

## Modeling Perceived Quality of Life for People Living Near a Nigerian Dumpsite

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In response to the rapid and unplanned growth that has led to the collocation of residential communities with refuse dumpsites in Lagos, Nigeria, we conducted a cross-sectional investigation of individuals living within the Olusosun community near a refuse dumpsite. Participants were 479 persons (>18 years of age, 52.6% male) who lived within 1 km of a refuse dumpsite. We examined the relationships between perceived quality of life and predictor variables, self-esteem, learned helplessness, and environmental expectations. Data analysis using structural equation modeling procedures partially supported our hypothesized explanatory model. Specifically, we found self-esteem had direct and indirect effects, through environmental expectations, on perceived quality of life. However, the indirect effect of learned helplessness on perceived quality of life was not supported. A limitation of our study, selective recruitment of participants who could read and write in English, emphasizes the need for future studies to recruit indigenous language speakers.

*Keywords:* perceived quality of life, self-esteem, learned helplessness, environmental expectations

Finding sufficient space to dispose of garbage has become a growing challenge in Lagos, as the city's waste disposal services struggle to keep pace with a rapidly growing population. Lagos is the economic nerve center, and former capital, of Nigeria, which hosts an international airport as well as the country's major seaports. The rapid industrialization of the city and consequent population growth has outstripped the growth of the city's infrastructure (Momodu,

Dimuna, & Dimuna, 2011). This rapid growth has led to unplanned urban sprawl, which has encroached upon the city's dumpsites. Consequently, the dumpsites are increasingly collocated with densely populated areas (United Nations [UN]—World Health Organization [WHO], 2008; WHO, 2005).

The Olusosun community in Kosofe Local Government Area of Lagos State, Nigeria, where the current study took place, is one such community that has encroached upon an officially designated refuse dumpsite. It is a lower-middle socioeconomic class neighborhood with a major dumpsite situated within the community and bordering many streets. The stench coming from the dump affects the community in a variety of ways (e.g., pulmonary infection, skin irritation; Ogunrinola & Adepegba, 2012). The people living in the community are also affected by the smoke (owing to burning refuse), and in the evening, the environment is enveloped in a visibility-reducing smog. The dumpsite is not fenced; people who rely on it for their livelihood frequently scavenge in the

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dumpsite. The rapid city expansion to Olusosun and other communities has led government officials and city residents to ignore the health and psychological hazards associated with living in proximity to the dumpsites (Momodu et al., 2011; WHO, 2005; UN-WHO, 2008).

In response to health and psychological hazards within urban communities globally, the 1992 United Nations Conference on Environment and Development developed Agenda 21 (UN, 1992). Agenda 21 is an international agreement advocating for the development of national policy to improve the health of individuals and communities within poor urban areas. With the goal of improving the quality of human life, Agenda 21 is an action plan that identified strategies to (a) halt and reverse the effects of environmental degradation and (b) promote environmentally sound and sustainable development efforts (UN-WHO, 2008). Despite the strategic goals of Agenda 21, rapid unplanned expansion continues (Momodu et al., 2011). Moreover, there is a dearth of research on perceived quality of life in Nigeria, particularly with regards to how an individual's perceptions are influenced by environmental factors such as living near refuse dumpsites (Olapegba, 2010).

It is important to note that dumpsites, and the associated environmental degradation, are a phenomenon that may be considered global in nature. However, the modes and forms of operating them may vary from place to place; thus, there are differing impacts on the people living near them (WHO, 2005). The purpose of this study was to investigate the relationship among individual psychological variables that contribute to perceived quality of life among those individuals living near refuse dumpsites in the Olusosun community. We proposed that perceived quality of life would be directly influenced by self-esteem. Moreover, we hypothesized that perceived quality of life would be indirectly influenced by an individual's perception of influence within his or her environment (Momodu et al., 2011; Vaughan, 1993), which we represent through the variables learned helplessness and expectations of environmental improvement. The hypothesized relationships among perceived quality of life and self-esteem, learned helplessness, and expectations of environmental improvement were drawn from Lucas' (2004) dynamic fitness model. In this

model, Lucas specifies that an individual's perceived quality of life is strongly influenced by the individual's: (a) attitude toward life, self, and the environment, (b) ability to accurately interpret the environmental state, and (c) ability to effectively interact with and influence his or her environment. Further, our hypothesized model is based on the expectation that different individuals will perceive their quality of life, within the same dumpsite area, differently, as their perception is influenced by their unique relationship with the environment and perceived level of influence within the environment (Vaughan, 1993). Next we describe each of the constructs included in our investigation.

### Perceived Quality of Life

In a 1994 report, the World Health Organization Quality of Life Group (WHO, 1994) defined quality of life as an individual's perception of their position in life within the context of the culture and value system, as well as within the context of his or her personal goals, expectations, and desired standard of living. The WHO definition highlights the salience of an individual's perception of life quality over and above the objective experience of life quality. It also emphasizes the significance of perceived quality of life as a representation of the degree to which the individual's environmental context and life circumstances meet the individual's expectations. Within this context, perceived quality of life cannot be defined by a mere absence of ill health or disease (Lucas, 2004). We agree with this emphasis on perception and argue that individual perception is central to quality of life for those individuals living near the refuse dumpsites of Lagos, Nigeria. Consequently, we have used perceived quality of life as the predicted variable in our model.

