Validation of the Questionnaire for Assessing Students' Organizational Abilities (QASOA)

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Key words: Disorganization, validity, evaluation, school-aged children

Abstract

The purpose of this study was to establish the validity of The Questionnaire for Assessing Students' Organizational Abilities (QASOA); a unique tool developed to examine organizational abilities in school children. Parents and teachers of 376 9-12 year-old boys completed the QASOA parent (QASOA-P) and teacher (QASOA-T) versions. Results from the factor analysis revealed three factors for each questionnaire. In addition, The Rey-Osterrieth Complex Figure Test (RCFT) was administered to 127 children from the group. Significant low correlations were found between the QASOA-P/T total scores, the three factors and the RCFT – Copy subtest. Significant low correlations were found between QASOA-T total score, the Factor 1 ("performing learning tasks") score and the RCFT Memory subtest. Thus, the results of the current study support the construct and concurrent validity of the QASOA.

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Introduction

Organization is a fundamental ability which is essential for successful activity performance and participation in everyday life. Organizational ability constitutes a component of executive functioning (Josman & Rosenblum, 2011). Successful participation in everyday occupations requires the ability to preplan and organize activities effectively across time and space (Ayers, 1989; Levine, 2002; Temple, 1997; Zental, Harper, & Stormont-Spurgin, 1993).

Effective organization across time relates to the initiation, logical ordering, continuation, and completion of the steps and action sequences needed to perform tasks (initiate, continue, sequence and terminate them). Effective organization of space and objects pertains to the skills needed to search for, locate, gather and organize tools and materials needed for tasks, as well as navigational skills (AOTA, 2002).

Organizational abilities of students

At school, disorganization is a common and frustrating problem for students with organizational difficulties, as the ability to effectively organize can make the difference between competent and incompetent school performance (Gambill, Moss, & Vescogni, 2008; Levine, 1994, 2002; Lifshitz, Josman, & Tirosh, in press; Rosenblum, Aloni, & Josman, 2010). Clinical experience indicates that students, parents and teachers alike express their concern over dysfunction in organization in terms of time and space, both in school-based and out-of-school activities. Frequent manifestations of disorganization are classroom and social activity tardiness, difficulties in finding and locating belongings, illegible handwriting, and unkempt personal appearance.

Assessment tools for organizational ability

A systematic study of organization requires sound assessment methods and tools. However, there are very few assessment tools that focus solely on organizational abilities. Often tests and questionnaires that refer to organizational abilities do so within the context of other difficulties. The main assessment tools reported in the literature that are related to organization in children are: (1) the Assessment of Motor and Process Skill (AMPS; Fisher, 1995); (2) the Behavioral Assessment of Dysexecutive Syndrome in Children (BADS-C; Emslie, Wilson, Burden , Nimmo-Smith, & Wilson, 2003; Engel-Yeger, Josman, & Rosenblum, 2009), which also includes the Dysexecutive Questionnaire for Children (DEX-C); (3) the Behavior Rating Inventory of Executive Function (BRIEF; Gioia, Isquith, Guy, & Kenworthy, 2000); (4) the Rey-Osterrieth Complex Figure Test (RCFT;

Osterrieth, 1944; Rey, 1941); and (6) the Child Organization Hyperactivity Index (COHI; Zental, Harper, & Stormont-Spurgin, 1993). These instruments have a few shortcomings in common: (a) organization is viewed from the perspective of a related concept, such as executive functions, (b) some of the instruments are specifically designed for the evaluation of children with attention deficit hyperactivity disorder (ADHD), and (c) some of them lack ecological validity since they are administered in a clinic setting and do not relate to the child's natural environment.

