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ORIGINAL ARTICLE

Construct validity of the battery test "High/Scope Beat Competence Analysis

Eleni Chatzikonstantinou[1] and Fotini Venetsanou[2]

[1]Department of Physical Education and Sports, Democritus University of Thrace, Greece

[2]Department of Physical Education and Sports, National & Kapodestrian University of Athens, Greece

Corresponding author:: Chatzikonstantinou Eleni, Efessou 37, 55132 Thessaloniki, Greece. Email: elemolu@yahoo.com

Abstract

The aim of this study was to investigate the construct validity of the "High/Scope Beat Competence Analysis Test" (High/Scope Educational Research Foundation, 2005), examining a) the effect of both age and sex on the children's H/SBCAT scores and b) the internal consistency of the battery test. Four hundred and fifty eight preschool and primary school children from Greece (238 boys, 220 girls), 5-8 years old (M =6.45 years, SD =1.12) participated in this study. For the data analysis both an ANOVA and a MANOVA were applied with the total battery score and the eight item scores being the dependent variables, respectively. Sex ($F_{1,450}$=27.371, p< .001, η^2= .057) and age ($F_{3,450}$=21.804, p< .001, η^2= .127) were found to have a significant effect on children's total battery scores but moderate η^2 coefficient. Studying the eight tests individually, girls had better performance than boys with η^2< .14, and each age group performed better than the younger groups in all the tests (η^2< .14) except "toe-tapping pad with alternating feet" in both tempos (120 and 132 beats/min). The internal consistency of the "H/SBCAT" was supported. The aforementioned results raise concerns about the validity of the "H/SBCAT". A modification of the battery items is suggested, in order "H/SBCAT" validity to be improved.

Key words: *Rhythmic ability, Validity, H/SBCAT*

Introduction

Rhythmic movements are phylogenetically old motor behaviors (Schaal, Sternad, Osu & Kawato, 2004) involved both in locomotion (walking, running, hopping) and feeding activities (scratching, chewing) and ubiquitous in human daily-life, ranging from basic functions to skillful abilities, like juggling or dancing (Ronsse, 2007). The ability to synchronize or syncopate one's limb movements to regularly occurring environmental events plays an important role in normal movement behavior (Shaffer, 1982). Rhythmic ability (or beat competency by other researchers) is the ability to observe, control, and differentiate the rhythm of a movement according to the environmental demands for the given time (Martin, 1994). Beat competency involves synchronizing one's body movements with one's perceptions of the underlying steady beat of a rhyme, song, or musical selection (Weikart, 1995). It is analyzed into two components, rhythmic accuracy and rhythmic maintenance (Mastrokalou & Hatziharistos, 2007) and considered very important for the development, execution and learning of motor skills (Thomas & Moon, 1976) since it facilitates understanding, memorization and movement presentation of the data from the temporal - dynamic structure and modulates the execution of the movement (Martin, 1994). Its importance has been revealed through research findings where rhythmic ability has been found to be positively related to achievement not only in dancing performance (Oreb & Kilibarda, 1996) and sports (Huff, 1972), but also in Mathematics, Language (Mitchel, 1994; Weikart, Schweinhart & Larner, 1987), and reading skills (Chamberlain, 2003; Douglas & Willatts, 1994; Horne, 2002).

One factor that is thought to affect the level of rhythmic ability and considered significant for the development of beat competency skills is age (Gilbert, 1980; Groves, 1969; Volman, 1997; Volman & Geuze, 2000). Research focusing on early childhood supports that children three to six years of age develop their motor-music proficiency (Gilbert, 1980) as they correspond effectively to simple rhythms or rhythmic motives (Martin, 1994) while a rapid developmental rhythmic aptitude is presented until the age of ten. Groves (1969) states that maturation significantly affects first, second and third grade children's ability to synchronize their body movements with rhythmic stimuli. During later

primary school age, what is observed is a rhythmic ability development at its highest level (Hirtz, 1985).

Studies examining the effect of gender on rhythmic ability, which is another factor affecting beat competency skills, have yielded conflicting results. Several researchers have stated that girls have higher scores than boys on tests of rhythmic ability (Derri, Tsapakidou, Zachopoulou & Gini, 2001; Gilbert, 1980; Karadimou, 2004; Kuhlman & Schweinhart, 1999; Pollatou, Karadimou & Gerodimos, 2005; Schleuter & Schleuter, 1985; Trump, 1987; Weikart, 2003). On the contrary, others have not found differences between the two genders (High, 1988; Thomas & Moon, 1976).

