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Exploratory and confirmatory factor analyses and invariance assessment of the perceived powerlessness scale among youth in Baltimore

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Abstract

Generalized perceived powerlessness is an important psychosocial construct that determines a wide range of health behaviors and outcomes. This study has two aims: (1) examine the structure of the newly developed perceived powerlessness scale using exploratory and confirmatory factor analyses and (2) assess the scale's invariance across key demographic variables using multi-group confirmatory factor analysis among a random household sample of African American and White youth (aged 15–24 years) residing in Baltimore, MD. Our study results demonstrated that the powerlessness scale is valid among a demographically diverse sample of urban youth, showing promise for use in future health behavior and outcome studies.

Keywords

adolescence; perceived control; race; validation; youth

Introduction

An individual's perception of powerlessness, or conversely of control, plays a central role in determining his or her well-being (Bandura, 2004). The relationship between perceived powerlessness, and health behaviors and outcomes are well established. Specifically, feeling powerless has been linked to adverse health outcomes and behaviors such as obesity and

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Declaration of Conflicting Interests

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chronic diseases (Hemmingsson, 2014; Infurna et al., 2017), decreased self-care (Hernandez et al., 2016), lower exercise levels (Gierc et al., 2016; Tulloch et al., 2017), mental health disorders (Goodman et al., 2009; Guerra et al., 2017; Paradies and Cunningham, 2012), and substance use (Kearns et al., 2017; Morgenstern et al., 2016). Individuals with higher powerlessness set lower goals, exhibit lower persistence in engaging in healthy behaviors, and perceive social and structural impediments to the changes they seek to be insurmountable, ultimately negatively impacting their well-being in various ways (Bandura, 2004). Perceived powerlessness may be especially relevant for youth since they have higher levels of perceived powerlessness when compared to adults (Lewis et al., 1999; Mirowsky and Ross, 2003). As youth become older, they gain autonomy and socioeconomic standing, thereby increasing their sense of control (Lewis et al., 1999).

For the purpose of this study, we conceptualized the construct in broad and inclusive terms and defined perceived powerlessness as “the belief that one can[not] determine or control one’s own internal states and behavior, influence one’s environment, and/or bring about desired outcomes” (Wallston et al., 1987). Self-efficacy is a widely used construct in the public health literature; we define perceived powerlessness more broadly than self-efficacy as it refers not only to behavior but also to an individual’s sense of control over internal feelings and external events or outcomes.

Perceived powerlessness can be either generalized or it can specifically reference a behavior or event. The generalized form of the construct is more distal and an example item is “sometimes I feel that I am being pushed around in life.” In contrast, powerlessness that is specific to a behavior or event is more proximal and examples include powerlessness in smoking cessation (Nair et al., 2017; Pinsker et al., 2017), sexual risk reduction (Ashcraft and Murray, 2017; Closson et al., 2017), chronic disease management (Grinslade et al., 2015; Tregua et al., 2016), and weight control (Sarge and Knobloch-Westerwick, 2013; Wilson et al., 2016). This study was interested in the generalized form of the construct. In the context of public health interventions, targeting the generalized construct can potentially be more effective in preventing a wider range of health behaviors. For example, targeting powerlessness in condom negotiation may improve condom use but not multiple partners and also may not address the more distal causes of sexual risk such as power differences between men and women in romantic relationships.

There are a dearth of studies that have recently validated the generalized perceived powerlessness construct among the general US adult population, and even fewer among youth. Looking at perceived powerlessness and other similar constructs (e.g. generalized self-efficacy, agency, and control), previous validation studies found various factor structures. One study among university students found a three-factor structure based on temporal orientation: past, current, and future perceived powerlessness (Frazier et al., 2011). Another study among university students found a two-factor structure with positive control versus negative control (i.e. powerlessness; Tapal et al., 2017). A study among younger adolescents found a four-factor solution based on type of experience: new experience, difficult situations, managing personal issues, and responsibility (Passmore, 2004).

