

Psychometric properties of the perceived social support from family and friends scale: Data from an adolescent sample in Ghana

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Abstract

Several studies have found that perceived social support plays a crucial role in the psychological and physical wellbeing of young people. A number of instruments measuring perceived social support have been developed and validated, including the Perceived Social Support from Family and Friends subscales. The psychometric properties of the Perceived Social Support from Family and Friends subscales have been demonstrated in a range of samples, although not in Ghana. The purpose of this study is to investigate the psychometric properties of the Perceived Social Support from Family and Friends subscales in Ghanaian adolescents using data from a school-based survey (N = 770; 14-21 years). Participants completed a self-report questionnaire containing the Perceived Social Support from Family and Friends subscales, the Adolescent Stress Questionnaire, and the 12-item General Health Questionnaire. An exploratory factor analysis in addition to simultaneous confirmatory factor analyses with structural equation modelling were performed to evaluate the factor structure and factorial validity of the subscales along with Cronbach's alpha and intercorrelations. Three factors and two factors were extracted for the Friends and Family subscales respectively. While the unidimensional model of the friends subscale had a better fit with the data than the three-factor model, the two-factor model of the family subscale had a better fit than the unidimensional model, even though the unidimensional models of both subscales produced higher internal consistency coefficients. With respect to construct validity, the family subscale demonstrated some evidence of convergent and discriminant validity, but the friends subscale demonstrated some evidence of only discriminant validity, in terms of the association between social support and common mental illness and perceived stress. It appears that the Perceived Social Support subscales are useful

instruments for assessing social support from family and friends and could therefore be used to further our understanding about the role of social support in stressful life events and psychological functioning of Ghanaian adolescents, although further research is required for the friends subscale.

Keywords: Perceived social support; psychometric properties; adolescents, common mental illness, perceived stress

Introduction

There is considerable interest among researchers and policy makers in the social-related support adolescents receive because it is crucial for adolescents' general health and wellbeing (Currie, Zanotti, Morgan, et al., 2012; Umberson & Montez, 2010). Social support is considered to be an important protective factor that has significant influence on various aspects of adolescent health and wellbeing including mental health (Uchino, 2004; Wight, Botticello & Aneshensel, 2006), physical health outcomes (Gini, Carli & Pozzoli, 2009; Holt-Lunstad, Smith & Layton, 2010) and behaviour-related health (Beets, Cardinal & Alderman, 2010; Berkman & Lochner, 2002; Cohen et al. 2004).

Social support is defined as the emotionally sustaining qualities of relationships. A sense that one is loved, cared for, and listened to (Umberson & Montez, 2010), and also involves one's social network's provision of psychological and material resources intended to benefit the ability to cope with stress (Cohen, 2004). Social support is a theoretically complex, multidimensional construct that has been conceptualised, operationalised, and measured in a variety of ways. A commonly accepted conceptualisation and delineation of social support relate to measures that (1) assess the structural characteristics of social networks (i.e. structural support), which assesses the extent and interconnectedness of an individual's social relationship and (2) measures that assess the resources that network members provide (i.e. functional support), which assesses the availability of psychological and material resources from an individual's interpersonal relationships (Rodriguez & Cohen, 1998).

In addition to the concepts of structural and functional social support, there is the issue of whether social support must actually be received to be beneficial or if simply perceiving that support is available is sufficient to gain health benefits (Berkman, 1995; Rodriguez & Cohen, 1998). It has been posited that while the perception of support depends upon the availability of supportive structures in the environment, perceived support and received support are not identical because perceived social support is most likely to be influenced by personality factors such as long-standing traits and temporal changes in attitude or mood (Procidano & Heller, 1983). Thus, perceived social support as conceptualised in this study reflects resources that network members provide which influences an individuals' perception of support that network members could provide. In this respect, a validation study that seeks to examine and clarify the extent and nature of social support within the cultural context of Ghana is imperative.

Although there is no clear-cut evidence to indicate that psychological mechanisms and other affective processes are directly responsible for links between social support and health (Uchino et al., 2012), two alternative conceptual models have been presented in the literature that suggest the pathways through which social support affects health, wellbeing and quality of life: the stress-buffering and main effect models. The stress-buffering model posits that social support is related to health and wellbeing only when individuals are experiencing stressful life situations while the main effect model, on the other hand, posits that social support in the form of social resources have a beneficial effect on health and wellbeing regardless of whether or not individuals are experiencing stress (Cohen, Gottlieb & Underwood, 2000; Kawachi & Berkman, 2001).

Besides the sample used to validate the original PSS, not many studies have been conducted using adolescent samples in low-income countries (López & Cooper, 2011), but it is known that socio-economic circumstances have a substantial influence on the perception and experience of stress during adolescence (Goodman et al. 2005). Coupled with the rapid socio-economic development and transformation in Ghana, in particular, and Africa in general, there is the need to provide social support to young people as an effective coping resource or buffer during stressful situations to promote health and wellbeing. Presently, there is no established, well-validated, and widely accepted instrument for assessing the levels of perceived social support from family and friends in Ghanaian adolescents. Indeed, no study has examined the psychometric properties, particularly the factor structure, of the Perceived Social Support from Family and Friends subscales by Procidano and Heller (1983). An appropriate instrument for assessing perceived social support in Ghanaian adolescents will present us with an opportunity to objectively and realistically perform a periodic assessment of perceived social support to examine adolescent needs for support, information, and feedback from their family and friends for the development of critical intervention strategies.

