Poverty in Ukraine: Development, Validity and Reliability of a New Measure of Financial Strain for Young Adults

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Abstract

The purpose of this paper was to develop a valid and reliable measure of financial strain for use with college-attending young adults in Ukraine. The newly developed measure represents an alternative approach to currently used objective measures of poverty and economic hardship. Objective measures are not adequate or applicable for use with Ukrainian young adults who are mainly dependent on

their families for economic support. Financial strain was conceptualized as the financial adjustments that young adults have to make to meet their basic housing, food and clothing needs. Items were generated to capture the construct of financial strain, and content validity of the scale was assessed. Exploratory factor analysis strongly supported the unidimensional nature of the scale. In addition, findings from simultaneous multiple-group confirmatory factor analyses indicated configural, metric and factor invariance of the measure across the southern and central regions of Ukraine. The new measure of financial strain was positively correlated with emotional distress and violence against romantic partners, indicating good predictive validity. The scale also showed good internal consistency. We suggest that the new measure is appropriate to use with young adults in other Eastern European countries in transition.

Introduction

Poverty is a major threat to environmental health and well-being of individuals worldwide, a situation that has been further exacerbated by the world financial crisis of 2008 (World Health Organization 2010). Although economic recovery has been sluggish in many parts of the world, the fiscal crisis engulfing many "transition economies" like Ukraine has been severe (World Bank 2010). Before the financial crisis in 2008, Ukraine's economic growth was slow, a result of limited political changes and slow economic reforms, but in recent years, heightened unemployment, falling incomes and price inflation have further worsened the quality of life for many Ukrainians (World Bank 2010). Most studies in Ukraine have examined poverty on the basis of absolute (what households should be able to count on to meet their basic food and non-food needs) or relative (based in relation to the overall distribution of income or consumption in a country) indicators (Grushetsky and Kharchenko 2009). In addition, traditional economic measures such as the lack of material resources or limitations in disposable income do not fully capture the meaning of poverty and economic hardship for Ukrainian families. Within the Ukrainian context, the psychological or subjective component of poverty which emphasizes the daily life challenges and financial

adjustments that families have to make on a daily basis to meet household needs has been understudied. Hence, in this paper, we focus on the subjective aspect of poverty, which is conceptualized as the financial adjustments that individuals living in poverty have to make on a frequent basis for their survival to meet their basic housing, food and clothing needs. We term this construct as financial strain, which we consider more appropriate to assess the experiences of poverty for individuals and families in transition economies. In this paper, we focused on the experiences of financial strain among young adults transitioning into adulthood in Ukraine. Traditional measures (e.g., objective assessments of income, employment status, etc.) are not applicable for young adults who mostly depend on financial support from their families. Increased financial strain is associated with declining physical and mental health among young adults, presents challenges for their personal relationships and is associated with young adults having a negative outlook about their future (Creed and Klisch 2005). Hence, our goal in this paper is fourfold: (1) to examine the current status of studies of poverty in Ukraine; (2) to develop a contextually appropriate measure of financial strain for young adults; (3) to determine the construct validity of the newly developed measure using measurement invariance techniques across the southern

and central regions of Ukraine; and (4) to determine the internal consistency of the new financial strain measure.

Economic context and studies of poverty in Ukraine

Poverty and economic stagnation of the Ukrainian economy existed before its separation from the Soviet Union in 1991. Although socialist economies were centrally regulated, with its citizens experiencing full employment, job security, subsidized housing, controlled pricing, free access to social resources and no officially reported rates of poverty, this period was also marked by slow economic growth and widespread shortages of goods and services (Bruck et al. 2008). In the 25 years post independence, Ukraine has transitioned from a socialist to a market economy, but a range of poor internal economic policies including inadequate economic liberalization and privatization of industries, government restrictions around trade and pricing, fiscal and monetary irresponsibility among other factors has led to economic stagnation and a steep economic downturn over the past decade (Matuszak and Sarna 2013). These macroeconomic factors have resulted in income inequality, declining wages, rampant inflation, declines in social benefits and low purchasing power of citizens, which, in turn, have affected the health and well-being of families and households (World Bank 1996).