Perceived quality of life is not a one-dimensional phenomenon (WHO, 1994), rather it is multidimensional, with several factors contributing to an individual's perception of how good a life he or she has (Kaplan, Bush, & Berry, 1979; WHO, 1994). Specifically, perceived quality of life is made up of self-ratings of the individual's affective experience (e.g., happiness, joy, and life satisfaction), the individual's perception that his or her life circumstances are consistent with his or her values, and the individual's personal sense of self (e.g.,

respect, well-being, efficacy; Cummins, 1997; Flora, 2004; Kaplan et al., 1979). In other words, perceived quality of life is a function of the aggregate of several domains of an individual's life and experiences; the different domains may, however, differ in their strength of contribution to the perception of quality of life.

### Self-Esteem

Self-esteem, a global trait (Schmitt & Allik, 2005) that is a key contributor to the individual's sense of self, strongly influences perceived quality of life (Ellis & Fouts, 1997). Consequently, self-esteem is the predictor variable in our model. Edelman (2004) asserted that it is good for people to feel good about themselves irrespective of the prevailing environmental situation. Thus with self-esteem as a foundational element of perceived quality of life (Ellis & Fouts, 1997; WHO, 1994), we expected that individuals with high self-esteem may be more capable of maintaining optimism in challenging circumstances, and thus more likely to display expectations of environmental improvement. This conceptualization is consistent with the concept of positive orientation in which self-esteem is associated with optimistic views of the future; self-esteem and optimistic expectations predict optimal psychological functioning and well-being (Alessandri, Caprara, & Tisak, 2012; Caprara et al., 2012). These established relationships formed the foundation of our expectation that higher levels of global self-esteem would contribute to a higher perception of quality of life, with indirect influence from higher expectations for environmental improvement.

Previous research has demonstrated a negative relationship between self-esteem and learned helplessness (e.g., Flynn, 1997), and supported the indirect effect of learned helplessness on the relationship between negative circumstances and poor psychological outcomes (Filson, Ulloa, Runfola, & Hokoda, 2010). Thus, we predicted that individuals with high self-esteem would be less likely to develop learned helplessness, despite their interactions with a degraded environmental context (Flynn, 1997). In addition, we expected to find a negative correlation between learned helplessness and positive expectations for environmental improvement, as learned helplessness has been shown to negatively correlate with positive ex-

pectations of change in other domains (e.g., Valas, 2001). Specifically, within the context of the Olusosun dumpsites, we expected that those individuals who were able to maintain a belief in their personal dignity (e.g., higher self-esteem), despite their involvement in activities that could be perceived as degrading, such as sifting through refuse, would be more likely to maintain a hopeful attitude toward their environment and thus would be more likely to perceive their quality of life as being higher.

Finally, we believe that environmental expectations and learned helplessness are related to an individual's explanatory style, and consequently, we include a brief review of explanatory styles to provide a more nuanced understanding of these variables within the context of the relationship between self-esteem and perceived quality of life. We believe that the inclusion of variables representing an individual's explanatory style will strengthen our model, as it will help us to better understand the ways in which the global trait of self-esteem affects perceived quality of life, either directly or through the circumstantially influenced states of expectation and learned helplessness.

### Explanatory Styles

The work by Abramson, Seligman, and Teasdale (1978) and Seligman (1992a) provides theoretical support for our hypothesis that individuals' beliefs about their role in life events and the state of their environment strongly influence their perception of life quality. Specifically, the researchers identified three types of beliefs that affect perception: (a) beliefs that events have a stable or unstable cause (i.e., if we believe that events are caused by factors that do not change, then we assume it is not worth trying to change them); (b) beliefs that events have an internal or external cause (i.e., events are caused by us or something outside of us); and (c) beliefs that events have a global or specific cause (i.e., when events are caused by a large number of factors [global in nature], we can do less to change them than if we attribute them to a specific cause).

Seligman (1992b) concluded that whether people feel helpless or not is a function of their explanatory styles. Thus, when individuals believe that events are caused by unstable, external, and global events they are likely to see the

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problem as pervasive, permanent, and unchangeable, and will therefore feel out of control in their situation or environment. Thus the individual's explanatory style has implications for an individual's perception of quality of life. Specifically, once an adverse situation is perceived as unchangeable and the individual feels helpless to create change, then the individual's perception of quality of life deteriorates. On the other hand, in situations where people felt that they had even a small amount of control, they reported being happier and healthier (Myers, 2002; Vaughan, 1993). Thus, we propose that a person may be living in an adverse environment yet have a sufficient internal perception of control to believe that the adversity in the environment can be adapted to or improved, and thus will maintain engagement with the environment with the hope that he or she may be able to positively influence his or her future health and general well being through continued interaction. Consequently, we included expectations of environmental improvement and learned helplessness as potential contributors to this relationship.

### Environmental Expectations

Previous research suggests that the individual's perception of the level of hazard or risk within the environment, in combination with the individual's perception of control over his or her exposure to such hazards, directly influences the individual's expectations of improvements within the environment (Vaughan, 1993; WHO, 1994). Those who reside in poor or degraded environments are more likely to believe that their ability to respond effectively to their environment is low, when compared with those living in environments with less degradation (Eyles, 1990). Consequently, perception of quality of life can be enhanced by the individual's expectation that they will be able to use self-protective measures to decrease the level of damage from contact with health hazards within the corrosive environment. Further, chronic poverty has been demonstrated to negatively influence the individual's expectations of the ability to positively adapt to environmental hazards, thus individuals from low socioeconomic circumstances can be expected to have a lower overall expectation of improvements within the environment (Flora, 2004; Vaughan, 1993).