Several instruments have been designed to assess perceived social support at different stages across the life span. One of the most widely used instruments is the Perceived Social Support (PSS) from family (PSS-FA) and from friends (PSS-FR) subscales (Procidano & Heller, 1983). The PSS was designed to measure the extent to which an individual perceives that their need for support, information, and feedback are fulfilled by family and by friends. The original PSS has a total of 40 items with 20 items each for the family and friends subscales. However, there is also a widely used shortened version made up of a total of 20 items with

10 items each for the family and friends subscales (DuBois, Felner, Sherman et al., 1994). Among college students, Procidano and Heller (1983) found that the 40-item PSS has good internal consistency with a Cronbach $\alpha = 0.88$ and $\alpha = 0.90$ for the PSS-FA and PSS-FR subscales respectively and with exploratory factor analysis concluding that each subscale comprises of a single factor. Other studies using adolescent samples have demonstrated that the PSS has good psychometric properties, even though these studies mainly concentrated on the internal consistency of the subscales. For example, a Cronbach's alpha of 0.80 was reported for the 20-item PSS-FR subscale in Australian adolescents (Gerner & Wilson, 2005), and Cronbach's alpha $\alpha = 0.90$ and Cronbach's alpha = 0.82 were found for the 10-item version of the PSS-FA and PSS-FR subscales respectively in adolescent samples in the USA (Karcher, 2008). Also, the 10-item PSS-FA and PSS-FR showed satisfactory internal consistency with Cronbach's alpha ranging between 0.78 and 0.87 among young adolescents in the USA (Moran & DuBois, 2002).

As previously indicated, besides the initial studies conducted by the developers of the PSS to examine its factor structure, only a few studies have since sought to explore the factor structure of both subscales. With a relatively large number of items per subscale, it is plausible to assume that the PSS subscales are likely to be multi-dimensional, at least, among different samples of adolescents other than the sample used for validating the instrument.

The purpose of this study is, therefore, to explore the factor structure, internal consistency and construct validity of the PSS-FR and PSS-FA subscales. Conceptualization of perceived social support from family and friends in terms of factor structure is theoretically

informative because of the relatively limited research on the PSS in Ghana and Africa, which could provide evidence for generalisation.

Methods

Participants

The sampling frame consisted of second and third year students in four senior high schools in Accra, Ghana, with an estimated number of 3,000 students. First-year students had not transitioned into senior high school when data were collected. Three classes in each of the four schools were randomly selected and students who were in their respective classrooms were invited to complete the questionnaires. Ninety seven percent of the students in the 12 randomly selected classrooms responded to the survey. The final sample of 770 consisted of 504 males and 266 females with a mean age of 16.9 years ($SD = 1.01$).

Procedure

Participants were asked to sign a consent form and those below the age of 18 were given an additional parental consent form for their parent or guardian to sign. Ethical approval was obtained from the University of Essex, UK, after school authorities in Ghana had given permission for their schools to participate in the study. As schools in Ghana do not have a specifically nominated ethics committee responsible for research ethics clearance, school authorities including a school counsellor/chaplain confer on issues about confidentiality, anonymity and harm to participants before they give permission for their schools to participate.

Measures

Perceived Social Support from Family and Friends Scales

The 10-item versions of the Perceived Social Support from Family (PSS-FA) and Friends (PSS-FR) subscales (Procidano & Heller, 1983) were used to assess perceived social support from family and friends respectively. In the original questionnaire, items were rated as *yes*, *no*, or *don't know*. For this study, we modified the response option by using a 5-point Likert scale ranging from 1 - strongly disagree to 5 - strongly agree in order to minimise loss of information, allow for the determination of the range of responses given and to possible to perform parametric statistical analysis. After reverse scoring all negatively worded items, the total scores range from 10 to 50 for each subscale with higher scores indicating more perceived social support. In this study the 10-item versions of the PSS have Cronbach's alpha = 0.86 and Cronbach's alpha = 0.71 for the PSS-FA and PSS-FR subscales respectively.

Perceived Stress

The Adolescent Stress Questionnaire (ASQ) (Byrne & Mazanov, 2002) was used to assess perceived stress. Three out of ten subscales totalling 19 items were selected based on their pertinence to the source of social support under consideration in this study. The three subscales are stressors of home life (10 items), peer pressure (5 items), and teacher interaction (4 items). The ASQ is scored on a 5-point Likert type scale with response categories ranging from 1 - never to 5 - very often. Items assess adolescents on stressors encountered in relation to home life (e.g. 'disagreement with parents' and 'lack of trust in the home'), peer pressure (e.g. 'pressure to fit in' and 'being judged by peers') and teacher interaction (e.g. 'lack of respect from teachers' and 'getting along with teachers'). Byrne, Davenport, and Mazanov (2007) found high Cronbach's alpha for all the subscales; stress of

home life Cronbach's alpha = 0.92, stress of peer pressure Cronbach's alpha = 0.88 and stress of teacher interaction Cronbach's alpha = 0.87 in Australian adolescents. Among Norwegian adolescents, Moksnes et al. (2010) found the various subscales of the ASQ to have good internal consistency; Cronbach's alpha = 0.87, and Cronbach's alpha = 0.89 for the stress of home life and stress of peer pressure subscales respectively. In this study, Cronbach's alpha of all the 19 items of the three ASQ subscales is 0.78 and Cronbach's alpha = 0.72, Cronbach's alpha = 0.71, and Cronbach's alpha = 0.63 for the home life, peer pressure and teacher interaction subscales respectively. The Cronbach's alpha of the teacher interaction subscale was below the commonly used threshold of 0.70 probably due to the relatively small number of items constituting the subscale (Cortina, 1993).

