Pathways of resilience: Predicting school engagement trajectories for South African adolescents living in a stressed environment

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ABSTRACT

School engagement is associated with the resilience of adolescents living in stressed environments in sub-Saharan Africa. Even so, there is scant understanding of the antecedents of African students' school engagement. In response, this article reports the results of an exploratory study conducted in 2018 and 2020 with a sample of 172 adolescents (average age: 16.02 years; SD = 1.67) from a risk-exposed municipality in South Africa. Clustered school engagement trajectories were identified using a longitudinal variant of k-means based on affective, behavioural, and cognitive school engagement. Evolutionary classification trees were used to identify meaningful predictors of the identified trajectories. The results point to specific combinations of factors – i.e., student age, parental/caregiver warmth, school resource levels, teacher competence – that sustained low and high school engagement trajectories. These combinations direct the attention of school psychologists and other service providers to the multiple systems that matter in varying ways for the school engagement of African students. They also call for continued investigation of the resource combinations that are salient to student engagement across stressed environments in sub-Saharan Africa.

1. Introduction

Youth resilience is a process that draws on resources from multiple systems to support young people, who are significantly stress-exposed, to function normatively (Masten et al., 2021). In sub-Saharan Africa, school engagement is often used as an indicator of normative functioning for youth with high levels of stress exposure (Herrero Romero et al., 2019; Kabiru et al., 2012). Many African families encourage youth to be school engaged, given associations between school engagement and educational success, and related potential for economic progression (Adegoke & Steyn, 2017; Van Breda & Theron, 2018). Even so, little attention has been paid to what informs African youths' capacity to be behaviourally, emotionally, and cognitively engaged in their schooling (Lam et al., 2014; Wills & Hofmeyr, 2019). Instead, like much of the resilience literature, studies of the factors associated with school engagement have more typically focused on young people in North American and European contexts (D'Angelo & Kaye, 2018).

This article redresses the historic inattention to what enables African young people to be engaged in their schooling. Such redress is overdue, not least because the African youth population is fast expanding (Sow,

2018). Realising the anticipated dividends of this youth bulge will require prioritisation of their resilience (Theron, 2020). Given the salience of school engagement to the resilience of African youth, and the malleability of the factors that influence school engagement (Fredricks et al., 2004), prioritising African youth resilience is intertwined with advancing an understanding of the multisystemic promotive and protective factors and processes (PPFPs) that support their school engagement.

To that end, we report the results of an exploratory study that used a data-mining approach. It allowed identification of interacting PPFPs, from a pool of multisystemic resources, that predicted trajectories of multidimensional school engagement over time. The data were generated by 172 South African (SA) public school-attending adolescents (average age: 16.02 years; SD = 1.67) who participated in the Resilient Youth in Stressed Environments (RYSE) study. RYSE is a bi-national (Canada; South Africa), longitudinal (2017–2021), mixed-methods study of the PPFPs that facilitate resilience among youth living in communities that rely on the volatile oil and gas industry (Ungar et al., 2021).

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1.1. A multisystemic approach to youth resilience

Early studies of resilience emphasized the role of personal protective factors – such as intrinsic motivation, intelligence, or individual agency – in explanations of what enabled risk-exposed youth to function normatively (Rutter, 1985). Subsequently, resilience scholars cautioned that individual-centred accounts of resilience were incomplete and/or erroneous because they failed to recognise the resilience-enabling contributions made by the social, institutional, and ecological systems that individuals are connected to (Masten, 2014; Masten & Cicchetti, 2016; Rutter, 2012, 2013; Ungar, 2011). In response, multisystemic accounts have become the recommended way of theorising and supporting youth resilience (e.g., Höltge, Theron, et al., 2021; Masten & Motti-Stefanidi, 2020; Masten et al., 2021; Ungar, 2021; Ungar & Theron, 2019), including in African contexts (Theron & van Breda, 2021). Multi-systemic accounts are rooted in a theory of resilience that recognises that multiple PPFPs, which are distributed across personal, relational/social, institutional, and ecological systems and responsive to contextual and cultural dynamics, interact to capacitate positive outcomes among youth exposed to adversity. The study reported in this article was framed by a multisystemic understanding of resilience, with a special interest in the multisystem PPFPs that could explain school engagement trajectories of young people from stressed communities.

1.2. School engagement: A multifaceted and multisystemic process

Broadly defined, engagement is a multifaceted process involving active participation (behaviour), emotional investment (affect), and mental exertion (cognition) (Fredricks et al., 2004). Although each facet can be discretely defined, they typically overlap and co-facilitate engagement (Sinatra et al., 2015). This same tri-dimensional understanding holds for students' engagement with school (Jimerson et al., 2003; Lam et al., 2014). Behavioural engagement in schooling is demonstrated when a student actively participates in the learning process and school-related activities (Sinatra et al., 2015). Examples include students making eye contact with their teacher, spending time on homework, or participating in sporting events. Affective engagement in schooling is evident when a student is emotionally involved with their learning, school activities, peers, and teachers. That involvement can be positive (e.g., enjoying school or liking the teacher) or negative (e.g., fearing specific peers or feeling nervous about tests), with positive affect predicting higher school engagement (Fredricks et al., 2004). Cognitive engagement in schooling refers to a student being psychologically invested in their learning (Sinatra et al., 2015). Examples include students regulating their attention to remain focused on learning tasks, linking new information to what was previously learnt, and aspiring to do well in academic or other school-related tasks.

Multiple factors from multiple systems shape students' capacity to engage behaviourally, emotionally, and cognitively in their schooling, including ones associated with the individual student, the school, and the student's social ecology (Quin, 2017; Ryan et al., 2019; Wang et al., 2020). Said differently, young people's capacity to engage in their schooling is complex and socio-ecologically informed (D'Angelo & Kaye, 2018; Fredricks et al., 2016; Quin, 2017). For example, promotive factors (i.e., factors considered enabling regardless of risk exposure level; Sameroff, 2000) that support school engagement could be a student's executive functioning skills (psychological system), a supportive parent (family system), or quality housing (built environment) (Bradley & Putnick, 2012; Theron, 2021). Similarly, protective factors (i.e., factors considered enabling when risk exposure is high; Sameroff, 2000) that support school engagement for vulnerable youth could be a student's determination to succeed against all odds (psychological system), a small household (family system), caring teachers and peers (school system), or a disaster-resilient school location (natural environment system) (Pillay, 2017; Theron, 2021). Among these, there is much emphasis on PPFPs relating to the teacher, family, and peer group. There

is also some acknowledgement that neighbourhood PPFPs matter as well.