Unlike in the Soviet Union, the current Ukrainian Government no longer provides the Ukrainian population with free housing and extensive social support; advanced education does not guarantee well-paid and high-status jobs. Hence, traditional pathways to financial independence are not the norm. Nowadays, many young adults in Ukraine feel lost in their transition to adulthood because of the changing social, economic and cultural traditions. They also cannot rely on the advice and life experiences of older generations who are often not equipped to

deal with the multitude of social, economic and cultural changes taking place in the new democratic and free market systems. In other words, many emerging adults do not have a clear "road map" that would guide their life and career choices.

According to a report by the United Nations in Ukraine (2009), "widespread poverty is one of the most acute socio-economic problems for the country. The extent of poverty, its depth, and a critical income polarization between social groups are a major cause for concern" (p. 1). In recent years, there has been a further significant deterioration of the county's economy, which has resulted in people experiencing difficulties to meet the economic needs of their families and themselves. Political instability, military conflict in the Donbas region and the consequent currency devaluation have driven up consumer prices. In April 2015, consumer prices were 60.9% higher than the year before (State Statistics Service of Ukraine [SSU] 2015). Yet, household incomes remained low; in 2015, an average monthly wage was UAH 3,728[1] compared with UAH 3,480[2] in 2014 (SSU 2015). The latest report by the SSU (2015) indicated that 9.7% of Ukrainians were unemployed with the highest unemployment rates among young adults. In the 2012–2013 academic year, tuition fees for university education ranged between US$500 and $2,000 a year. At the same time, the average monthly wage of Ukrainian adults was around $384 in 2013 (UAH 3073; in 2013, 1 Ukrainian Hryvnia equaled 0.072 US dollar). While the Ukrainian Government provides some tuition and housing subsidizes, it is not nearly enough to cover the costs of university education. Most full-time students depend on their parents for financial support. The need for this support in turn results in financial strain for most families.

Studies examining poverty and economic hardship have used what we refer to in this paper as an economic approach characterized

by regional and national assessments of per capita income, household dependency ratios (dependent family members to the earning/ productive members and expressed as a percentage), unemployment, numbers of pensioners, education status and so on. Research on poverty in Ukraine has been conducted and analyzed by government statistical agencies or private research institutes, such as the State Statistics Service of Ukraine, Kiev International Institute of Sociology and the Institute for Demography and Social Studies of the National Academy of Sciences of Ukraine (Grushetsky and Kharchenko 2009). There have been a series of nationwide surveys, such as Ukraine-96, the Ukrainian Longitudinal Monitoring Survey (Lehmann and Terrell 2006) and Life in Transition Survey (Habibov 2010), which have provided rich information on the macroeconomic characteristics of poverty. These surveys have assessed the absolute and relative poverty of the Ukrainian population. The absolute poverty rate in Ukraine was assessed at $4.30 per day by the United Nations and reflected the inability of a person to pay for a minimum consumption basket; relative poverty was indicated when individuals' per capita expenditures were <75% of the median expenditure level, which, in 2014, was set at UAH 1,227 by the Ukrainian Government (Ministry of Social Policies of Ukraine 2015; Paniotto and Kharchenko 2008; National Academy of Sciences of Ukraine (NASU) 2008). In all these large-scale surveys, the construct of poverty was assessed as a dichotomy with a focus on the number (and percentage) of individuals who were below the specific poverty level.

There are regional variations in poverty levels across Ukraine (Cherenko 2008). Although there are limited data on the regional distribution of poverty, numerous Ukrainian Government reports on regional economic development provide some evidence of the economic development in different administrative regions. The State

Statistics Services of Ukraine provides publicly available data using the following indicators: gross domestic product (GDP) per capita, individual income and unemployment rate. Thus, for example, comparison of two regions in Ukraine – Cherkasy and Odessa – based on the reports by SSU, suggests that the GDP per capita of the Cherkasy region was lower than that of the Odessa region by 9.3%, the average monthly wage was lower by 9.0% and the unemployment rate was higher by 3.8% (SSU 2015).

