

ARTICLE

Psychometrics of the SDQ-I for Palestinian Adolescent Students

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Abstract: The Self-description Questionnaire–I (SDQ–I) is a multidimensional instrument that measures eight self-concept facets hypothesized in Shavelson’s hierarchical model. This study investigated self-concept in a sample of Palestinian adolescent students using an Arabic version of the SDQ–I. Three-hundred sixty adolescents (163 girls and 197 boys) aged 13 to 16 years ($M = 14.3$, $SD = .87$) participated. The 72-item SDQ–I was administered in four Palestinian schools to assess the psychometric properties of the SDQ–I. This included the factor structure and the internal consistency reliability of the SDQ–I subscales and mean score responses of Palestinian self-concept. Factor analysis results, which accounted for the majority of the variance, supported an underlying general self-concept factor structure that demonstrated the eight factors that the SDQ–I is designed to measure. This is consistent with previous studies in similar age groups and the SDQ–I reliabilities were similar to those reported in the literature. Students perceived total self-concept positively (mean = 3.71). Three facets of self-concept (parent relations, reading, and general self-concept) indicated high positive self-concept. Correlations among the different dimensions were consistent with the hierarchical structure in Shavelson’s model. Overall, the findings provided compelling support for Shavelson’s model, and the structure validity of Western self-concept measure. Interpretations were provided for the discrepancies regarding the Palestinian-Arab culture.

Keywords: Self-concept; Adolescent; Palestinian students; Self-description questionnaire

1. Introduction

Improved self-concept is considered to be a valuable educational outcome; for instance, it helps to explain other constructs and outcomes. Shavelson, Hubner and

Stanton ^[1] defined the term self-concept as a person’s perception of himself formed from experiences and relationships with the environment where people play an important role. In addition, Calhoun and Morse ^[2] specified that self-concept is a personality characteristic

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describing how one feels about oneself regarding their abilities, strengths, and weaknesses. In the past few decades, self-concept and its relation to constructs like academic achievement have attracted attention. This attention was reflected in many studies, such as those that analyzed academic achievement as it relates to various psychological factors, including self-concept (e.g., [3-11]). Additionally, researchers [12,13] that highlighted the relationship between self-concept and academic achievement emphasized that self-concept is closer in proximity to academic achievement than other cognitive variables. To this end, studies [4,14-17] indicated that students assess their self-value through the level of their academic achievement and performing better in academics. Other studies mentioned that high self-concept yields success in educational environments and social and emotional contexts [4,7,9,10,18-21]. In contrast, low self-concept hinders students' academic performance as indicated in cross-cultural studies [22-24]. Some researchers postulated that self-concept and academic performance influence each other mutually. On their [25] review of literature on Reciprocal Effects Model findings, they indicated that the model connects self-concept and academic performance together and suggests that academic self-concept and performance mutually re-enforce each other, with one building off the other. Regarding the predictive ability of self-concept for school achievement, studies [5,25-27] found that self-concept predicts academic achievement. On the other hand, it was found [28] that junior high school students perceived themselves positively; however, self-concept did not directly predict students' academic performance. In the latter study, self-concept influenced students' academic performance when students showed effort in learning.

Much of the research on self-concept also focused on the development and validation of theoretical models, the development of instruments [1,8,29-32] and exploring empirical relations between self-concept and a wide variety of variables, including academic achievement [33]. Shavelson, Hubner and Stanton [1] proposed a multifaceted hierarchical model of self-concept that emphasized the domain specificity of self-concept. The model hypothesized a general self-concept of two facets, academic and nonacademic self-concept. These facets were divided into specific components that evaluate behavior in certain situations. The Self-description Questionnaire-I (SDQ-I, [30,34]) that is based on the Shavelson, Hubner and Stanton [1] model measures the multiple dimensions of self-concept in preadolescents, and it has also been used with early adolescents, such as Grades 7 through 10 [34]. Research showed that the reliability of the SDQ-I constructs is generally high (greater than 0.75) [30,35]. Also,

construct validity research [34,36-38] provided support for the multidimensionality of the SDQ-I. For late adolescents, the multidimensional, hierarchical structure of self-concept is well established. For younger students, such as preadolescents and adolescents, a paucity of research and appropriate measures indicated that self-concept is poorly differentiated. Therefore, there is a need for research that discusses younger ages regarding the consistency of self-concept structure. Researchers in the Middle East (Arab region) studied self-concept and its relation to education by investigating the SDQ-I reliability and validity, gender differences and socioeconomic effects, and its relationship to achievement, which showed significant positive correlations [15,35,39,40]. The SDQ-I reliabilities and construct validity of a multidimensional and hierarchical structure were also established [15,35]. Assessing the structure underlying the SDQ-I has vital implications theoretically and practically because if not clearly defined, then using SDQ-I may not be justified.