Common Mental Illness

The 12-item General Health Questionnaire (GHQ-12) was used to assess common mental illness. The GHQ-12 is a well-established, self-administered screening instrument for identifying psychological distress in general population surveys (Goldberg 1972).

Participants indicate their agreement or disagreement along a 4-point Likert scale for each item (1- not at all, to 4 - very often). Although there is some evidence that the GHQ-12 has subscales, for the purpose of this study, the total score on the GHQ-12 was used as an indicator of common mental illness and this was derived by summing the 12 responses after reversing the six negatively worded items. The total score ranged from 12 to 48 with high scores indicating higher levels of common mental illness. Tait, French and Hulse (2003) reported Cronbach's $\alpha = 0.88$ among Australian adolescents and Muldoon, Schmid and Downes (2009) reported Cronbach's alpha = 0.83 for the GHQ-12 from their sample of Irish adolescents. In this study the GHQ-12 had Cronbach's alpha of 0.75.

Statistical analysis

Statistical analysis was performed with IBM SPSS 22 software. The data were initially scrutinised and screened for accuracy of data entry, outliers and multivariate normality (Tabachnick & Fidell, 1996). These were done by proofreading the data; examining scatter plots that showed that the data were linear and without outliers; and performing missing completely at random test for missing values which showed that the data were missing completely at random, ($\chi^2 (330) = 346.83, p > 0.05$), with missing values of 5.7% and 4.8% for PSS-FR and PSS-FA subscales respectively. Notwithstanding the fact that the percentage of missing values was within the acceptable limit (Bennett, 2001), a full information maximum likelihood estimation method was applied in structural equation modelling as this produces less biased estimates by accounting for missing data (Byrne, 2010). A Kolmogorov-Smirnov test was used to test for multivariate normality on the PSS-FA, PSS-FR, GHQ-12 and ASQ-19. The results showed that all four variables were not significant ($p > 0.05$), indicating that the data were normally distributed. This was further confirmed in a histogram that was subsequently produced. Preliminary analyses were also performed to examine differences in perceived social support by demographic factors.

To test for construct validity, Pearson correlation coefficients were estimated to examine the associations among PSS-FA, PSS-FR, GHQ-12 and the three ASQ subscales. Two aspects of construct validity were assessed: convergent and discriminant validity. As reasonable tests of convergent and discriminant validity, it would be expected that PSS-FA will be more strongly negatively associated with stress of home life (ASQ-home) than PSS-FR. Conversely, PSS-FR would be expected to be more strongly negatively associated with stress of peer pressure (ASQ-peer) than PSS-FA (Steiger, 1980). There is evidence that family support has

a more significant effect on lifetime disorders and social stress than friend support (e.g. Gayman et al., 2009), so it is expected that the PSS-FA will be more strongly associated with the GHQ-12 than the PSS-FR. The Williams modification of the Hotelling test (Kenny, 1987) was used to test for differences between dependent correlations using Lee and Preacher (2013) web based calculator. These measures of perceived stress and common mental illness are robust to cultural differences, particularly in Ghana (see Glozah and Pevalin, 2015, 2016).

Cronbach's alpha was used to assess internal consistency. In order to examine the factor structure and test for factorial validity of the PSS-FR and PSS-FA, the PSS-FR and PSS-FA data sets were divided into three by randomly drawing from the total data resulting in a sample of 242 and 244 for the PSS-FR models and PSS-FA models respectively. Accordingly, three analyses were performed with the PSS-FR data and the PSS-FA data: one Exploratory Factor Analysis (EFA), one unidimensional Confirmatory Factor Analysis (CFA), and one CFA based on the EFA, with each model being run on new data. An EFA with a Maximum Likelihood extraction method was performed because the Kaiser-Meyer-Olkin measure of sampling adequacy was 0.73 and 0.87 for the PSS-FR and PSS-FA subscales respectively, which exceed the recommended value of 0.60 (Tabachnick & Fidell, 2007). Structural Equation Modelling was used to perform the CFA with a Full Information Maximum Likelihood method (a superior method for dealing with missing data by assuming multivariate normality) to test for model fit. AMOS 21 software was used to perform the CFA.

Five indices were used to assess the degree to which the data fitted the model: the Root Mean Square Error of Approximation (RMSEA), Tucker–Lewis Index (TLI), Comparative Fit

Index (CFI), Chi square degrees of freedom ratio (χ^2/df), and chi square (χ^2) goodness-of-fit statistic. RMSEA cut-off values ≤ 0.05 indicate a good fit although values ranging from 0.06 to 0.08 also indicate acceptable fit with values above 1 indicating poor fit. CFI and TLI cut-off values range from 0 to 1 with values closer to 1 indicating good fit, although CFI and TLI values ≥ 0.95 are highly recommended. The smaller the χ^2 goodness-of-fit statistic, the better the fit, with zero indicating perfect fit and a value with χ^2 ($p > 0.05$) indicating acceptable fit. Chi square degrees of freedom ratio (χ^2/df), (or CMIN/DF), specifies the ability of the hypothesised model to fit the sample data. Values less or equal to 2 indicate a good fit (Byrne, 2010; Hu & Bentler, 1999). The statistical significance of all parameter coefficients were evaluated at the 0.05 level in the structural equation model.

Results

Demographic characteristics and perceived social support

Results of independent samples t-tests showed that there were no significant differences in PSS-FR and PSS-FA by age. Similarly, there were no significant difference in PSS-FR and PSS-FA by gender. Also, while there were no significant differences in PSS-FR between day and boarding students, boarding students reported significantly higher PSS-FA than day students. Finally, results of one-way analysis of variance showed significant group difference in both PSS-FR and PSS-FA. Tukey post hoc tests revealed that students whose parents have moderate education reported significantly higher PSS-FR than those whose parents have low education. Likewise, students whose parents have high education and moderate education reported significantly higher PSS-FA than those whose parents have low education. Table 1 presents the differences in perceived social support by demographic characteristics.