Teacher-related PPFPs. Teacher capacity to form emotionally supportive connections with their students is generally believed to advance students' engagement in schooling, also over time (Quin, 2017; Woolley & Bowen, 2007). For example, Berkowitz et al.' (2017) review of 78 school climate studies showed that positive teacher—student relationships mitigated the negative effects of socioeconomic challenges on young people's school engagement and achievement. Caring teachers are similarly important to other groups of vulnerable youth, as shown by resilience studies with youth who are refugees, materially disadvantaged, bullied, and/or neglected (Masten, 2014; Motti-Stefanidi & Masten, 2013; Yavuz & Kutlu, 2016). Caring teachers are also prominent in SA studies of resilience (Van Breda & Theron, 2018). For example, caring teachers encouraged and/or sustained the school engagement of SA youth challenged by street connectedness (Malindi & Machenjedze, 2012), economic vulnerability (Dass-Brailsford, 2005; Pillay, 2012; Theron, 2016), stigma (Bireda & Pillay, 2018; Machenjedze et al., 2019; Pillay, 2012), and/or experiences of abuse or neglect (Phasha, 2010; Theron & Engelbrecht, 2012). To encourage/sustain school engagement, teachers engaged in acts of care that facilitated student access to essential material resources, bolstered students' self-esteem, and/or responded to students' attachment needs.

Albeit to a lesser extent, school engagement studies have also reported the value of teachers' instructional competence to student engagement in schooling (Fredricks et al., 2004). In this regard, Quin's (2017) review of 46 studies of teacher contributions to students' school engagement concluded "that teachers need to strike a balance between the affective, relational aspects of teaching and high-quality instruction" (p. 376). Wang et al. (2020) indicated that instructional competence mattered more for the school engagement of older (i.e., high school) than younger (i.e., primary school) students. They did wonder, however, whether this phenomenon had less to do with age and more with the high school practice of multiple teachers and concomitant limited opportunity for teacher—student bonds to form.

The resilience literature acknowledges the value of teacher competence, particularly teacher capacity to teach well and manage classroom dynamics effectively (Cefai, 2007; Downey, 2008; McGee & Lin, 2017). SA studies of resilience recognise the importance of teacher instructional competence to the continued school engagement of students challenged by learning difficulties (Hall & Theron, 2016), violence (Herrero Romero et al., 2019), and/or socio-economic disadvantage (Mampane & Bouwer, 2011). Still, compared with reports of caring teachers, teacher competence is less prominent in SA studies of resilience.

Family-related PPFPs. The family context, including caregivers that are materially and emotionally supportive, matters for how well youth engage in their schooling (Veiga et al., 2016; Woolley & Bowen, 2007). School-attending youth who live in materially constrained households, often have little choice but to work part-time. Part-time employment is generally associated with poorer high school engagement and education outcomes, probably because of how part-time work decreases time to commit to schooling and its related tasks (Neyt et al., 2019). Similarly, when young people report low levels of parental support or negative parental expectations, school engagement suffers (Sharkey et al., 2008). On the other hand, supportive, authoritative parenting is strongly associated with higher levels of school engagement over time (Simons-Morton & Chen, 2009; Wang & Eccles, 2012), with some indication that educated parents (particularly mothers) are more likely to engage in positive parenting than parents with no/limited education (Carneiro et al., 2013; Dickson et al., 2016). The value of positive parenting practices (e.g., being interested in youths' schooling; expecting positive education outcomes) to school engagement has also been demonstrated in resilience studies with vulnerable young people, including refugee youth (Motti-Stefanidi & Masten, 2013) and young people living with foster families (Goemans et al., 2018).

Specifically, SA resilience studies note the value of positive parenting

practices to vulnerable youth's continued engagement in schooling (Van Breda & Theron, 2018), including youth challenged by structural disadvantage (Mhongera & Lombard, 2020; Herrero Romero et al., 2018; Theron, 2016; Theron & Van Rensburg, 2018), with warm caregivers encouraging education aspirations and/or providing school-related resources. In comparison, there were almost no reports of caregivers in disadvantaged communities supporting their children's mastery of learning tasks (e.g., helping with homework); this likely related to the limited education levels of most parents in disadvantaged SA communities (Maarman & Lamont-Mbawuli, 2017).

Peer-related PPFPs. Peer influences also matter for school engagement, possibly even more in adolescence than in childhood (Quin et al., 2018; Veiga et al., 2016; Wang & Hofkens, 2020). Various studies have shown that youth who experience peer acceptance are more likely to be engaged – particularly emotionally – in their schooling (Danneel et al., 2019; Engels et al., 2017; Jennings, 2003; Simons-Morton & Chen, 2009). When students make and sustain connections with school-engaged peers who are high achieving, they tend to emulate the positive behaviours of those peers (Wang & Hofkens, 2020).

In resource-constrained communities in South Africa, peers are infrequently associated with school engagement. Instead, there are concerns that the peer group is typically disinclined to advance positive behaviours, including being educationally engaged and respectful of school staff and fellow students (Maarman & Lamont-Mbawuli, 2017). Similarly, the SA resilience literature cautions that while pro-social, positive peers can be a source of encouragement and inspiration to school-attending youth (Bireda & Pillay, 2018; Malindi & Machenjedze, 2012; Theron, 2016), the broader peer group is unlikely to be associated with school engagement or other positive outcomes for youth from structurally disadvantaged communities (Mampane & Bouwer, 2011; Theron & Van Rensburg, 2018).

Neighbourhood-related PPFPs. Schools in structurally and socio-economically advantaged neighbourhoods are typically better funded and, therefore, better resourced. Better resourced schools usually have sufficient and effective staff, high quality curricula and related learning/teaching materials, and school-based mental and behavioural health supports (Maarman & Lamont-Mbawuli, 2017; Wang et al., 2020). While school engagement is more strongly associated with schools that are better resourced, students at under-resourced schools can still be highly school engaged when other systemic resources are available (Wills & Hofmeyr, 2019).