Rhythmic development is related to music and movement training programs which are based on rhythmic stimuli and movement activities. According to bibliography, physical practice of certain rhythmic patterns improves the rhythmic ability of both preschool aged children (Burnett, 1983; Blessedell, 1991; Dunne-Sousa, 1989; High, 1988; Olsen-Pietrowsky, 2003; Nolan, 2007; Zachopoulou**,** Derri, Chatzopoulos & Ellinoudis, 2003) and school aged ones (Cernohorsky, 1992; Moore, 1984; Rohwer, 1998; Rose, 1995). In the course of development, children learn to perform many different rhythmic coordinated actions, such as walking, hopping, bicycling, bouncing a ball, skipping, tapping, clapping, dancing, and playing music. The emergence of an adequate timing control mechanism is essential for the development and learning of such rhythmic coordinated actions (Parker, 1992; Thelen, 1991). Rhythmic motor activities and game-type ones are usually the most important components in kindergarten programs because they satisfy children's innate desires to move and help them to develop body and space awareness, as well as to progress through initial, elementary, and mature stages of acquiring skills, such as running, jumping, kicking, throwing, and catching (Gallahue & Ozmun, 1998). The combination of movements with rhythm and music accompaniment usually provides an attractive learning environment for children and enhances rhythmic accuracy.

It becomes obvious that the development of rhythmic ability constitutes a particularly significant research field, which should be of specific interest. Decisions about planning and evaluating music-movement programs that improve rhythmic ability are based on appropriate assessment methods and accurate screening tests. Several studies have tried to measure and analyze rhythmic ability using different battery tests and measurements.

The "High/Scope Beat Competence Analysis Test" is one of the most applied tests for the assessment of rhythmic ability (Derri et al., 2001; High, 1988; Kuhlman & Schweinhart, 1999; Pollatou et al., 2005; Weikart, 2003; Zachopoulou et al., 2003). This tool is considered an appropriate measure of the beat competency of five to eight years old children assessing their performance in synchronizing locomotor and nonlocomotor movements to the underlying beat in a piece of recorded music (High/Scope Educational Research Foundation, 2005).

However, the evidence for the psychometric properties of the "H/SBCAT" is not adequate, as related research is not sufficient and moreover it concerns previous versions of the test. More specifically, a study that gives support to the suitability of "H/SBCAT" is that of Weikart et al. (1987) in which the battery test had alpha coefficients of internal consistency ranging from .70 to .79. The concurrent validity of the instrument was shown by its statistically significant, positive correlations with the Test of Gross-Motor Ability (Kiger, 1994) and school achievement (Kiger, 1994; Weikart et al., 1987). Another study conducted by Kuhlman & Schweinhart (1999) investigated the metronome and musical timing of four to eleven year olds. The Interactive Metronome measured metronome timing while the High/Scope Beat Competence Analysis Test measured musical timing. The results of this research present the concurrent validity of metronome timing and musical timing where the two measures had statistically significant correlations in the expected direction with most of

the variables examined. As for the latest version (High/Scope Educational Research Foundation, 2005) there is no evidence for the validity and reliability of the battery test.

The music education research community finds itself in need of appropriate assessments that afford valid interpretations of the results. Taking into consideration the importance of rhythmic development between the ages of five to eight and the necessity for its evaluation, the aim of the current study is to investigate the construct validity of "High/Scope Beat Competence Analysis Test" (High/Scope Educational Research Foundation, 2005), examining a) the effect of both age and gender on the children's H/SBCAT scores and b) the internal consistency of the battery test.

Method

Participants

Four hundred and fifty eight preschool and primary school children from Greece (238 boys, 220 girls), 5-8 years old (M =6.45 years, SD =1.12), without an identified neurological, sensory or motor problem participated in this study. The children were divided into four age groups [60-72 months (n= 111), 73-84 months (n = 142), 85-96 months (n= 95) and 97-108 months (n= 110)]. In this way the first group involved the preschool aged children and the other three groups the primary school ones. The method of stratified sampling was used to select the participants of the study from a number of randomly selected state schools, using gender and age as the stratification variables. All the participants were required to bring a consent form written and signed by their parents prior to their participation in the research.