Demographic Variables	Social Support from Friends (PSS-FR)					Social Support from Family (PSS-FA)				
	N	M(SD)	df	t	F	N	M(SD)	df	t	F
Age										
Younger (14-17)	564	30.29 (5.75)	724	0.23		567	35.86 (8.02)	731	1.84	
Older (18-21)	162	30.17 (5.43)				166	34.57 (7.62)			
Gender										
Male	481	30.31 (5.55)	724	0.30		485	35.36 (7.68)	731	-0.98	
Female	245	30.18 (5.93)				248	35.96 (8.44)			
Resident Status										
Day	538	30.13 (5.62)	724	-1.04		544	34.55 (7.97)	362.95	-6.34***	
Boarding	188	30.63 (5.83)				189	38.49 (7.13)			
Parental Education										
Low (0-4)	270	29.49 (5.46)	(2, 721)		4.94**	265	34.00 (7.74)	(2, 728)		8.84***
Moderate (5-9)	347	30.92 (5.71)				361	36.28 (7.96)			
High (10-12)	107	30.01 (5.93)				105	37.12 (7.84)			

Table 1: Differences in perceived social support by demographic characteristics (N = 770)

** $p < 0.01$, *** $p < 0.001$, M = mean, SD = standard deviation

Factor Structure

On the first data, EFA with a direct oblimin rotation method was performed to examine the factor structure of the PSS-FR and PSS-FA, based on the assumption that all extracted factors would be correlated. Only factors with Eigenvalues greater than one were retained. With the PSS-FR, three factors were extracted - the first factor with five items, labelled 'informational support' had an Eigenvalue of 2.61 and explained 26.1% of the variance, the second factor with four items, labelled 'emotional support' had an Eigenvalue of 1.23 and explained 12.3% of the variance and the third factor with one item, labelled 'lack of confidence' had an Eigen value of 1.17, explaining 11.7% of the variance. Thus, all three factors explained a total variance of 50.1%. Table 2 shows the factor structure and factor loadings of the PSS-FR.

Table 2: Factor Loadings for the Perceived Social Support Scale – Friends (PSS-FR)

PSS-FR Items	PSS-FR-10	Factor 1	Factor 2	Factor 3
1. My friends are sensitive to my personal needs	0.63	0.73		
2. I rely on my friends for emotional support	0.55	0.59		
3. My friends are good at helping me solve problems	0.63	0.57		
4. My friends give me the moral support I need	0.56	0.54		
5. There is a friend I could go to if I were just feeling down, without feeling funny about it later	0.41		0.65	
6. I have a deep sharing relationship with a number of friends	0.38		0.40	
7. I've recently gotten a good idea about how to do something from a friend	0.31		0.40	
8. I wish my friends were much different	0.20			0.51
9. My friends enjoy hearing about what I think	0.44			0.38
10. When I confide in friends, it makes me feel uncomfortable	0.17			0.24

Table 3: Factor Loadings for the Perceived Social Support Scale – Family (PSS-FA)

PSS-FA Items	PSS-FA-10	Factor 1	Factor 2
1. My family gives me the moral support I need	0.68	0.80	
2. My family enjoys hearing about what I think	0.75	0.79	
3. I rely on my family for emotional support	0.70	0.70	
4. My family is sensitive to my personal needs	0.69	0.66	
5. The relationship between me and my family is better than my friends' relationship with their family	0.42	0.40	
6. I wish my family were much different	0.41	0.40	
7. I have a deep sharing relationship with a number of members of my family	0.66		0.76
8. Members of my family are good at helping me solve problems	0.75		0.75
9. There is a member of my family I could go to if I were just feeling down, without feeling funny about it later	0.57		0.67
10. Members of my family come to me for emotional support	0.47		0.54

With the PSS-FA, two factors were extracted – the first factor with five items labelled ‘emotional and moral support’ had an Eigenvalue of 4.36 and explained 43.6% of the variance and the second factor with five items labelled ‘trust and belonging’ had an Eigenvalue of 1.16 and explained 11.6% of the variance. All extracted factors explained a total variance of 55.2%. Table 3 shows the factor structure and factor loadings of the PSS-FA.

Internal Consistency

The Cronbach’s alpha coefficient was estimated to determine the internal consistency of all the factors in the multidimensional models with the exception of the third factor of PSS-FR as it is a factor with a single indicator. Cronbach’s alpha of 0.68 and 0.85 were found for the one-factor PSS-FR and one-factor PSS-FA respectively. The multidimensional PSS-FR factors - FR1 and FR2 had relatively low Cronbach’s alpha of 0.62 and 0.53 respectively. This notwithstanding, the item-total correlation coefficients were reasonable high - 0.46, 0.47, 0.41, 0.37 and 0.22 for FR1 items and 0.37, 0.32, 0.31 and 0.27 for FR2 items. Furthermore, the two factors of the PSS-FA had high Cronbach’s alpha: FA1 = 0.79 and FA2 = 0.74, which are higher than that of the PSS-FR factors.

Factorial Validity

Confirmatory factor analyses were performed on the: one-factor PSS-FR, 3-factor PSS-FR, one-factor PSS-FA and 2-factor PSS-FA. The unidimensional and multidimensional models were performed on the second and third data respectively. The CFA performed on the third data was based on the results of the EFA that was run on the first data. With regard to the PSS-FR, as the third factor of the 3-factor model had a single indicator, the error variance of

this indicator was constrained to 0.2 in order to ensure that the model is identified (Hayduk & Littvay, 2012).