Self-concept can be a potentially valuable construct for educators as they work to understand students in a social and intellectual context. Numerous studies (using mainly western samples) assessed self-concept, but not for Palestinian school students who are relatively under-represented in the Educational Psychology literature. Overall, there is minimal empirical research on self-concept of nonwestern students. Hence, there is a need for research that assesses self-concept in the Palestinian Territories of a Middle Eastern culture and has potential value for practice. Accordingly, using a Palestinian sample, this study's purpose was to provide empirical data and analysis of the psychometric properties of the Self-description Questionnaire-I, including the factor structure and the internal consistency reliability of the subscales. And also to assess the self-concept of Palestinian students through descriptive analysis. This study is significant in that it provides an assessment of self-concept in the context of different linguistic and cultural practices. The results may produce useful knowledge and an understanding of Palestinian students. The study results, therefore, are likely to be significant for students, teachers, parents, and the Palestinian society in promoting education among students in the Palestinian Territories where education is challenged due to the Israeli occupation.

2. Materials and Methods

2.1 Participants

Data were collected from 360 students (163 girls,

197 boys) enrolled in four public schools that are representative of the school system in the Salfit Governorate of the Palestinian Authority in West Bank. The sample was obtained with the cooperation of schools' principals and teachers. Participants ranged in age from 13 to 16 years with a mean age of 14.3 years ($SD = .87$) and were in Grades 8 to 10 in public schools where Arabic is the language of instruction. By grade level, there were 66 (18.3%) eighth graders, 155 (43.1%) ninth graders, and 139 (38.6%) tenth graders. The present study took the last three school years (Grades 8 to 10) of the education stage before students transition to secondary grades that branch to mainly science and arts streams. After 10th grade (11th and 12th grades), the academic (general) education comprises of the literary stream (social studies and languages) and the scientific stream (biology, chemistry, mathematics, and physics) schooling. This group of students (Grades 8 to 10) gives a more informed view compared to the eleventh and twelfth grade students who are already either in the arts or science streams. The governorate serves Palestinian students and could be described as comprising mainly of families from lower-middle to middle socioeconomic class backgrounds according to Hollingshead and Redlich^[41] SES classification. Regarding parents' formal educational levels, 121 of the mothers and 79 of the fathers have lower than a high school degree. The participants were living in either towns or villages, and they are of Palestinian nationality and Islamic religion. It is considered that for the interpretations of the results in this study that there is no difference between Palestinian students in villages and towns in terms of the quality of education they receive and resources available to them^[42]. The Ministry of Education and Higher Education^[43], formed by the Palestinian Authority in 1994, manages education in the Palestinian Territories. In their documents, they did not indicate performance differences between students who came from different geographical regions (e.g., villages and towns) based on the results of the Tawjihi exams (also known as General Secondary Education Certificate Examination).

The Palestinian Authority was established in 1994 as a consequence of the 1993–1995 Oslo Accords. It is an interim self-government body with partial civil rule in the three areas "A" "B" and "C" of West Bank, and its authority includes education for Palestinians in area "C," where Salfit governorate is located^[44]. Salfit governorate is one of 16 governorates of the Palestinian Authority. It is situated in the central West Bank, under Israeli occupation. According to the Palestinian Central Bureau of Statistics^[45], the governorate had a population of 75,444 in 2017, or 2.6% of the population of the West Bank. The Directorate

of Education and Higher Education in Salfit governorate has 71 public schools located in the villages and towns and other private schools. A branch of Al-Quds Open University is situated in the governorate. The construction of Al Zaytona University of Science and Technology is currently ongoing but has opened some of its programs for enrollment. The governorate contains one hospital and 18 clinics and government health centers in all villages and towns. The Jerusalem Legal Aid and Human Rights Center^[46] stated that Salfit Governorate is home to 18 villages and towns where half of them are run by village councils and the other half by municipalities. 16 Israeli settlements are located in the same governorate with a population standing at 48,045 persons. As a region^[47], it is distinguished into 12 major land use classes. These include Palestinian built-up areas, open spaces, forests, and construction sites; and Israeli settlements, closed Israeli military areas, and military bases.