Challenges to assessing poverty in Ukraine

Participant responses to income-related questions in Ukraine often do not accurately reflect actual earnings (Grushetsky and Kharchenko 2009). According to Grushetsky and Kharchenko (2009), household budget surveys in Ukraine have indicated significant differences between household income and expenditures. One of the reasons for this has been that income is consistently underreported in most surveys. In the Ukrainian Longitudinal Monitoring Survey, household expenditures exceeded income by nearly 150% (Grushetsky and Kharchenko 2009). Grushetsky and Kharchenko (2009) suggest that incomes were minimized by many respondents, as they were involved in informal employment and doubted the confidentiality of the surveys. Another factor for underreporting may be lack of time or the inability of the respondents to account for all their supplementary earnings at the time of the interview (Grushetsky and Kharchenko 2009).

Research on poverty in the US and other developed countries suggests that poverty is strongly associated with one's educational level and employment status (Edin and Kissane 2010). However, the relationship between education/employment and household income is significantly affected by cultural, historic and economic factors, which are unique for Ukraine and other post-Soviet countries. The report by the

Institute of Demography and Social Studies suggests that "poverty and the poor in post-socialist countries differ markedly in comparison with other parts of the world, in particular because a significant portion of the post-socialist poor are quite highly educated" (NASU 2008: 8). Indeed, wages are low not only among unskilled workers but also among highly educated professionals. For example, in the healthcare and social services sector, which primarily consists of doctors, nurses and social workers, the average salary in January–November 2015 was UAH 2,722 ($108) per month; in the educational sector, the average salary was equal to UAH 3,038 ($122) per month (SSU 2015). Research by Bruck et al. (2008) suggests that the impact of education on the financial well-being of Ukrainians increased in recent years, with an additional year of schooling contributing to a 4.1% increase of the mean consumption level. Thus, although advanced education may help Ukrainians succeed and obtain a well-paid job, it does not protect against poverty as well as it does in the developed countries.

Examining informal economy and workplace crime in Ukraine, Rodgers, Williams and Round (2008) found that 30% of the respondents received their wages or some part of it as cash in an "envelope," allowing employers to reduce their payroll tax obligations. The researchers suggested that "due to the historical antecedents of the Soviet workplace and the sheer scale of workplace crime in Ukraine, such activities are considered a 'normal' aspect of everyday life rather than criminal activities" (p. 667). In a study on the prevalence of off-the-books entrepreneurs in Ukraine, Williams (2009) found that only 10% of start-up enterprises operated on a wholly legitimate basis, whereas 51% were not registered and conducted all their trade in the informal economy. The former Prime Minister of Ukraine Mykola Azarov argued that in 2011, shadow trade accounted for 40% of the domestic market (InterfaxNews 2011). According to Transparency International (2012), Ukraine was ranked 134 out of 178 countries on the Corruption Perceptions Index for 2010. Widespread corruption, money laundering activities and workplace crime indicate that individual financial well-being may depend not only on the employment status and hours worked but also on the workplace access to the semi-legal or illegal income.

In conclusion, current methods of assessing poverty and economic hardship using the economic approach have the following shortcomings: (1) they are dependent on information on earnings that are subject to distortion in transition countries such as Ukraine; (2) do not capture the unique conditions faced by subgroups in the population such as young adults; and (3) they do not capture economic situations at the household/individual level.

Subjective measures of financial strain
One approach to measuring economic hardship that is more focused on the household/individual level of people's lives and living conditions is as reflected by the extensive work of Conger et al. (2002). In their discussions about family economic hardship and family/youth outcomes, Conger et al. indicated that the association between family economic conditions (e.g., household income, unstable work, debt–asset ratios, employment status, etc.) and parental and family functioning was through family members' experiences of economic pressure (similar in nature to the term financial strain used in this paper). Thus, subjective economic pressure is said to be a key variable in understanding family/youth outcomes more than objective indicators of family economic hardship. Conger et al. (2002) conceptualized economic pressure as a multidimensional construct including: (1) "unmet material needs," (2) "can't make ends meet" and (3)