Results of the unidimensional CFA models performed on the second data showed that the two models had a reasonably good fit with the data. Modification indices however suggested that the PSS-FR model could be improved by correlating the error variance of item five and item 10 for PSS-FR, which was not surprising as these items appear to refer to the same idea – ‘lack of confidence’ and ‘wishing that friends were much different’. Similarly, modification indices suggested the correlation of the error variance of item seven and item eight of the PSS-FA, which again appeared plausible to assume that ‘when members of an individual’s family are good at helping them solve problems’, they are more likely to ‘have a deep sharing relationship’. Both unidimensional models had a better fit after correlating the two shared residual variances. Table 4 shows the goodness-of-fit statistics for the two unidimensional models and Figure 1 shows the factor loadings of these models with correlated and uncorrelated residuals.

Results of the multidimensional CFA performed on the third data showed that the two models had a reasonably good fit with the data, but modification indices suggested that a correlation between the error variances of item five and item 10 in both PSS-FR and PSS-FA models could improve model fit. For the PSS-FR, the suggested modification indices was the same as what was suggested for the unidimensional model. It seems plausible that for the PSS-FA, “The relationship between me and my family is better than my friends’ relationship with their family” and “I wish my family were much different” may be referring to a similar idea and so would share a common residual variance. After correlating these error

variances, both models had a better fit. Table 4 shows the goodness-of-fit statistics and Figure 1 shows the factor loadings of both multidimensional models.

From Table 4, it could be seen that although the correlated or modified unidimensional and multidimensional models had a better model fit statistics, the PSS-FR one-factor model had a better fit with the data than the 3-factor model. On the other hand, however, the PSS-FA 2-factor model had a better fit with the data than the one-factor model.

Table 4: Fit statistics of models

Model	Model Description	χ^2	χ^2/df	TLI	CFI	RMSEA
PSS-FR						
1	1-factor (10 items)	118.134	3.475	0.880	0.909	0.057
2-uncorrelated residuals	3-factors (10 items)	104.491	3.265	0.890	0.922	0.055
2-correlated residuals	3-factors (10 items)	80.719	2.604	0.922	0.946	0.046
PSS-FA						
1	1-factor (10 items)	241.035	7.089	0.894	0.920	0.090
2-uncorrelated residuals	2-factors (10 items)	119.230	3.507	0.956	0.967	0.057
2-correlated residuals	2-factors (10 items)	112.101	3.397	0.958	0.969	0.056