The primary objective of this study is to examine the factor structure of a newly developed generalized perceived powerlessness scale through psychometric testing. The scale was developed for youth who have recently transitioned or currently transitioning into adulthood and includes developmentally appropriate domains such as powerlessness in school. Scale development also took into consideration the specific structural context of Baltimore City. Baltimore City has low educational attainment with 68 percent of the population that attained a high school diploma or equivalent. Baltimore also ranks low in labor force participation with just over half (57%) of the adult population in the labor force and with 8 percent of the population unemployed. Baltimore's median income is lower than the national average and ranks 87th among the 100 largest cities in the United States. Baltimore's poverty rate is higher when compared to other cities (Brookings Institution Center on Urban and Metropolitan Policy, 2003). Youth in Baltimore also face significant barriers to their well-being; between 2009 and 2015, juvenile homicides increased by nearly 50 percent and teen pregnancy rates, while decreasing compared to previous years, are still high at 41 percent according to the Maryland Health Department (Baltimore City Health Department, 2016). While this study's scale adapts three items from previously developed scales, we have added items that are developmentally specific for youth as well as items that are reflective of the structural realities of Baltimore City.

Perceived powerlessness is often determined by an individual's social position, including his or her socioeconomic status (SES), race/ethnicity, and gender (Falci, 2011; Gilster, 2016; Pieterse and Carter, 2010; Ross, 2011; Stock et al., 2017). Restrictions in access to resources and power that derive from social disadvantage can result in a profound sense or perception that one's life outcomes are not responsive to his or her efforts and choices (Pearlin et al., 1981; Wheaton, 1980). Perceived powerlessness exists on a continuum and can exist among socially privileged individuals (or conversely be absent among the disadvantaged), but it is the magnitude of this perception that varies according to social position (Bell and Hetterly, 2014; Stock et al., 2017). Given this influence of race/ethnicity, gender, and SES on perceived powerlessness and the pronounced levels of structural inequalities some of our study participants may face in Baltimore City, the secondary aim is to assess the scale's invariance across these three demographic variables. This study contributes to the literature through establishment of factor structure and assessment of measurement invariance of a novel perceived powerlessness construct for its future use among youth across different demographic groups in health behavior and outcome studies.

Methods

Participants and procedures

The current analysis stems from a longitudinal household study of youth, aged 15–24 years. Data were collected from February 2011 through May 2013 and yielded a baseline sample of 350 participants and a 6-month follow-up sample of 257. The target population consisted of African American and White, English speaking, sexually active persons between the ages of 15 and 24 who resided in Baltimore City. The objective of the parent study was to examine how gender roles shape sexual risk behaviors, and accordingly, the eligibility

criteria for the study specified that participants have had sex within the past 6 months. The limitations of these eligibility criteria are later addressed in the “Discussion” section.

Investigators employed a stratified sampling design by census block groups (CBGs) to allow for oversampling in areas with high concentrations of the target population. A probability-based sample of residential mailing addresses was then generated within each CBG. Enumeration was conducted by telephone for sampled households with available phone numbers (33%) or, if not, in-person by trained research assistants. If age-eligible individuals lived within the household, screening was conducted to determine eligibility. In selected households with more than one age-eligible person, one was randomly selected for screening. Parental/guardian informed consent and adolescent informed assent were obtained for individuals younger than 18 years old. Informed consent was obtained for individuals 18 years or older. Of the 12,000 households that were sent letters, 10,509 were successfully contacted. Of those who were contacted, 281 households had participants who met our study eligibility criteria, and 237 households agreed to participate (84%). Consented and enrolled participants were administered an audio computer-assisted self-interview (A-CASI) in a private setting. The A-CASI survey captured information on demographics, perceived powerlessness, various psychosocial variables (e.g. social support and gender attitudes), and individual- and partner-related sexual risk behaviors (e.g. condomless sex). The study was approved by the Institutional Review Board of the Johns Hopkins Bloomberg School of Public Health.

