

# A Social Ecological Modeled Explanation of the Resilience Processes of a Sample of Black Sesotho-Speaking Adolescents

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### **Abstract**

The primary aim of the study that this article reports was to model and test a social ecological explanation of resilience as explained by Ungar. Its secondary aim was to investigate resilience-promoting supports in school-going Black South African adolescents. School attendance was specified as a culturally appropriate, functional outcome of resilience. The Pathways to Resilience Research Project gathered data through the Pathways to Resilience Youth Measure. Seven hundred and thirty school-going adolescents (age 12–19 years, 388 female, 341 male, one unspecified) from Thabo Mofutsanyana District, in South Africa's Free State province, participated in this cross-sectional study. Latent variable modeling was used to test measurement models of adolescents' self-reported perceptions of social ecological contributions (resources and risks) to their resilience. A complex model based on a social ecological explanation of resilience fitted the data best. The structural model showed that the resilience process predicted 32% of the variance in school attendance. Social skills, cultural, and spiritual resources were most supportive of adolescents' resilience. The results confirmed that the complex model explained resilience in Black South African adolescents as a person-context relational process

and prompt principals, parents, teachers, and governmental departments to encourage school attendance.

### **Keywords**

Latent variable modeling, adolescents, South Africa, school attendance, resilience, social ecological explanation

## **Introduction**

Resilience, or positive adjustment to extreme adversities, was first defined quite simplistically as a person-focused construct (i.e., individual traits and personality characteristics informed resilience) (Masten, 2014a). Researchers then questioned this initial overreliance on simplistic and/or individual-centered conceptualizations of resilience that underestimated the influence of social ecologies on resilience processes (Luthar, Cicchetti, & Becker, 2000; Masten, 2014a; Ungar, 2012). To fully comprehend the complexities of resilience processes, resilience had to rather be conceptualized as a relational/transactional construct between an individual and his/her environment (Chuang et al., 2018; Lerner et al., 2013; Luthar et al., 2000; Masten, 2014a, 2018). Such an understanding was supported by front-runners in the field of resilience research, such as Luthar et al. (2000), Masten (2014a, 2018), Panter-Brick (2015), and Rutter (2012). In response, Ungar (2011, 2012) proposed a social ecological explanation of resilience and an accompanying mathematical expression. To date, his proposal is quantitatively untested, also in South Africa. Therefore, the primary aim of this study was to model a social ecological explanation of resilience, as explained by Ungar, and, subsequently, to investigate which social ecological supports/resources meant more to a sample of Black South African school-going adolescents.

### *A social ecological explanation of resilience*

Ungar (2011) proposed that, to fully understand the processes associated with resilience, researchers needed to refocus their attention on social ecological supports and the quality of supports that social ecologies offered adolescents at risk. Understanding resilience as a process in which social ecologies and at-risk adolescents collaborated to achieve functional outcomes (e.g., school attendance) became known as the Social Ecology of Resilience Theory (Ungar, 2011, 2012).

In this article, a social ecological explanation of resilience underpins how resilience is conceptualized. Seen from this perspective, resilience demands constructive, bidirectional transactions between young people and their life-worlds. Adolescent-driven transactions entail adolescents steering towards, or asking/bargaining for, support required to cope well with adversities (Ungar, 2015).

Concurrently, social ecologies are co-responsible for adolescents' positive adjustment (Ungar, 2018). To this end, their contributions include assisting adolescents to access culturally and contextually meaningful opportunities and resources that buffer risk and/or reciprocate adolescents' negotiations for support (Rutter, 2012).

To explain this evolved conceptualization of resilience (i.e., resilience as a collaborative adolescent-environment process), Ungar (2012) specified four principles that informed social ecological understandings of resilience. First, Ungar (2012, 2017) referred to how social ecologies were a significant partner in resilience processes. Accordingly, explanations of resilience should not foreground young people's capacities or agencies. Rather than expecting adolescents to be responsible for their positive adaptation to threatening life-worlds and centering explanations of resilience on adolescents' capacities, social ecologies need to initiate/reciprocate and/or advocate for support for adolescents at risk. In this way, even though adolescent contributions count, adolescents are not central to resilience processes.

Second, many different pathways could lead to resilience, and adolescents might differ in their perceptions of how meaningful a pathway might be. One adolescent could follow expected pathways (e.g., an adolescent failing Mathematics navigates towards his/her teacher for support), and another might navigate pathways that differ from what mainstream society or culture would anticipate/sanction (e.g., an adolescent joins a gang in order to fulfil his/her basic needs of food, clothing, and shelter). Ungar (2012) referred to such diverse pathways of resilience as "atypicality" (p. 7). Therefore, a "one-size-fits-all" pathway to positive adjustment is highly unlikely. Researchers should focus on the functionality of the behavior that adolescents exhibit when experiencing risks rather than predetermining and/or prescribing which paths lead to resilience.

Third, resilience is dynamic. Resilience processes may vary over time and/or across contexts, individuals, and groups; therefore, resilience is changeable in nature. Multiple factors, such as more/less meaningful resources, exposure to new/different contexts, or the experience of new/other relationships, could have an impact on resilience processes. For example, a new sibling, interaction with different peers, the transition from primary to secondary schooling, or relocation to a new town/country could alter how individuals transact with their social ecologies, and vice versa. Consequently, researchers should refrain from predicting resilience in terms of simple and/or static relationships.