"financial cutbacks." The subscale, "unmet material needs" was assessed on a four-point response scale (1 = strongly agree; 4 = strongly disagree) about whether family members could afford to meet family needs for housing, clothing, food and medical care, etc. (e.g., My family has enough money to afford the kind of home we would like to have; We have enough money to afford the kind of clothing we should have; We have enough money to afford the kind of medical care we should have). The subscale "can't make ends meet" was assessed by two items that included (1) whether family members had difficulty paying bills during the past 12 months on a five-point scale (1 = no difficulty at all; 5 = a great deal of difficulty) and (2) the amount of money left at the end of the month on a five-point scale (1 = more than enough money left over; 5 = not enough to make ends meet). The subscale "financial cutbacks" was measured using 14 items that asked participants about whether they had to make changes in their expenditures because of financial shortcomings on a "yes" or "no" format (e.g., postponed household purchases, changed food shopping or eating habits to save money).

The measures of economic pressure developed by Conger et al. and by other family researchers (e.g., Hilton and Devall 1997) examine subjective aspects of poverty; however, its use among young adult populations is limited, as it was developed for older adults who are married and/or have children. For example, detailed questions about monthly bills and debt may not be suitable for young adults, and especially for students, as family finances may still be handled by parents and thus young adults may not be aware of certain financial problems.

Development of the measure of financial strain

As indicated earlier, there are currently no measures available that assess financial strain among young adults in the Ukraine.

In the current study, financial strain was conceptualized as the financial adjustments that individuals living in poverty have to make on a frequent basis to meet their basic housing, food and clothing needs. Our conceptualization of financial strain is closely aligned with the conceptualization of "financial cutbacks" from the Conger et al. (2002) study with rural Iowa families (Iowa Youth and Families Project). In addition, we also examined items (e.g., Not enough money for food; Not enough money for clothing) that were used in the World Mental Health Survey (WMHS) (Bromet et al. 2005; Paniotto and Kharchenko 2008). We adapted the list of items from both surveys based on the socioeconomic information drawn from the Ukrainian literature (e.g., the item "Have to use second-hand garments or use hand-me-down garments, because new ones were too expensive to buy" was used instead of "Not enough money for clothing"). A list of 22 items was considered for content validity by a group of university experts and young adults in Ukraine. The final list of eight items (discussed below) was decided upon based on discussions between the first author, Ukrainian faculty experts in the US and young adults in Ukraine. Discussions between all involved indicated that this set of eight items reflected the financial situation of young adults in Ukraine. Although the items from the WMHS survey and the Conger et al measure of "financial cutbacks" were assessed on a yes/no format, based on focus group discussions, it was decided to assess the frequency of financial strain over a one-year period on a five-point response scale (0 = never; 4 = always). Because in our paper we aimed to develop an instrument that would measure the subjective experiences of financial strain among young adults rather than categorize people into two groups (poor vs. not poor), the use of a Likert scale was more appropriate for our research goals. Translation

procedures were based on the recommenda-tions of Sousa and Rojjanasrirat (2011). The items in the newly developed financial strain measure were first translated from English to Ukrainian and to Russian. They were then back-translated to English by two Ukrainian residents who were fluent in Ukrainian, Russian and English. The translated and back-translated versions were compared to check for mismatches in content and meaning of the statements. When there were mismatches, the text was adjusted until there was agreement on the final version of the document. Finally, pilot testing of the pre-final version of the scale in Ukrainian and Russian languages was performed with a sample of Ukrainians who did not speak English.

Outcomes of financial strain

A nationally representative study on the epidemiology of psychiatric disorders in Ukraine conducted within the World Mental Health research program by the World Health Organization suggests a strong link between mental health problems and financial strain (Bromet et al. 2005). The study demonstrated that inadequate financial status predicted mood disorders, which were observed in almost 10% of the surveyed men and 21% of surveyed women. The prevalence of psychiatric disorders, based on 12-month rates, was the second highest (with the US being the highest) for the 14 countries completing the survey. Kharchenko (2010) suggested that in Ukraine, financial strain resulted in social disadvantages and deprivation including the inability to access healthcare services, which, in turn, lead to emotional distress.