Measures

Perceived powerlessness—The 12-item perceived powerlessness scale was developed by the study team to reflect an urban context such as Baltimore, characterized by lack of educational and economic opportunities as well as high levels of poverty and violence (Centers for Disease Control and Prevention, 2013; Polk et al., 2011; Sibinga et al., 2016). The scale directly borrowed and adapted items from pre-existing scales that are generalized and do not have any specific reference to a domain (Pearlin et al., 1981; Shaw and Krause, 2001). The scale also included items referencing structural domains that would be salient to the study population: school or job, political participation (i.e. voting), and finances. An example of a generalized item from the scale was “When I have a problem, I do not feel confident I can solve it.” An example of an item referencing a structural domain (e.g. school or job) was “Working hard in school or on the job does not guarantee better opportunities later on.” Even though structural domain items are more specific than the generalized items, they are still generalized since they do not reference a specific health behavior or outcome. All items in the scale were negatively worded (i.e. a statement indicating powerlessness rather than positive control). The scale had responses rating on a 4-point Likert-type scale (1 = strongly agree; 2 = somewhat agree; 3 = somewhat disagree; 4 = strongly disagree). Items were reverse coded so that higher scores indicated greater perceived powerlessness.

Demographic and psychosocial characteristics—We collected a range of demographic data from participants, including gender (male vs female), race/ethnicity (African American vs White), and SES (low vs high). For SES, we employed a subjective construct (i.e. perceived SES). Perceived SES was measured using an image of a ladder with

10 rungs (values ranging from 1 to 10 with 1 indicating higher perceived SES); participants were asked to place themselves based on where they think they stand in society in terms of money, education, or jobs (Adler et al., 2000; Demakakos et al., 2008). The scores were then dichotomized as low SES (>6) versus high SES (<6). For descriptive purposes only, a summary perceived powerlessness score was created by adding up individual items scores, divided by the total number of items, and dichotomized at the median (<1.9 : low vs ≥ 1.9 : high) for ease of interpretation. Additional psychosocial variables for descriptive analyses included depressive symptoms (Center for Epidemiologic Studies Depression Scale (CESD-R): <16 (below clinical threshold) vs ≥ 16 (mild to severe); Eaton et al., 2004), ever arrested (yes vs no), and grew up without a dad (yes vs no).

Analytical strategy

Differences in key demographic and psychosocial variables by perceived powerlessness level were examined via Pearson's chi-square tests for binary variables and t -tests for continuous variables with significance set at $\alpha < 0.05$. Descriptive analyses were conducted in STATA, Version 13 (StataCorp, 2013).

We took an inductive approach to determine how to best conceptualize perceived powerlessness based on the data. Accordingly, we conducted a principal components analysis (PCA) on a polychoric correlation matrix, and subsequently, exploratory factor analysis (EFA) on the baseline data. Although the categorical indicators showed a non-multivariate normal distribution, we proceeded with a polychoric correlation matrix as the study team had no theoretical reasons to believe that the underlying latent variable is non-normal (Muthen, 1984). The number of factors was determined via the following criteria: Eigen values greater than 1.0 (Chubb et al., 1997), percent variance explained, scree plot (Pieterse and Carter, 2010), and parallel analysis. EFA was then conducted using a promax rotation and a maximum likelihood estimator (Kaiser, 1974). Items were considered for dropping if they had high levels of uniqueness (>0.50), if they did not load highly on one factor (>0.40 ; Goodman et al., 2007; Lien et al., 2001) and by examining the substantive content of the items. Once items were dropped, PCA and EFA were re-conducted to ensure that adequate uniqueness values and factor loadings were achieved. Sampling adequacy was examined using Bartlett's test of sphericity and Kaiser–Meyer–Olkin (KMO). A KMO value of greater than 0.90 and a Bartlett's p -value <0.05 indicate satisfactory compatibility of the indicators (Kaiser, 1974).