Following South Africa's democratisation in 1994, public schools were classified as Quintile 1 to 5 schools. The quintile classification corresponded to the socioeconomic status of the school's neighbourhood. It aimed to redress the Apartheid-related educational injustices that were meted out to Black students, most of whom continued to live in disadvantaged neighbourhoods post-1994, and associated cycles of poor educational outcomes and intergenerational poverty (Maistry & Africa, 2020; Spaull, 2019). Accordingly, higher quintile schools (i.e., Quintile 4–5) receive substantially less state subsidy but are permitted to levy self-determined school fees and engage in fund-raising initiatives (Maistry & Africa, 2020). In comparison, Quintile 1–3 are designated no-fee schools (i.e., they must rely on state-funding, mostly because their students would not be able to afford any fees). Students attending Quintile 1–3 schools receive a government-subsidized meal during the school day (Devereux et al., 2018).

Despite being well-intentioned, no-fee schools are routinely associated with inferior and less well-maintained infrastructure; limited access to learning and teaching support materials; poorer personnel provisioning and less competent teachers; high student–teacher ratios; and poor educational outcomes (Maarman & Lamont-Mbawuli, 2017; Marais, 2016; Motala & Carel, 2019; Spaull, 2019; Van Dyk & White, 2019). Relatedly, behavioural, affective, and cognitive disengagement with schooling is widely reported for students at no-fee schools (Marais, 2016; Spaull, 2015, 2019). Because Quintile 4–5 schools are associated with better education opportunities and more resources, families from

poorer neighbourhoods strive for their children to attend Quintile 4–5 schools, even if that means long public transport commutes and financial sacrifice (Van Dyk & White, 2019). For the most part, however, students in disadvantaged communities cannot avoid attending no-fee schools. SA studies of resilience report that students who attend resource-constrained schools are more likely to be school engaged when their families and communities valorise education and encourage students to do the same (Pillay, 2012; Theron, 2016; Theron & Van Rensburg, 2018). This valorisation is intertwined with hopes that education could break the cycle of intergenerational poverty and scaffold entry into better neighbourhoods (Maila & Ross, 2018). Neighbourhood-based organisations that provide homework and other learning support are also instrumental to the school engagement of youth attending under-resourced schools (Bireda & Pillay, 2018).

1.3. School engagement: A variable process

Importantly, the aforementioned factors and processes have variable promotive/protective value. For instance, Quin et al. (2018) reported non-significant associations between positive parenting and youth engagement in school, especially for older adolescents. A different study (i.e., a *meta*-analysis of 99 studies) showed that supportive teacher—student interactions were particularly important to older students (Roorda et al., 2011). This same *meta*-analysis found that girls who experienced their teachers as supportive were more likely to achieve better, although that outcome could relate more to how girls are socialised than being born female (Roorda et al., 2011). Likewise, a longitudinal study with vulnerable Dutch youth (i.e., young people who were fostered) reported that younger age and female sex predicted better school engagement (Goemans et al., 2018). In contrast, a survey of young people in seven European countries (i.e., Belgium, the Netherlands, Poland, Portugal, Spain, Sweden, United Kingdom) showed that age and sex were negligibly associated with school engagement (D'Angelo & Kaye, 2018). Similarly, a review and *meta*-analysis of 61 studies showed that associations between classroom climate (defined as instructional support, socioemotional support, and classroom organization and management) and youths' educational outcomes were not sensitive to students' grade levels (i.e., age) (Wang et al., 2020). In short, such variability accentuates the "need to better understand why, for whom, and under what conditions" (Wang et al., 2020, p. 17) specific PPFPs matter for school engagement.

1.4. The current study

Given the salience of school engagement to the resilience of African youth, and the historic inattention to the school engagement of African youth (Lam et al., 2014; Wills & Hofmeyr, 2019), we use data generated by SA participants in the RYSE study to explore which PPFPs predicted school engagement. We favoured an exploratory approach (i.e., one that excludes *a priori* hypotheses, usually because none can defensibly be put forward). No hypotheses could be proposed because the antecedents of school engagement are under-investigated for SA youth and because the findings concerning the individual, school and social-ecological factors associated with low versus high school engagement are discrepant. Thus, informed by a tri-dimensional conceptualisation of school engagement (Fredricks et al., 2004; Lam et al., 2014), we explored clusters of co-occurring affective, behavioural, and cognitive school engagement trajectories, i.e., joint-trajectory clusters. Then, with a focus on practicability, we identified the most significant predictors that potentiated the classification of students into an identified cluster.

The "grain size" (Sinatra et al., 2015, p. 8) at which we measured school engagement was a microlevel one, as students self-reported the affective, behavioural, and cognitive dimensions of their engagement with schooling and the individual, relational, institutional, and ecological factors that we used to predict their school engagement. To bolster our analysis of our data, we also included the SA government's quintile

classification of schools in analyses of what predicted school engagement trajectories. If school engagement measurement is understood as a continuum that ranges from a person-oriented to context-oriented one (Sinatra et al., 2015), our inclusion of personal, relational, institutional, and ecological factors fits with a person-in-context understanding of school engagement. While we were primarily interested in students' personal school engagement trajectories (i.e., person-oriented), we were attentive to factors in the family, neighbourhood, and school systems (i.e., context-oriented) that research has shown can shape an individual student's school engagement trajectory (i.e., person-in-context).

Two research questions guided our analyses:

1. Which clusters of co-occurring trajectories of affective, behavioural, and cognitive school engagement can be identified over the course of two years in a sample of South African high-school students?
2. What are significant characteristics of the identified multi-dimensional school engagement clusters?

2. Method

2.1. Context

The SA RYSE research site is a semi-urban town and its adjacent township in a risk-exposed municipality in one of South Africa's poorer provinces (i.e., Mpumalanga). The architects of Apartheid conceptualized townships as resource-constrained, racially segregated neighbourhoods (Wills & Hofmeyr, 2019). Despite South Africa's democratisation in 1994, townships are still mostly inhabited by people of colour and remain resource constrained (Msimanga & Sekhampu, 2020). The SA RYSE research site is generally characterized by physical degradation and widespread socioeconomic disparity (skewed toward socioeconomic disadvantage), violence, and repeated service delivery protests (Höltge, Ungar, & Theron, 2021).