The study by Bromet et al. (2005) showed that inadequate financial status was also associated with alcohol disorders among Ukrainians. In addition, financial strain represents a significant vulnerability factor in intimate partner violence (IPV). Ehrensaft et al. (2003) reported that in the US, there was

about a 20% decline in the risk for partner violence for each one-standard-deviation increase in socioeconomic status of the survey participants.

Analytic strategy

Construct validation of the newly developed measure of financial strain was undertaken using a series of psychometric procedures. First, we used exploratory factor analysis (EFA) techniques to ascertain the dimen-sionality of the underlying construct and the strength of factor loadings. Following this initial step, construct validation procedures included examining the nature of the association between items and the under-lying construct across two regions in Ukraine – Cherkasy and Odessa – using simultaneous multiple-group confirmatory factor analyses (CFA). The CFA was con-ducted by examining measurement invari-ance of the measure across the two regions. Finally, the reliability and predictive validity of the measure were also examined.

Sample and Procedure

Full-time students (undergraduate and graduate programs) were invited to take part in this study. It should be noted that 80% of secondary and high school graduates in Ukraine continue their education at higher education institutions (HEI) ('vywinavchal-nizaklady') (Pochtovyuk 2013). In academic year 2011–2012, 76% of HEI students were enrolled in undergraduate and graduate programs, and the rest were enrolled in junior specialist programs (Educational, Audiovisual and Culture Executive Agency 2012). These figures suggest that under-graduate and graduate students represent the majority of the young adult population in Ukraine.

Students were recruited from 11 academic departments at three universities located in Odessa and Cherkasy (the universities and the departments were selected using convenience sampling). In total, 612 students participated

in the survey (from a sampling frame of 625 students; response rate of 98%). From this original sample, 14 participants were excluded from the analysis, because they had skipped over >10% of the survey or did not take the survey seriously (e.g., these individuals either endorsed the midpoint or the extreme ends on the Likert response scale for all the questions). The final sample consisted of 598 students (166 males), including Ukrainians (92.3%), Bulgarians (3.2%), Russians (1.8%) and members of other ethnicities. Participants ranged in age between 18 and 26 years ($M = 19.45$; $SD = 1.15$).

Data were collected in Spring and Summer 2013. Students completed the questionnaires during or after their classes. Respondents were given the option to choose whether they wanted to take the survey in Russian or Ukrainian. Participation in the survey was voluntary; students did not receive any course credits or financial rewards for participating in the study.

Measures
Financial strain
Financial strain was assessed using the eight items of financial strain developed for the current study. The full list of the items is presented in Appendix 1 (available at: http://www.longwoods.com/content/25152). The Russian and Ukrainian versions of the questionnaire are available upon request.

Psychosocial outcomes
The following four aspects of psychosocial outcomes were assessed: emotional distress, positive affect, alcohol use and IPV. Emotional distress was measured using 17 items on depression and anxiety symptoms (e.g., "uncontrollable crying," "anxiety attacks") from the Trauma Symptoms Checklist 40 (TSC-40; Briere 1996). Responses were provided on a four-point scale (0 = never; 3 = often) ($M = 0.84$; $SD = 0.53$). Cronbach's alpha was 0.87. To measure positive affect, the participants were

asked to report on a five-point scale (0 = none of the time; 4 = all of the time) how much time during the past 30 days they felt "cheerful," "in good spirits," "extremely happy," "calm and peaceful," "satisfied" and "full of life" ($M = 2.66$; $SD = 0.67$). Cronbach's alpha was 0.90. Alcohol use was measured using the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al. 1993). The measure included 10 items (e.g., "How often do you have a drink containing alcohol?"). Responses to eight questions were rated on a five-point scale (1 = never; 5 = daily or almost daily) and the rest on a three-point scale (1 = no; 3 = yes, during the last year) ($M = 0.40$; $SD = 0.45$). Cronbach's alpha was 0.81. Intimate partner violence was assessed using 20 items (e.g., "Slapped my partner") of the Revised Conflict Tactics Scales (CTS2; Straus et al. 1996). Participants reported on how often they had engaged in violent acts over the past year on a seven-point scale (0 = never being violent; 6 = being violent more than 20 times) ($M = 0.75$; $SD = 0.79$). Cronbach's alpha was 0.89.