2.2 Measure

Marsh's Self-description Questionnaire-I (SDQ-I)^[30,34] is designed to measure the multiple dimensions of self-concept based on Shavelson's hierarchical multi-faceted model of self-concept^[1,48]. The SDQ-I assess four areas of nonacademic self-concept (physical ability, physical appearance, peer relations, and parent relations) and three areas of academic self-concept (reading, mathematics, and general school), and general self-concept. In this study, the SDQ-I was used to assess self-concept, including a demographic data sheet that gathered information such as gender, age, grade, and education of the parents. Previous research^[35,39,40] adapted the SDQ-I to Arabic and established its reliability and validity in Lebanon, and similarly Abu-Hilal and Bahri^[15] verified its reliability and validity in the United Arab Emirates. The Arabic version of the SDQ-I developed in previous research^[35,39,40,49] was used. This version is identical to Marsh's SDQ-I^[30,34]. The SDQ-I consists of 72 items divided into eight subscales that measure self-concept in reading (10 items), mathematics (10 items), general school (10 items), physical ability (9 items), physical appearance (9 items), peer relations (9 items), parent relations (9 items), and general self-concept (6 items). For reading and mathematics, students' ratings of their skills, ability, enjoyment and interest in the content area were assessed. General school is thought of as students' ratings of their skills, ability, enjoyment and interest in school subjects in general. Physical ability assesses students' ratings of their skills and interest in sports, games, and physical activities. Physical appearance addresses students' ratings of their physical attractiveness, how their appearance compares

with others, and how others think they look. Peer relations are students' ratings of their popularity with peers, how easily they make friends, and whether others want them as a friend. Parental relations checks students' ratings of how well they get along with their parents, whether they like their parents, and the quality of their interactions with their parents. Lastly, general self-concept is students' ratings of themselves as effective and capable individuals who are proud and satisfied with the way they are. Each subscale of the SDQ-I uses a 5-point Likert-type scale to endorse agreement with an item using ratings of 1: False, 2: Mostly false, 3: Sometimes false, sometimes true, 4: Mostly true, or 5: True. Students responded by indicating whether they agree or disagree with the self-descriptive statements related to their competence. The higher the score, the more positive the self-concept. Sample items of the SDQ-I in mathematics are, "I learn things quickly in mathematics," in physical ability, "I like to run and play hard," in general school, "I hate all school subjects," and in general self-concept, "Overall I have a lot to be proud of." The negatively worded items were reverse-scored. The SDQ-I can be administered in individual or group settings and takes approximately 15-20 minutes to complete^[48]. A composite score of the eight subscales gives a total that indicates self-concept.

2.3 Procedures

Marsh's Self-description Questionnaire-I (SDQ-I), a multidimensional self-report measure of self-concept, was given to assess students' self-concept. Students completed the questionnaire (the SDQ-I Arabic version) collectively according to a group-class period during normal school hours. Teachers provided participants with instructions in Arabic on the response format and shared brief information about the study. It was communicated to students that there were no right or wrong answers and to respond with honesty. They were also told that these questions will not impact their school grades. They were informed that if they had any questions (for example, not understanding an item), that they can ask for clarification. Participants were volunteers and were limited to students in attendance on the day that the SDQ-I was distributed. Their responses are confidential.

In this study, quantitative methods were used in the process of data analysis. The Statistical Package of Social Sciences (SPSS) software (version 26.0) was used for statistical analysis. To determine the reliability of the measure, internal consistency reliability coefficients were computed for the total self-concept (SDQ-I) and for each of the eight subscales as one indication of the functioning of the subscales. To check for the multidimensionality of

self-concept as revealed by the response of the Palestinian participants on the SDQ-I, an exploratory principal axis factoring analysis was performed using extracted communalities and an oblique rotation. Descriptive statistics (means and standard deviations) were utilized to describe the SDQ-I and its subscales for the whole sample.

