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Development and Validation of a Self-Concept Scale for College Students Using Comics Superhero Characters

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Abstract

Self-concept refers to the domain of self-descriptions that have self-evaluative connotation. Though many researchers embarked in the study of self-concept, and some even developed tests that measured self-concept, majority of these instruments had methodological and theoretical problems due to lack of systematic instrument development and presentation. The objective of the study is to develop a reliable and valid alternative approach to measuring the self in a semi-structured undisguised comics-type test that directly accounts for the way college students consider their choices of superheroes' traits that characterizes their own. A preliminary survey on self-concept, in a form of open-ended statements was conducted to five hundred ninety-eight (598) college students of selected schools in Manila and Bulacan to know how college students see themselves indicative of their self-concepts. Results of which, were collated to form the preliminary form. The preliminary form of the SCSS was administered to five hundred ninety-five (595) college students of different universities and colleges. Eighty-eight (88) items under eight (8) components were subjected to item analysis by identifying factors through a series of exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Descriptive results were also calculated, as well as the exact reliability coefficient through split-half and Cronbach's alpha.

For the validity, content analysis was applied using two groups of experts who ascertain the suitability of each item in terms of content, relevance, clarity, appropriateness and their representations. They include three (3) experts who have a long experienced in comics industry and another three (3) experts in the field of college students' self-concept formation. From the total of 88 items, 30 items were eliminated. However, the items that constitute the final form of the SCSS was concentrated into 55 items under six (6) factors upon post-analysis consideration. Statistical analysis revealed that the experts' ratings were consistent and has high reliability with a generated r value of .894. The SCSS final form was administered to 809 respondents following the same procedures that were used for the preliminary form. The test scores were subjected to reliability facility, such as Alpha Coefficient and Split-Half, computing the reliability coefficients of the final form. Validity was established through convergent analysis, tested in a sample of 419 respondents who took the Tennessee Self-Concept Scale (TSCS: 2) Adult Form. The test was found to have high reliability with $r = .792$.

Keywords : self-concept, comics superhero

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Introduction

Man is the only living creature that can self-reflect. This self-reflexive activity implies a process by which the individual is able to perceive and evaluate oneself. Having reference to himself as an object, his composite view of the thoughts and feelings is distinctively referred to as *self-concept*. Stake (1994) defined self-concept as the domain of self-descriptions having self-evaluative connotation. It is an all-encompassing and important dimension in personality functioning. According to Emler (2001), those with low self-esteem/ self-concept in college students are likely to show depression, become pregnant during teenage years and have suicidal thoughts, experience unemployment (male), have eating disorders (female) and have difficulty in forming and sustaining social relationships. In contrast, college students with high self-esteem/ self-concept are unlikely to use or abuse illegal drugs, commit crime, drink alcohol, smoke to excess, abuse children or play academically.

Since we cannot feel or see a person's self-concept, we cannot put ourselves in someone else's skin. Self-concept can only be inferred by using various measurement techniques. The variety and range of self-concept scales are vast. Keith and Bracken (1996) proposes that the plethora of self-concept scales that have been developed are one-offs, used in idiosyncratic research studies and appear only fleetingly in the professional literature. Moreover, Hattie and Marsh (1996) had provided minimum criteria for assessing the quality of such scales and felt that most of them lacked "credibility." Evidently, since each type of measure has weaknesses, assessment of self-concept should use an eclectic approach. Problems of different sorts exist concerning the psychometric properties of the instruments. Many scales are substantiated with test-retest reliability data when internal consistency, employing factor analysis, would be more meaningful. With regard to validity, instrument developers depended heavily on theories and expert judgment leading to content validation and not on construct related or criterion validation. Convergent validation, i.e., the study of the interrelationships between more than one method of measuring self-concept and other constructs which may be similar or dissimilar to self-concept is seldom use. When planning self-concept assessment, it is precautionary to take appropriate measurement approach. A test developer can be more confident in his results when several different measurement methods produce comparable finding.

To develop a self-concept measure, through factor analysis, that will fully define this elusive construct by examining the material and formal aspects of self-concept scales was envisioned in the development of the Superhero Comics-type Self-concept Scale for Adolescents (SCSS-A). The hypothetical construct of self-concept appears to be multidimensional and represented by several factors. This instrument brings together the seemingly divergent areas of self-esteem, self-image, and self-efficacy theories by enhancing a conception of self in bringing together its structural and processing aspects. The SCSS-A was developed as a self-concept measure that assesses the dimensions of self-concept in a more effective form unlike those measured by self-report pen-and-paper instruments. It employed a unique administration format—through comics-type form, that will bring out truthfulness on adolescents, particularly college students, in answering the test and with outmost interest.