Next, a confirmatory factor analysis (CFA) was conducted on the baseline and follow-up samples separately to test the validity of the models proposed by the EFA. A weighted least squares mean and variance (WLSMV) estimator was used, as recommended as with categorical indicators whose distribution is not multivariate normal (Muthen and Muthen, 1998-2005). Adequacy of model fit was assessed using the root-mean-square error of approximation (RMSEA), with values of <0.06 as indicating good fit (Hu and Bentler, 1999). In addition, the Tucker–Lewis index (TLI) and comparative fit index (CFI) values of >0.95 were used to denote good fit (Hu and Bentler, 1999). We used the modification indices and theoretical considerations to assess whether correlating any of the item residual errors would significantly improve model fit and substantively change the parameter estimates. We

did not find any pairs of item residual errors meeting those criteria, and therefore, present a final model without correlated item residuals. PCA and EFA were performed using Stata 13 (StataCorp, 2013). Reliability was assessed via Cronbach's alpha. CFA was performed using MPlus Version 7 (Muthen and Muthen, 1998-2005).

In order to assess measurement invariance by gender, race/ethnicity, and SES, we performed multiple-group CFA using baseline data. We first estimated an unconstrained model in which all the loadings and thresholds were allowed to vary. Next, a constrained model was fit, wherein the loadings and thresholds were set to be equal across groups. We then performed a robust chi-square model difference test using the MPlus DIFFTEST function. Although not explicitly a part of the objectives of this study, we also repeated the CFA in the follow-up sample and assessed measurement invariance across time comparing the baseline against the follow-up sample to ensure that participants were responding to the construct in the same way at two different time points.

Results

Table 1 lists the results of the descriptive analyses. The mean age of the sample ($N = 350$) at baseline was 21 years old and the majority of the sample identified as African American (65%), and female (62%). About half of the sample (58%) perceived their SES as low. Other psychosocial characteristics reflected the structural context of the Baltimore population: nearly 38 percent of the sample reported mild to severe depressive symptoms, 21 percent had ever been arrested, and 70 percent indicated growing up without a father figure. The median score for the perceived powerlessness scale at baseline was 1.9 (interquartile range (IQR): 1.6–2.4) with higher scores indicating greater levels of perceived powerlessness. There were no differences in perceived powerlessness scores by demographic and psychosocial characteristics with the exception of depressive symptoms (i.e. high powerlessness individuals were more likely to report mild to severe depressive symptoms; $p < 0.001$) and lifetime arrest (i.e. high powerlessness individuals were more likely to have been arrested; $p = 0.041$).

EFA

The results of the initial PCA and scree plot conducted on the baseline sample for the perceived powerlessness scale indicated that the scale has a three-factor structure—present perceived powerlessness (“present”), future perceived powerlessness (“future”), and financial perceived powerlessness (“money”). However, items 3, 5, and 12 (refer to Table 2) exhibited high uniqueness values (>0.50) and did not load highly (>0.40) on one factor. These three items were the only items that did not reference oneself; they referenced “we” and “people” rather than “I.” Therefore, based on uniqueness values, factor loadings, and item wording, items 3, 5, and 12 were dropped from the scale. PCA and EFA were re-run, and again, the results indicated a three-factor structure. The percent variance explained improved from 63 percent (12-item scale) to 75 percent (9-item scale). The KMO value was 0.847 with chi-square value ($\chi^2 = 977.061$), and Bartlett's test of sphericity was significant ($df = 36, p < 0.001$), indicating acceptable level of compatibility among the nine items. Cronbach's alpha for the nine-item scale was 0.83, indicating acceptable reliability. Alpha

for the present and future powerlessness factors were 0.77, and 0.66 for financial powerlessness. Results of the final EFA are presented in Table 2.