3. Results

The reliability coefficient alpha for the SDQ-I had a value of 0.92. This is consistent with the coefficient (0.94) reported by El-Hassan^[35] and the coefficient (0.96) reported by Alkhateeb^[49] in earlier investigations of the SDQ-I with school students. The subscale and the SDQ-I reliabilities ranged between 0.75 and 0.92 (see Table 1) similar to Marsh^[30] and El-Hassan^[35], with the exception of the General Self-concept subscale where it was 0.65 (consistent with $r = 0.63$ in^[35]), who attributed this to the subscale's brevity. Henson^[50] indicated that a value of 0.65 may be rather low as a reliability above 0.70 is typically acceptable^[51]. To validate and derive the factor structure for self-concept in the Palestinian Territories, the correlation matrix of the 72 items was analyzed by principal axis factoring analysis with oblique Direct Oblimin and delta (δ) set at zero. This procedure is appropriate because it is theoretically and empirically more accurate^[52] for factors that are related to each other^[53]. Oblique rotation is more appropriate for exploratory principal axis factoring analysis than for principal components analysis because the latter assumes no error, and this is not consistent with social science research as error exists. McGuire and Tinsley^[54] argued against using principal components analysis due to the statistical assumption that the measure to be analyzed has nearly perfect reliability. Therefore, the researchers in the present study felt it is inappropriate to use principal components analysis as a factor extraction method for the SDQ-I. Employing the general and accepted factor extraction (Kaiser-Gutman rule of 1.0 as the minimum eigenvalue, and Cattell's scree test), eighteen factors with eigenvalues greater than 1.0 were extracted. They successively accounted for 63.1% of the total variance, and this is consistent with other research studies based on the SDQ-I^[34-36,38]. Rotation of factors analysis indicated a solution of 8 factors, as also indicated by the scree test, accounting for 40.7% of the total variance. Extracting more than 8 factors produced factors with non-significant variable loadings. Factor loadings were above .30 and were low on factors that the items were not designed to measure. For the Palestinian students, the factor analysis results generally supported the underlying factors that the SDQ-

I was designed to measure as predicted by the Shavelson model^[1]. An examination of a measure’s underlying factor structure and its stability across different ethnic groups is one important step in legitimizing the widespread use of any given measure^[36]. Failure to attend to such ethnic and cultural considerations can negatively impact the assessment and violates ethical standards^[55]. This study has confirmed that the SDQ–I is also valid for Arabic speaking adolescents, as it is with Caucasian samples, for example.

Means and standard deviations for the SDQ–I and its eight subscales for the whole sample are presented in Table 1. The subscale means ranged between 3.25 to 4.15 on a 5.0 scale. The summated item mean for the SDQ–I was 3.71. The mean scores were similar to those reported by El-Hassan^[35] in the Lebanese sample. The SDQ–I and its eight subscales had a mean higher than 3, “sometimes false, sometimes true,” indicating positive self-concept. Based on the five-point Likert scale type used, a mean score greater than 3.0 was deemed to be perceived as

positive. The Parent Relations, Reading, and General Self-concept subscales had a mean of 4 (or slightly higher), “mostly true,” indicating high positive self-concept. Pearson’s product-moment correlations were used to examine relationships between the SDQ–I subscales. Table 2 reports the matrix of correlations of scores on self-concept subscales. These intercorrelations were similar to those reported by El-Hassan^[35] in the Lebanese sample.

Table 1. Means and Standard Deviations of the SDQ–I Subscales, and Cronbach Alpha Coefficients (*n* = 360)

Subscale	<i>M</i>	<i>SD</i>	<i>Alpha</i>
Physical Ability	3.52	.57	.75
Physical Appearance	3.85	.61	.76
Peer Relations	3.63	.67	.78
Parent Relations	4.00	.74	.81
Reading	4.02	.63	.80
Mathematics	3.25	.85	.86
General School	3.49	.69	.82
General Self-concept	4.15	.58	.65
Self-concept (SDQ–I)	3.71	.43	.92

Self-description Questionnaire–I (SDQ–I,^[30,34]).

Table 2. Pearson Correlations Among Subscales of the Self-description Questionnaire–I (*n* = 360)

Self-concept Subscale	1	2	3	4	5	6	7	8
1. Physical Ability								
2. Physical Appearance	.35†							
3. Peer Relations	.27†	.60†						
4. Parent Relations	.21†	.37†	.34†					
5. Reading	.29†	.25†	.28†	.40†				
6. Mathematics	.15†	.11*	.16†	.19†	.32†			
7. General School	.19†	.20†	.26†	.29†	.61†	.61†		
8. General Self-concept	.26†	.43†	.51†	.43†	.49†	.14†	.35†	
9. Self-concept (SDQ–I)	.50†	.61†	.64†	.63†	.72†	.61†	.74†	.64†

Self-description Questionnaire–I (SDQ–I,^[30,34]). **p* < .05. †*p* < .01.