Measures

The "High/Scope Beat Competence Analysis Test" battery (High/Scope Educational Research Foundation, 2005) was used for the measurement of children's rhythmic ability. It consists of four test items: 1) patting knees with both hands at the same time in seated position, 2) patting knees with alternating hands in seated position, 3) walking in place from standing position, and 4) toe-tapping pad with alternating feet. The students are required to synchronize the aforementioned tasks to the steady beat of two musical selections that are comprised of different tempos: (a) 132 beats/minute and (b) 120 beats/minute. Performances are preceded with a short, visual follow-the-leader game demonstrating the movement tasks without music, avoiding the use of tempos employed for the testing selections. During the procedure of each item, the examiner should avoid to provide any visual or auditory assistance. Each music selection is played from the beginning for every item of the battery. The performance of each student are videotaped and evaluated by the same or another examiner.

A three-point scale (0-2) is applied for the evaluation. A score of "2" indicates that the child can accurately match his/her movement to the underlying steady beat for 30 or more beats of 32 total beats. A score of "1" indicates that the child accurately demonstrates the beat for a short time but he/she is not able to keep it throughout (15-29 beats). A score of "0" indicates that the child is not able to feel the beat accurately and demonstrates it for fewer than 14 beats.

A student who scores a "2" throughout the assessment, with both musical selections, may be said to possess basic timing (steady beat independence). A student who scores a "2" on any single step of the assessment, with both music selections, has beat competence at the specific level of difficulty.

Procedure

Each student was tested individually in an indoor area according to the test guidelines (High/Scope Educational Research Foundation, 2005). Students were allowed to express the steady beat that they perceived, including the microbeat, macrobeat and the off-beat. Each test item was performed for 32 beats of music, including the eight beat- introduction, resulting in 40 total beats. The same 32 beats of music and eight beat -introduction was repeated for all the eight test items. The mean duration for the administration of the battery was six to eight minutes per child. Students' individual performances were videotaped for later viewing and evaluated by the first author of this study experienced with "H/S BCAT" administration. Intra-rater reliability had been examined before the study using the intraclass correlation coefficient (3.1) and it was found to be excellent (R=.91).

Statistical Analyses

First, an ANOVA was employed to test the effect of age and gender on the total battery test score. As the "H/S BCAT" manual does not provide norms, the total point score of the participants was used for the analysis. Then, a 2X4 (gender x age) MANOVA, with the point scores of the eight "H/S BCAT" item scores being the dependent variables, was applied. Post hoc comparisons were made using the Bonferroni test, with alpha set at .05. In addition to p values, effect sizes as measured by Eta Squared (η^2) values were also used for data interpretation. According to Cohen (1988), only η^2 of $\geq$.14 are considered sufficiently large to be of any consequence. Finally, the Pearson correlation coefficients between the eight item scores and the total score were calculated in order to examine the internal consistency of the battery.

Results

The results of the ANOVA for the effect of gender and age on children's total score, revealed no statistically significant interaction between the two above factors ($F_{3, 450}$= .233, p> .05). "Gender" had moderate η^2 coefficient but a significant effect on the total scores ($F_{1,450}$=27.371, p< .001, η^2= .057) where girls had better performance than boys (Table 1). Similarly, the factor age had a significant effect on the total scores but moderate η^2 coefficient ($F_{3,450}$=21.804, p< .001, η^2= .127). According to the results of the Bonferroni test, the mean total score of the group of each age was significantly greater than the total scores of all the other, younger age groups. Moreover, the 3rd and 2nd grade children had a significantly higher mean total score than 1st grade and preschoolers. Finally, the performance of the 1st grade group was significantly greater to the performance of the preschoolers (Table 1).

Table 1. Means and Standard Deviations for total score and each test of "H/SBCAT" by age and gender