CFA

We present the results of the CFA performed on the baseline sample here since results were comparable between baseline and follow-up samples. We specified a second-order single-factor model (“power”) and a first-order three-factor model (“future,” “present,” and “money”) for the CFA based on a priori theoretical considerations. Figure 1 gives the standardized parameter estimates for the second-order single-factor model (baseline only). The model fit indices of the baseline sample suggested that the model was a good fit to the data with the exception of RMSEA: degrees of freedom (df) = 24, chi-square (χ^2) = 75.073, RMSEA = 0.078, CFI = 0.976, and TLI = 0.964. Model fit indices for the follow-up sample similarly suggested a good fit with the exception of RMSEA and TLI values: df = 24, χ^2 = 84.660, RMSEA = 0.100, CFI = 0.952, and TLI = 0.929 (Table 2).

Invariance analyses

The chi-square differences by gender, SES, and time point were not significant ($p = 0.219$; $p = 0.496$; $p = 0.993$, respectively) for the perceived powerlessness scale. This suggests that the larger, unconstrained model does not statistically significantly differ from the smaller, constrained model, and therefore, measurement invariance can be assumed. However, the chi-square test for measurement invariance by race/ethnicity was significant ($p < 0.001$), indicating measurement non-invariance.

Table 3 displays results of the invariance testing by race/ethnicity of the perceived powerlessness scale. We see that for the perceived powerlessness scale factor loadings are generally higher for the future factor and lower for the present factor among White youth. Item 6 is also noticeably higher among White youth compared to African American youth. The model fit for the perceived powerlessness scale was comparable between the two groups.

Discussion

The results of this study indicate that the proposed perceived powerlessness scale is a valid measure of the construct among a demographically diverse, urban youth population. We a priori specified a model in which the scale was unidimensional on the second order and multidimensional on the first order. That is, there were three distinct latent variables on the first order and those three dimensions were explained by another underlying latent variable at a higher order—perceived powerlessness.

To our knowledge, this scale is one of the first to be developed for youth and for an urban context in which there are high levels of poverty and lack of access to jobs and education. Despite the scale having integrated generalized and structural domain items, results of the EFA and CFA indicated that these two different sets of items were explained by one latent factor. In terms of the first-order factors, we would have expected to find a “general” factor (i.e. generalized items) and three separate structural domain factors (i.e. school/job, political

participation, and finances/money). Instead, the EFA revealed three factors: “present,” “future,” and “money.”

The first of these two were related to temporal orientation—feeling powerless in the present versus feeling powerless about the future. The third factor related to feeling powerlessness about one’s financial situation (“money”), potentially reflecting the salience of financial concerns to our study population above and beyond other structural factors. Very few researchers have considered the importance of time in the delineation of the perceived powerlessness (Frazier et al., 2011). Wallston et al. (1987) theorized that those who feel powerless about the past are troubled by the causes of their health problems (Wallston et al., 1987). Conversely, those who feel powerless about the future feel less equipped to find solutions their health problems. Therefore, making this temporal distinction enables practitioners to potentially identify and target those who may not feel responsible for getting a disease, but believe they have control in how they respond to their illness.

In line with previous scholarly work, results of the invariance testing indicated that invariance by race/ethnicity was not supported. Differences in factor loadings between groups could occur if the meaning or salience of the construct differs across those groups (Vares et al., 2015). Factor loadings were higher for three of the four “future” items among White youth compared to African American youth. Conversely, factor loadings were higher for all three of the “present” items among African American youth. A study looking at temporal orientation among White and African American individuals found that African American individuals may be more present-oriented in their health beliefs when compared to White individuals (Brown and Segal, 1996). Several scholars have theorized that the present-oriented mind-set and beliefs among some African American individuals is likely a psychological response to the uncertain nature of their environment that stems from their marginalization (Brown and Segal, 1996; Houston, 1990; Jones, 1988). It is not that African American youth are inherently present-oriented, but rather that the experiences of discrimination and limited opportunities as a social group create a sense of elusiveness for controlling future behaviors and outcomes. Ethnographic work with urban African American youth has shown that this sense of powerlessness in the future is not uniform within the group or even within a person (Tsui et al., 2008). An individual may feel powerless about future economic opportunities but not feel powerless about other domains. Therefore, our results on temporality must be interpreted with caution.