Further, when the environment is objectively bad, with multiple objective hazards present within the environment (e.g., an open dump, disease-ridden ponds, filth in the streets), and the individual is socioeconomically disadvantaged, the individual will be less likely to believe that he or she can effectively negotiate the environmental conditions and thus will be likely to perceive a poor quality of life (Lucas, 2004; Vaughan, 1993). However, those individuals who are able to profit financially from the degraded environment are not affected to the same extent by the psychological hazards that coexist with a degraded environment, in that they are better equipped to maintain a sense of efficacy as they negotiate the environment. For example, scavengers within the Nigerian dumpsites, who are normally thought to engage in filthy and demeaning tasks as they sort through refuse, have been able to resell their scraps as valuable resources. Thus they have successfully leveraged the lack of infrastructure and abundance of garbage to improve their environmental conditions as they negotiate a dangerous and unhealthy environment and transform the environmental hazards into financial resources (Momodu et al., 2011). Consequently, we hypothesized that individuals' expectations that they could effect change within their environment will maintain a stronger sense of self and higher perceived quality of life.

### Learned Helplessness

However, when an individual's explanatory style is characterized by persistent negative beliefs about his or her inability to influence their environment, a state of learned helplessness may predominate. Learned helplessness is acquired as individuals experience a lack of control over repeated bad events, and refers to a cognitive state in which people believe that nothing they do can change their situation (Peterson, Maier, & Seligman, 1993). Similarly, Comer (2004) and Smith (2001) affirmed that as learned helplessness develops individuals gradually become less willing to attempt tasks that may enable them to improve the quality of their environment. The findings of these studies reveal that individuals who have become victims of learned helplessness have yielded control of their lives and/or circumstances to external individuals or causes. Consequently, they perceive a lower quality of life. Individuals who are forced to take up residence near a refuse

dumpsite owing to financial constraints, governmental regulations, or other compelling reasons, and whose efforts to change their situation are met with constant frustration, may experience learned helplessness, resulting in hopelessness and resignation (Myers, 2002); this would serve to reduce an individual's perception of quality of life (Seligman, 1965).

### The Proposed Model

The purpose of our study was to test a model of perceived quality of life among individuals living within a 1 km radius of a local refuse dumpsite collocated with the Olusosun community in Kosofe Local Government Area of Lagos State, Nigeria.

Specifically, we evaluated the direct effects of self-esteem, environmental expectations, and learned helplessness on perceived quality of life. Based on previous findings, we hypothesized that (a) quality of life would be positively influenced by self-esteem (Ellis & Fouts, 1997; WHO, 1994), (b) learned helplessness would be negatively correlated with perceived quality of life (Filson et al., 2010), and (c) environmental expectations would be positively correlated with perceived quality of life (Lucas, 2004; Vaughan, 1993). Further, we predicted separate indirect effects from self-esteem to quality of life through environmental expectations (Alessandri et al., 2012; Caprara et al., 2012) and learned helplessness (Filson et al., 2010; Flynn, 1997; Valas, 2001). We hoped to provide a more nuanced contextual understanding of the factors contributing to individuals' perceived quality of life within degraded environmental circumstances.

## Method

### Participant Characteristics

The participants in the project were residents of the Olusosun community in Kosofe Local Government Area of Lagos State, Nigeria. There were three primary inclusion criteria: (a) the community members must have been at least 18 years of age, (b) must have been able to read and write in English (the official language of Nigeria), and (c) must have been living within a 1 km radius of the local refuse dumpsite.

The ages of the 500 men and women who were included in the project ranged between 18

and 60 years ( $M = 28.70$ ,  $SD = 9.9$ ). Just more than one-half of the participants were male (263). Regarding marital status, 58% were single, 38% were married, and 3% were divorced, widowed, or separated. Regarding occupation, 36% of participants indicated that they were students, 31% indicated that they were involved in trade, 16% indicated that they were employed by the private sector, whereas 14% indicated that they were employed by the public sector. Regarding religious affiliation, 69% of participants self-identified as Christian, 30% self-identified as Islamic, and 1% self-identified as other. Additional demographic information is presented in Table 1.

### Sampling Procedures

With the goal of having 800 men and women complete the survey, 12 streets in the Olusosun community were randomly selected. Within those streets, the participants were selected using accidental sampling techniques (i.e., people who were walking along the street at the time the researchers came by, who met the inclusion criteria, and who were willing to participate were enrolled in the study). The setting was purposively selected for its proximity (within 1 km) to the local dumpsite.

The paper and pencil packet of measures was delivered in person by one of six research assistants who explained the project in detail, determined the eligibility of community residents, and obtained verbal informed consent from 800 participants who agreed to enroll in the study. Participants had the option to complete the packet and have it collected the same day, but in most instances (72%), participants requested that the questionnaires be left and collected at a later date (within 2 weeks). Because one of the inclusion criteria for participating in the study was that participants must be residents of the study area, those that did not complete the questionnaire immediately took the option of having it picked up later at an agreed upon date in their respective residences. Of the 800 packets that were originally distributed, 572 were returned. Of those packets that were returned, 72 were mutilated and unreadable, and 21 did not meet our minimum criteria of 75% completion when the statistical analyses were performed. Thus, 479 questionnaires (60% of all packets distributed) were used in the final analysis.