Results
Before beginning the analyses, we examined the percentage of missing data. Only 1% was missing and the data were determined to be missing at random. Hence, multiple imputations using the expectation maximization technique were conducted to replace the missing values (Little and Rubin 1987). We also examined skewness and kurtosis of the variables. All items met the assumptions for univariate normality with the exception of the violence and alcohol use scales. These two scales were log-transformed.

Exploratory factor analysis
Using a randomly drawn sample of 249 (42%) from the sample of 598 participants, we ascertained the dimensionality and strength of factor loadings of the financial strain scale. The eight items of the scale were subjected to maximum likelihood (ML) method of

extraction. The intercorrelations among the eight items were >0.30 (with the exception of two correlations). The Kaiser–Meyer–Olkin value was 0.87 (higher than the recommended value of 0.60). The Bartlett's test of sphericity was also statistically significant. These findings pointed to the appropriateness of the data for factor analysis. ML analysis indicated the presence of one factor (eigenvalues exceeding 1) explaining 42.49% of the variance. Inspection of the scree plot also indicated the presence of a single factor of financial strain. In addition, all factor loadings loaded ≥0.39 and hence all items were retained for the CFA analysis.

Multiple-group confirmatory factor analyses – measurement invariance

Measurement invariance was assessed following guidelines suggested by Dimitrov (2010). The following four progressively restrictive models were tested (1) *configural invariance*, which was examined by specifying the financial strain items on to a single latent construct for each region (similar pattern of factor loadings); in this model, all parameters were allowed to vary freely across regions; (2) *metric invariance*, was examined by setting the factor loadings to be equal across the two regions, while allowing other parameters to vary freely across regions; this model examined whether the strength of the factor loadings was the same across the two regions (weak measurement invariance); (3) *scalar or intercept invariance* was examined by constraining the item intercepts and the factor loadings across the two regions; this model examined whether the strength of the factor loadings and item intercepts was similar across the two regions (strong measurement invariance); and (4) *factor invariance* that was examined by constraining the factor loadings and latent factors across the two regions.
Model fit for each of the models was assessed separately by using multiple fit indicators. In addition to the chi-square statistic (χ^2) and

the associated *p*-value, descriptive fit indexes such as the comparative fit index (CFI), Tucker–Lewis Index (TLI) and Root Mean Square Error of Approximation (RMSEA) were also used to evaluate each of the models. Nonsignificant chi-square, CFI values ≥ 0.95, TLI ≥ 0.95 and RMSEA ≤ 0.06 (Hu and Bentler 1999) were considered criteria for good model fit. Values of at least 0.90 for CFI and TLI are considered acceptable (Bentler 1990) as are values <0.08 for RMSEA (Hu and Bentler 1999). Information from the different model fit indices was jointly considered to examine the acceptability of the models (at least criteria for two out of three fit indices needed to be met). In addition to determining individual model fit, we also compared competing pairs of models using the chi-square difference test and changes in normed fit index or change in the incremental fit index. Change in CFI ≤ 0.01 was considered necessary to ascertain if the more restrictive model was superior to the less restrictive model (Cheung and Rensvold 2002).

Means, standard deviations, unstandardized and standardized factor loadings for items on financial strain are indicated in Table 1. In the preliminary run, findings indicated that the data were multivarate nonnormal and hence the bootstrap resampling procedure (to account for the underestimation of standard errors that occurs with skewed distributions) within AMOS (using 2,000 bootstrap samples) was used to estimate model test statistic *p*-values and parameter standard errors (Efron and Tibshirani 1993; Nevitt and Hancock 2001).

Configural invariance
The one-factor solution of financial strain items indicated acceptable model fit for both regions and supported configural invariance (χ^2 = 170.163; *df* = 40; RMSEA = 0.07; CFI = 0.933; TLI = 0.907) (Table 2). Factor loadings for both regions were statistically significant (≥0.45 for both groups).