When we look closely at the wording of the financial perceived powerlessness items, we also see that one item refers more to present concerns (item #4) and the other is more future oriented since it is about saving money (item #6). In line with patterns of the “present” and “future” factors, the factor loadings were higher for present financial concerns and lower for future financial concerns among African American youth. In short, results of the invariance testing may again be supporting the notion that temporal orientation may be playing a role as it was during assessment of the factor structure. Understanding that perceived powerlessness may work through racial/ethnic-specific mechanisms can help with the development of tailored interventions.

In contrast to race/ethnicity and contrary to our hypothesis, invariance across gender and SES was supported, implying that both male and female (or low and high SES) participants were using the same underlying framework and metric when responding to the scale (Bruce and Thornton, 2004; Chubb et al., 1997; Shaw and Krause, 2001). Measurement and threshold invariance ensure that any group differences in perceived powerlessness is reflective of real differences of the construct and not measurement artifacts. There are a dearth of studies looking at measurement invariance across gender and possibly none across SES. One study found that a perceived powerlessness measure was invariant across gender in an adolescent Chinese population (Leung and Leung, 2011).

The study was characterized by several limitations. Our study employed a subjective measure of SES while an objective measure such as family income would have greatly enhanced our analyses. In line with the overall aim of the parent study, our study sample only included recently sexually active participants, which may have biased results away from the null. The use of A-CASI may have resulted in biases associated with self-reported data; still, A-CASI may have reduced social desirability bias on sensitive questions compared to interviewer administered instruments. All items in the perceived powerlessness scale were negatively worded, yet studies have demonstrated that negative items can affect the internal consistency of the scale and that positive items are sufficient for validly measuring a construct (Solis Salazar, 2015; Van sonderen et al., 2013). Our results indicated that temporal orientation is an appropriate way to conceptualize perceived powerlessness, but none of the items included references to feeling powerless about the past. Finally, the perceived powerlessness scale was developed for administration among urban youth and may not be widely applicable to adults or to individuals living in non-urban areas.

The study also had several strengths. A demographically diverse and longitudinal sample allowed for testing of measurement invariance across race/ethnicity, gender, SES, and time. The scale is one of the first to measure perceived powerlessness among urban youth facing immense structural constraints. There were also several methodological strengths to study. We treated and analyzed the indicators as categorical, which many studies often do not do, despite having employed ordinal items that do not have a multivariate normal distribution. We used both EFA to explore the number of factors and their substantive meaning and then subsequently tested the factor structure using CFA rather than using just EFA or CFA alone. Finally, we conducted the CFA on both baseline and follow-up samples, which strengthen the interpretation of our results.

Future scale development should consider items assessing powerlessness in the past to allow for a more complete representation of all domains (Kane, 2006; Messick, 1989) and should ideally include only positive items (Solis Salazar, 2015; Van Sonderen et al., 2013). A shorter form of this scale by inclusion of single items in each domain is also suggested. Future work, especially through the use of qualitative inquiry, should aim to clarify cultural nuances of how the construct is perceived among African American youth and subsequently how perceived powerlessness may differentially influence health behaviors across racial groups. Future studies involving latent constructs and demographically diverse samples should continue to test for measurement invariance across groups especially with a construct like perceived powerlessness that is inextricably linked to social identities, even if doing so

means that the scale's use becomes more limited and analyses involving the scale become more complex.