Table 1  
Means, Standard Deviations, Reliability Coefficients, and Intercorrelations Between Demographic, Predictor, and Criterion Variables

Variable	N	M/%	SD	1	2	3	4	5	6	7	8
1. Self-esteem	480	20.36	4.69	0.62	—						
2. Environmental expectations	429	19.58	3.94	0.097*	0.67	—					
3. Learned helplessness	490	19.06	5.11	0.213**	-0.207**	0.69	—				
4. Perceived quality of life	424	43.36	10.01	0.385**	-0.359**	0.074	0.85	—			
5. Gender				0.063	-0.030	0.032	-0.057	—			
Male	263	53%									
Female	237	47									
6. Length of stay near dumpsite				-0.035	-0.066	-0.008	-0.017	-0.043	—		
<10 years	304	61									
≥10 years	196	39									
7. Education				0.085	-0.165**	0.109*	-0.122**	-0.005	-0.184**	—	
Secondary certificate	186	37									
National diploma	128	26									
Bachelor's degree	143	29									
Graduate degree	12	2									
8. Ethnicity				0.014	-0.001	0.064	0.078	0.021	-0.131**	0.005	—
Yoruba	359	72									
Igbo	104	21									
Hausa	5	1									
Other	29	6									

Note.  $N = 500$ . Where appropriate, alpha coefficients are presented on the diagonal. Self-esteem (0–3), environmental expectations, learned helplessness, and perceived quality of life were measured on a 1–5 scale. For all scales, higher scores indicate higher levels of the variable.

\*  $p < .05$ . \*\*  $p < .01$ .

### Sample Size, Power, and Precision

Although there are not explicit standards set for sample size when using path analysis, using 10 participants per estimated parameter appears to reflect the general consensus (Byrne, 2010; Schreiber, Stage, King, Nora, & Barlow, 2006). In our model, we specify 22 regression weights and three variances, totaling 25 parameters estimated. Because we have a sample size of 479, we have an acceptable ratio of 19.2 participants to one parameter estimated.

### Measures

An author-constructed demographic questionnaire was used to collect additional information, including participant age, gender, ethnic identity, highest level of education attained, marital status, occupation sector, and religious affiliation. Information was also sought about the length of stay within proximity to the dumpsite.

**Assessment of perceived quality of life.** The Perceived Quality of Life Scale (PQLS;

Olapegba, 2009a) consists of 22 items that are designed to evaluate the participant's self-perceived quality of life in the current environment, specifically within the Nigerian context. For each item, participants are asked to rate their perceived quality of life within their current environment. The descriptors attached to the 1 to 5 scale range from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicate higher levels of perceived life quality. Example items include, "I am in a perfect state of health," and "I enjoy my job and my family."

The PQLS had been developed for use in the Nigerian context by generating 32 items through literature searches and interviews that inquired about valued dimensions of participants' lives (Olapegba, 2009a). Twelve experts evaluated the content validity of these items and as a result the pool was reduced to 25 items. The 25-item version was fielded in a sample of 150 participants; factor analysis showed that most items loaded on a single factor; items with low factor loadings were removed, resulting in the

22-item PQLS. Although the validity of the PQLS has yet to be established beyond the test developer's judgments, the Cronbach's alpha for the self-rated scale was .87, while correlation between forms was .68 (Olapegba, 2009a). In the present study, the Cronbach's alpha for the scale was .85.

**Assessment of self-esteem.** The Rosenberg Self-Esteem Scale (RSES; Hagborg, 1993; Rosenberg, 1965) consists of 10 items, designed to provide a measure of an individual's global self-esteem. For each item, participants are asked to rate their perceived level of self-esteem. The descriptors attached to the 0 to 3 scale range from 0 (*strongly disagree*) to 3 (*strongly agree*). Higher scores indicate higher levels of self-esteem. To control for positive response bias, five of the statements (items 3, 5, 8, 9, and 10) are reverse-coded and worded negatively. Example items include, "I feel that I am a person of worth, at least on an equal plane with others," and "I feel I do not have much to be proud of" (reverse-coded).

The RSES has been translated into 28 languages and has been used in cross-cultural studies in 53 countries (Schmitt & Allik, 2005). The reported Cronbach's alpha from a Zimbabwean study was .75, whereas the Cronbach's alpha for a Tanzanian study was .61. Early studies reported Cronbach's alphas ranging from .82 (Rosenberg, 1965) to .74 (McCarthy & Hoge, 1982). The scale has also been used in a cultural validation study with 150 Nigerian participants; the Cronbach's alpha was .67 (Olapegba, 2008). In the present study, the Cronbach's alpha for the scale was .62.

**Assessment of environmental expectations.** The Environmental Expectations Scale (EES) consists of 10 items, designed to evaluate the participant's level of optimism about their ability to adjust to a challenging environment, designed specifically for the Nigerian context (Olapegba, 2008). For each item, participants are asked to rate their expectations about likelihood of change within their current environment. The descriptors attached to the 1 to 5 scale range from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicate greater environmental expectations. To control for positive response bias, one of the statements (item 4) was reverse-coded and worded negatively. Example items include, "I know government will one day come to our rescue and find a solution to our problems in this area," and "Ad-

vancement in medicine can take care of any disease arising from the environment" (see Appendix Table A1 for the full scale).