The dearth of appropriate instruments for the assessment of organization among students prompted Lifshitz and Josman (2006) to develop the Questionnaire for Assessing Students' Organizing Abilities; an instrument for assessing children's organizational abilities within their natural environment. This instrument has two versions; one for parents, to assess the child's organizational abilities in the home environment (the QASOA-P) and another for teachers, to assess organizational abilities in school (the QASOA-T). This instrument is unique in that it emphasizes children's abilities in their two primary natural environments - at home and in school. Moreover, it was designed to address organization as an independent concept, rather than as a concept associated with or secondary to another functional domain.

The purpose of the present study is to examine the utility of the QASOA - T/P as a unique assessment tool for measuring organizational abilities in children. The specific aims of the study are: 1. to identify the underlying dimensions of organization, as represented in the QASOA - T/P questionnaires, 2. to establish the concurrent validity of the QASOA - T/P by correlating performance on the RCFT with the parent/ teacher answers on the questionnaire, and 3. to establish convergent validity of the QASOA - T/P by correlating performance on the RCFT with the parent/ teacher answers on the questionnaire.

Method

Participants

The study population comprised 376 Israeli boys in the fifth and sixth grades, aged 9-12 years (M =10.62 years, SD = .61), whose parents completed a demographic questionnaire and signed a consent form. Only boys were included in the study because students with organizational disabilities are often described as having learning disabilities or attention deficit disorder and there is a much higher reported rate of male than female students with

these disorders (Willcutt & Pennington, 2000). Thus, it was felt that gender differences might be a confounding factor in this study (Biederman et al., 2002). All the participants attended regular schools and all were Hebrew speakers. All the schools (18) are located in an urban area attended by students from a low to high socio-economic status.

Exclusion criteria included participants whose intelligence level was below average, as measured by the WISC-R-95 (Kahan, 1998; Wechsler, 1974); and those with known neurological or chronic health disorders (e.g., paralysis, severe sensory disorders, or any other chronic disease) – as reported by their parents and/or students who regularly take medication for chronic conditions.

Instruments

1. The Questionnaire for Assessing Students' Organizational Abilities – Teachers, (QASOA-T; Lifshitz & Josman, 2006). The QASOA-T includes 22 items related to organization at school, such as, "The child manages to allocate work time efficiently during the lesson". The responses are rated on a 4-point Likert scale (0 – *always,* 1 – *usually,* 2 – *rarely,* 3 – *never*), such that a higher score indicates a more severe level of disorganization. The total score ranges from 0 (*no difficulty*) to 66 (*maximum difficulty*) (see Appendix A). Internal consistency was found to be $\alpha = .93$ (N = 160). A cut-off score of 18 or more was found to demonstrate disorganization at school (M = 8.0, SD = 9.7) (Lifshitz & Josman, 2006). In addition, content validity was established by expert judges and the tool was found to discriminate between children with and without organizational difficulties ($t = 6.05$, $p = .00$) (Lifshitz & Josman).

2. The Questionnaire for Assessing Students' Organizational Abilities - Parents (QASOA-P; Lifshitz & Josman, 2006). The QASOA-P includes 14 items related to organization at home, such as, "The child arranges materials neatly in his/her working environment (so that it will not fall/ disrupt work/ get lost)". Participants rate each item on a 4-point Likert scale (0 – *always,* 1 – *usually,* 2 – *rarely,* 3 – *never*) with a higher score indicating a more severe level of disorganization. The total score ranges from 0 (*no difficulty*) to 42 (*maximum difficulty*). Internal consistency was found to be $\alpha = .81$ (N = 82). A cut-off score of 10 and above (M = 5.7 points, SD = 4.2 points) reflects disorganization at home (Lifshitz & Josman, 2006) (see Appendix B). Initial research also revealed that the QASOA-T and QASOA-P were significantly correlated ($r=.50$, $p<.001$) (Lifshitz & Josman, 2006).