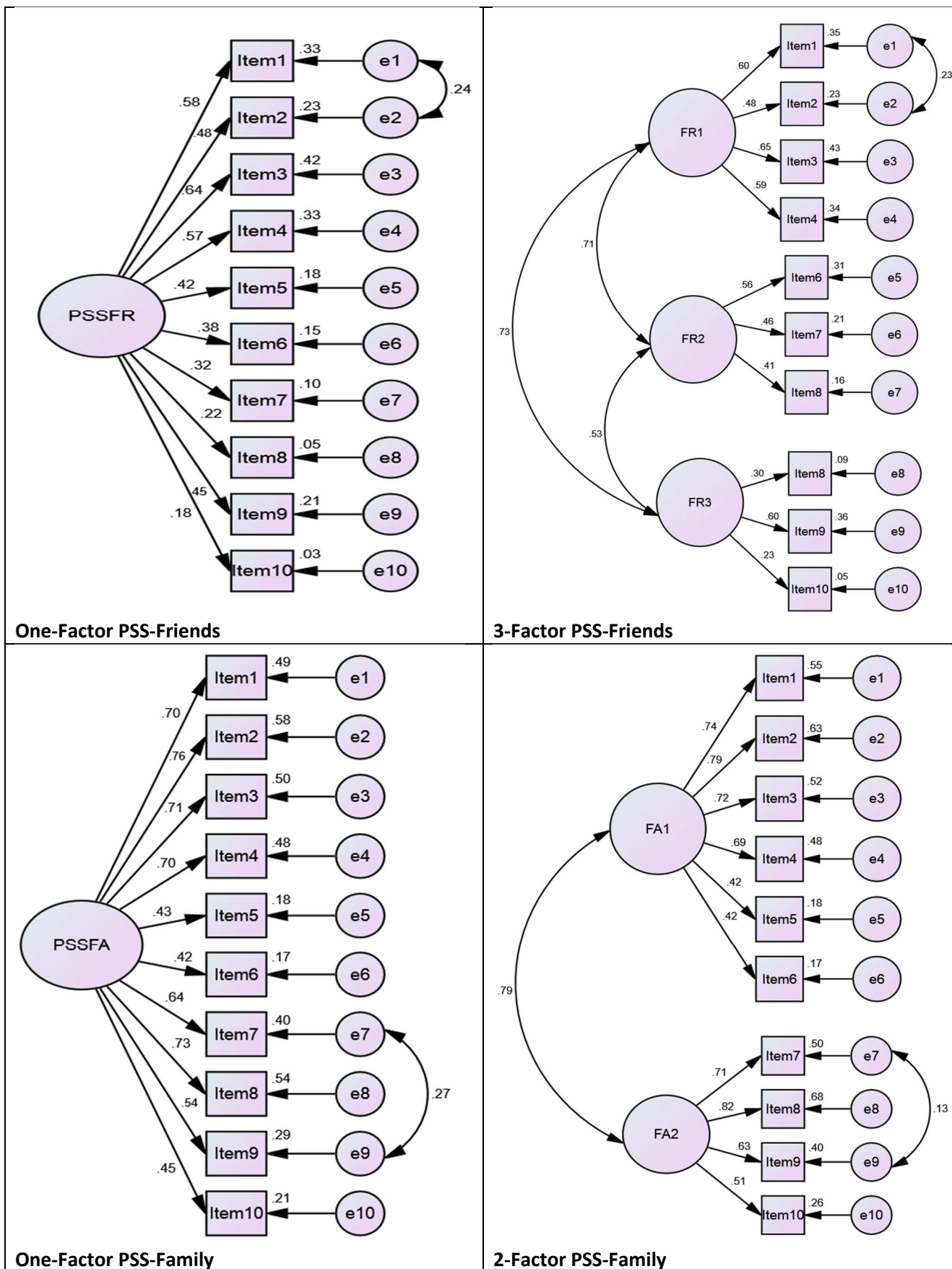


Figure 1: Standardised parameter estimates of the four models tested. Squares represent items and ellipses represent factors. One-way and two-way arrows indicate factor loadings and between-factor correlations, respectively. Numbers on top of squares represent squared multiple correlations. PSSFR = Perceived Social

Support from friends; PSSFA = Perceived Social Support from Family; FR1, FR2, FR3 = Perceived Social Support from Friends, factors 1, 2 and 3 respectively; FA1, FA2 = Perceived Social Support from Family, factors 1 and 2 respectively.

Construct Validity

To examine the construct validity of the PSS-FR and PSS-FA, a Pearson correlation analysis was estimated to examine the associations among the PSS-FR, PSS-FA, and the ASQ subscales, home and peer. It can be observed from Table 5 that the PSS-FA had a significant negative association with ASQ-home (-0.33), whereas the PSS-FR had a non-significant association (-0.01). The test for the difference between two dependent correlations: $r(\text{PSS-FA, ASQ-home}) = r(\text{PSS-FR, ASQ-home})$, taking into account $r(\text{PSS-FR, PSS-FA})$ is $t(767) = 7.15, p < 0.001$. Also from Table 5, the PSS-FR had a non-significant negative association with ASQ-peer (-0.05) and the PSS-FA also had a non-significant association (-0.07). The test for the difference between two dependent correlations: $r(\text{PSS-FR, ASQ-peer}) = r(\text{PSS-FA, ASQ-peer})$, taking into account $r(\text{PSS-FR, PSS-FA})$ is $t(767) = 0.43, p = 0.66$. The test of equality between the associations of the PSS-FA and PSS-FR with the GHQ-12: $r(\text{PSS-FR, GHQ-12}) = r(\text{PSS-FA, GHQ-12})$, taking into account $r(\text{PSS-FR, PSS-FA})$ is $t(767) = 3.89, p < 0.001$.

These Hotelling test results indicate that the PSS-FA has reasonably good convergent (stronger associations with home stress and common mental illness) and discriminant (weak association with stress from peers) validity; the same cannot be said of the PSS-FR as most of the evidence is only in favour of discriminant validity (weak association with stress from home). It was expected that the PSS-FR would have a weaker association with the GHQ-12 than the PSS-FA. A weaker relation between the PSS-FR and GHQ-12 was found, but the PSS-FR still had a significant negative association with the GHQ-12.

Table 5: : Pearson Correlations among Perceived Social Support (Friends) and Perceived Social Support (Family) scales and subscales, General Health Questionnaire, and Adolescent Stress questionnaire (N = 770)

	1	2	3	4	5	6	7	8	9	10	11	12
1. PSS-FR	-											
2. PSS-FA	0.17**	-										
3. FR1	0.82**	0.12**	-									
4. FR2	0.72**	0.18**	0.40**	-								
5. FR3	0.64**	0.06	0.29**	0.18**	-							
6. FA1	0.11**	0.92**	0.06	0.10**	0.07	-						
7. FA2	0.20**	0.87**	0.15**	0.24**	0.03	0.61**	-					
8. GHQ12	-0.19**	-0.36**	-0.10*	-0.05	-0.26**	-0.35**	-0.28**	-				
9. ASQ19	-0.03	-0.27**	0.01	0.12**	-0.20**	-0.31**	-0.15**	0.41**	-			
10. ASQ-H	-0.01	-0.33**	0.01	-0.08*	-0.13**	-0.37**	-0.18*	0.37**	0.86**	-		
11. ASQ-P	-0.05	-0.07	-0.03	0.15**	-0.23**	-0.09*	-0.01	0.30**	0.71**	0.34**	-	
12. ASQ-T	0.01	-0.12**	0.03	0.04	-0.05	-0.11**	-0.11**	0.19**	0.57**	0.26**	0.28**	-
M	30.26	35.56	10.90	9.67	9.73	22.62	12.96	18.13	39.81	21.78	11.26	6.72
SD	5.68	7.94	3.02	2.54	2.22	4.98	3.85	5.55	9.35	6.00	3.81	2.66

* $p < 0.05$, ** $p < 0.01$. M = mean, SD = standard deviation.