Conclusion

Our results showed that the perceived powerlessness scale can be treated as a valid instrument to assess perceived powerlessness among urban youth. Structural domains, in addition to the generalized items, are relevant in measurement of this construct among urban youth. The results of this study also support its use as valid measures across gender and SES. However, invariance across race/ethnicity was not supported, meaning direct comparison of group differences in perceived powerlessness by race/ ethnicity should not be made. There is great potential for the use of the scale in future health behavior and outcome studies among urban youth and especially among those who live in disadvantaged neighborhoods with limited economic and educational opportunities. Interventions aiming to increase one's level of perceived power may not only increase engagement in healthy behavior, but they might also reduce health disparities among those who occupy low social status.

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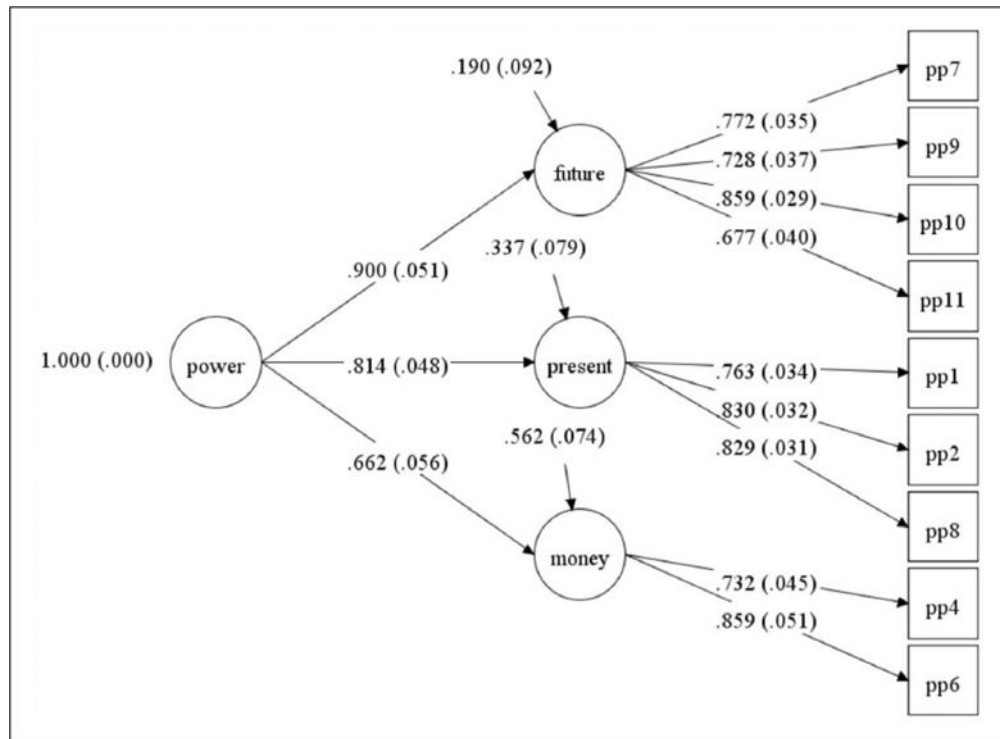


Figure 1. Standardized parameter estimates of the second-order single-factor model of the perceived powerlessness scale at baseline. Values in parentheses are standard errors of the parameter estimates.

Table 1
Participant characteristics by low versus high perceived powerlessness^a at baseline (*N* = 350).

	Total		Low powerlessness		High powerlessness		<i>p</i> -value
	<i>n</i>	(%)	<i>n</i>	(%)	<i>n</i>	(%)	
Age (mean, SD)	21.0	(2.6)	21.0	(2.6)	21.0	(2.5)	0.945
Gender							
Female	218	(62.3)	101	(47.0)	114	(53.0)	0.717
Male	132	(37.7)	58	(45.0)	71	(55.0)	
Race/ethnicity							
African American	228	(65.1)	110	(49.1)	114	(50.9)	0.142
White	122	(34.9)	49	(40.8)	71	(59.2)	
SES							
Low	204	(58.1)	88	(43.6)	114	(56.4)	0.152
High	141	(40.9)	71	(51.5)	67	(48.6)	
Depressive Symptoms (16) ^b	128	(37.9)	35	(27.3)	93	(72.7)	<0.001
Ever arrested	75	(21.4)	26	(35.6)	47	(64.4)	0.041
Grew up without a dad	243	(70.0)	115	(48.5)	122	(51.5)	0.221

SD: standard deviation; SES: socioeconomic status.