3. The Rey-Osterrieth Complex Figure Test (RCFT; Osterrieth, 1944; Rey, 1941). The RCFT is an age-normed standardized test, appropriate for

individuals aged 6-89 years. This tool is used to assess spatial, visual, and structural perception, as well as planning, organization, and visual memory. The test consists of two subtests - the Copy subtest and the Memory/ Recall (Immediate and Delayed) subtest. Researchers have reported that organizational skills are needed for the efficient completion of the RCFT (Anderson, Anderson, & Garth, 2001; Watanabe et al., 2005). The complex figure is composed of 18 parts and scores range from 0 (*faulty drawing*) to 2 (*normal drawing*) for each part. The total score ranges from 0-36. The test's reliability and validity have been well-established (Kolb & Whishaw, 1985; Meyers & Meyers, 1995). In the current study, the subjects completed the Copy and Immediate Memory subtests.

4. WISC-R-95 (Kahan, 1998; Wechsler, 1974). The WISC-R-95 is an age-normed standardized test suitable for use with individuals aged 6-14 years. A short form of the WISC-R-95 was used to determine the estimated verbal I.Q. The Similarities and Vocabulary subtests from the verbal section were chosen on the basis of their high reliability coefficient (Sattler, 1988). Other studies, particularly those performed with children diagnosed with developmental coordination disorder (DCD), have also utilized these subtests to determine the estimate of the participants verbal I.Q. (Piek & Coleman-Carman, 1995; Skinner & Piek, 2001).

Procedure

The Israeli Board of Education's Committee on Activities Involving Human Subjects approved all recruitment and intervention procedures. Parents (n=376) signed a consent form and completed both the QASOA-P and a demographic questionnaire. Teachers (n=376) completed the QASOA-T for children they had known for at least a year. The questionnaires for each child were completed both by his/her parents and teacher.

Research assistants administered the WISC-R-95 to assess the intelligence of the children and an educational psychologist interpreted the raw scores. The first author administered the RCFT (Copy and Immediate Memory) to participants' individually, in a quiet room at the child's school.

The first aim was examined by analyzing the data from all 376 questionnaires. The second and third hypotheses were tested using data from 127 participants only. Both the QASPA-T/P and the RCFT were administered to these participants. It is important to note that this article represents part of a larger study in which the RCFT was administered to only 127 children (see Lifshitz, 2007).

Data analysis

Factor analysis was performed for both the QASOA-T and the QASOA-P, with a factor loading above 0.34 considered acceptable. Cronbach's α coefficient was calculated to examine the internal consistency of each factor. Spearman correlation was calculated when the factor analysis revealed only two questions within one factor. Descriptive measures of the participant's performance in the RCFT Copy and Memory dimensions were calculated using means and standard deviations. A t-test for equality of means was performed to compare the results of fifth and sixth grade participants in the RCFT Copy and Memory dimensions. Pearson's correlation was performed to examine the relationship between the participants' total RCFT (Copy and Memory) scores and the QASOA-T and QASOA-P total scores and factor scores. Cohen's effect size measures were used in the context of the Pearson correlation.

Results

Construct validity

The factor analysis revealed three factors for each of the two questionnaires. The cumulative percentage of variance accounted for by the three factors in the Teacher's questionnaire was 69% and the three factors of the QASOA-T were as follows: (1) performance of learning tasks (10 items pertaining to allocating work time efficiently during lessons; writing up tasks legibly and in a logical sequence); (2) orientation in time and space (eight items pertaining to awareness of dates of special class events and transitions at school); and (3) organizing equipment (four items pertaining to packing and unpacking equipment from a backpack). Table 1 presents the three QASOA-T factors and the internal reliability for each factor.

The cumulative percentage of variance accounted for by the three factors in the Parent's questionnaire was 61% and the three factors of the QASOA-P were: (1) performing learning tasks (six items, pertaining to allocating work time efficiently when doing homework and performing writing tasks in a logical sequence; (2) orientation in time and space (six items, pertaining to knowing dates of special events, organizing equipment and transitions at home); and (3) the quality of written products (two items, pertain to performing writing tasks neatly and legibly). Table 2 presents the three QASOA-P factors and the internal reliability for each factor.