One of the most vividly impressive pop culture developments of the recent times is the strong resurgence of the costumed superheroes as entertainment and cultural icons. Superheroes have cemented their place in the contemporary cultures in cinemas, televisions, entertainment products, etc. Adolescents are more aware of the international recognition of Superman, Batman, Spider-man, Iron man, the Hulk, X-men, Fantastic Four and the likes, than the works of contemporary philosophers and psychologists. Superhero comics moreover, constitute one of those original American forms like jazz, blues, muscle cars, and *Krispy Kreme* doughnuts that have reached out to the world and have made a distinctive impact across cultures (Morris & Morris: 2005). Besides being enormously entertaining, superhero comics bring about a unique artistic space along powerful use of visual imagery and prose to elicit in vivid ways some of the most interesting and important questions facing the readers—questions regarding their personal identity and many other important issues. Wright (2001) puts it that "comic book stories presented physical strength and appearance as the measure of an individual's worth, while the ads offered children the supposed means for achieving it."

Hence, the course of developing the SCSS-A was to ascertain at mid-level of specificity a set of subscales that would represent categories of self-evaluations derived from characteristics or traits of comics' superheroes in popular culture media. It would have universal or near universal relevance for all adolescents, regardless of age, gender, academic level or other variables and have meaning for an extensive area of life settings and roles. The objective is to develop a reliable and valid alternative approach to measuring the self in comics-type scale that

directly accounts for the way college students consider their choices of superheroes' traits that characterizes their own.

Components of Adolescents' Self-Concept

Rather than proposes a model based only on concepts on several dimensions of adolescents' lives (family, peers, schools, physical) the study uses the structural/processual model seeing self-concept as more part of goal-strivings than a set of dimensions (Hattie: 2003). The research utilized Stake's (1994) six subscales: *power, task accomplishment, giftedness, vulnerability, likeability and morality*, as factor structures. In addition to these six subscales, other than these six *evaluative* components, the nature of self-concept is according to Bong and Clark (1999), multidimensional, in the sense that it has both *cognitive* and *affective* components. *Self-efficacy* and *self-esteem* variables showed the highest correlations with self-estimates of abilities (Ackerman & Wolman: 2007). In general, the study attempts to develop a self-concept scale by factor analysis using eight (8) dimensions hypothesized as initial factors for the preliminary form of the scale.

The Scale's Category and Description

The SCSS-A intends to provide an objective measurement through a multidimensional character of the self by designing comics in which the test is incorporated in the story. The reading material will draw out socio-psychological information from the readers by choosing characters that will depict their unique concept of self in their chosen items. The instrument had processed information to measure the extent of adolescents' self-concept. Thus, the instrument evolves from subjective-projective type of *processing* the responses, to objective-psychometric interpretation of empirically *structuring* the responses. The SCSS-A is the first and novel measure of integrating the *structured—non-structured* dimensions, and can be categorized as such. The scale is designed with the structural/processual model of self-concept as its primary theoretical stance. The scale tends to estimate the self in a predominantly Western evaluation with modification of items to suit into the local experience. Rather than the more abstract question format "Who am I?" the scale sought to answer the question "When I'm in the situation of superhero X, I am?" or "Just like superhero X, I'm_____." In doing so, participants were required to consider the impact pop culture has upon the process of self-conceptualization. The SCSS-A requires respondents to evaluate the extent to which qualities describing his/her superheroes are indicative of their own qualities. Although unlike other self-concept profiles, the SCSS-A does not ask respondents to choose between two statements that describe different types of adolescents. Thus, unlike other scale, the SCSS-A offers a midpoint response option. An example of an SCSS-A item is as follows: "Some superhero like the Batman is intelligent compared to others. He is... 1.) *Always like me*, 2.) *Mostly like me*, 3.) *Sometimes like me/ sometimes unlike me*, 4.) *Mostly unlike me*, and 5.) *Always unlike me*. College student respondents reveal their self-image by responding to each statement on a five-point scale. The utilization of this type of scaling provides respondents with a familiar means of completing the SCSS-A.