In the fourth place, culture (i.e., beliefs, values, customs, and language) informs resilience processes and shapes adolescents' understanding of the meaningfulness of resources (Panter-Brick, 2015). The underlying processes of resilience facilitate positive developmental outcomes that might differ from one culture to another (e.g., Western adolescents find a supportive adult or nuclear family protective, whereas many Black South African adolescents experience

supportive communities and family systems as protective) (Theron, Theron, & Malindi, 2013). Resilience mechanisms are, therefore, relative to the culture in which adolescents are embedded. Consequently, Ungar’s four principles nullify a simple, linear understanding of resilience as individually focused and culturally neutral and illustrate the culturally relative, complex, and sometimes unexpected nature of resilience-supporting person ↔ context transactions (Lerner et al., 2013; Masten, 2016).

Flowing from the above, Ungar (2011, 2012) hypothesized a social ecological expression of resilience. Ungar’s hypothesis borrowed Kurt Lewin’s (1951) expression of human behavior. Lewin explained behavior as a result of the interaction between an individual and his/her environment. Ungar modified this expression in order to explain the complex person ↔ social ecological transactions that underpinned resilience processes. Accordingly, Ungar proposed a multifaceted explanation of resilience. The explanation provides an understanding of resilience as a process in which social ecologies and individuals collaborate in contextually and culturally relevant ways to achieve functional outcomes in the face of adversity, as seen below:

$$R_B = \frac{f(P_{SC}, E)}{(O_{AV}, O_{AC})(M)}$$

$R_B$  signifies the functional behaviors/outcomes (such as school attendance, being a dreamer, and having a resilient personality in the South African context; see Theron et al., 2013) that indicate that individuals have adjusted well to extreme hardships. Functional behaviors are described as observable positive outcomes of the resilience process (Wright & Masten, 2015). From a social ecological perspective, the resilience process is a transactional process ( $f$ ) where individuals ( $P$ ) at risk (due to major hardships, negative life events, and/or biological risks) make good use of opportunities/resources ( $O$ ). Opportunities/resources are found in the form of available ( $O_{AV}$ ) and/or accessible ( $O_{AC}$ ) resources within adolescents themselves (e.g., personal skills or social skills) as well as the social ecology (e.g., peer support, relationships with caregivers, and spiritual, educational, and cultural resources). The social ecology ( $E$ ) is responsible for providing the individual with resources that support functional behaviors, in doing so facilitating positive adaptation. The significance individuals attach to the opportunity depends on its cultural and contextual appropriateness or meaning ( $M$ ). For example, Sesotho-speaking young people found education to be supportive of their resilience. In the light of past racial isolation, Black South African young people seek out educational advancement as a way out of poverty and towards a better future (Dass-Brailsford, 2005; Phasha, 2010).

Ungar’s reference to the meaningfulness of resources informing resilience processes is supported by a limited number of studies (Masten, 2014a;

Panter-Brick, 2015; Theron & Theron, 2014; Van Breda, 2015). Resilience studies show that the meaning individuals attach to resilience-supporting opportunities/resources (e.g., knowing one's own strength, feeling safe with caregivers, or being treated fairly in the community) differs from individual to individual (Masten, 2014a, 2018; Ungar, 2012). These differences can be attributed to past experiences that influence perceptions of the usefulness of a resource (O'Connor, Forrester, Holland, & Williams, 2014; Samuels & Pryce, 2008) or to the cultural salience of an opportunity/resource (i.e., how much a cultural group values and/or promotes use of a specific opportunity/resource) (Panter-Brick, 2015).

In addition to the meaningfulness of resources, satisfaction with a resource affects perceptions of resource usefulness. For example, a study by Daining and DePanfilis (2007) emphasized that, in the context of foster care, adolescents' perceptions of the effectiveness of support from friends and family correlated with adolescents' satisfaction with these supports. Furthermore, Lee, Cheung, and Chen (2005) indicated that adolescents' willingness to make use of an Internet-based learning program was dependent on adolescents' perception of the program's usefulness as well adolescents' perception of satisfaction with the program. However, despite the support included above, there is scant statistical confirmation of resilience processes being interrelated with *meaningful* resource opportunities—operationalized in the study on which this article reports as adolescents' satisfaction with available resources.

### *Contextualizing the current study*

The study on which this article reports forms part of the five-country Pathways to Resilience Research Project (see [www.resilienceproject.org](http://www.resilienceproject.org)), which investigated the physical and social ecologies that enhanced adolescents' positive adjustment in the face of severe adversities, such as chronic poverty (Resilience Research Centre, 2010). The South African site (i.e., Thabo Mofutsanyana District, Free State province) is troubled by multiple socioecological risks (i.e., high school dropout rates, poverty, unemployment, high levels of crime/violence, lack of services, and HIV/Aids-related issues) (Heunis, Engelbrecht, Kigozi, Pienaar, & Van Rensburg, 2009; Jamieson, Berry, & Lake, 2017). These risks put adolescents at risk of negative outcomes; however, some adolescents do well despite these risks (Theron & Theron, 2014).

Like Sesotho-speaking individuals elsewhere, those residing in this district are generally deeply rooted in traditional African beliefs and traditions (Prozesky, 2009). These include a profound respect for God, kinship, and a collective way of living, called "Ubuntu"—translated into English as "I am because we exist" (Bujo, 2009; Mokwena, 2007; Prozesky, 2009). "Ubuntu" teaches respect for all (e.g., individuals, community members, and ancestors) and can also be viewed as a community living as one family, which includes sharing all child-rearing responsibilities such as teaching adolescents about spirituality/religion and

traditional practices (Lesejane, 2006; Mkhize, 2006). Likewise, education is of great importance to Sesotho-speaking individuals in this community, since it can provide socioeconomic advantages not only for themselves but also for their family and community members (Theron, 2016). The importance of education has been reported in other studies of resilience among Black South African adolescents (e.g., Theron, 2017; Van Breda, 2017).