PSS-FR – Perceived Social Support (Friends); FR1-3 PSS-FR subscales; PSS-FA – Perceived Social Support (Family); FA1-2 PSS-FA subscales; GHQ12 – 12-item General Health Questionnaire; ASQ19 - Adolescent Stress Questionnaire; ASQ-H – Stress of Home Life; ASQ-P – Stress of Peer Pressure; ASQ-T – Stress of Teacher Interaction

Discussion

This study examined the psychometric properties – factor structure, factorial validity, internal consistency and construct validity of the PSS-FA and PSS-FR subscales in Ghanaian adolescents by using both exploratory factor analysis and confirmatory factor analysis. To the best of our knowledge, no validation studies have been conducted among Ghanaian adolescents with the perceived social support from family and friends subscales by Procidano and Heller (1983). There were no significant age and gender differences in PSS-FA and PSS-FR in our sample of Ghanaian adolescents. However, previous studies have found that females (Demaray & Malecki, 2002; Rueger, Malecki & Demaray, 2010) and younger adolescents (Bokhorst, Sunter & Westenberg, 2010) perceive significantly more social support than males and older adolescents respectively. Perhaps, in this study, there would have been age differences in social support if first year students, who are much younger, had participated, suggesting that differences in social support may exist in adolescent samples with a relatively wider age range. It could also be speculated that there were no differences in social support because older samples were used in this study. It has been found that 12-year old children perceive more support from parents than from friends but from 18 years onwards this becomes stable and there are no gender differences between support from family and friends (Bokhorst, Sunter & Westenberg, 2010).

Also, while there were no significant differences in PSS-FR between day and boarding students, boarding students reported significantly higher PSS-FA than day students. It is plausible to assume that parents or families are likely to provide more support to boarding than day students. For example, food served in the boarding house is generally known not to be very nutritious so parents will be inclined to provide support in the form of more

money and advise on eating habits to their children who are boarding students compare to day students who go to school and return home on a daily basis, whom they can have regular and direct supervision. On the other hand, regardless of whether they are boarding or day students, adolescents have the same group of friends and so they may perceive similar levels of social support. In other words, boarding students have day students as their friends and vice versa as they may be attending the same school or are classmates, so differences in social support between boarding and day students would not be expected.

Finally, in relation to parental education, students whose parents attained high to moderate education reported significantly higher PSS-FA and PSS-FR than those whose parents attained low education. Low level of education, which could result in low family income, is related to less involvement and less support from parents (Brody, Murry, Kim, & Brown, 2002). By deduction, adolescents whose parents have attained a higher level of education are also more likely to have friends in the same social class as them who live in comfortable neighbourhoods and attend good schools and therefore, could provide or receive social support. These are likely to have been the case in this study given that parents of majority of the samples had attained moderate to high level of education.

With regard to the factor structure of the subscales, it was found that while the PSS-FR had three underlying factors, the PSS-FA had two underlying factors, contrary to the unidimensional factor suggested by the original developers of the instrument (Procidano & Heller, 1983). In relation to the meaning of the multidimensional factors of the PSS found in this study, 'trust' (a label for the multidimensional PSS-FA) has been considered an essential and important element of a successful social network (Sherchan et al., 2013), similar to how

'sense of belonging' has been asserted to be an integral part of the availability of a social network (Hale et al., 2005). The closely-knit characteristic of families within the socio-cultural context of Ghana may explain why adolescents would tend to have a good sense of trust, confidence and belonging and to perceive this as an important kind of social support from their family.

In relation to the PSS-FR, Beets et al. (2010) assert that 'informational support' (a label for the multidimensional PSS-FR) is a dimension of social support that has received the least attention in the social support literature and is one of the support mechanisms for which little information has been gathered. The ability to extract informational social support, as part of the multidimensional factors derived in the present study, is therefore valuable. 'Emotional support' is also a distinct kind of social support that involves discussions of feelings, expression of concerns, and acceptance of the individual (Bokhorst, Sunter & Westenberg, 2010). Lack of confidence (label for the third factor of the PSS-FR, although a single item) may be similar to the principle of mutual trust where adolescents expect that friends will not reveal confidences, will not break promises, and will not sabotage other important ties, which is essential in peer social network and support (Stanton-Salazar & Spina, 2005). In relation to Ghanaian adolescents, it could be speculated that the increasing availability and intense use of various social media may imply that they are in constant contact with their peers which suggests that peers would be a major source for informational and emotional support as well as issues surrounding promises and confidences.

Results of the internal consistency of the scales revealed that the one-factor models of the PSS-FR and PSS-FA comprising of 10 items each, had higher and more acceptable Cronbach's alpha than factors of the multidimensional models. Consistent with findings of previous studies, the 10-item one-factor models had good internal consistency (e.g. Eskin et al. 2007; Gerner & Wilson, 2005; Jones & Trickett, 2005; Karcher, 2008; Way & Greene, 2006). As there are practically no studies that have explored the dimensionality of the PSS-FA and PSS-FR, there is no basis to compare the Cronbach's alpha of the multidimensional factors extracted from these subscales. Nonetheless, the Cronbach's alpha for the present study were low for the PSS-FR factors compared to the generally acceptable coefficient of 0.70 (Nunnally & Bernstein, 1994). These low Cronbach's alpha values may be attributed partly to the small number of items in each of these subscales as Cronbach's alpha generally decreases with smaller number of items (Cortina, 1993; Nunnally & Bernstein, 1994).

As the one-factor model of the PSS-FR had higher and more acceptable Cronbach's alpha than factors of the 3-factor model and also that the one-factor model fits the data better, it may be proper to regard it as a unidimensional scale. This notwithstanding, given that the modified 3-factor model had relatively high item total correlations, factor loading and model fit, both the one-factor and 3-factor models could be used but interpretation would be more meaningful when the 3-factor model is used to delineate three different but closely related kinds of perceived social support (Gottlieb & Bergen, 2010; Rueger, Malecki & Demaray, 2010). The same assumptions could be applied to the PSS-FA scale where both the one-factor and 2-factor models could be used but interpretation with the 2-factor model makes it possible to discern and delineate the kind of social support perceived rather than the one-

factor model that classifies perceived social support simply by source (Gottlieb & Bergen, 2010; Rueger, Malecki & Demaray, 2010).