The scale was developed within the context of the Nigerian environment and was designed to acknowledge the presence of environmental degradation while assessing the individual's positive or negative expectations of environmental change. A pool of 31 items was generated from reviews of the relevant literature and interviews with Nigerians living in impoverished circumstances. Ten experts in the field of psychology and environmental studies then reviewed the items and were asked to rate the appropriateness of the items based on their expertise. Items that were consistently rated as appropriate by at least 8 out of the 10 experts were retained, while those items that did not meet these criteria were discarded. This process yielded a narrowed pool of 25 items that were fielded in a sample of 124 randomly selected participants (Olapegba, 2008). Factor analysis indicated that the majority of items loaded on one factor with a Cronbach's alpha of .44. This factor analysis also indicated that the scale could be improved if several items were dropped. Consequently, 15 items with low loadings on the primary factor were dropped, which raised the Cronbach's alpha to .65. The EES was then fielded in a sample ( $n = 150$ ) of individuals living near refuse dumpsites in Lagos, Nigeria (Olapegba, 2008). Although the validity of the EES is yet to be established beyond the test developer's judgments, the Cronbach's alpha for the present study was .67.

**Assessment of learned helplessness.** The Learned Helplessness Scale (LHS; Olapegba, 2009b) consists of seven items. All items are designed to evaluate the participant's perception of helplessness within their circumstances. For each item, participants are asked to rate their perceived level of control within their current environment. The descriptors attached to the 1 to 5 scale range from 1 (*strongly agree*) to 5 (*strongly disagree*). Higher scores indicate higher levels of learned helplessness. Example items include, "I don't have much control over what happens to me," and "life is generally unfair."

Consistent with the scale-development procedures used for the development of the PQLS and EES scales, a pool of items was initially generated from relevant literature reviews and interviews with local Nigerians living within



impoverished circumstances that helped us to operationalize learned helplessness within the Nigerian cultural context. Ten experts rated 21 items for appropriateness. When 8 out of 10 experts rated an item as appropriate, it was kept, whereas those items that did not receive approval from at least 80% of the experts were discarded. This led to the fielding of 15 items in a sample of 124 participants (Olapegba 2009b). A factor analysis using principal component analysis (PCA) indicated that most items loaded on one factor, whereas eight items had very low factor loadings. Consequently, these eight items were dropped from the final scale. The Cronbach's alpha for the 7-item scale was .71. The LHS was fielded a second time in a sample of 150 participants (Olapegba, 2009b). The Cronbach's alpha for the second fielding of the LHS was .74. The Beck Depression Inventory (BDI) was concurrently administered with the second fielding of the LHS, and the correlation of .53 demonstrates some evidence of construct validity. In the present study, the Cronbach's alpha for the scale was .69.

### Research Design

As described above, our data were collected in a natural setting at a single point in time and no variables were manipulated. We used latent variable modeling in a structural modeling frame to first create and test a measurement model. This was accomplished by creating variable parcels (see Little, Cunningham, Shahar, & Widaman, 2002). Parcels are more psychometrically stable than items and were a well supported choice for use in this study owing to our primary interest in understanding the relationships between the variables in our hypothesized model. Next we evaluated the direct and indirect effects by following the recommendations of Mallinckrodt, Abraham, Wei, and Russell (2006).

## Results

### Creating and Evaluating the SEM Measurement Model

Bivariate correlations between demographic, predictor, and criterion variables (as well as their means and standard deviations) are presented in Table 1.

Structural equation modeling (SEM) procedures based on maximum likelihood estimation

with AMOS (version 19.0) statistical software were used. Our analytic approach followed the two-step evaluation of first the measurement model and then the structural model (Byrne, 2010; Kline, 2005). For both, we evaluated the model fit with the following criteria (Byrne, 2010; McDonald & Ho, 2002). First, we sought a nonsignificant chi-square. Second, we sought a comparative fit index (CFI)  $\geq .95$ . Third, we desired a root mean square error of approximation (RMSEA) and its associated confidence interval to be  $\leq .08$ .

Because the analytic approach used in AMOS involved bootstrapping, the software could not accommodate for missing data. Thus much care was taken to retain as many cases as possible in the data set. We followed the recommendations of Little et al. (2002) to create four parcels as indicators of each latent variable; four was chosen so as to allow each latent variable to be over identified. Specifically, we followed Little et al.'s instructions for the Item-to-Construct Balance procedure by randomly assigning each item to the four parcels in an alternating fashion. Parcel values were created by requesting the mean of the items represented in each parcel so long as 75% of the items belonging to that parcel were nonmissing. Once the item parcels were created, we proceeded with the test of our measurement model. This resulted in a deletion of 21 cases. As is common among large sample models of this nature, the chi-square value was statistically significant (indicating less than adequate fit). Although our RMSEA and its associated confidence interval fell within acceptable guidelines, our CFI value was less than the .95 criteria:  $\chi^2(98, N = 479) = 252.75, p < .001$ ; CFI = .918; RMSEA = .057 (90% CI [.049, .066]). Table 2 shows that all loadings of the measured variables (i.e., the parcels) on the latent variables were strong and statistically significant. Table 3 provides the correlations between the latent variables.