## Method

To test a social ecological explanation of resilience, this study employed a secondary analysis of the cross-sectional data generated in the Pathways to Resilience Research Project, South Africa. The analysis took the form of latent variable modeling. This method potentiates a complex understanding of the multifaceted interactions involved in resilience processes (Chuang et al., 2018; Masten, 2012; Theron, 2015).

For the purposes of modeling Ungar's expression, the authors decided to use school attendance to signify functional behaviors/outcomes ( $R_B$ ). As mentioned above, individuals living in the Thabo Mofutsanyane District face high levels of unemployment and poverty (Heunis et al., 2009; Jamieson et al., 2017). Qualitative studies with young people from this district have shown that education is valorized as a "way out" of poverty and unemployment (Jefferis & Theron, 2017; Theron, 2016). Adults in this community echo the importance of education, regular school attendance, and scholastic progress (Theron et al., 2013).

The interaction of individual and social ecological resources and challenges  $f(P_{sc}, E)$  was modeled using personal resources (i.e., personal skills, perceptions of peer support, and social skills), social ecological resources (i.e., relationship with caregiver(s) as well as cultural, spiritual, and educational contextual resources), and challenges (i.e., lack of community safety, negative peer support, poor relationship with caregiver(s), and antisocial, health risk, and/or disruptive behaviors). The opportunity ( $O_{Ar}, O_{Ac}$ ) that was available and accessible to all adolescents was schooling as well as other resources offered (i.e., participants could report on any nonschooling service/program/youth group that they had used recently). The meaning ( $M$ ) adolescents attached to schooling was measured by their perceptions of satisfaction with schooling as well as other resources.

## Participants

In the South African study, usable data were generated by 1137 adolescents from three subgroups (i.e., school going, service using, and functionally resilient). For the purposes of this article, only data generated by Sesotho-speaking school-going adolescents were included. A total of 730 (388 female, 341 male, and one undisclosed) adolescents were recruited from English-medium schools in the Thabo Mofutsanyana District. School staff members (i.e., principals and

teachers), local service providers (i.e., the Department of Basic Education), and nongovernmental organizations (i.e., shelters and recreational programs) referred participants to the Pathways to Resilience Research Project. This sample was made up of 97.95% Black adolescents, aged 12 to 19 years ( $M=16.35$ ,  $SD=1.52$ ), who self-identified as Sesotho-speaking. Participants were in, or had completed, Grades 6 to 12 ( $M=8.6$ ,  $SD=1.02$ ).

### *Procedures*

An advisory panel (AP) (i.e., teachers, social workers, and officials from the Department of Basic Education, Free State province, who were knowledgeable about local adolescents and local culture) steered the South African study. The AP assessed and approved the project's aims and methodologies (e.g., survey-based data collection) and ensured that the project was conducted in ways that were ethical and aligned with African world views (including that of the survey used). For example, the AP advised that school attendance/progress constituted a culturally congruent functional outcome associated with resilient adolescents in their context (Theron et al., 2013). They also directed the language of administration, as explained next.

The Pathways to Resilience Youth Measure (PRYM) was administered in English to groups of 30 to 45 adolescents by three Sesotho-speaking fieldworkers and a researcher (Theron, Liebenberg, & Malindi, 2014). On the advice of the AP, the PRYM was not translated into Sesotho, given participants' attendance of English-medium schools. In addition, the AP and South African pathways researchers collaborated with the scale developers (Resilience Research Centre, 2010) to simplify the English and use typically South African terms (e.g., "skip school" for bunking school). Together, they also predetermined code-switches (Sesotho synonyms) for further English terms that the AP considered potentially challenging for participants (a total of nine words) (Theron et al., 2014). The research team that administered the PRYM spoke English and Sesotho (the participants' mother tongue) and used the predetermined code-switches if participants asked for clarification. Participants self-completed the PRYM items. Completion took up to 90 minutes.

Informed and written consent was obtained (from participants and their caregivers) before the administration of the PRYM. The Department of Education, Free State province, South Africa, and the authors' institutions gave ethical clearance for this study. Each adolescent participant received a hamburger meal as a token of appreciation.

### *Measures*

The PRYM, a self-report instrument (Resilience Research Centre, 2010), was used for data collection. The PRYM is made up of validated scales and subscales



of adolescent perceptions of risk and resources, with three- to six-point categorical response options. For the purposes of the current article, the following scales or subscales provided the variables used to test Ungar's social ecological expression of resilience: Boston Neighborhood Survey, National Longitudinal Study of Children and Youth Brief Questionnaire, 4-H Study of Positive Youth Development (Phelps et al., 2007), Strength and Difficulties Questionnaire (Goodman, 2001), Child Youth Resilience Measure, based on Ungar's social ecological explanation of resilience (Liebenberg, Ungar, & Van de Vijver, 2012), and Youth Services Survey. Scales and reliabilities of previous studies are summarized in Table 1.