Factorial validity was supported with reasonably good model fit of the multidimensional models of the PSS-FR and PSS-FA when some residual variances were allowed to co-vary. However, while the 2-factor model of the PSS-FA had a better fit than the unidimensional model, the unidimensional model of the PSS-FR had a better fit than the 3-factor model. It could be surmised that EFA results produced multidimensional factors for both PSS-FR and PSS-FA because the sample consisted of relatively older students who were able to discern subtle differences in perceived social support. It has been found that age-related social network and support changes are unavoidable and are due to normative, age-related life events (Wrzus et al., 2012), which could potentially also influence the meaning, understanding and definition individuals attach to perceived social support. Additionally, in terms of social support, Ghana could be described as having a collectivist culture where group goals and support are taken seriously. As such, there is the likelihood for individuals, knowing that support will be available, to have or seek unique and assorted perceptions of social support. It has been emphasised that cultural contexts have a significant role in determining the meaning and function of various forms of social support (Chen et al., 2012). Therefore, as the multidimensional nature of the subscales found in the present study appear to preserve the conceptual scope of understanding the uniqueness of support seeking, it is recommended that perceived social support should be construed as such in the present sample.

In terms of construct validity of the PSS, the PSS-FA demonstrated some evidence of convergent and discriminant validity but the PSS-FR only demonstrated some evidence of discriminant validity. The PSS-FA had a significantly strong negative association with stress of home life, a measure it should be associated with theoretically (Cohen, Gottlieb, & Underwood, 2000). This implies that, for example, a PSS-FA item such as “My family is sensitive to my personal needs” would be expected to be strongly negatively associated with ASQ (stress of home life) item like “Not being taken seriously by your parents” and so converge on the expected association. This finding coincides with that of previous research that have found that a strong negative relation exist between family social support and various forms of stressful life events (Hamdan-Mansour & Dawani, 2008; Murberg & Bru, 2004). Again, due to the closely-knit nature of homes or families within the socio-cultural context of Ghana, it is expected that homes or families would provide more social support to adolescents, which would in turn reduce the levels of stress adolescents’ experience. On the other hand, homes that are not very supportive to adolescents may induce or increase the levels of stress adolescents’ experience.

The convergent validity of the PSS-FA was also shown by the statistically significant stronger correlation with the GHQ-12. This may imply that adolescents benefit more from support from their family than from their friends in relation to common mental illness, which is consistent with existing evidence (Auerbach et al., 2011; Rethon et al., 2011). Similarly, it has been reported that family support generally have a more significant effect on lifetime disorders and social stress than friend support (Gayman et al., 2009). Also, Helsen et al. (2000) found that parental support had a stronger effect on adolescents’ emotional problems than support from their friends. This may be due to the fact that, even though

relationships with their friends are also essential for their social functioning, the relationship with their parents appear to be more valuable and may dominate during adolescence (Gayman et al., 2009). Within the socio-cultural context of Ghana, young people depend on their parents and/or family for subsistence and guidance until, in many cases, they graduate from university and get jobs. This generosity shown by the family is likely to be appreciated by adolescents and consequently construed to be more beneficial compared to that of their friends. This may explain why adolescents in this study reported to benefit more from their family than from friends.

As a limitation, the present study used only second-year and third-year senior high school students, excluding much younger adolescents from the study, hence, the generalisation of the results to all adolescents in senior high schools in Ghana should be done with caution. Another limitation is that this validation study used the 10-item version of the PSS-FA and PSS-FR scales, but the original scales have 20 items each. This may have influenced the use of exploratory factor analysis, which needs a relatively large number of items in order to extract meaningful and stable factors. Hence, the small number of items per factor extracted might influence the stability of these factors. This notwithstanding, the extracted factors, with a small number of items, segregated into fairly meaningful and coherent components, making the use of the 10-item versions sufficient for assessing social support from family and from friends. Therefore, future studies are recommended that would explore the 20-item version of the scales in order to encompass all relevant dimensions of perceived social support which may not have been captured in this study.

Given that this study used a cross-sectional design and also that first year students (who are much younger) could not participate in this study, it would be important for future studies to examine the psychometric properties of the PSS with much younger adolescents in Junior High schools in Ghana and monitor them through to the Senior High Schools and, perhaps, beyond. Also, because there are other competing measures of perceived social support coupled with that fact that only two sources of support were measured in this study, it would be interesting for future research to examine how the PSS compares with other measures of perceived social support (including measures on perceived support from significant others) and how these are associated with perceived stress and psychological functioning. Finally, regardless of the evidence provided by the findings of this study suggesting evidence of construct validity of the PSS-FA, it is worth noting that the difference in strength of association between the PSS-FA and PSS-FR in relation to common mental illness and perceived stress, could simply be due to random sampling variance.

Conclusion

This study provided a comprehensive psychometric evaluation of the perceived social support from family and from friends subscales in Ghanaian adolescents. The PSS-FR and PSS-FA have acceptable factorial validity and reasonably good internal consistency. The PSS-FA demonstrated evidence of construct validity, but the PSS-FR did not demonstrate the same level of evidence, as its expected convergence with stress from peers was not present. As such, these scales could be used as instruments for assessing perceived social support from family and from friends in Ghanaian adolescents with some caution and further research for the PSS-FR subscale.

Compliance with Ethical Standards

Conflicts of interest: All authors declare that they have no conflict of interest.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants included in the study.

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