity = PAHFE Decision-Making: Physical Activity factor and DM Healthy Food = PAHFE Decision-Making Healthy Food Choices factor.
c. This measure was assessed only at posttest.

Efficacy subscale was a useful predictor of the BSEQ. Similarly, the Decision-Making for Healthy Food Choices Efficacy factor was a useful and significant predictor of the CDSE scale scores, accounting for 33.1% of the variability in the CDSE scores (r = .575); the regression coefficient (b = .443) was also significant (t = 4.103). Therefore, the Decision-Making for Healthy Food Choices Efficacy and Decision-Making for Physical Activity Efficacy subscale scores showed significant convergent validity.

Criterion-related validity evidence for the Decision-Making for Physical Activity Efficacy subscale was obtained from the regression of the SPAN Physical Activity Behavior subscale on Decision-Making for Physical Activity Efficacy and Goal-Setting for Physical Activity Efficacy. Table 4 shows that both sets of regression were significant. The Decision-Making for Physical Activity Efficacy as well as the Goal-Setting for Physical Activity Efficacy both significantly predicted the SPAN Physical Activity

Table 3. Regression Analysis Results

Criterion[a]	Predictor[b]	Constant	*b*	95% CI	*t*	*p*	r	r^2
Discriminant validity evidence								
Pretest								
SPAN Nutrition	PAHFE DMPA	2.041	-0.001	–0.038, 0.036	–0.055	0.956	–0.005	0.000
Posttest								
SPAN Nutrition	PAHFE DMPA	0.699	0.068	0.040, 0.095	4.901*	0.000	0.430	0.185
Pretest								
SPAN Physical Activity	PAHFE DMHF	2.981	0.023	0.000, 0.045	1.988	0.049	0.189	0.036
Posttest								
SPAN Physical Activity	PAHFE DMHF	3.370	0.008	–0.010, 0.026	0.861	0.392	0.086	0.007
Convergent validity evidence								
BSEQ	DMPA	–15.302	3.530	2.639, 4.421	8.027*	0.000	0.797	0.635
CDSE	DMHF	25.933	0.443	0.224, 0.663	4.103*	0.000	0.575	0.331

NOTE: CI = confidence interval; SPAN = School Physical Activity and Nutrition; PAHFE = Physical Activity and Healthy Food Efficacy Scale for Children; DMPA = Decision-Making for Physical Activity Efficacy; DMHF = Decision-Making for Healthy Food Choices Efficacy; BSEQ = Barrier Self-Efficacy Questionnaire; CDSE = Child Dietary Self-Efficacy Scale.
a. SPAN Physical Activity = SPAN Physical Activity Behavior subscale; SPAN Nutrition = SPAN Nutrition Knowledge subscale.
b. PAHFE DMPA = PAHFE Decision-Making: Physical Activity factor; PAHFE DMHF = PAHFE Decision-Making Healthy Food Choices factor.
*$\alpha = .05$

Behavior subscale. Similar results were obtained with respect to the Decision-Making and Goal-Setting Healthy Food Choices subscales. Both Decision-Making for Healthy Food Choices Efficacy and Goal-Setting for Healthy Food Choices Efficacy were found to significantly predict the SPAN Eating Behavior subscales.

DISCUSSION

The PAHFE was designed to measure children's self-efficacy related to goal setting and decision making for physical activity and healthy food choices. Content validity evidence was obtained by using two professional experts. Construct validity evidence came from factor structure information as well as from convergent and discriminant validity evidence. Criterion-related validity evidence was obtained by use of the SPAN as the criterion.

With respect to the instrument's factor structure, the four-factor model was found to fit significantly better than both the two- and three-factor models. Although an argument may be made for the three-factor model, it was felt that the four-factor model provided