### *Statistical analysis*

Latent variable modeling analyses were done with Mplus Version 7.2 (Muthén & Muthén, 1998–2016) and descriptive statistics (e.g., demographics) using SPSS 22.0 (IBM Corp, Released 2015). Due to the categorical nature of the data gathered by the PRYM and the sample size, the weighted least square estimator was employed (Muthén & Muthén, 1998–2016). Goodness of fit was determined using the following: (a) chi-square ( $\chi^2$ ) degrees of freedom (*df*), (b) the Tucker-Lewis index (TLI), (c) the comparative fit index (CFI), (d) root mean square error of approximation (RMSEA), and (e) the 90% confidence interval (CI) of RMSEA and its significance (*p*) (Byrne, 2012; Schreiber, Stage, King, Nora, & Barlow, 2006; Wang & Wang, 2012). Cut-off scores for acceptable fit were scores  $\geq .90$  for TLI/CFI, values  $\leq .08$  for RMSEA, and RMSEA 90% CI; a *p*-value greater than .05 indicated close fit of the model. R-square ( $R^2$ ) values (variance explained) were used to assess the effect sizes of results; scores greater than 0.25 indicated a large effect (Cohen, 1988; Field, 2013). Point-estimate reliability ( $\rho$ ) was computed as described by Raykov (2012) as opposed to alpha coefficients, given that Mplus 7.2 makes use of weighted factor loadings and mean scores, thus violating the assumption of tau-equivalence (i.e., each item contributes equally to a latent variable) that is needed to calculate alpha coefficients.

## **Results**

### *Measurement models*

According to Kline (2011), when adequate theoretical and empirical grounds are available, one should test and compare measurement models (i.e., models with the same observed variables, thus items that are directly measurable). The model with the smallest Akaike information criterion (AIC)/Bayesian information criterion (BIC) should be retained, and other models excluded. In this study, five measurement models were tested using latent variable modeling. As explained



**Table 1.** Latent variables and subscales.

Latent variable	Instrument	Construct	Item example	Response options
Challenges within social ecology (Risks)	Six items from the Boston Neighborhood Survey (BNS) (Resilience Research Centre, 2010)	Lack of community safety (Unsafe)	“People in my community can be trusted” “If a child or young person was being abused by his or her family, how likely is it that your neighbors would report it?”	“Not at all” to “Very unlikely” on four- and three-point scale
	‡ ( $\alpha = .54$ ) (Van Rensburg, Theron, & Rothmann, 2018)			
	Four items from the National Longitudinal Study of Children and Youth Brief Questionnaire (NLSCY) (Resilience Research Centre, 2010)	Negative peer impact (Neg. peer)	“Smoked cigarettes” “Drank alcohol”	“None” to “All” on a four-point scale
	‡ ( $\alpha = .72$ ) (Van Rensburg et al., 2018)			
	Four items from the NLSCY (Resilience Research Centre, 2010)†	Poor relationship with mother and father figures (Neg. rel.)	“Thinking of the mother/father you identified above, how much affection do you receive from him/her?” “Overall, how would you describe your relationship with the mother/father?”	“A great deal” to “Not at all” on a four-point scale “Very close” to “Not very close” on a four-point scale
	Behavioral risks (Behav. risk): Five items from the 4-H Study of Positive Youth Development (4HSQ) (Delinquency Scale) ‡ ( $\alpha = .73$ ) (Phelps et al., 2007)	Antisocial behavior (Antisocial)	“Stolen something from a shop” “Hit or beat up someone” “Smoked cigarettes” “Used dagga”	“Never” to “Five or more times” on a five-point scale “Never” to “Regularly” on a four-point scale
	Seven items from the 4HSQ (Risk Scale) ‡ ( $\alpha = .86$ ) (Phelps et al., 2007)	Health risk behavior (Health risk)	“I get very angry and often lose my temper” “I fight a lot”	“False,” “Sometimes,” and “True” on a three-point scale
Five items from the Strengths and Difficulties Questionnaire (SDQ) ‡ ( $\alpha = .80$ ) (Goodman, 2001)	Disruptive behavior (Disrupt)			
Resources within social ecology (Resources)	Five items from the Individual Personal Skills subcluster of the Child Youth Resilience Measure (CYRM)	Personal skills (Personal)	“I try to finish what I start” “I know my own strengths”	“Does not describe me at all” to “Describes me a lot” on a five-point scale

(continued)