Given this history, the RYSE site includes resourced and resource-constrained public schools, with the latter typically reporting high levels of student disengagement from schooling and poorer education outcomes (Maarman & Lamont-Mbawuli, 2017). In Mpumalanga, the student–teacher ratio (averaged across Quintile 1–5 primary and secondary schools) is 31.2 students to every teacher, with around 582 students and 18.6 teachers per school (Department of Basic Education, 2018). In 2018, Mpumalanga students reported large class sizes as the most pressing challenge to their education (SA Market Insights, 2020), possibly because most resource-constrained high schools are characterised by teacher-student ratios that exceed 1:35 (Marais, 2016). Despite these challenges, most parents and elders from the RYSE site actively encourage young people to view education as an opportunity for social and economic mobility and to be optimally invested in their schooling (Theron & Ungar, 2019).

2.2. Procedure

The study was approved by the principal investigators' Institutional Review Boards [Health Sciences Research Ethics Board, Dalhousie University (2017-4321); Faculty of Health Sciences Research Ethics Committee and Faculty of Education Ethics Committee, University of Pretoria (UP17/05/01)]. As explained elsewhere (Höltge, Ungar, et al., 2021; Ungar et al., 2021), a team of local adolescents and adults served as a Community Advisory Panel (CAP). Following training by the RYSE research team, the CAP helped develop the research methodology, recruit participants, and conduct part of the research. At the time of the study, participant recruitment was guided by the following eligibility criteria: (a) residence/school attendance/employment in the research site; (b) aged 14 to 24 years; and (c) proficient in English. Because the CAP recruited widely, multiple schools ($n = 12$) were represented in the sample.

As suggested by the CAP and prior resilience studies in South Africa

(Van Rensburg et al., 2019), the Time (T) 1 2018 surveys were administered by trained research assistants. They read survey items aloud to small groups of participants who then self-completed each item. In 2020, the T2 survey items were again read aloud, but the administration was one-on-one (given COVID-19 moratoriums on group-facilitated research). An informed consent form was signed by each participant (and their parent/legal guardian if participants were younger than 18). Participants received a modest token of appreciation for their participation (a supermarket voucher of around $15 [ZAR150] in 2018 and $30 [ZAR300] in 2020).

2.3. Participants

The 2018 sample consisted of $N = 340$ high school students (i.e., Grade 8–12 students). Only participants who participated in 2018 and 2020 and indicated that they were still attending high school in 2020 were included in the analyses reported in the current article (SA law allows students to prematurely terminate schooling provided they have turned 15 or completed Grade 9). These criteria resulted in $N = 173$ eligible individuals. One participant was excluded because they did not complete the school engagement measure in 2018, resulting in a final sample of $n = 172$ high-school students. This sample included 114 female pupils and 58 male pupils (average age:16.02; $SD = 1.67$), of which 91 attended a resource-constrained public high school (six Quintile 2 and one Quintile 3 schools) and 81 a resourced public high school (three Quintile 4 and two Quintile 5 schools). Two of these schools included technical subjects in their curricula; the rest offered the basic range of SA high school subjects (i.e., English and at least one other official SA language; Mathematics or Mathematical Literacy, Life Orientation, and typical electives [e.g., Accounting, Business Studies, Geography, Life Sciences, Physical Science, Tourism, etc.]).

Participants reported an average 2018 household size of 5.17 people ($SD = 1.72$). Mean total school engagement in 2018 was 120.88 (SD = 14.06) and 123.24 (SD = 13.36) in 2020. Please see Table 1 for further sample characteristics.

The $n = 167$ participants that only participated in 2018 (49% attrition rate) were mostly female (59.9%) and showed a mean age of 16.84 years (range 14–22 years, which was significantly higher compared to the included sample ($t = 3.93$, $p < .01$)). Most students self-identified as Black (82%), followed by White (16.2%). Regarding school engagement, those who were lost to follow-up did not show any significant differences compared with the retained sample: total ($t = -0.15$, p > .05), affective ($t = -0.03$, $p > .05$), behavioural ($t = -0.77$, $p > .05$), and cognitive ($t = -0.53$, $p > .05$) school engagement. However, those lost to follow-up showed a significant difference regarding the grade they were in during 2018. Typically, they were in higher grades in 2018 than the retained sample ($r = 0.23$, $p < .01$). There was a similar split between resourced and resource-constrained schools in those lost to follow up, with $n = 88$ attending resourced-constrained schools and $n = 79$ attending resourced schools.

2.4. Measures

2.4.1. Joint-trajectory cluster indicators

School engagement. Since RYSE took place in Canada and South Africa, the School Engagement Scale (SES) by Lam et al. (2014) was used. This scale was developed in a multi-country study spanning 12 countries across three continents to construct an internationally applicable SES. The SES assesses three factors of school engagement: affective (9 items that assess pupils' affection for school and learning, e.g., "I am very interested in learning.", range: 9–45), behavioural (12 items that assess learning effort and participation in school-related activities, e.g., "In class, I work as hard as I can.", range: 12–60), and cognitive (12 items that assess learning strategies, e.g., "When I study, I try to connect what I am learning with my own experiences.", range: 12–60). Further, a total SES score can be calculated. Sum scores were derived for the

Table 1
Sample characteristics.