Descriptive Statistics

From a total of 595 respondents for the preliminary form, majority of the sample were male with a total of 312 which represents 52.4% of the total sample respondents. There were only 283 female respondents which represent only 47.6% of the total sample. In quite the same way, sample for the final form has the majority of male respondents numbering at 480, which represents a 59.3 percentage and female respondents of 329, representing a 40.7 percentage. Three schools were used as samples in the administration of the preliminary form. College students from Bulacan State University (BuSU) and Emilio Aguinaldo College (EAC) were numbered 243 and 238 respondents respectively. A difference of 5 respondents from a percentage of 40.84 and 40.00 in the order designated. Philippine Christian University (PCU) had 114 respondents at 19.16 %. From a total of 809 respondents for the final form, majority of the sample were represented by students from Bulacan State University (Bulsu) with the biggest distribution of 426 respondents, comprising a 52.70 % of the sample in the study. Next to it was Emilio Aguinaldo College (EAC) tallied at 179 representing 22.10 %. The other three schools (DYCI, PWU and PCU) follow in descending order of 13.30, 8.50 and 3.30 percent respectively.

In the preliminary form, majority of the respondents are freshmen college students, with a total of 279 representing nearly half of the total sample at 46.89 %. Next to it were sophomores with 260 and represents 43.70 %, then followed by the third year students with 31 which represents 5.21 % and the least were in the fourth year level with an equivalent of 25 respondents at 4.20%. For the final form, a large number of freshmen students (n=446) represents almost half of the respondents at 55.10 %, the third year students were next at 29.90 % with 242 participants. Respondents from the sophomores were 95 at 11.70 % and the seniors 26 at 3.20 %.

Table of Specifications

In the search for the domain of the college students' self-concept, the researcher conducted a preliminary survey by farming out an open-ended statements to the first group of respondents (n=598). The survey given to 598 students from different universities and colleges, meant to generate the adolescents' traits/characteristics of themselves and how these ideas manifest the different components of their conception of selves. The open-ended statements systematically covers statements requiring respondents for definitions, descriptions and traits associated with likeability, morality and argentic themes (task accomplishment, power, vulnerability and giftedness). The respondents were asked to think or to define the identified themes of self-concepts. The open-ended statements use already established components validated in Stake's (1994) Six-Factor Self-Concept Scale. Six survey open-ended statements were used to elicit the characteristics/traits descriptive of the self. In the survey, the respondents wrote down characteristics/traits of themselves that complete the sense of the statements such as: *I am powerful when _____*. Results of the preliminary survey were then be tallied to know the common perception of adolescents on the identified subcomponents of Stake (1994) through the meanings they gave for each subcomponent. The subscales for the construct have to be identified so that items need to be created that will transform the construct into something that can be measured. The Table below (Table 1) shows the table of specification of the preliminary draft which used Stake's (1994) six factors as initial components:

Table 1: Table Of Specification Of The Preliminary Draft

Factors	Items' Distribution	Total	Percentage
<i>Factor 1: Power</i>	Items 2, 4, 5, 7, 11, 20, 39, 40, 41, 43, 44, 45, 46, 56, 58, 73, 84	17 Items	19.31 %
<i>Factor 2: Task Accomplishment</i>	Items 6, 13, 24, 27, 31, 32, 42, 47, 48, 54, 60, 63, 69, 76, 85, 87, 88	17 Items	19.31 %
<i>Factor 3: Giftedness</i>	Items 3, 14, 17, 33, 34, 37, 49, 50, 53, 68, 72, 74, 77, 79, 80	15 Items	17.04 %
<i>Factor 4: Vulnerability</i>	Items 16, 19, 28, 29, 30, 35, 55, 65, 66, 70, 81, 86	12 Items	13.63 %
<i>Factor 5: Likeability</i>	Items 9, 12, 18, 22, 25, 36, 52, 59, 61, 67, 71, 78, 82, 89	14 Items	15.90 %
<i>Factor 6: Morality</i>	Items 8, 10, 15, 21, 23, 26, 38, 51, 57, 62, 64, 75, 83	13Items	19.31 %
	TOTAL	88 Items	100.00 %

To simplify the description of data, factor analysis was used to reduce the number of dimensions or factors of the test. In this study, the researcher already identified six factors from Stake's (1994) scale that was assumed to comprise the constructs of the SCSS-A. Statistical analyses resulted in the elimination of least satisfactory items from the 88 traits/characteristics used in the preliminary form and reveal eight (8) dimensions of self-concept with 58 items accepted. The researcher identified the eight (8) factors that compose the scale. Table 2 presents the list of self-concept dimensions with their corresponding items after factor analyses.