**Table 1.** Continued.

Latent variable	Instrument	Construct	Item example	Response options
	(Liebenberg, Ungar, & Van de Vijver, 2012) ‡ ( $\alpha = .59$ ) (Liebenberg et al., 2015)			
	Two items from the Individual Peer Support subcluster of the CYRM (Liebenberg, Ungar, & Van de Vijver, 2012) ‡ ( $\alpha = .74$ ) (Liebenberg et al., 2015)	Peer support (Peer)	“My friends are on my side” “My friends stand by me during difficult times”	“Does not describe me at all” to “Describes me a lot” on a five-point scale
	Four items from the Individual Social Skills subcluster of the CYRM (Liebenberg, Ungar, & Van de Vijver, 2012) ‡ ( $\alpha = .62$ ) (Liebenberg et al., 2015)	Social skills (Social)	“I know how to behave in different social situations” “I know where to go in my community to get help”	“Not at all” to “A lot” on a five-point scale
	Seven items from the Relationship with Caregivers subscale of the CYRM ‡ ( $\alpha = .83$ ) (Liebenberg, Ungar, & Van de Vijver, 2012)	Physical and psychological caregiving (Care)	“My caregiver(s) watch(es) me closely” “My caregiver(s) know(s) a lot about me”	“Not at all” to “A lot” on a five-point scale
	Five items from the Cultural Context subcluster of the CYRM (Liebenberg, Ungar, & Van de Vijver, 2012) ‡ ( $\alpha = .60$ ) (Liebenberg et al., 2015)	Cultural context (Culture)	“I am proud of my cultural background” “I enjoy my community’s traditions”	“Not at all” to “A lot” on a five-point scale
	Three items from the Spiritual Context subcluster of the CYRM (Liebenberg, Ungar, & Van de Vijver, 2012) ‡ ( $\alpha = .40$ ) (Liebenberg et al., 2015)	Spiritual context (Spiritual)	“Spiritual beliefs make me strong” “I think it is important to serve my community”	“Does not describe me at all” to “Describes me a lot” on a five-point scale
	Two items from the Educational Context subcluster of the CYRM (Liebenberg, Ungar, & Van de Vijver, 2012) ‡ ( $\alpha = .49$ ) (Liebenberg et al., 2015)	Educational context (Edu.)	“Getting an education is important to me” “I feel I belong at my school”	“Not at all” to “A lot” on a five-point scale
	14 items from the Youth Services Survey (YSS) measuring youths’ perception of	Satisfaction with schooling (Sat. with school)	“My teachers and/or other school staff stand by me during difficult times”	

(continued)

**Table 1.** Continued.

Latent variable	Instrument	Construct	Item example	Response options
Satisfaction with resources (SAT)	their school Two items measuring whether their educational needs were met (Resilience Research Centre, 2010) ‡ ( $\alpha = .85$ ) (Van Rensburg, Theron, Rothmann, & Kitching, 2013)		"I have a say in school activities and can ask for what I need"	"Strongly agree" to "Strongly disagree" on a five-point scale
	14 items from the YSS measuring adolescents' perception of quality of another service Two items measuring whether the opportunity used was the opportunity needed by the adolescents (Resilience Research Centre, 2010) For example, another resource/service included, a clinic, a doctor, the Department of Home Affairs, the local municipality, or a local adolescent club†	Satisfaction with other resource/service (Sat. with other)	"I felt I had someone within the service to talk to when I was in trouble" "I received the service that was right for me"	"Strongly agree" to "Strongly disagree" on a five-point scale
School attendance	Four items from the NLSCY (Resilience Research Centre, 2010)†	School attendance	"During the last 12 months (or during the last full school year you attended), how many times did you skip a day of school without permission?" "During the last 12 months (or during the last full school year you attended), how many times did you get suspended?"	"Never" to "Every day," "Never" to "Once a week," and "Yes" and "No" on a two-, five-, and six-point scale

Note: ‡ refers to available reliabilities from previous studies.

†To the best of the authors' ability, scores from previous studies were not found, but scores for the current study indicate acceptable reliability.

below, these models all examined social ecological pathways of resilience (Ungar, 2011) but explored varied factor structures (more and less simplistic) of these pathways. In all five models, meaningfulness, availability, and accessibility of resources were measured by participants' self-reported levels of satisfaction with their schooling as well as another resource (i.e., participants could report on any nonschooling service/program/youth group that they had used recently). The remaining factors were modeled as follows:

*Model 1* (which was the most complex) consisted of three second-order latent variables, namely:

- resources (measured by seven first-order latent variables: personal skills, peer support, social skills, relationship with caregiver, cultural contexts, spiritual context, and educational context);
- risks (measured by three first-order latent variables—lack of community safety, negative peer support, and poor relationship with mother and father figures—and one second-order latent variable, namely, behavioral risk, which consisted of three first-order latent variables, namely, antisocial behavior, health risk behavior, and disruptive behavior); and
- satisfaction with resources (measured by two first-order latent variables: satisfaction with school and satisfaction with other resource).

All three above-mentioned second-order latent variables made up one third-order latent variable, namely, resilience process. In addition, one first-order latent variable, namely, school attendance (measured by four observed variables), was correlated with resilience process as a culturally appropriate functional outcome (Theron et al., 2013).

Ungar (2011, 2012) and others (e.g., Masten, 2014c) warn against simplistic conceptualizations and operationalizations of resilience. The rationale behind *Model 2* was to establish whether a simplistic one-factor/unidimensional model (i.e., the most simplistic model), based on the interactions among observed variables measuring social ecological risks and resources, together with satisfaction with resources, might well explain a social ecological understanding of resilience in a sample of Sesotho-speaking adolescents. Model 2 consisted of only two first-order latent variables, namely, resilience process (measured by 90 observed variables; all observed variables measuring resources, risks satisfaction with school and other resource) and school attendance (measured by four observed variables). Resilience process and school attendance (as a culturally appropriate functional outcome) were allowed to correlate. In other words, Model 2 tested for common method variance (namely, it tested whether the variance of a construct was due to measurement methods rather than the construct being measured) (Johnson, Rosen, & Djurdjevic, 2011; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Masten and Reed (2005) state that multiple resources (i.e., the additive effect of resources) could buffer risks and, therefore, support resilience. *Model 3*

reflected a basic model (i.e., additive model) of resilience (Masten, Cutuli, Herbers, & Reed, 2009) that was more complex than Model 2. It examined how resources and risk interacted as one second-order latent variable, thus investigating whether multiple social ecological resources buffered risks.