Variable	Overall sample (N = 172)	Joint-trajectory clusters		ρ
		Stable high ABC SE (n = 105)	Stable low ABC SE (n = 67)	
	Mean (SD, range)	Mean (SD, range)	Mean (SD, range)	
Individual				
Total SE				
T1	120.88 (14.06, 74–147)	128.85 (9.09, 107–147)	108.38 (11.08, 74–130)	
T2	123.24 (13.63, 80–157)	130.13 (10.16, 104–157)	112.45 (11.19, 80–135)	
Affective SE				
T1	34.84 (6.42, 15–45)	37.36 (4.03, 27–45)	30.88 (4.81, 15–39)	
T2	35.47 (5.67, 16–45)	37.80 (4.34, 21–45)	31.81 (5.61, 16–43)	
Behavioural SE				
T1	42.32 (6.42, 21–55)	45.64 (4.82, 29–55)	37.12 (5.03, 21–47)	
T2	43.00 (6.15, 26–60)	46.13 (4.90, 34–60)	38.85 (5.23, 26–50)	
Cognitive SE				
T1	43.32 (5.77, 26–55)	45.85 (4.78, 34–55)	40.38 (5.62, 26–53)	
T2	44.48 (4.75, 33–55)	46.20 (4.25, 35–55)	41.79 (4.23, 33–52)	
Sex	66.28% female students	62.86% female students	71.64% female students	−0.09
Age	16.02 (1.67, 14–23)	15.99 (1.70, 14–23)	16.07 (1.63, 14–22)	0.05
Race[a]				
Black	81.40%	82.90%	79.10%	
White	15.70%	13.30%	19.40%	
Others	2.90%	3.80%	1.50%	
Part-time job	9.88% yes	10.48% yes	8.96% yes	0.01
Education importance	4.75 (0.59, 2–5)	4.83 (0.51, 2–5)	4.63 (0.69, 2–5)	−0.19*
Family				
Maternal education	4.77 (1.14, 1–6)	4.77 (1.17, 1–6)	4.78 (1.11, 1–6)	−0.00
PC Warmth	11.33 (1.36, 3–12)	11.69 (0.80, 7–12)	10.78 (1.80, 3–12)	−0.35**
Support	13.40 (2.15, 3–15)	13.74 (1.80, 8–15)	12.85 (2.52, 3–15)	−0.20**
Peers				
Support	11.77 (2.55, 4–16)	11.96 (2.56, 4–16)	11.46 (2.52, 4–16)	−0.10
Teachers				
Caring	2.60 (0.63, 1–3)	2.73 (0.52, 1–3)	2.39 (0.72, 1–3)	−0.27**
Competence	2.59 (0.61, 1–3)	2.75 (0.53, 1–3)	2.33 (0.64, 1–3)	−0.38**
Physical household ecology				
Household size	5.17 (1.72, 2–11)	5.18 (1.79, 2–11)	5.15 (1.63, 2–11)	−0.01
Housing[a]				
Brick house	61.60%	61.00%	62.7%	
Subsidized housing	26.20%	28.60%	22.40%	
Others	12.20%	10.50%	14.90%	

Note. SE = school engagement. ABC SE = affective, behavioural, and cognitive school engagement. PC = Parental/Caregiver. ρ = Spearman's rho correlation coefficient for cluster membership and predictors. [a] = comparison of race and housing composition of clusters via χ^2-test (no significant differences detected). * $p <.05$. ** $p <.01$.

subscales as well as total scale. Higher scores indicated higher engagement. A 5-point Likert scale was used for the affective and behavioural subscale (1 = "strongly disagree" to 5 = "strongly agree), as well as for the cognitive subscale (1 = "never" to 5 = "always"). Reliabilities: total SES (2018: Ω = 0.92, 2020: Ω = 0.93), affective SES (2018: Ω = 0.84, 2020: Ω = 0.88), behavioural SES (2018: Ω = 0.81, 2020: Ω = 0.82), cognitive SES (2018: Ω = 0.87, 2020: Ω = 0.88).

2.4.2. Predictors

The RYSE survey is a compendium of scales, sub-scales, and individual items that measure risk and resilience-supporting resources (Ungar et al., 2021). From this survey, the following predictors – all of which are associated with school engagement – were selected.

Individual. At the individual level, sex (female pupils, male pupils), age, race/ethnicity (1 = Black, 2 = White, 3 = other) were assessed. In relation to personal motivation for school and factors that could detract from that, the survey included the following items that were included into the analysis: "Do you work a paid part-time job while you are in school?" (Yes, No), and "Getting an education and/or improving qualifications/skills is important to me" (1 = "Not at all" to 5 = "A lot"). The latter item was taken from the Child and Youth Resilience Measure (CYRM-28) which assesses a multitude of cross-culturally important resilience-supporting resources (Ungar & Liebenberg, 2011).

Family. The 3-item Parental-Caregiver Warmth scale (PCWarmth; Ruchkin et al., 2004) was used to measure participant experience of a parent or caregiver. Items included: "Is proud of me", "Shows their love for me", and "Makes me feel good when I am with them" (1 = "Never" to 4 = "Most of the time"). A higher sum-score (range: 3–12) indicated higher parental/caregiver warmth. The reliability of the scale was Ω = 0.79. In addition, three CYRM-28 items were used to measure family support: "My family stands by me during difficult times", "My family know a lot about me", and "I feel safe when I am with my family" (1 = "Not at all" to 5 = "A lot"). A higher sum-score (range: 3–15) indicated higher family support. The reliability of the scale was Ω = 0.76. Finally, given the centrality of mothers to the development of African children (Brown et al., 2020) and the value of maternal education to child development in general (Carneiro et al., 2013; Dickson et al., 2016), the survey enquired about maternal education (1 = no schooling, 2 = did not complete high school, 3 = high school, 4 = some college, 5 = bachelor's degree, 6 = postgraduate qualification).

Peers. Perceived peer support was measured using the Peer Support Scale (Lerner et al., 2005). The scale consisted of four items (e.g., "My friends care about me") and a 4-point Likert scale (1 = "never true" to 4 = "always true"). A higher sum-score (range: 4–16) indicated higher peer support. The reliability of the scale was Ω = 0.86.

Teachers. Teacher variables included participants' subjective perception of (A) teacher competence ("My teachers teach well"), and (B) teacher caring ("My teachers treat me well (e.g., are friendly)"). These items were rated on a 3-point Likert scale (1 = "agree", 2 = "unsure", 3 = "disagree") and reverse coded for the analysis.

Physical ecology. Two survey items measured participants' physical household ecology: the total number of people in the participant's household and the type of housing/dwelling (1 = formal brick house, 2 = government-subsidized housing [typically a small, poorly constructed house; Sekoboto & Landman, 2019], 3 = other (e.g., shack, hostel flat, single room in someone's back yard).

School quintile. We used the School Masterlist Data (Department of Basic Education, 2021) for Mpumalanga to derive each school's quintile ranking. A categorical variable was included in our analysis to account for this information.