Table 1. Item means, *SD*s, and unstandardized and standardized factor loadings of the financial strain scale for Odessa and Cherkasy samples

Financial strain items	Odessa			Cherkasy		
	Beta	β	Mean (*SD*)	Beta	β	Mean (*SD*)
EHQ3	1.319***	0.478	1.10 (1.16)	1.150***	0.453	1.24 (1.18)
EHQ4	1.904***	0.821	0.73 (0.97)	1.927***	0.778	0.98 (1.15)
EHQ5	1.727***	0.811	0.56 (0.89)	2.008***	0.855	0.85 (1.09)
EHQ6	1.995***	0.843	0.75 (0.99)	2.098***	0.894	0.99 (1.09)
EHQ7	1.964***	0.728	1.36 (1.13)	1.936***	0.720	1.41 (1.25)
EHQ8	0.911***	0.464	0.42 (0.823)	1.197***	0.568	0.65 (0.98)
EHQ1	1.000	0.492	0.59 (0.652)	1.000	0.446	0.99 (1.04)
EHQ2	0.711***	0.481	0.32 (0.62)	0.846***	0.489	0.54 (0.80)

β = standardized beta; Beta = unstandardized Beta weight; *SD* = standard deviation.
Note: Factor loading for EHQ1 was fixed at 1. ***$p < 0.001$.

Table 2. Fit statistics for the measurement invariance models for the financial strain scale for the Odessa and Cherkasy samples

Invariance models	χ^2	*df*	*p*	CFI	TLI	RMSEA	Δ *df*	Δ χ^2	Δ *p*	ΔNFI	ΔCFI
Configural	170.163	40	<0.001	0.933	0.907	0.074					
Metric	178.177	47	<0.001	0.933	0.920	0.068	7	8.013	0.331	0.004	0.000
Scalar	222.807	55	<0.001	0.914	0.913	0.072	8	44.630	0.000	0.023	0.019
Factor	184.709	48	<0.001	0.930	0.918	0.069	1	6.532	0.011	0.003	0.010

χ^2 = chi-square; CFI = comparative fit index; *df* = degrees of freedom; RMSEA = root mean square error of approximation; TLI = Tucker–Lewis index; NFI = normed fit index.

Metric invariance

The strengths of the factor loadings were similar or equivalent across the two regions supporting the acceptability of the metric invariance model ($\chi^2 = 178.177$; *df* = 47; RMSEA = 0.068; CFI = 0.933; TLI = 0.92). Although the chi-square difference test was significant, findings indicated that the metric invariance model was a good fit to the data compared with the configural invariant model.

Scalar invariance

The scalar invariance model was supported as indicated by the acceptability of the fit indices ($\chi^2 = 222.807$; *df* = 55; RMSEA = 0.072; CFI = 0.914; TLI = 0.913). When this model was compared with the metric invariance model, results indicated that the chi-square difference test was significant and the change in CFI was ≤0.019. The scaler invariance model was not a superior fit to the data compared with the metric invariance model.

Factor variance invariance

The factor invariance model was supported as indicated by the acceptability of the fit indices ($\chi^2 = 184.709$; *df* = 48; RMSEA = 0.069; CFI = 0.930; TLI = 0.918). When this model was compared with the metric invariance model, results indicated that the chi-square difference test was significant and the change in CFI was ≤0.01. The factor invariance model was a good fit to the data compared with the scalar invariant model.

In summary, the financial scale indicated configural, metric and factor variance invariance across regions. Model fit statistics were acceptable across all different models of invariance, although the change in chi-square value was significant when comparing different measurement invariance models; the change in CFI was ≤0.01 (exception of the scalar invariance and metric invariance model comparison). After examining the Lagrange multiplier tests, three item intercepts were freed to vary across regions (wear torn/damaged shoes [item 2], unable to buy dairy products [item 5] and unable to pay mortgage/house rent [item 8]). Doing so resulted in a change in CFI of ≤0.01. Although these three items could be included with the other five invariant items (given that they indicated configural, metric and factor variance invariance), a more appropriate approach would be to exclude items 2, 5 and 8 from the measure of financial strain when comparing financial strain across regions.

Reliability and predictive validity

Reliability analysis indicated that the Cronbach alpha for the scale was 0.80. To assess the predictive validity, the associations between financial strain and outcomes were examined (Table 3). Significant positive correlations were observed between financial strain, emotional distress and IPV. Financial strain was negatively correlated with positive affect but not with alcohol use.