### Evaluating the Structural Model

On the basis of Lucas' (2004) dynamic fitness model, we specified a saturated structural model, noting our hypothesized direction of the relations between predictor (self-esteem), intermediary variables (environmental expectations, learned helplessness), and the outcome variable

Table 2  
Factor Loadings for the Measurement Model

Construct and observed indicators	Unstandardized factor loading	SE	CR	Standardized factor loading
<b>Self-esteem</b>				
Parcel 1	0.65	0.086	7.53	0.494
Parcel 2	0.68	0.096	7.06	0.449
Parcel 3	0.75	0.111	6.81	0.428
Parcel 4	1.00			0.686
<b>Environmental expectations</b>				
Parcel 1	1.00			0.698
Parcel 2	0.88	0.083	10.60	0.665
Parcel 3	0.97	0.093	10.41	0.640
Parcel 4	0.49	0.077	6.41	0.353
<b>Learned helplessness</b>				
Parcel 1	0.90	0.103	8.70	0.611
Parcel 2	0.80	0.093	8.66	0.607
Parcel 3	1.01	0.112	8.99	0.666
Parcel 4	1.00			0.565
<b>Perceived quality of life</b>				
Parcel 1	1.00			0.817
Parcel 2	0.99	0.059	16.91	0.758
Parcel 3	1.01	0.062	16.25	0.731
Parcel 4	0.94	0.057	16.48	0.741

Note. N = 500. For all factor loadings,  $p < .001$ .

(perceived quality of life); the direction of the paths is illustrated in Figure 1. Because the structural model is fully saturated with no degrees of freedom in the structural portion of the model, reporting fit indices would be inappropriate (i.e., the fit indices report with the AMOS output reflect the fit of the measurement model). Consequently, determining model adequacy requires evaluation of the strength of the specified paths as well as the squared multiple correlations of the endogenous variables.

Because the specified model retains indirect effects, we followed the recommendations by Mallinckrodt et al. (2006) to determine whether they were statistically significant. In AMOS, we generated 1,000 bootstrap samples drawn by

default with replacement from the full set of 479 cases with nonmissing data with 90% bias-corrected confidence intervals and bootstrap estimates of indirect, direct, and total effects. Additionally, we used the phantom model approach (Macho & Ledermann, 2011) to obtain the individual indirect effects. The phantom strategy has functional significance only and was successfully used in AMOS to isolate the indirect effects. The indirect effect of self-esteem on perceived quality of life through environmental expectations was statistically significant ( $\beta = .13, p = .001$ ). In contrast, the indirect effect of self-esteem on perceived quality of life through learned helplessness was not ( $\beta = .02, p = .066$ ). The direct path between self-esteem and perceived quality of life remained statistically significant ( $\beta = .45, p = .002$ ). Table 4 provides a summary of each of these paths. This model accounted for 43% of the variance in perceived quality of life and 21% and 5% of the variance for environmental expectations and learned helplessness, respectively.

**Discussion**

We examined our model of perceived quality of life within a culturally distinct and understudied population. Members of the Olusosun com-

Table 3  
Correlation Between Latent Variables

Variable	1	2	3	4
1. Self-esteem	—			
2. Environmental expectations	0.28***	—		
3. Learned helplessness	0.21**	-0.29***	—	
4. Perceived quality of life	0.57***	0.46***	0.09	—

Note. N = 500.  
\*\*  $p < .01$ . \*\*\*  $p < .001$ .

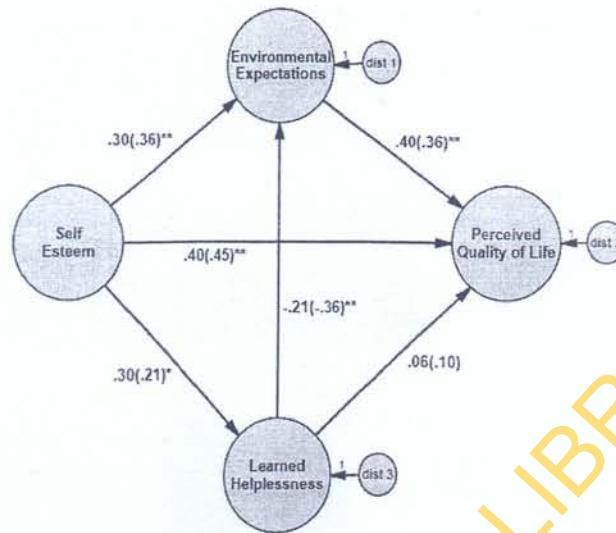


Figure 1. The model of perceived quality of life as a function of self-esteem, environmental expectations, and learned helplessness. Circles represent latent constructs. Single headed arrows with straight-lines connecting latent factors to other latent factors represent structural loadings. Unstandardized regression coefficients are displayed, with standardized coefficients in parentheses. The value of the indirect effect of self-esteem on quality of life through environmental expectations was .12 (.13)\*; the value of indirect effect of self-esteem on quality of life through learned helplessness was .02 (.02). Statistical significance was indicated with the following symbols: \*  $p < .05$ , \*\*  $p < .01$ .

munity living with poor sanitation within 1 km of a Nigerian refuse dumpsite share many characteristics with the 2.4 billion people living without adequate sanitation or garbage removal

services in the developing world (Uwaegbulam, 2004). Despite the efforts of local communities, the UN, and the WHO to improve sanitation (UN, 1992; WHO, 2005), environmental degra-

Table 4  
Bootstrap Analysis of Magnitude and Statistical Significance of Indirect and Direct Effects