Table 1
QASOA-T Factor Loading and Cronbach's α

		Factor 1	Factor 2	Factor 3
1.	Child comes to class with all necessary equipment.	.57		
2.	Child manages to find necessary equipment in schoolbag.			.47
3.	Child manages to take out equipment needed for class on time (from schoolbag or locker).			.44
4.	Child arranges equipment neatly in his/her working environment (so that it will not fall, disrupts work, get lost).			.51
5.	At the end of the day, child manages to gather his/her equipment into schoolbag/locker.			.47
6.	Child manages to allocate work time efficiently during the lesson.	.83		
7.	Child manages to carry out the class work on time.	.93		
8.	Child manages to present the written product neatly in his/her notebook for the different subjects (writes on the correct pages, in the correct direction, maintains spaces, uses eraser or liquid eraser, uses sharpened pencil/working pen.	.81		
9.	The written product in the child's notebook is legible.	.66		
10.	Child knows dates of special class events (theater, day trip, exam, birthday, etc.).		.46	
11.	Child carries out written tasks at the appropriate speed.	.92		

		Factor 1	Factor 2	Factor 3
12.	Child manages to make the transition between varied tasks (copying off the board, work page, using a ruler, etc.).	.61		
13.	Child finds his/her way around school and arrives at the various destinations (home classroom, gym, bathroom, office, lab, computer room, arts and crafts room, etc.).		.70	
14.	Child manages to use auxiliary tools such as pencil sharpener, scissors, ruler, eraser, glue.		.53	
15.	Child is able to integrate into group activities in the classroom while carrying out his/her group tasks efficiently (time, quality, and cooperation).	.51		
16.	Child is able to integrate into group activities in the schoolyard while carrying out his/her group tasks efficiently (time, quality, and cooperation).		.59	
17.	Child manages to make the appropriate transition between classes (changes into sports clothes on time for gym class, etc.).		.75	
18.	Child manages to maintain personal hygiene (at mealtime, in the bathroom, cleanliness of clothes).		.71	
19.	Child brings completed homework to school.	.70		
20.	Child is able to express his/her thoughts in writing in logical sequence.	.85		

		Factor 1	Factor 2	Factor 3
21.	Child is able to move about the classroom without bumping into children, furniture, or objects.		.48	
22.	Child is in class at the beginning of the lesson (arrives on time from home and after recess)		.60	
	Cronbach's α	.96	.87	.91

Table 2
QASOA-P Factor Loading and Cronbach's α

		Factor 1	Factor 2	Factor 3
1.	Child arranges equipment neatly in his/her working environment (so that it will not fall, disrupts work, get lost).		.49	
2.	Child manages to divide time efficiently when doing his/her homework.	.67		
3.	Child manages to carry out the class work on time (does not have to complete at home or copy from a classmate).	.80		
4.	Child manages to present the written product neatly in his/her notebook for the different subjects (writes on the correct page, in the correct direction, maintains spaces, uses eraser or liquid eraser, uses sharpened pencil/working pen).			-.59

		Factor 1	Factor 2	Factor 3
5.	The written product in the child's notebook is legible			-.64
6.	Child knows dates of special class events (theater, day trip, exam, birthday, etc.)		.34	
7.	Child carries out written tasks at the appropriate speed.	.77		
8.	Child manages to make the transition between varied tasks (doing homework, going out for after-school classes, youth-movement activities, friends, etc.).	.62		
9.	Child knows how to properly organize the learning equipment required for school.		.56	
10.	Child manages to maintain personal hygiene (at mealtime, in the bathroom, cleanliness of clothes).		.74	
11.	Child is ready for the school day with homework prepared.	.49		
12.	Child is able to express his/her thoughts in writing in logical sequence.	.56		
13.	Child is able to move about the house without bumping into family members, furniture, or objects.		.43	
14.	Child is ready to leave for school on time.		.52	
	Cronbach's α	.86	.76	r_s=.60***