^aDichotomized at median (<1.9; low vs 1.9; high).

^bCenter for Epidemiologic Studies Depression Scale (CESD-R).

Table 2

Results of the EFA on the perceived powerlessness scale at baseline.

Item (α for 9-item perceived powerlessness scale = 0.83)	Loading	Uniqueness
Factor 1: present perceived powerlessness ($\alpha_{\text{present}} = 0.77$)		
pp1. Sometimes I feel that I am being pushed around in life	0.738	0.385
pp2. When I have a problem, I do not feel confident I can solve it	0.845	0.256
pp8. At school or work, I do not always speak up when I have something to say because I do not think anyone will listen to me	0.668	0.339
Factor 2: future perceived powerlessness ($\alpha_{\text{future}} = 0.77$)		
pp7. I do not think that my education has prepared me to achieve a successful career	0.530	0.465
pp9. I do not think much about voting in the future because politicians are not interesting in helping to improve the situation of people like me	0.867	0.358
pp10. There is no point in trying to change things for the better because no one cares or wants to help	0.806	0.272
pp11. Working hard in school or on the job does not guarantee better opportunities later on	0.577	0.552
Factor 3: financial perceived powerlessness ($\alpha_{\text{financial}} = 0.66$)		
pp4. I worry about money because jobs for me or my family members are not easy to find or keep	0.900	0.243
pp6. Saving money is hard to do in my household because we already have a hard time paying the bills	0.678	0.426
Deleted items		
pp3. When bad things happen, we are not supposed to know why. We are just supposed to accept them	–	–
pp5. People die when it is their time to die, and nothing can change that	–	–
pp12. Most people in my life want something better but do not know how to get it	–	–

EFA: exploratory factor analysis.

Table 3

Results of invariance testing of the perceived powerlessness scale by racial/ethnic group.

		Factor loadings (95% CI)			R^2 ^a	
Item		African American (AA)	White	AA	White	
Rotated factor loadings and R^2 values						
Future by						
pp7		0.701 (0.603, 0.799)	0.896 (0.825, 0.967)	0.619	0.627	
pp9		0.710 (0.618, 0.802)	0.761 (0.661, 0.861)	0.535	0.542	
pp10		0.883 (0.816, 0.950)	0.873 (0.791, 0.955)	0.776	0.786	
pp11		0.631 (0.523, 0.739)	0.744 (0.638, 0.850)	0.464	0.470	
Present by						
pp1		0.806 (0.732, 0.880)	0.671 (0.538, 0.804)	0.601	0.606	
pp2		0.849 (0.775, 0.923)	0.816 (0.708, 0.924)	0.697	0.703	
pp8		0.900 (0.827, 0.973)	0.702 (0.584, 0.820)	0.710	0.716	
Money by						
pp4		0.719 (0.609, 0.829)	0.715 (0.595, 0.835)	0.521	0.526	
pp6		0.742 (0.624, 0.860)	0.928 (0.801, 1.055)	0.683	0.689	
Degrees of freedom		25	25			
χ^2		69.146	50.231			
RMSEA		0.088	0.091			
CFI		0.968	0.972			
TLI		0.954	0.960			
Model fit statistics						

CI: confidence interval; RMSEA: root mean square error of approximation; CFI: comparative fit index; TLI: Tucker–Lewis Index.

Bolded items indicate the higher factor loading when comparing African American versus White youth.

^aCoefficient of determination.