4. Discussion

This study assessed the psychometric properties of the Self-description Questionnaire–I and the mean responses of the Palestinian participants’ self-concept. The internal consistency reliability coefficients for the SDQ–I and the subscales were similar to those reported in previous research^[15,30,35]. This Research from different cultures showed that reliability of the SDQ–I subscales is generally high (greater than 0.75). Results of this study are in agreement and indicate that responses to the SDQ–I of Palestinian adolescents reliably measures facets of self-concepts that are internally consistent. An exception was the low reliability for the General Self-concept subscale, and this could be because the subscale is short (6 items), and the participants of this study were relatively young and seem less able to evaluate their worth in general. The school system does not seem to give school students

the opportunity to evaluate themselves. Marsh^[48] argued children have more realistic perceptions of their strengths and weaknesses as they mature. General self-concept is a global perception of self, which students usually receive less feedback on compared to academic self-concepts (general school, reading, and mathematics), where students usually receive feedback on and are hence, more realistic. Reliability affects validity^[56] and the low reliability for the General Self-concept subscale can attenuate the regression result, so further research is needed to assure that the general self-concept subscale is reasonably adequate and accurate in the regression analysis. The psychometric and factor analysis findings in this study are a clear support for the use of the SDQ–I with this age of school students. Factor analysis yielded strong evidence for the multidimensionality of self-concept. Except for the General Self-concept subscale, the remaining seven derived factors provided strong support

for the validity of the SDQ–I. However, the self is a wide concept, and the General Self-concept subscale cannot adequately account for the complexity of the self.

Mean responses revealed relatively high values on the SDQ–I subscales, particularly on parent relations, reading, and general self-concept subscales. Family is a central pillar in the Arab society, and it forms the basis for social circles. Education is highly valued among families across the Palestinian society. Accordingly, it is not surprising that these subscales ranked quite high. Students' relatively low mathematics self-concept deserves further empirical investigation. Mathematics programs should be designed to learn mathematics that is more interesting to students and encourage the development of positive self-concept with respect to mathematics abilities. Their physical self-concept was also low, which might be because these students were in the process of transitioning to young adults and they are experiencing developmental changes that may affect the evaluation of their physical ability. Comparison of Palestinian adolescents' mean responses to the Lebanese mean responses^[35] reveals slightly higher general self-concept but lower mathematics than the Lebanese. Education is highly valued in the Palestinian and Lebanese societies. Given that both are Middle Eastern cultures, attempting to find a theoretical explanation to this difference is not preferable, especially since the difference is small. Correlations among the different subscales of the SDQ–I were consistently substantial, as was also found in^[37]. Enhancement of self-concept should be a key education objective, and this can be accomplished by setting realistic goals, encouraging parental engagement in students' learning, and providing consistent and positive feedback towards their performance^[57].

The results were generally in agreement with previous research findings, but this study still contributes to the literature because it provides knowledge about Palestinian students and the Self-description Questionnaire–I has rarely been used with Palestinian samples. Also, Palestinian life has unique and complex characteristics that warrant investigating self-concept among Palestinians. The role cognitive ability and prior learning plays is important, but self-concept can help students to comprehend their academic achievement behavior. The current study was limited to Palestinian students in four public schools in only one governorate, this being Salfit Governorate. Therefore, the scope and generalizability of the results are limited to students who were enrolled in 8th, 9th, and 10th grade of these four schools at the time these data were collected. To enhance the findings' generalizability, future research on self-concept should use samples drawn from

various grades and socioeconomic backgrounds. This research attempted to fill a gap in research on self-concept by investigating the self-concept construct in a different culture, this being Palestinians. Replication of this study and using various indicators for academic achievement, such as standardized tests, to assess the relationship between self-concept and academic achievement is recommended. Longitudinal studies also could be conducted in future research to determine the implications of these results. Intercultural studies that compare different countries are needed^[22,23,58,59]. Moreover, to complete this study's questionnaire, participants were asked to select responses that were already provided, meaning they were confined to the questionnaire's structure. Therefore, some additional and more systematic research^[60,61] is needed to better understand self-concept of Palestinian students. Overall, a need exists for self-concept studies, especially in the Palestine Territories, as little to no self-concept research has been conducted on Palestinian students. Also, more research is needed to investigate the variables influencing self-concept. Self-concept may be connected to motivation for academic achievement.

Conflict of Interest

The authors declare to have no conflict of interest.

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