Model 3 consisted of one second-order latent variable, namely, resilience process, measured by 12 first-order latent variables (lack of community safety, negative peer support, poor relationship with mother and father figures, personal skills, peer support, social skills, relationship with caregiver, cultural resources, spiritual resources, educational resources, satisfaction with school, and satisfaction with other resources), and one second-order latent variable, namely, behavioral risks (antisocial behavior, health risk behavior, and disruptive behavior). In addition, one first-order latent variable, namely, school attendance (measured by four observed variables), was specified and correlated with resilience process as a functional outcome.

*Model 4* followed the same rationale as Model 2. However, instead of modeling resources, risks, and satisfaction with school and resources as one latent variable, Model 4 specified all observed variables regarding resources and risks as a one-factor/unidimensional construct. Satisfaction with school and satisfaction with other resource (of participants' choosing) were modeled as two separate latent variables (instead of a second-order latent variable). As a result, Model 4 was more complex than Model 2. Model 4 consisted of one first-order latent variable, namely, school attendance (measured by four observed variables), and one second-order latent variable, namely, resilience process, measured by three first-order latent variables: social ecology (66 observed variables; all observed variables measuring resources and risks), satisfaction with school (14 observed variables), and satisfaction with another resource (14 observed variables). School attendance and resilience process were allowed to correlate as a functional outcome. In addition, Model 4 also evaluated for common method variance of the social ecology latent variable as well as a two-factor structure of satisfaction with resources (Johnson et al., 2011; Podsakoff et al., 2003).

*Model 5* also followed the same rationale as Model 2 but further investigated whether a two-factor model consisting of social ecology (i.e., resources and risks) and satisfaction with resources could best explain a social ecological understanding of resilience. It was, thus, more complex than Models 2 and 4. Model 5 was composed of one third-order latent variable, namely, resilience process, measured by two second-order latent variables entitled social ecology (lack of community safety, negative peer support, poor relationship with mother and father figures, behavioral risks, personal skills, peer support, social skills, relationship with caregiver, cultural contexts, spiritual context, and educational context) and satisfaction with resources (satisfaction with other resource and satisfaction with resources). Resilience process was allowed to correlate with one first-order latent variable, namely, school attendance (measured by four observed variables), as a functional outcome.

**Table 2.** Fit statistics of measurement models.

Model	$\chi^2$	df	RMSEA	90% CI	$p$	CFI	TLI	AIC	BIC
Model 1	6271.50	4257	.03	(.02, .02)	1.00	.92	.91	161,807.22	163,194.32
Model 2	11,139.95	4276	.05	(.05, .04)	1.00	.71	.71	167,766.08	169,065.91
Model 3	6564.22	4260	.03	(.03, .03)	1.00	.90	.90	161,871.22	163,244.54
Model 4	8508.71	4269	.04	(.04, .04)	1.00	.82	.82	164,747.45	166,079.44
Model 5	6373.20	4258	.03	(.03, .03)	1.00	.91	.91	161,828.78	163,211.28

Note:  $\chi^2$ : chi-square; *df*: degrees of freedom; RMSEA: root mean square error of approximation; 90% CI: 90% confidence interval; CFI: comparative fit index; TLI: Tucker-Lewis index; AIC: Akaike information criterion; BIC: Bayesian information criterion.

The AIC and BIC values of the competing measurement models were assessed with a maximum likelihood estimator and specifying the nature of the variables as categorical.

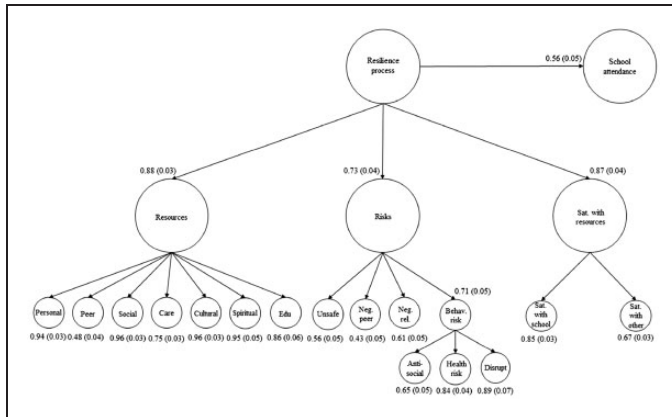
Table 2 indicates that Model 1 (i.e., the most complex model) had the lowest AIC and BIC values—indicating a better-fitting model (Byrne, 2012) compared to the other four models. Also, acceptable model fit was established (CFI = .92, TLI = .91, RMSEA = .03, 90% CI (.02, .03),  $p > .05$ ). See Figure 1 for a visual representation of Model 1.

Table 3 illustrates the lower order latent variable factor loadings, variance extracted, reliabilities, and correlations of the variables in the measurement model. In addition, all but two first-order latent variables showed acceptable reliabilities ( $\rho$ ) (i.e., disruptive behavior,  $\rho = .53$  and spiritual resource,  $\rho = .49$ ).

### Structural model

The structural model was based on the measurement model with the lowest AIC and BIC values (i.e., Model 1). One structural model was tested with a path from the resilience process to school attendance. The results indicated a good fit (CFI = 0.92, TLI = 0.91, RMSEA = 0.03, 90% CI (0.02, 0.03),  $p > 0.05$ ) for the model (Byrne, 2012; Schreiber et al., 2006; Wang & Wang, 2012). A total of 32% of the variance in school attendance, a socioculturally relevant functional behavior/outcome of the resilience process (see Theron, 2016; Theron et al., 2013), was predicted by Model 1 based on a complex social ecological understanding of resilience (see Table 3), indicating a large effect according to Cohen (1988) and Field (2013).