Financial strain and demographic characteristics

Financial strain was examined across several demographic characteristics. An independent-samples t-test showed significant gender differences (males: $M = 0.89$; $SD = 0.83$; females: $M = 1.05$; $SD = 0.80$; $t(598) = -2.16$; $p < 0.05$). The magnitude of the differences in the mean was very small (eta-squared = 0.008), indicating that only 0.8% of the variance in financial strain was explained by sex. Positive correlation was observed between financial strain and age ($r = 0.16$; $n = 598$; $p = 0.01$). The level of financial strain varied depending on the city where the participants studied (Odessa: $M = 0.9$; $SD = 0.77$; Cherkasy: $M = 1.12$; $SD = 0.85$; $t(598) = -3.24$, $p = 0.001$); however, the geographic location explained only 1.7% of the variance in financial strain (eta-squared = 0.017).

Discussion

This study proposed a new measure of financial strain among young adults in Ukraine. The scale represents the first instrument that allows researchers to capture financial conditions specific to young Ukrainians. The new financial strain scale has several advantages over the existing measures used in Ukraine. First, unlike the objective indicators of poverty that provide aggregate data on economic hardship of Ukrainians (NASU 2008), the new scale allows researchers to examine poverty at the individual level.

Table 3. Associations between financial strain and outcomes

	Mean	SD	1.	2.	3.	4.
1. Financial strain	1.00	0.81				
2. Emotional distress	0.85	0.53	0.34**			
3. Positive affect	2.65	0.66	−0.31**	−0.50**		
4. Alcohol use	0.13	0.11	0.08	0.11**	−0.04	
5. Violence against romantic partner	0.21	0.16	0.14**	0.29**	−0.09*	0.31**

SD = standard deviation. *$p < 0.05$; **$p < 0.01$.

Second, the scale assesses individual or family financial situations more accurately than traditional criteria such as household income, parental education and employment. Indeed, as discussed above, because of the widespread informal economy and wages paid in cash, income is often underreported and thus cannot be a reliable indicator of financial strain. Similarly, parental employment status may be classified incorrectly when the official employment status does not match with the actual employment (e.g., when a person who is registered by the government as unemployed works full-time). Because social and economic characteristics of Ukraine are similar to many other Eastern European countries in transition, we suggest that the new measure may be used in several other post-Soviet countries, such as Russia and Belarus.

EFA and CFA, as well as predictive validity and reliability analyses, were performed to examine the psychometric properties of the new scale. EFA suggested the unidimensional nature of the scale, with all items being positively correlated with each other. The CFA of the scale indicated configural, metric and factor invariance across the southern and central regions of Ukraine. The analysis also showed that the measurement properties of the scale would improve if items 2, 5 and 8 were removed from the scale. To examine predictive validity, we tested the associations between financial strain and psychosocial outcomes. As expected, we observed relationships between financial strain and such outcomes as emotional distress, positive affect and IPV. Financial strain did not correlate with alcohol use. Overall, the scale showed good predictive validity.

The financial strain scale has the following limitations, which should be addressed in future research. Our sample was limited to university students and did not include those who dropped out of college and whose education was limited to vocational training. In addition, our sample was limited to southern and central Ukraine; psychometric properties of the scale across other regions in Ukraine should be examined in future studies. Psychometric characteristics of the scale should be tested cross-culturally to assess whether the scale is suitable for measuring financial strain among young adults in other Eastern European countries in transition.

In recent years, challenges of poverty and financial strain have become even more of a concern for Ukrainian families given the uncertainties of war and political and economic turmoil. In these situations, young adults in college may experience even greater financial strain than in earlier years because their families may have fewer economic resources to share with their young adult children. We consider that our newly developed measure of financial strain is appropriate for use with young adults in Ukraine and in other Eastern European countries. Use of this measure will help researchers better understand the nature and experiences of young adults' financial strain.

Notes
1. Equals US$177 as of 2 June 2015, according to the exchange rate by the National Bank of Ukraine.
2. Equals US$221 as of 31 December 2014, according to the exchange rate by the National Bank of Ukraine.

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