Independent variable	Inter-mediary variable (if any)	Dependent variable	$\beta$ (standardized path coefficient and product)	Mean effect (B) <sup>a</sup>	SE of mean <sup>a</sup>	90% confidence interval for mean effect <sup>a</sup>		Two-tailed significance <sup>a</sup>
						Lower	Upper	
Indirect effects								
SE	→ EES	→ PQOL	$(.361) \times (.362) = .130$	0.118	0.017	0.075	0.188	0.001
SE	→ LH	→ PQOL	$(.212) \times (.100) = .021$	0.019	0.033	0.002	0.061	0.066
Direct effects								
SE	→	EES	.361	0.296	0.072	0.196	0.436	0.001
SE	→	LH	.212	0.302	0.174	0.099	-0.679	0.015
SE	→	PQOL	.448	0.403	0.099	0.259	0.578	0.002
EES	→	PQOL	.362	0.397	0.088	0.252	0.544	0.003
LH	→	PQOL	.100	0.063	0.051	-0.023	0.144	0.213
LH	→	EES	-.361	-0.208	0.045	-0.287	-0.138	0.002

Note.  $N = 500$ . SE = self-esteem; EES = environmental expectations; PQOL = perceived quality of life; LH = learned helplessness.

<sup>a</sup> These values are based on unstandardized path coefficients.

dation remains a pressing concern within many communities, with little recognition of the effects of the environment on the quality of life within the community (Momodu et al., 2011; Ogunrinola & Adepegba, 2012; Olapegba, 2008).

As a step toward examining individual quality of life, we have attempted to identify the primary contributors to perceived quality of life within a community that is colocated with a refuse dumpsite. The indirect effect between self-esteem and perceived quality of life suggests that the global trait of self-esteem and an individual's explanatory style (i.e., expectations of environmental improvement) share variance in predicting perceived quality of life for individuals living within 1 km of refuse dumpsites in Nigeria. This confirms our hypothesis that under some circumstances, the individual's global traits are influenced by explanatory style, which may be more sensitive to changes in the individual's circumstances. Although the fit of our model did not fully meet our expectations, our model provides preliminary support for the hypothesized relationship between quality of life and the individual's self-esteem and expectations that he or she, or the government, will be able to intercede in the challenging environment to create change and an improved quality of life (Cummins, 1997; Kaplan et al., 1979; Vaughan, 1993).

The dynamic fitness model (Lucas, 2004) posits that human beings are complex systems that continue to adapt in terms of needs and aspirations, and adaptation leads to a constantly changing perceived quality of life. Our hypothesis that an individual's expectations of environmental improvement will contribute positively to improved quality of life is resonant with dynamic fitness model's conceptualization of quality of life as a moving target. Our results partially supported the hypothesized relationships between variables, such that self-esteem was found to directly and indirectly (through environmental expectations) contribute positively to perceived quality of life, and learned helplessness was found to negatively contribute to expectations of environmental improvement.

However, we are baffled by other findings, in which contrary to our expectations, learned helplessness was positively correlated with both self-esteem and quality of life. This result was surprising, as previous evidence (Filson et al.,

2010; Flynn, 1997) suggested the opposite relationship and we had predicted that higher levels of learned helplessness would be negatively correlated with self-esteem, environmental expectations, and perceived quality of life. These results indicate that the previously supported relationships (Filson et al., 2010; Flynn, 1997; Valas, 2001) between these variables of interest and learned helplessness, in particular, failed to replicate when applied to the unique Olusosun cultural context. Although replication of previous findings is often considered to be a gold standard in psychological sciences, Heppner (2006) cautioned researchers to not disregard research findings when Western/U.S. constructs and tools fail to replicate in the international context. In light of Heppner's perspective, this failure to replicate indicates that it is possible that we have not fully appreciated the Olusosun phenomena and failed to capture a sophisticated picture of the cultural constructs that we sought to investigate.

Although there was a statistically significant, negative, direct effect from learned helplessness to expectations of environmental improvement, contrary to our hypothesis (Filson et al., 2010), learned helplessness did not contribute meaningful variance (directly or indirectly) to quality of life. The significant, positive, direct effect from environmental expectations to perceived quality of life indicates that the degree to which some individuals living near refuse dumpsites believe their environment is likely to improve directly influences their perception of life quality (Lucas, 2004).

Our findings were consistent with previous evidence that self-esteem has a significant, positive, direct effect on perceived quality of life (Ellis & Fouts, 1997). Additionally, the influential effects of expectations about ability to influence the environment and learned helplessness indicate that the influence of self-esteem on perceived quality of life is neither static nor the sole determinant of perceived life quality. Rather, our findings suggest that the underlying influence of self-esteem can be enhanced by the individual's resilience or overwhelm in response to their expectations of change in their environmental circumstances (Edelstein, 2004; Flora, 2004). Our results also support Edelstein's assertion that higher self-esteem is protective, in that it has a significant, positive, direct effect on perceived quality of life, and a

significant, positive, direct effect on increased environmental expectations, irrespective of the individual's prevailing negative environmental situation.

Proximity to the dumpsite was a constant factor for all the participants in our study, thus we surmise that the general environment and objective quality of life were roughly equivalent for the participants in our study. With this constant factor in the background, our results indicate that there were distinct differences in perceived quality of life, with those individuals with higher self-esteem and stronger expectations of environmental change scoring consistently higher on the measure of perceived quality of life. Thus our results affirm the concept of human resilience and demonstrate that people can experience a corresponding improvement in quality of life despite their physical surroundings (Edelstein, 2004). However, the significant influence of environmental expectations provides a caution against the overly positive attribution of the effect of self-esteem (Lucas, 2004) and serves as a reminder that human resilience does not absolve our community leaders from taking steps to improve the physical surroundings. Self-esteem is not a buffer against the risk of illness and disease (WHO, 1994).