*p<.001***

Concurrent and convergent validity

Results of the RCFT subtests (Copy and Memory) for 54 fifth grade boys were compared to those of 73 sixth grade boys using the t-test for equality of means. No significant differences were found between the two groups (Copy- fifth grade, M = 28.44, SD = 5.33; Copy - sixth grade, M = 28.68, SD = 6.67; Memory - fifth grade, M = 16.17, SD = 7.09; Memory - sixth grade, M = 16.36, SD = 8.07). Therefore, the two groups were combined and all the raw scores on the RCFT were used for further analysis. The following distribution of the RCFT Copy and Memory results were found (n=127): M=28.57, SD=6.11 and M=16.27, SD=7.64, respectively.

Table 3 presents the Spearman correlation results for the relationship between the participants' total RCFT (Copy and Memory) scores and the QASOA-T and QASOA-P total and factor scores.

Table 3
Pearson correlations between RCFT (Copying and Memory) and QASOA-T and QASOA-P total scores and factors (N=127)

Test	RCFT Copy	RCFT Memory
QASOA-T Total	-.37**	.24**
QASOA-P Total	-.29**	-.04
QASOA-T factors		
Factor 1	-.40**	-.27**
Factor 2	-.30**	-.15
Factor 3	-.27**	-.13
QASOA-P factors		
Factor 1	-.30**	-.09
Factor 2	-.23*	.04
Factor 3	-.22*	.07

* p< .05*, p< .01**

Table 3 demonstrates low but significant correlations between the RCFT Copy test, the QASOA-T total and the three factors' scores. In addition, low but significant correlations were also revealed between the RCFT Copy test, the QASOA-P total and the three factors' scores. Furthermore, low but significant correlations were found between the RCFT Memory test, the QASOA-T total and Factor 1 scores (i.e., performance of learning tasks). No significant relationship were found between the RCFT Memory test and QASOA-P total or Factor 2 and 3 scores. Moderate Spearman correlations ranging from r=0.22-0.40 were obtained.

Discussion

The purpose of the current study was to establish construct and criterion (concurrent) validity for the two versions of the Questionnaire for Assessing Students' Organizational Abilities; i.e., for teachers and parents (QASOA -T/P). Furthermore, the present study aimed to assist us in delineating the constructs comprising organizational ability and in validating these constructs by employing an external measure of cognitive organization (RCFT). Thus, follow-up research using these questionnaires can also assist in understanding the mechanisms underlying organizational dysfunction.

Construct validity

Factor analyses revealed that both versions of the QASOA are comprised of three different factors, thus providing support to the hypothesis that organization is composed of various facets. The findings indicated that the factors revealed in the QASOA-T and the QASOA-P differ somewhat. While the first two factors are similar for both questionnaires ("performance of learning tasks" and "orientation in time and space"), the third factor of the QASOA-T is related to "organizing equipment", whereas that of the QASOA-P is related to the "quality of the written product". This third factor of the QASOA-P contains two items, encompassed within Factor 1 of the QASOA-T, "performance of learning tasks". It is possible that the difference between the two questionnaires might be attributed to the fact that the QASOA – P was derived from the QASOA –T, and consists of only 14 items (as opposed to the 22 items in the QASOA -T) that specifically address a student's organization activity in his/her home environment. It is interesting to note that Rosenblum et al. (2010) found that the QASOA-P is sensitive in detecting organizational deficits in children with dysgraphia. This highlights one of the strengths of the QASOA-P, in that the two items which comprise

Factor 3 can not only detect disorganization at home, but are also sensitive to potential graphic dysfunction. This finding has clinical importance; when parents report that their child has difficulties in organizing written products (Factor 3), a therapist should consider further evaluation of his/her handwriting skills.