2.5. Analyses

All analyses were performed using *R* 4.0.3 in *RStudio* 1.3.1093 (R Core Team, 2020). The R-syntax for the main analyses can be found in the supplemental material. Data were used from 2018 and 2020 only,

because the scale for school engagement was not administered in 2019. A random forest approach was used to impute missing values using *missForest* 1.4 (for details see Stekhoven & Bühlmann, 2012).

To cluster participants based on co-occurring trajectories in the three school engagement factors, a longitudinal variant of k-means was used (Genolini et al, 2013). This method has been shown to work adequately for smaller sample sizes (Genolini et al., 2015). K-means works as follows: first, each participant is randomly assigned to a cluster center. Cluster centers are the average trajectory of individual trajectories that belong to one cluster. Optimal partitioning is reached when clusters are compact and the distance between clusters can no longer be maximized. This is done by an iterative procedure based on Expectation (computation of cluster centers) and Maximization (assigning participants to the best fitting cluster). The following distance measures were inspected to decide on the adequate number of clusters (Genolini et al., 2015): Calinski & Harabasz, Ray & Turi, and Davies & Bouldin. These distance measures are non-parametric. A higher distance indicates a better partition solution. Since there was no *a priori* hypothesis about the appropriate number of joint trajectories, 2 to 5 cluster solutions were tested. Each cluster solution was estimated 1000 times with different starting conditions. The trajectories were standardized during this procedure. The package *Kml3d* 2.4.2 was used for this analysis (Gelonini et al., 2013).

To identify meaningful predictors that classify participants to their cluster, an evolutionary classification tree (evtree) approach was used (Grubinger et al., 2014). These trees can handle different variable types, study complex interactions between a diverse set of predictors, and investigate non-linear relationships between predictors and outcomes. Basically, the predictors are investigated for empirically based, significant splitting values or thresholds that have a high certainty of classifying individuals to their respective cluster. In comparison to classical conditional inference trees with recursive partitioning that are only able to find locally optimal trees, evolutionary classification trees search for globally optimal trees. Evtrees are population-based in that many different trees are processed simultaneously and modified in a stepwise manner. This leads to an increase of the average quality of the trees until the best solution is found. The general goal of evtree is to find the best solution for the prediction performance of the tree and its complexity. The trees were estimated using 1000 iterations, 500 trees, an alpha of 0.1 (the complexity parameter), a maximum tree depth of three branches for practical interpretability, and a minimum of ten

observations for each internal node. This analysis was done with *evtree* 1.0.8 (Grubinger et al., 2014).

3. Results

3.1. Joint-trajectory clusters: Stable low vs. stable high affective, behavioural, and cognitive school engagement

All fit indices favoured a two-cluster solution as can be seen in Fig. 1 (see supplemental material for the fit indices): one cluster showed constantly higher values in affective, behavioural, and cognitive school engagement over time (stable high ABC SE) compared to the other cluster (stable low ABC SE). Paired *t*-Tests with Bonferroni correction ($\alpha = 0.017$) showed no significant differences between the two measurements of each school engagement factor for each respective cluster ($p > .02$). A MANOVA for each assessment confirmed significant differences between the clusters. In 2018 ($V = 0.53$, $F(3,168) = 62.32$, $p < .01$), the strongest difference was found for behavioural SE ($F(1,171) = 123.55$, $p < .01$, $\eta^2 = 0.42$), followed by affective SE ($F(1,171) = 90.80$, $p < .01$, $\eta^2 = 0.35$), and cognitive SE ($F(1,171) = 46.62$, $p < .01$, $\eta^2 = 0.22$). In 2020, ($V = 0.41$, $F(3,168) = 38.87$, $p < .01$), the strongest difference was also found for behavioural SE ($F(1,171) = 85.79$, $p < .01$, $\eta^2 = 0.34$), followed by affective SE ($F(1,171) = 61.91$, $p < .01$, $\eta^2 = 0.27$), and cognitive SE ($F(1,171) = 44.23$, $p < .01$, $\eta^2 = 0.21$).

3.2. Predictors of joint-trajectory clusters

Table 1 shows the descriptive characteristics of each identified cluster. The marginal correlation coefficients show that the stable high ABC SE cluster reported generally higher levels of resources than the other cluster. The correlations of the predictors can be found in the supplemental material separately for each cluster. A logistic regression was used for an overview of the independent linear effects of all predictors on cluster membership. Four significant predictors emerged: age ($b = 0.31$, $z = 2.13$, $p < .05$), having a part-time job ($b = 1.75$, $z = 2.07$, $p < .05$), parental/caregiver warmth ($b = -0.72$, $z = -3.01$, $p < .01$), and how well teachers teach ($b = -1.03$, $z = -2.80$, $p < .01$). These results indicate that the stable high ABC SE cluster was characterized by significantly younger age, having a part-time job, higher parental/caregiver warmth, and more competent teachers than the low ABC SE cluster when controlling for the other predictors.
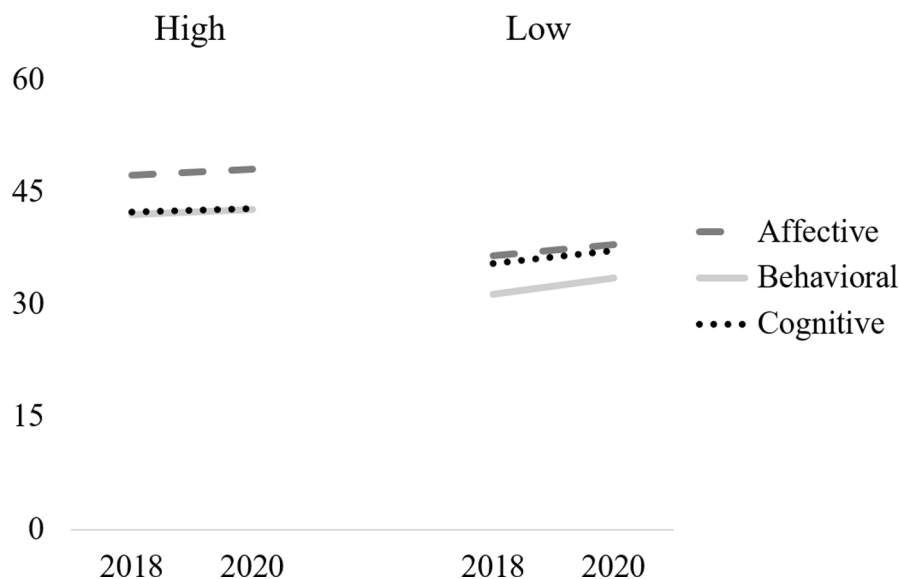

Fig. 1. *Identified Joint-Trajectory Clusters, Note.* Stable high affective, behavioural, and cognitive school engagement cluster on the left. Stable low affective, behavioural, and cognitive school engagement cluster on the right. All subscales have been re-scaled to a range between 0 and 60 to be comparable.