Table 4. Regression Analysis Results: Criterion-Related Validity Evidence

Criterion[a]	Predictor[b]	Constant	*b*	95% CI	*t*	*p*	r	r^2
Pretest								
SPAN	PAHFE							
Physical Activity	DMPA	2.743	0.033	0.013, 0.054	3.183*	0.002	0.287	0.082
Posttest								
SPAN	PAHFE							
Physical Activity	DMPA	3.037	0.022	0.004, 0.040	2.433*	0.017	0.228	0.052
Pretest								
SPAN	PAHFE							
Physical Activity	GSPA	3.053	0.068	0.009, 0.126	2.280*	0.024	0.204	0.042
Posttest								
SPAN	PAHFE							
Physical Activity	GSPA	2.996	0.076	0.020, 0.131	2.710*	0.008	0.252	0.064
Pretest								
SPAN	PAHFE							
Eating	DMHF	20.200	0.232	0.130, 0.334	4.507*	0.000	0.413	0.170
Posttest								
SPAN	PAHFE							
Eating	DMHF	22.156	0.194	0.099, 0.288	4.079*	0.000	0.388	0.150
Pretest								
SPAN	PAHFE							
Eating	GSHF	21.107	0.639	0.369, 0.909	4.695*	0. 000	0.407	0.166
Posttest								
SPAN	PAHFE							
Eating	GSHF	23.802	0.397	0.0035, 0.790	1.998*	0.048	0.198	0.039

NOTE: CI = confidence interval; SPAN = School Physical Activity and Nutrition; PAHFE = Physical Activity and Halthy Food Efficacy Scale for Children; DMPA = Decision-Making for Physical Activity Efficacy; GSPA = Goal-Setting for Physical Activity Efficacy; DMHF = Decision-Making for Healthy Food Choices Efficacy; GSHF = Goal-Setting for Healthy Food Choices Efficacy.

a. SPAN Physical Activity = SPAN Physical Activity Behavior subscale; SPAN Nutrition = SPAN Nutrition Knowledge subscale.

b. PAHFE DMPA = PAHFE Decision-Making Physical Activity factor; PAHFE GSPA = PAHFE Goal-Setting Physical Activity factor; PAHFE DMHF = PAHFE Decision-Making Healthy Food Choices factor; PAHFE GSHF = PAHFE Goal-Setting: Healthy Food Choices factor.

*α = .05.

a more accurate representation of the data. The four-factor model consisted of two subscales related to goal setting, Goal-Setting for Physical Activity Efficacy and Goal-Setting for Healthy Food Choices Efficacy, and two subscales related to decision making, Decision-Making for Physical Activity Efficacy and Decision-Making for Healthy Food Choices Efficacy. The scores on each of these subscales showed a high degree of internal consistency. The Decision-Making for Physical Activity Efficacy subscale had an α = .88 (pretest) and .93 (posttest), whereas the Decision-Making for Healthy Food Choices Efficacy subscale had αs of .86 and .93 for the pretest and posttest administrations, respectively. The Goal-Setting for Physical Activity Efficacy subscale had αs of .59 (pretest) and .78 (posttest) and for the Goal-Setting for Healthy Food Choices Efficacy .69 (pretest) and .75 (posttest).

The regression analyses between the PAHFE Decision-Making for Physical Activity Efficacy subscale and the BSEQ scale provided convergent validity evidence. Specifically, the Decision-Making for Physical Activity Efficacy scores had a significantly strong positive correlation ($r = .80$), with a measure also designed to measure a child's physical activity self-efficacy, the BSEQ. Similarly, the regression analyses between the Decision-Making for Healthy Food Choices Efficacy and the CDSE scale provided convergent validity evidence. The Decision-Making for Healthy Food Choices Efficacy subscale scores also significantly correlated highly with the CDSE ($r = .58$), a measure designed to assess a child's self-efficacy to make healthy food choices.

The PAHFE Decision-Making for Physical Activity Efficacy and Decision-Making for Healthy Food Choices Efficacy subscales also appeared to be largely unrelated to measures assessing different constructs, as evidenced by small and, in general, nonsignificant correlations between the PAHFE subscale scores and the SPAN Physical Activity Behavior subscale and Nutrition Knowledge subscale. In short, the PAHFE's Decision-Making for Physical Activity Efficacy and Decision-Making for Healthy Food Choices Efficacy subscale scores exhibited the expected discriminant and convergent validity evidence. These findings contribute further support for the construct validity of the PAHFE scores.