Table 2: List Of Self-Concept Factors With Their Corresponding Items After Factor Analysis

Factors	Items' Distribution	Total	Percentage
<i>Factor 1: Morality</i>	Items 10, 15, 21, 23, 26, 38, 46, 53, 71, 89	10 Items	11.36 %
<i>Factor 2: Vulnerability</i>	Items 19, 28, 29, 30, 65, 66, 70, 86	8 Items	9.09 %
<i>Factor 3: Self-Esteem</i>	Items 72, 73, 74, 75, 76, 77, 78, 84, 88	9 Items	10.22 %
<i>Factor 4: Self-Efficacy</i>	Items 41, 44, 48, 50, 51, 57, 59	7 Items	7.95 %
<i>Factor 5: Likeability</i>	Items 12, 18, 25, 36, 60, 61	6 Items	6.81 %
<i>Factor 6: Giftedness</i>	Items 14, 17, 33, 34, 37, 40, 43, 49, 68	9 Items	10.22 %
<i>Factor 7: Power</i>	Items 2, 5, 7, 9, 11, 20	6 Items	6.81 %
<i>Factor 8: Task Accomplishment</i>	Items 24, 31, 32	3 Items	3.40 %
	TOTAL	58 Items	100.00 %

Through factor analysis, items were classified or clustered according to the factors or dimensions of the self-concept of adolescent respondents. Note that eight components (factors) have been extracted. But after post analysis decision, two factors were combined into one, and one factor eliminated both because of low standardized alphas. Table of specification for the final draft is presented:

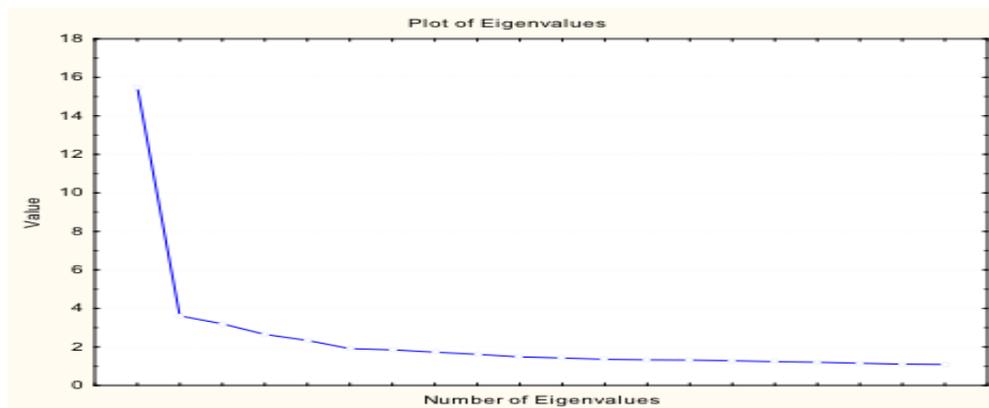
Table 3: Table Of Specification Of The Final Form

Factors	Items' Distribution	Total	Percentage
Factor 1:Morality	Items 5, 9, 14, 15, 17, 25, 27, 44, 53, 54	10 Items	18.18 %
Factor 2:Vulnerability	Items 12, 18, 19, 20, 31, 40, 41, 43	8 Items	14.54 %
Factor 3:Power	Items 1, 2, 3, 6, 13, 29, 30, 35, 45, 46, 47, 48, 49, 50, 51	15 Items	27.27 %
Factor 4:Competency	Items 11, 33, 34, 36, 37, 52, 55	7 Items	12.72 %
Factor 5:Likeability	Items 4, 7, 16, 23, 38, 39	6 Items	10.90 %
Factor 6:Giftedness	Items 8, 10, 21, 22, 24, 26, 28, 32, 42	9 Items	16.36 %
	Total	55 Items	100.00 %

Item Analyses Measures

Exploratory Factor Analyses. Factors for each item were identified through a series of exploratory factor analyses (EFA). Following each analysis, items that had a substantial factor loading on one and only one meaningful, identifiable self-concept factor was retain; items that failed to do so was revised or eliminated. Items were tested in sample of respondents to extract factors by scree criterion. The eigenvalues, i.e. the proportion of variance explained by each factor, for each of the items in the preliminary form of the SCSS-A when group into eight (8) factors were presented in the Figure below. An eigenvalue of 15.5 was generated for factor 1, 3.6 for factor 2, 3.2 for factor 3, 2.6 for factor 4, 2.3 for factor 5, 1.9 for factor 6, 1.8 for factor 7 and 1.7 for factor 8.