Next, evolutionary classification trees were used to investigate complex interactions between predictors and non-linear relationships between predictors and outcomes. The trees were limited to a maximum of three branches to derive practicable results. The final tree showed an overall predictive accuracy of 79.10%. Four significant cluster predictors emerged: age, parental/caregiver warmth (PCWarmth), a school's quintile ranking, and how well teachers teach (TTeach). Both clusters were predicted by three different predictor combinations (see Fig. 2), with the predictors able to correctly classify participants to the stable low (86.93%) and high (78.27%) ABC SE clusters.

Fig. 2 shows that two age groups emerged: participants younger than 16 years and participants who were 16 years and older. For under 16-year-olds, the first decisive predictor was going to either a resource-constrained (Quintile 1–3) or resourced (Quintile 4–5) school: going to a resource-constrained school showed an 84% likelihood of belonging to the high ABC SE cluster. For under 16-year-olds who attended a resourced school, PCWarmth was the second decisive factor: when they also reported maximum PCWarmth, there was a 75% likelihood of participants belonging to the high ABC SE cluster. If they reported less than maximum PCWarmth, the low cluster was likely (76.2% likelihood). For participants aged 16 years and older, belonging to the low ABC SE cluster was 100% likely if they did not report an almost maximum PCWarmth. If they perceived high PCWarmth, then perceived teacher competence was another decisive factor which determined the participant's trajectory: they likely belonged to the high ABC SE cluster if they perceived their teachers as very competent (76%). If not, assignment to the low cluster was likely (85% likelihood).

4. Discussion

School engagement is frequently reported as an outcome associated with the resilience of vulnerable sub-Saharan children, also over time (Adegoke & Steyn, 2017; Theron & Van Rensburg, 2018; Van Breda & Theron, 2018). Even so, published studies of what facilitates school engagement have typically excluded sub-Saharan children (Lam et al., 2014). The results reported in this article redress this inattention. Exploratory analyses of the 2018 and 2020 RYSE survey data generated by the same sample of South African adolescents show low and high

school engagement trajectories. Which cluster a student belonged to was predicated on the multisystemic resources that students reported. A higher school engagement trajectory was predicted by student perceptions of multiple resources at multiple system levels. In comparison, students who clustered in the stable low school engagement trajectory generally reported fewer resources at multiple system levels. Whilst the finding that multiple resources matter for school engagement is not different from studies with students in non-African contexts (Fredricks et al., 2004; Jimerson et al., 2003; Motti-Stefanidi & Masten, 2013; Ryan et al., 2019), it nevertheless underscores the importance of respecting the multisystemic nature of resilience pathways and related outcomes such as school engagement (Masten et al., 2021; Ungar & Theron, 2019). Said differently, low versus high school engagement is not an individual process; instead, it one that is also predicted by environmental and systemic factors.

Further, our results also redress the tendency of school engagement studies to be cross-sectional (Quin et al., 2018). They show that the affective, behavioural, and cognitive school engagement of the RYSE sample of South African students remained mostly constant over the 2018–2020 period. That result contrasts with reports that school engagement declines over time as students age (Fredricks et al., 2004; Wang & Eccles, 2012). The absence of a decline among RYSE participants could be attributed to the valorization of education by many SA families and associated socialization of children to maximize opportunities for education (Theron, 2016). Children are socialized to appreciate schooling as a high school diploma is understood as an effective way to escape from disadvantage (Maila & Ross, 2018).

Importantly, over-time results show that student membership in the stable low and high school engagement clusters was predicted by various combinations of PPFPs traditionally associated with school engagement. Certain PPFP combinations were identified that showed a high certainty (85–100%) of classifying students in the low school engagement trajectory, while the classification certainty for the stable high trajectory was somewhat lower (60–80%). Within the various combinations, student age, perceived parent/caregiver warmth, school quintile, and perceived teacher competence were the PPFPs that mattered most for which school engagement trajectory students were categorised into. Whilst the identified PPFPs factors reflect the literature
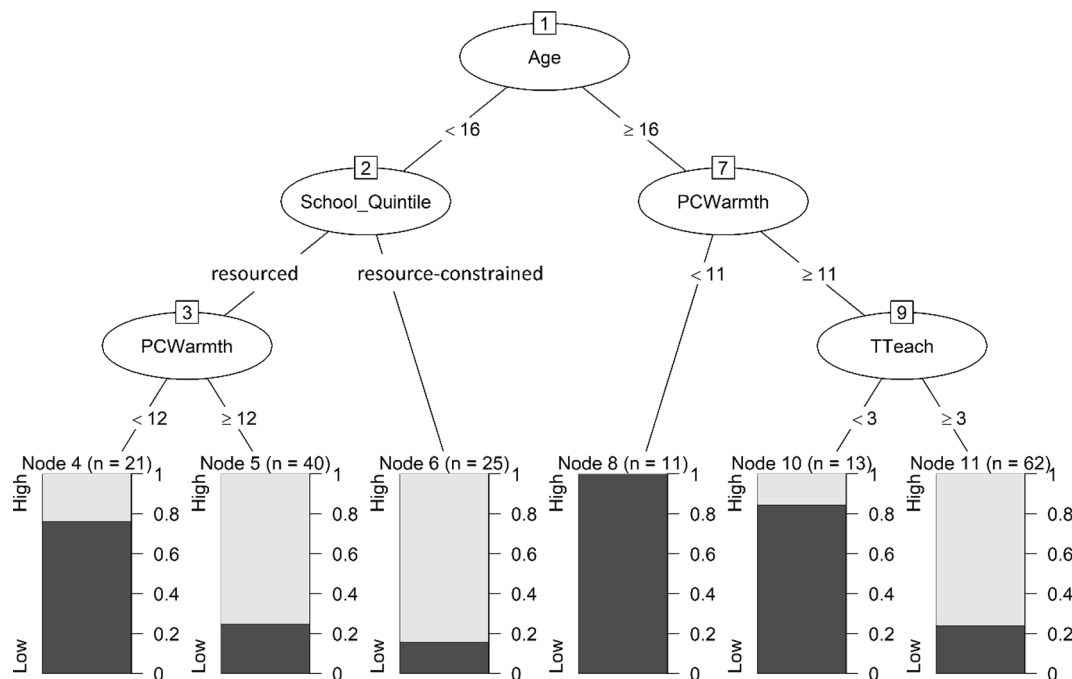