With regard to preliminary analyses of background variables, we found that education level was significantly negatively correlated with both expectation of improvement in the environment and perceived quality of life. This finding appears to indicate that academic attainment makes it more difficult to maintain contentment in a difficult environment and leads to a decrease in perceived quality of life. This is consistent with previous research (Vaughan, 1993), which suggests that the individual's perception of control is a more significant factor in predicting protective behavior than education. This finding emphasizes the power of the individual's negative expectations of change and lack of expectation in personal or governmental ability to improve environmental conditions.

A neglected environment can be detrimental to an individual's physical and psychological health (WHO, 1994), for example, through exposure to hazardous refuse and an overall low quality environment. Although learned helplessness was not implicated in perceived quality

of life, it had a strong negative relationship with environmental expectations, which suggests that learned helplessness contributes to the individual's expectations about the ability to positively influence the environment. Connecting this work with Abramson et al.'s (1978) and Seligman's (1965) work suggests that when these adverse environmental circumstances are perceived as pervasive, unchangeable, permanent, and outside of the individual's sphere of influence then learned helplessness is likely to be high, while the resulting expectation of environmental influence is likely to be low. This can result in a severe negative impact on an individual's mental health.

### Limitations

Limitations pertaining to our participants' backgrounds are important to highlight. Specifically, we selectively sampled only people who could read and speak the English language. English speakers were selected for convenience, and although English is the national language of Nigeria, it is possible that there were significant differences between our English-speaking participants and those community members who were unable to speak English. Subsequent researchers should try to recruit a more representative sample, including those individuals who are literate in the English language as well as those who are not. This would serve to enhance the generalizability of results to the entire population of Nigerians living in proximity to a dumpsite.

Our study is also limited by the psychometric characteristics of those measures that were specifically written for the Nigerian context. Specifically, the PQLS (Olapegba, 2009a), the EES (Olapegba, 2008), and the LHS (Olapegba, 2009b) were all developed for use within the Nigerian context, but their performance has not yet been compared with standard measures of these constructs. Future studies may consider the inclusion of personal values such as life aspirations and family orientations (Cummins, 1997; Momodu et al., 2011; Vaughan, 1993) when developing a model of perceived quality of life for use within communities with significant environmental hazards.

### Summary/Implications for Future Research

Our hypothesized model represented our efforts to apply Western psychological concepts and evidence for relationships between variables that were drawn from studies conducted outside of the Sub-Saharan African context. It was our hope to use predominating psychological theories (Western in origin) to better understand a phenomenon that is uniquely African. Thus our failure to completely replicate the findings of previous studies have left us both surprised and hopeful that we will be able to take steps toward constructing future investigations that are better designed to accurately capture and reflect the true nature of individuals' experience of life within the context of extreme environmental degradation.

As such, we hope that our study represents an initial step toward a new program of research focused on the quality of life of individuals living within proximity to refuse dumpsites or other environmental hazards. We hope our results will allow future studies to develop a more nuanced model of quality of life. We also hope that this vein of research will raise awareness within the global research community and empower local communities to become advocates to improve their environment quality and quality of life.

Our study has significant implications for future research, in that our results provide preliminary support for the conceptualization of perceived quality of life (Cummins, 1997; Kaplan et al., 1979) as it is influenced by the individual's internal self-concept and psychological interpretation of our relationship with the environment (Flora, 2004). We support the United Nations' articulation of the need for strategic goals and integrated program measures to (a) halt and reverse the effects of environmental degradation, and (b) promote environmentally sound and sustainable development in order to promote improved quality of human life for those living within rapidly developing areas (UN, 1992; WHO, 2005). We also argue the Olusosun community and the Nigerian government in particular must create a strategic development plan that will acknowledge and address the health and psychological hazards associated with living in proximity to these dumpsites.

Our study is the first to model the perceived quality of life within this type of community,

thus we provide a broad overview and general understanding of the direct and indirect effects of the relationships between factors that contribute to the development of perceived quality of life among individuals living in communities colocated with dumpsites. Despite the forward movement represented by our study, it was beyond the scope of our investigation to provide a more detailed understanding of the relationships between our variables of interest, as they contribute to perceived quality of life within this population. It is imperative that further research be conducted to provide more detailed information about the quality of life of individuals living near refuse dumpsites. We hope that future studies will also take additional strides toward the identification of interventions to promote sustainable development within communities that are colocated with dumpsites.

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Appendix

Table A1  
*Environmental Expectations Scale*

Items	SA	A	U	D	SD
1. I know government will one day come to our rescue and find solutions to our problems in this area.	5	4	3	2	1
2. Advancement in medicine can take care of any disease arising from the environment.	5	4	3	2	1
3. I tolerate this environment because I know I will one day move to a better place.	5	4	3	2	1
4. I stay here because I have no other choice.	5	4	3	2	1
5. There are enough social activities around to take my mind off our problems.	5	4	3	2	1
6. I always try to look at the bright side of life.	5	4	3	2	1
7. Despite past failures, we still keep trying to find solutions to our environmental problems.	5	4	3	2	1
8. The fact that government is talking about problems of this area indicates there is still hope.	5	4	3	2	1
9. God is the one sustaining us in this environment.	5	4	3	2	1
10. I believe God can deliver us from this situation.	5	4	3	2	1

Note. Scoring: Strongly agree (5), Agree (4), Undecided (3), Disagree (2), Strongly disagree (1). Item 4 is reversed.

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