In this sample of Sesotho-speaking adolescents, a complex social ecological understanding of resilience indicated that three first-order latent variables contributed a great amount of variance to the second-order resources latent variable ( $R^2 \geq .90$ ): social skills ( $R^2 = .94$ ), cultural context ( $R^2 = .91$ ), and spiritual context ( $R^2 = .91$ ). Also, the expression indicated that the latent variable of



**Figure 1.** Structural model.

Unsafe: lack of community safety; Neg. peer: negative peer support; Neg. rel.: poor relationship with mother and father figures; antisocial: antisocial behavior; health risk: health risk behavior; disrupt: disruptive behavior; behav. risk: behavioral risks; personal: personal skills; peer: peer support; social: social skills; care: relationship with caregiver; cultural: cultural contexts; spiritual: spiritual context; Edu.: educational context; Sat. with school: satisfaction with school; Sat. with other: satisfaction with other resource; Sat. resources: satisfaction with resources.

satisfaction with resources showed that satisfaction with school explained most of the variance ( $R^2 = 0.73$ ) of the second-order latent variable, satisfaction with resources.

## Discussion

The primary aim of the current study was to statistically model Ungar’s (2011, 2012) social ecological conceptualization of resilience (as expressed in the adaptation of Kurt Lewin’s equation). Ungar’s expression was tested using survey data generated by school-going adolescents who participated in the South African Pathways to Resilience Research Project. A complex model based on Ungar’s expression was identified as best fitting the data. Alternative models evaluated more simplistic operationalizations (i.e., unidimensional models) of a social ecological understanding of resilience. Acceptable goodness of fit was obtained for the complex social ecological understanding of resilience that significantly predicted school attendance—a known functional outcome of the resilience process among Black Sesotho-speaking adolescents (Theron et al., 2013). In essence, the model showed that resilience processes were complex and informed by systemic risks and resources found at the level of the individual adolescent and his/her social ecology. In doing so, this model offered the statistical detail to validate prior hypotheses (Ungar, 2011, 2012) and narrative accounts (Theron, 2016, 2017; Theron et al., 2013) of the symbiotic relationship



**Table 3.** Correlation matrix: Lower and higher order latent variables.

Lower order	$\rho$	$R^2$	$\beta$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Unsafe <sup>R</sup>	.62	.32**	.56**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2. Neg. peer	.88	.19**	.43**	.24**	–	–	–	–	–	–	–	–	–	–	–	–	–	–
3. Neg. rel. <sup>R</sup>	.88	.37**	.61**	.34**	.26**	–	–	–	–	–	–	–	–	–	–	–	–	–
4. Antisocial	.80	.42**	.65**	.26**	.20**	.28**	–	–	–	–	–	–	–	–	–	–	–	–
5. Health risk	.91	.71**	.84**	.33**	.26**	.36**	.55**	–	–	–	–	–	–	–	–	–	–	–
6. Disrupt	.53	.79**	.89**	.35**	.27**	.38**	.58**	.75**	–	–	–	–	–	–	–	–	–	–
7. Behav. risk	–	.50**	.71**	.40**	.30**	.43**	.65**	.84**	.89**	–	–	–	–	–	–	–	–	–
8. Personal	.66	.88**	.94**	–.34**	–.26**	–.37**	–.28**	–.36**	–.38**	–.43**	–	–	–	–	–	–	–	–
9. Peer	.81	.23**	.48**	–.17**	–.13**	–.18**	–.14**	–.18**	–.19**	–.22**	.45**	–	–	–	–	–	–	–
10. Social	.71	.92**	.96**	–.35**	–.27**	–.37**	–.28**	–.36**	–.39**	–.43**	.90**	.46**	–	–	–	–	–	–
11. Care	.87	.56**	.75**	–.27**	–.21**	–.29**	–.22**	–.29**	–.30**	–.34**	.71**	.36**	.72**	–	–	–	–	–
12. Cultural	.76	.91**	.96**	–.35**	–.26**	–.37**	–.28**	–.36**	–.39**	–.43**	.90**	.45**	.92**	.72**	–	–	–	–
13. Spiritual	.49	.91**	.95**	–.35**	–.26**	–.37**	–.28**	–.36**	–.38**	–.43**	.90**	.45**	.91**	.72**	.91**	–	–	–
14. Edu.	.72	.74**	.86**	–.31**	–.24**	–.33**	–.25**	–.33**	–.35**	–.39**	.81**	.41**	.82**	.64**	.82**	.82**	–	–
15. Sat. with school	.91	.73**	.85**	–.31**	–.23**	–.33**	–.25**	–.32**	–.34**	–.38**	.61**	.31**	.62**	.49**	.62**	.62**	.56**	–
16. Sat. with other	.92	.45**	.67**	–.24**	–.18**	–.26**	–.20**	–.25**	–.27**	–.30**	.48**	.24**	.49**	.38**	.49**	.49**	.44**	.57**
Higher order	$\rho$	$R^2$	$\beta$	1	2	3	4											
1. Sat. with resources		.75**	.87**	–	–	–	–											
2. School attendance <sup>R</sup>	.71	.32**		–.49**	–	–	–											
3. Resources		.77**	.88**	.76**	.49**	–	–											
4. Risks		.54**	.73**	–.64**	–.41**	–.64**	–											
5. Resilience process	–	–	–		.56**	–	–											

Note:  $\rho$ : reliability;  $\beta$ : factor loading;  $R$ : items interpreted in reverse; unsafe: lack of community safety; Neg. peer: negative peer support; Neg. rel.: poor relationship with mother and father figures; antisocial: antisocial behavior; health risk: health risk behavior; disrupt: disruptive behavior; behav. risk: behavioral risks; personal: personal skills; peer: peer support; social: social skills; care: relationship with caregiver; cultural: cultural contexts; spiritual: spiritual context; Edu.: educational context; Sat. with school: satisfaction with school; Sat. with other: satisfaction with another resource; Sat. resources: satisfaction with resources.