Tempo	Battery tests	Age groups							
		5 years old		6 years old		7 years old		8 years old	
		Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
120 beats/ min	**Patting knees, both hands, same time, seated position**	1.27+0.72	1.59+0.50	1.48+0.65	1.65+0.62	1.61+0.62	1.69+0.61	1.82+0.44	1.87+0.39
	Patting knees, alternating hands, seated position	1.14+0.62	1.29+0.51	1.45+0.62	1.59+0.52	1.52+0.57	1.67+0.58	1.46+0.61	1.8+0.40
	Walking in place, standing position	1.31+0.47	1.39+0.54	1.45+0.50	1.61+0.49	1.63+0.49	1.64+0.49	1.64+0.48	1.80+0.40
	Toe-tapping pad, alternating feet	.94+0.38	1.12+0.50	1.03+0.36	1.26+0.47	1.21+0.49	1.62+0.54	1.42+0.50	1.59+0.50
132 beats/ min	**Patting knees, both hands, same time, seated position**	1.19+0.69	1.27+0.78	1.13+0.64	1.53+0.62	1.39+0.70	1.48+0.68	1.46+0.68	1.67+0.51
	Patting knees, alternating hands, seated position	1.07+0.55	1.24+0.66	1.23+0.69	1.45+0.53	1.29+0.62	1.54+0.55	1.28+0.64	1.67+0.48
	Walking in place, standing position	1.14+0.46	1.22+0.52	1.30+0.56	1.44+0.55	1.39+0.59	1.49+0.56	1.46+0.54	1.68+0.50
	Toe-tapping pad, alternating feet	0.91+0.41	1.07+0.35	0.98+0.38	1.23+0.48	1.29+0.53	1.54+0.51	1.30+0.54	1.57+0.50
	Total	1.12+0.05	1.27+0.06	1.26+0.05	1.47+0.04	1.42+0.05	1.58+0.06	1.48+0.05	1.70+0.05

The multivariate analysis that was performed on the test scores of "H/SBCAT" revealed statistically insignificant interaction between the two factors (Pillai's trace = .069, $F_{24,1335}$=1.305, p= .148). On the contrary, significant was found to be the effect of "gender" (Pillai's trace= .089, $F_{8,443}$= 5.437, p< .001, η^2= .089) with η^2< .14 not qualifying for Cohen's (1988) acceptability criteria. Studying the eight tests individually, girls had better performance than boys in all the tests of "H/SBCAT" with η^2< .14. Similarly, "age" had a significant effect on the test scores but η^2< .14 (Pillai's trace= .227, $F_{24,1335}$= 4.559, p< .001, η^2= .076). Each age group performed better than the younger groups in all the tests. The only test in which age groups had $\eta^2 \geq .14$ was "toe-tapping pad with alternating feet" in both tempos (120 and 132 beats/min) (Table 2).

Table 2. Manova results for the main effects of the factors "age" and "gender" and their interaction

Tempo	Tests	Age			Gender			Age * Gender		
		F	p	η^2	F	p	η^2	F	p	η^2
120 beats/min	**Patting knees, both hands, same time, seated position**	9.372	.000	.059	7.350	.007	.016	1.051	.370	.007
	Patting knees, alternating hands, seated position	11.624	.000	.072	13.031	.000	.028	.850	.467	.006
	Walking in place, standing position	11.281	.000	.070	4.982	.026	.011	.563	.640	.004
	Toe-tapping pad, alternating feet	24.790	.000	.142	30.455	.000	.063	1.350	.257	.009
132 beats/min	**Patting knees, both hands, same time, seated position**	5.337	.001	.034	10.164	.002	.022	1.670	.173	.011
	Patting knees, alternating hands, seated position	5.645	.001	.036	21.082	.000	.045	.658	.574	.004
	Walking in place, standing position	9.753	.000	.061	6.531	.011	.014	.394	.757	.003
	Toe-tapping pad, alternating feet	23.855	.000	.137	26.442	.000	.055	.282	.838	.002
	Total	21.804	.000	.127	27.371	.000	.057	.233	.874	.002

More specifically, the 3rd grade group indicated better scores than preschool and 1st grade group in test "patting knees with both hands at the same time in seated position" in both tempos. Preschool group had the worst performance in "patting knees with alternating hands in seated position" in tempo 120 beats/min and "walking in place from standing position" in both tempos. In tests "toe-tapping pad with alternating feet" in both tempos, 2nd grade group had statistically significant differences from younger age groups, and 3rd grade performances were statistically better than these of preschool and 1st grade's.

Regarding internal consistency of the "H/SBCAT", Pearson correlation rates of performance in each test with the total performance ranged between r =. 77 (A2: patting knees with alternating hands in seated position, in tempo 120 beats/min) and r = .67 (A4: toe-tapping pad with alternating feet, in tempo 120 beats/min) (p< .01) (Table 3).