The literature generally refers to organization/disorganization in terms of functional ability in both time and space (AOTA, 2002; Ayers, 1989; Blanche & Pharham, 2001; Levine, 2002; Temple, 1997; Zental, Harper, & Stormont-Supurgin, 1993). However, although the items in the QASOA-P/T refer to both temporal and spatial elements, statistical analysis revealed that they are grouped into factors pertaining to daily functions. This can be explained by the ecological perspective of the questionnaire that addresses the daily functional aspects of students' organization. The identification of the specific daily activities that students have difficulty coping with by means of these instruments can facilitate a more specific and therefore more effective intervention.

Criterion validity

Significant low correlations were found between the RCFT Copy test and the QASOA-T/P total scores, as well as to the three factors of which each is comprised. This finding supports the questionnaires' concurrent validity. These results can be attributed to the significant load of items relating to writing activities in both questionnaires. In addition, the findings may indicate that many of the organizational skills represented in the questionnaires relate to visual spatial organization, a function that is also examined in the RCFT Copy test. Perhaps the reason that the correlations were not greater relate to the fact that the QASOA-T/P assesses performance in the individual's natural environment, whereas the RCFT is a neuropsychological test that evaluates skill performance in a clinical setting. The low correlations found between these tests also seem to strengthen the validity of the QASOA by demonstrating that it exhibits both convergent and discriminant validity. In other words, these two assessments share some components that would theoretically be expected to correlate (convergent), but differ in other components (discriminant) that theoretically would not be expected to correlate (Anastasi, 1997).

Interestingly, correlations were found between the RCFT Memory dimension, the QASOA-T total score and "performance of learning tasks" (Factor 1). These findings suggest that some of the organizational skills

represented in the questionnaire involve memory. Previous findings (Savage et al., 1999; Shin et al., 2004) and learning theorists (Levine, 2002) also indicated that there is a relationship between memory and organizational skills.

In addition, addressing the three factors related to organization can be readily used for planning an intervention program for students with disorganization at school. The benefit of such a "top-down" program is that it would target the child's functioning at school. Hence, the effectiveness of the questionnaires is that it focuses on daily functioning rather than on the underlying components of organization. Therefore, it can be used to assist in planning treatment within the school setting that can be enhanced by an appropriate approach at home.

Limitations

There are several limitations inherent in the design of this study. First, only boys were included in the research sample, as explained in the Methods section. However, it would be useful to design an additional study that includes girls. This would enable us to assess the influence of gender on organization and to compare organizational abilities between genders. Furthermore, only fifth and sixth grade children participated in this study. To better understand the developmental aspects of organization, it would be necessary to perform a study that examines a wider age span of participants through the appropriate adaptation of the instrument, via the inclusion of items that reflect the daily activities of younger and older children.

Another limitation of the study relates to potential population bias, since no follow-up was performed to address the difference between the parents of students who agreed to their participation in the study and those that did not. It is also worthy of noting, that the specific parent who completed the parent questionnaire (i.e., mothers versus fathers) was not identified. Thus, it is conceivable that the present study population is biased, in that those parents who volunteered to have their children included may have been more sensitive and responsive to their children's problems and needs.

Conclusions

The ability to organize effectively can contribute to more efficient daily performance in both the school and home environments. The current instrument, found to be valid, can serve as a means of identifying organizational difficulties, as well as for planning an appropriate intervention program for student with disorganization.

A previous study by the current authors (Lifshitz & Josman, 2006) established the internal consistency, content validity and discriminant validity of the QASOA. The current study indicates that the QASOA also demonstrates construct and concurrent validity.

The psychometric results of both these studies seem to suggest that the QASOA questionnaires are suitable measures for the identification of students' disorganization. A future study focusing on the differential contribution of each of the two versions of the instrument in assessing children with suspected organization deficits is warranted. In addition, it would be useful to examine the questionnaire results following intervention for disorganization.

In summary, the present study represents a further step in examining the psychometric properties of the QASOA and thus, in paving the way for its future use in both research as well as the clinical setting.

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