Figure 1. A Scree Plot that Shows Relevant Components



The scree plot plots the eigenvalues on a bi-coordinate plane, the y-axis is the eigenvalues and the x-axis is the component number. Because the eigenvalues decrease in value as the components increase, the line will be an accelerated curve downward. The scree plot was used to select how many factors to rotate on a final solution. For these data, any factor with an eigenvalue greater than 1.0 was considered, thus, 8 factors were extracted.

Confirmation of Self-concept Factors

To confirm the items and their factor structure, adolescent samples representing a wide range of age, academic level and academic settings were selected. The factor structure was tested through empirically evaluating whether the factor structure/pattern matrices for the given set of items across different samples are invariant across samples. The findings will indicate that the factors taken will provide a reasonably good fit for the adolescent data set. The next table shows the distribution of items for each factor with the corresponding discriminatory index value for each item. A total of ten (10) items were considered as good ones in factor 1 since

they are all greater than .40. There were eight (8) items considered as good ones for factor 2. For factor 3, there were nine (9) good items, seven (7) good items for factor 4, six (6) good items for factor 5, nine (9) good items for factor 6, six (6) good items for factor 7, and three (3) good items for factor 8. After good items were extracted from the eight (8) factors, the fifty-eight (58) good items left were confirmed through factor analysis. The resulting data were as follows:

Table 4: Post-analysis Decisions

FACTORS	ITEM NUMBERS	TOTAL
1.Morality	Items 10, 15, 21, 23, 26, 38, 46, 53, 71, 89	10 Items
2.Vulnerability	Items 19, 28, 29, 30, 65, 66, 70, 86	8 Items
3.Self-Esteem	Items 72, 73, 74, 75, 76, 77, 78, 84, 88	9 Items
4.Self-Efficacy	Items 41, 44, 48, 50, 51, 57, 59	7 Items
5.Likeability	Items 12, 18, 25, 36, 60, 61	6 Items
6.Giftedness	Items 14, 17, 33, 34, 37, 40, 43, 49, 68	9 Items
7.Power	Items 2, 5, 7, 9, 11, 20	6 Items
8.Task Accomplishment	Items 24, 31, 32	3 Items

Various postanalysis decisions arise after the analysis is at hand. The common criteria are loadings of 0.4 and above. Notice that the first 1-4 factors account for quite a lot of variance, then a sudden drop. The researcher looks at 2% as the cut-off point in accepting the factor, thus eliminating factor 8 ($\alpha = .589$) with only three (3) items. Factor 7 was acceptable but makes sense in joining with factor 3. It has generated a low alpha of .278 but quite reasonable amount of variances (6 items) were accountable and make good sense by their fusion with Factor 3. The results of factor analysis would be useful according to Loewenthal (2001) having some of the advantages of item weighting without the disadvantages, is to *use the factor loading as criteria* for retaining the items in the scale.

Reliability Measures

When divided into two parts, the first half of the scale has forty-four (44) items while the second half has also forty-four (44) items. The first half of the test has a mean of 155.13 while the second half has 153.28. The standard deviation is 14.32 for the first half of the test and 15.93 for the second half. An r value of .786 using the Cronbach's Alpha was generated between the first and second half of the test, while the correlation corrected for attenuation generated an r value of .915. Using the Guttman's Split-half reliability and Spearman Brown coefficient, an r value of .877 and .880 were generated respectively. These scores represent an important index of the test reliability, suggesting that the test is acceptable. The revised edition was administered to 809 respondents following the same procedures that were used for the preliminary form. From the 55 items of the Final Form, odd-even split-half reliability analysis was applied: twenty-eight (28) items for odd and twenty-seven (27) items for even. Reliability indices range from .652 to alpha measures of .792, indicating an acceptable reliability coefficient.

Validity Measures

When the 88 raw items or traits referring to the self had been identified, the researcher represented each one of these traits with superheroes at his knowledge possess the specific characteristics. The listed self-descriptions made by the researcher were given to three judges experts in adolescent formation. A clinical psychologist, a personality expert and a counselor validated the material content of the scale namely, the traits and characteristics listed and tallied in the survey form. The formal aspect of the scale, viz., the superheroes that represent the traits and characteristics were given for validation to those knowledgeable in comics industry specifically in this study: a comic writer, a comic artist and a comic enthusiast. These judges classified each descriptor according to which one of the suggested superheroes by the researcher the traits are represented. The final set of superheroes chosen represent frequent responses by the participants and were relatively representative of the comics-type test. The reliability coefficient of the experts' rating on the preliminary draft of the SCSS-A which consists of eighty-eight (88) items, generated an r value of .894 using Cronbach's Alpha. The

second group of experts on the fifty-five (55) items of the final form however, exhibited a more significant score of .917.