Table 3: Correlations of performance in each test with the total performance in "H/SBCAT"

	Internal Consistency	
Tempo	**Tests**	**R**
120 beats/min	Patting knees, both hands, same time, seated position	.73
	Patting knees, alternating hands, seated position	.77
	Walking in place, standing position	.73
	Toe-tapping pad, alternating feet	.67
132 beats/min	Patting knees, both hands, same time, seated position	.75
	Patting knees, alternating hands, seated position	.76
	Walking in place, standing position	.70
	Toe-tapping pad, alternating feet	.69

Discussion

The aim of this study was the examination of the construct validity of the "High/Scope Beat Competence Analysis Test" (High/Scope Educational Research Foundation, 2005). For that purpose, the effect of gender and age on both total and items scores of five to eight years old children, as well as the internal consistency of the battery were examined.

The ANOVA applied to the total battery test score revealed a statistically significant effect of the factor "gender" on children's performance. Nevertheless, η^2 coefficient did not meet Cohen's (1988) criteria for acceptability (η^2>.14) showing that the identified differences were not of practical importance. That finding is in accordance with previous studies in which gender was not found to be an influential factor to rhythmic skills (Groves, 1969; Smoll, 1975; Thomas & Moon, 1976). However, the findings of several studies support that girls out-perform boys in rhythmic ability tests (Gilbert, 1980; Schleuter & Schleuter, 1985; Trump, 1987). Apart from that, researchers, having used previous forms of "H/SBCAT" concluded that there are differences between the rhythmic performance of the two genders (High, 1988; Karadimou, 2004; Pollatou et al., 2005) agreeing with Kuhlman & Schweinhart (1999) who state that girls exhibit greater finesse than boys in performance with music accompaniment though they get lower scores in performance with metronome. However, the aforementioned studies do not report η^2 coefficient's rates, information that could possibly lead to different conclusions.

As far as the "H/SBCAT" items are concerned, girls performed better in all of them but these differences were not of practical importance because of low η^2 coefficient's rates. That finding comes in contrast with the study of Trump (1987) where females scored significantly higher than males on patting bilaterally. Moreover, Derri and associates (2001), using a modified form of "H/SBCAT" (Weikart, 1987) for the assessment of preschool children's rhythmic ability, found that girls were more accurate in bilateral movement of hands, while boys were more accurate in bilateral movement of feet in a sitting position [it should be noticed, however, that this test is not included in the version of the "H/SBCAT" examined in the current study].

Pollatou and associates (2005) also, using a previous version of "H/SBCAT" (Weikart, 1987), found that girls performed better than boys in four of the six items (patting knees with both hands in a seated position, patting knees and alternating hands in a seated position, tapping the floor with alternating feet from a seated position and walking in place from a standing position). A possible explanation for the aforementioned finding is provided by Gordon (1979) who state that girls might have more complete underlying mechanisms than boys to perform complex rhythmic patterns demanding activation of the lower limbs. Apart from that, it is well known that girls have more experience in rhythmic movement activities (Weikart, 2003).

As concerns the factor "age", it was found to have a statistically significant effect on the total scores of the four age groups. The best scores were that of the 3rd grade students and the worst were that of the preschool children. The poor performance of preschoolers is explained by the fact that tasks of keeping a beat with bodily movement are thought to pose a difficult challenge for the majority of children in that age (Rainbow, 1981). It has been reported that fewer than 10% of kindergarten children can independently feel and express the steady beat of recorded music (Wright & Schweinhart, 1994). Apart from that, it is well known that the administration of any assessment in children 3-6 year old is difficult, primarily due to their developmental age (Runfola & Etopio, 2009).

According to the results of the multiple comparisons tests, statistically significant differences were found among the performance of the four age groups except for the

difference in the scores of 2nd and 3rd grade students which was not statistically significant. Similarly, in Kuhlman and Schweinhart's study (1999) each age mean was not significantly different from adjacent years, but was significantly different from any age more than one year above or below it.

However, the identified statistically differences among the total scores of the age groups in the present study were of no practical significance because of moderate η^2 coefficient rates (Cohen, 1988). Nevertheless, it is well established that age is a primary factor of rhythmic skills development. Researchers who have applied either the "H/SBCAT" (Kuhlman & Schweinhart, 1999) or other instruments (Frega, 1979; Jordan, 1986; Rainbow, 1977; Rainbow & Owen, 1979; Rainbow, 1981; Schleuter & Schleuter, 1985) have found that age affects children's rhythmic ability. It is believed that children's abilities to synchronize body movements with a rhythmic stimulus are dependent upon age and maturation (Groves, 1969) and upon instruction and training in rhythmic movement (Trump, 1974). Many researchers studying mixed-age groups postulate that maturation, rather than training, may have the greatest effect on improvement (Groves, 1969; Smoll, 1974). The aforementioned raise concerns about the ability of the "H/SBCAT" scores to differentiate among the age groups.