Limitations

Because the validation of an instrument is an ongoing process, no single study can be seen as a definitive statement that an instrument has been validated. The study's sample size is comparable to other validation studies. In fact, some published validation studies as well as those examining self-efficacy have used smaller samples and less diverse populations (Barlow, Shaw, & Wright, 2001; Dennis & Faux, 1999; Lytle et al., 2003; Weber et al., 2004). In many respects, the racial/ethnic sample's demographics are similar to those of the United States as a whole, except in terms of the Hispanic representation. That is, the sample consisted of 68.9% Caucasian (non-Hispanic), 11.3% African American, 3.8% Latino/a, and 4.7% Asian American. According to the U.S. 2000 census (U.S. Census Bureau, 2000), the percentages of the population that are Caucasian (non-Hispanic), African American, Latino/a (any race), and Asian American are 69.4%, 12.7%, 12.6%, and 3.8%, respectively. Nevertheless, the instrument's validity evidence would be enhanced by using more Hispanics.

Implications for Practice

The findings in this study have implications for both researchers and practitioners. Self-efficacy continues to be a strong predictor and correlate of behavior change. Self-regulation skills, such as personal goal setting and decision making, are important psychosocial skills critically linked to both controlling and changing behavior (Bandura, 1989; Bandura & Cervone, 1983; Locke & Latham, 2002) and integral to motivation, attentiveness, and behavior attainment (Cullen et al., 2001; Hamrick et al., 1980; Howison et al., 1988). Goal setting and decision making are identified as content standards to be taught in the K-12 health and physical education curricula as defined by the Joint Committee on Health Education Standards (1995) and the National Association for Sport and Physical Education (2004). The PAHFE instrument shows potential for assessing a child's perceived level of efficacy in performing these skills. This information can direct intervention activities that require skill mastery such as in school and community-based physical education and health education programs and weight management programs in clinical settings. The PAHFE instrument can be a tool used by practitioners to help identify which student, client, or patient might need or is likely to benefit from self-efficacy-enhancing intervention strategies.

The PAHFE scale can be useful to practitioners whose interventions are framed around SCT, particularly the constructs of self-efficacy and behavioral capability. The PAHFE scale could be used as a measure for interventions in which personal goal-setting and decision-making skills are embedded into the program objectives or outcomes. The scale can be used to provide programmers with further insight into how young people judge their ability to set personal goals and make decisions about healthy eating and physical activity, as well as identify the salient barriers and obstacles that might keep young people from pursuing these behaviors. For instance, if at baseline a child scores low on the Self-Efficacy Physical Activity subscale for decision making, the practitioner can more mindfully structure intervention activities in which decision-making skills are appropriately developed and self-efficacy enhanced. Self-efficacy-enhancing activities can be tailored to the needs of a learner(s) because the PAHFE scale can identify the perceived barriers that are the most difficult for a child to overcome and therefore impedes action. As a postintervention measure, the PAHFE scale can be used to assess the positive or negative changes of the baseline measures and to assess program impact overtime.

The results from the larger study in which this scale was initially tested indicated that moderate to high levels of self-efficacy were significantly correlated with physical activity and healthy eating behaviors. In this two-group pretest and posttest design, the participants in the treatment group showed significant improvement at the end of a 10-week self-management intervention, when compared with the control group, in regard to goal-setting and decision-making efficacy ($\alpha = .05$), physical activity levels ($\alpha = .04$), and healthy eating, such as fruit and vegetable consumption ($\alpha = .00$) as well as dairy consumption ($\alpha = .01$). These findings contribute further support for the utility of the PAHFE scale to assess children's perceived confidence to set personal goals and make decisions about healthy eating and physical activity. The PAHFE may be considered to be a useful predictor of both physical activity and eating behaviors among upper elementary-aged children.

The PAHFE instrument is brief and easy to administer. The instrument does not require a high reading ability to complete and is easy to score at either the subscale or full instrument level. The instrument can be used by classroom teachers, youth leaders, health professionals, researchers, and others who may be interested in assessing efficacy levels of young people toward personal goal setting and decision making regarding healthy eating and/or physical activity.

The results of this study provide support that the PAHFE may be a useful predictor of physical activity and healthy eating behaviors of upper elementary children. Moreover, the findings in this study suggest that the PAHFE is a valid measure to assess a child's perceived capability in setting goals and making positive decisions related to physical activity and healthy eating.

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