The construction and validation of the SCSS-A was based on the basic paradigm for every test construction and validation. If the subscales are valid measures of the adolescents' self-concept, they should be correlated with an existing self-concept measure. This relationship was tested in a sample of 419 respondents who took the Tennessee Self-Concept Scale (TSCS: 2) Adult Form. The pattern of correlations is supposed to be consistent with the expectations as shown by the next table:

Table 5: Convergent Validity Of The Final Form Of The SCSS-A.

Test/Scale	Number of Items	Respondents	r Value
Superhero Self-Concept Scale for Adolescents (SSCS-A)	55	415	.634
Tennessee Self-Concept Scale 2 nd Ed.(TSCS: 2 Adult Form)	82	415	Prob. .000

The correlation output on the above table shows that the level of statistical significance is moderately correlated at the *r* value of .634. This correlation is significant at the 0.01 two-tailed significance level, which means this output have already predicted the direction of association. The remainder of the output tells the exact probability obtained, and the number of cases included in the analysis.

Discussion

Knowledge of a raw score on a given scale seldom provides enough information to make a meaningful interpretation of the adolescents' self-conception, given the many varied ways that the scale can be constructed. It is imperative to provide the users of the SSCS-A of materials with information sufficient to understand the particular scale employed. The next table (Table 6) presents an expression of the degree of correspondence between the scores in the final form and the classificatory variables:

Table 6: Categorical Correlations Between Variables And Scores

Variables	R Value	Probability Value
Age	.063	.074
School	.098 **	.005
Year Level	.148 **	.000
Course	.047	.183
Gender	.056	.109

Note: **Correlation is significant at the 0.01 level (2-tailed)

The degree of concomitant variation between the scores and the classificatory variables reveals that only the school types and year level yield a significant relation, at .098 and .148 respectively. Age, gender and course are not significantly related to score. A great deal of research has focused on the significant relations of self-concept on students' settings (year level and school types). Bornholt (2001) provided social explanations of adolescents' self-concepts in the context of schooling. He suggested that personal and social layers of explanations apply well to adolescents' intentions about school work. His theory provided a systematic framework that heightens our awareness of social contribution (e.g. year level in school context) to adolescents' self-concepts. In the context of schooling, Bornholt suggested that "actual achievement would explain students' intentions about further study to some extent. This means that more able students would plan to study higher level senior courses. (p. 68)" Consequently, it is expected that the more the year level gets higher, the self-concept scores get higher as well. School types (public and private) were also found to be correlated with self-concept scores. As noted in this research, morality is a component of adolescents' self-concept. According to Brown (2006) students, both from private and public schools were primarily influenced by their teachers. Teachers conveyed their self-concepts (including moral self-concepts) influencing the development of young persons' character (cf. Ericson, 1950; Maclean et. al., 2004; Markus, 1983; Tsang, 2001; Vallacher et. al., 2002; Wegner et. al., 1986 as cited by Brown, 2006). Historically therefore, the moral realm of different educational institutions has been as important as the realm of knowledge in the development of adolescents' self-concept.

As accentuated in the results that emerged from the consideration of year level scores, the seniors got the highest self-concept scores down to the freshmen getting the lowest. This is logical because the more adolescents positively move forward in academic year level, the more they look to themselves positively as maintaining a harmonious, stable and satisfying relationship with his or her environment. Alam (2009) explored the effects of self-concept and social adjustment on academic performance of adolescents and revealed significant positive relations in agreement with the findings of this present research. With regard to the result exhibited on comparing school types, those in private schools score higher compared to those in public schools. This is understandable since some of the public's perception seems to be favoring on private schools on teaching students a higher degree of values than public schools.

Summary

Based on the research findings, the following were accentuated in the assessment of the Superhero Comics-Type Self-Concept Scale for Adolescents (SCSS-A): (1) the narrative pictorial instrument is unique in its design and takes into account adolescents' relevant context, and therefore desirable in practical setting, (2) the distribution of scores around the mean of SCSS-A in its preliminary and final form approximates symmetrical dissemination, (3) the preliminary form and the final form of the SCSS-A is a reliable and valid instrument, (4) there were significant differences on the scores of the final form of the SCSS-A to types of schools and the year level of students, and (5) most of the procedures provided substantial evidence as to the reliability and validity of the instrument.

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