Regarding the test items, the effect of age was found to be statistically significant, but only in two of them exceeded the η^2 coefficient's rate .14, meeting the Cohen's criterion (1988) for acceptance of the importance of the independent variable. These were both tempos of "toe-tapping pad with alternating feet" in which the 2nd grade students had statistically significant differences with all younger groups, and 3rd grade students outperformed the preschool and 1st grade students. It should be noted that in this particular test, most of the students did not tap the toes to the front and back but they were performing in their own space moving all their body weight right and left, tapping their toes alternatively. In that way, students might have been more accurate with requested rhythmic movements, particularly the 3rd grades who have developed motor skills due to advanced age.

Regarding the "H/SBCAT" internal consistency, according to the present results the majority of the tests had a high correlation with the total score ($r > .73$) except "toe-tapping pad with alternating feet" test in tempo 120 ($r= .67$) and 132 ($r= .69$) beats/min. However, all the correlations of the individual tests with the total performance were statistically significant at the level of $p <.01$, supporting the internal consistency of "H/SBCAT".

Summarizing the aforementioned, although the internal consistency of the "H/SBCAT" was supported, its validity is questionable concerning the effect of age and gender in the performance of preschool, 1st, 2nd and 3rd grade children. Girls had higher scores than boys and each age group performed better than the younger groups. However these differences were not supported by high η^2 coefficient rates and consequently they can not be considered as practically important. Some other issues that have to be mentioned have to do with the tasks included in the battery. To start with, the influence of children's motor development level in test items that include locomotion should be examined. Data from this study indicated, for example, that the 2nd and 3rd grade students outperformed preschool and 1st grade students in both tempos of "walking in place from standing position" and "toe-tapping pad with alternating feet". For the interpretation of the above findings it would be useful to take into consideration the fact that children exhibiting poor control over lower extremities often display incomplete cephalocaudal development. Therefore, children unable to march to the steady beat of music may not lack timing ability, but rather, possess incomplete cephalocaudal motor development (Weikart, 1995). For that reason, the poor performance of preschool and 1st grade students can not be safely ascribed to poor rhythmic ability.

Apart from the aforesaid, visual assistance is an issue that it should be focused on. Before each test item, the examiner was demonstrating the required movements of "H/SBCAT" on which the student was trying to synchronize his/her movements. Although

movement synchronization is better to auditory than visual rhythms (Patel, Iversen, Chen & Repp, 2005; Repp & Penel, 2003), this visual assistance influences positively the student's performance. Several studies describe tasks in which the examiner instructs the examinee to "watch me and listen" before repeating the rhythm patterns (McCarthy, 1972; Mutti, Sterling & Spalding, 1978). The ability to listen before moving is more evident in girls than in boys. In contrast, boys appeared to be dependent on watching rather than listening while the rhythm patterns were demonstrated (Owen, Adams, Forrest, Stolz & Fisher, 1971). Vision is evidently considered to affect response in rhythm tapping tasks in one way or another (Haines, 2003). In conclusion, visual assistance affects in some way children's performance. Taking this into account, it is concluded that, the implementation of the"H/BCAT" should be further examined, as it seems that, before each item, visual contact to the requested rhythmic movements influences positively male's rather than female's performance.

The philosophy of progressive education inspired by John Dewey triggered the new child-centered school of teaching in which rhythmic movement is considered an important component in the development of the whole child (Campell, 1991). Balance, self-awareness, coordination, and a sense of internal rhythm are all developed through movement activities (Alexander, 2006). The importance of rhythmic ability has been already mentioned and its evaluation has been considered essential (Chamberlain, 2003; Martin, 1994; Mitchel, 1994).

However, the findings of the present study raise concerns about the validity of the "H/SBCAT" for the evaluation of children's aged 5 to 8 years rhythmic ability. An alternative form of the aforementioned instrument with adjustments to its items is recommended in order "H/SBCAT" validity to be improved. Nevertheless, the validation process is an ongoing one and should not be limited to the results of one study. Further research is needed in order to accumulate sound evidence about the validity of the "H/SBCAT".

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