\*\* $p \leq .01$ .

between an individual and his/her environment. It showed that achieving functional outcomes that had sociocultural valence (i.e., school attendance) entailed the individual adolescent appropriating individual resources (i.e., individual skills and social skills) and systemic resources (i.e., peer support, physical caregiving, psychological caregiving, spiritual resources, educational resources, and cultural resources). Thus, the model suggested that, in the face of risk, the resilience processes of this sample of Sesotho-speaking adolescents were co-determined by individual and social resources. This fits in with other ecological systems explanations of resilience—based on non-African samples—by leaders in the field of resilience (e.g., Cicchetti, 2013a, 2013b; Masten, 2014a, 2014b, 2018; Panter-Brick, 2015; Rutter, 2012, 2013; Wright & Masten, 2015).

The associated (or secondary) aim was to identify social ecological supports/resources that participants self-reported as meaningful. In addition to demonstrating that a complex model explained the resilience process of a sample of Sesotho-speaking adolescents as a social ecological transaction, the results of the current study also indicated that three resilience-supporting resources (i.e., social skills, cultural resources, and spiritual resources;  $R^2 \geq 90\%$ ) explained a large proportion of social ecological resources that adolescents in this community drew on. This makes sense, since the Basotho are extremely respectful of African culture, which includes spirituality, cultural pride, and interdependence (Munyaka & Motlhabi, 2009; Prozesky, 2009).

## **Implications for social ecologies**

First, the results of the current study showed that adolescents' social ecologies (as opposed to a young person's abilities alone) were crucial to resilience processes (as theorized by Ungar, 2015). In particular, given the sociocultural valence of the three resources, which constituted a large percentage of the resources on which the Sesotho-speaking sample drew, the results suggested that the resources that were made available and accessible to young people had to be culturally and contextually relevant. Young people are more likely to appropriate resources that resonate with the sociocultural values they have been socialized to respect and enact. The results, furthermore, discredited earlier notions in quantitative South African resilience research (Van Rensburg, Theron, & Rothmann, 2015) that resilience was a simplistic relationship, thereby suggesting that a "one-size-fits-all" pathway of resilience was highly unlikely. One implication is that mental health service providers, social work professionals, teachers, and other community members who serve the youth should rather facilitate "custom-made" resilience intervention programs that draw on culturally and contextually relevant social ecological supports that are meaningful and accessible to young people. In instances, where relevant resources are inaccessible, these service providers should assist social ecologies to make culturally and contextually relevant supports/resources available to young people facing hardships.

Second, the study's AP previously identified that school attendance was an indicator of resilience among adolescents living in the Thabo Mofutsanyana District (Theron et al., 2013). The results showed a practically significant relationship of large effect between school attendance and the resilience process. The literature speaks to the high attrition rates of young people living in disadvantaged communities (i.e., in poverty) in Southern Africa (Boyes, Berg, & Cluver, 2017; Dieltiens & Meny-Gibert, 2012). Given that school attendance was integral to the resilience process of our Sesotho-speaking sample, teachers, principals, parents, and community members should preferably support adolescents to not become part of the attrition statistics.

Lastly, since Sesotho-speaking youth attached more meaning to schooling (compared with other services), a possible implication is that service providers should utilize schools as sites of service provision. This is certainly the tendency in lower middle-income countries with regard to mental health services (Kieling et al., 2011), but this innovation can be expanded to include other services (e.g., social services or interventions aimed at bolstering adolescent social skills).

## **Limitations**

The findings should be interpreted in the light of a number of limitations. The cross-sectional nature of the data only allowed us to make inferences regarding the contribution of adolescents' social ecologies to their resilience at a single point in time. In addition, adolescents' self-completion of the PRYM might have resulted in the data being biased by adolescents' emotions or experiences around the time of survey completion (Creswell, 2012). Even though the AP guided the decision to administer the PRYM in English and even though the research team used simplified English and predetermined code-switches to facilitate comprehension, it is possible that levels of English literacy might have confounded participant responses. Nevertheless, as in the present study, self-report measures do yield valuable insight into theoretical constructs, such as the process of resilience (Haefel & Howard, 2010).

## **Conclusion**

To conclude, this study asserts that a multifaceted social ecological understanding of resilience is quantitatively plausible. It also adds to nascent latent variable modeling explanations of resilience as a social ecological construct (Wu, Tsang, & Ming, 2014) and answers the calls of resilience researchers from the Global North (e.g., Masten, 2012, 2014a; Panter-Brick, 2015) and Global South (e.g., Chuang et al., 2018; Theron, 2015; Van Breda, 2018) for resilience studies to utilize sophisticated quantitative methodologies. Lastly, this study advocates that schools, parents, and other community members who wish to champion the resilience of Sesotho-speaking rural adolescents should encourage adolescent investment in education.

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