Fig. 2. *Final Evolutionary Classification Tree, Note.* PCWarmth = parental/caregiver warmth. TTeach = perceived teaching ability/competence of teachers. Numbers to the right of the bars indicate the likelihood of being in the stable low (black) vs high (grey) ABC SE cluster in relation to the respective predictor interaction.

that reports antecedents of low/high school engagement (e.g., Fredricks et al., 2004; Quin, 2017; Sharkey et al., 2008; Wang & Eccles, 2012), their varied combinations (see Fig. 2) are a timely reminder of the importance of better understanding "why, for whom, and under what conditions" (Wang et al., 2020, p. 17) these factors matter.

In the reported sample, younger (i.e., <16 years) versus older (i.e., >16 years) age was pivotal to which social support factors mattered more or mattered less for lower and higher school engagement. The decisive influence of age is at odds with studies that concluded that age was negligibly associated with school engagement (e.g., D'Angelo & Kaye, 2018; Wang et al., 2020), or that younger age is more strongly associated with school engagement than older age (Goemans et al., 2018). Further, parent/caregiver warmth was important to both age groups' school engagement, but differently so. Very high parental/caregiver warmth was associated with an 80% chance of belonging to the stable high school engagement cluster when students were younger and attended a resourced school. This fits broadly with the developmental and resilience literature that reports that parental social support typically matters more for younger adolescents (Van Harmelen et al., 2017). Interestingly, though, very high parental/caregiver also mattered for older students (even though high parental warmth was not sufficient in and of itself to predict older students' chances of belonging to the stable high school engagement cluster). This is at odds with reports of non-significant associations between positive parenting and youth engagement in school, particularly for older adolescents (Quin et al., 2018). Instead, the importance of very high parental/caregiver warmth to younger and older African students' school engagement fit with Wang and Eccles' (2012) conclusion that parental support remained fundamental to a sizeable sample of American students' engagement across grades 7–11.

The very high levels of parent/caregiver warmth that predicted students' membership in the high school engagement cluster were somewhat surprising. The SA RYSE research site was characterised by widespread structural disadvantage (Höltge, Ungar, et al., 2021; Ungar et al., 2021), and so these high levels of warmth fit poorly with expectations that structural disadvantage and related challenges would undermine positive parenting (Conger et al., 2002). Younger students who reported parent/caregiver warmth that was less than the maximum score possible (i.e., 12) and attended a resourced school were more likely to be in the low school engagement cluster. Similarly, older students who reported less than an almost maximum score (i.e., <11) for parent/caregiver warmth were more likely to be in the low school engagement cluster (regardless of whether their school was resourced or not). The reason for these very elevated levels is unclear but could perhaps be explained by context: in environments as stressed as that of the RYSE study, parental pride and affirmation need to be pronounced to have a protective effect.

We are unaware of any previous SA study that has reported that caregiver support has a differential protective impact relative to whether students are younger and attend a resourced school or not. Contextual dynamics could perhaps explain why caregiver warmth was not a decisive factor in the school engagement trajectory of students who were < 16 and attending a resource-constrained school. Students attending resource-constrained schools probably lived in the poorest neighbourhoods where caregivers typically work long hours, have limited education, and struggle to contribute to their children's mastery of learning tasks (Maarman & Lamont-Mbawuli, 2017). Further, SA resilience studies report that students in resource-constrained schools are often school-engaged in the hope that education will scaffold an adult life that is different from that of their caregivers. As would be expected, caregivers and elders in such contexts appear to actively encourage upward mobility via education-mediated pathways (Maila & Ross, 2018; Theron, 2016; Theron & Van Rensburg, 2018). In comparison, resourced schools might demand more from students (e.g., more stimulating learning tasks; expectations to be involved in school sports teams; caregiver support likely plays a decisive role in how younger

students engage with those demands. Similarly, contextual dynamics could explain why caregiver support was important to the school engagement of older students, regardless of the school they attended. In the absence of a materially and emotionally supportive caregiver, many older students from disadvantaged neighbourhoods quit high school and seek employment (Spaull, 2015). Likewise, in the SA context, where access to tertiary education is limited and youth employment is scarce, caregiver support likely sustains continued school engagement (Spaull, 2019; Theron, 2016).

Teacher factors also came into play when older RYSE students perceived almost-maximum levels of parent/caregiver warmth: older students were more likely to be school engaged when they experienced very warm parenting and competent teaching. The importance of teacher competence to the older RYSE students fits with Wang et al.' (2020) finding that instructional competence mattered more for the school engagement of older (i.e., high school) than younger (i.e., primary school) students. This finding also fits contextual dynamics. Viewed contextually, it is possible that the salience of teacher competence to the school engagement of the older (i.e., 16 years+) RYSE students could perhaps have related to their school leaving, and concomitant school-leaving exams, being more imminent than for younger high school students. The school leaving exams determine students' capacity to gain entry to tertiary education or employment opportunities and realise associated gains for their families and communities (Maila & Ross, 2018; Theron & van Rensburg, 2018). Previous SA studies of resilience that acknowledged the value of teacher instructional competence to risk-exposed students' school engagement did not differentiate between older and younger students (Hall & Theron, 2016; Herrero Romero et al., 2019; Mampane & Bouwer, 2011).

4.1. Limitations

Evolutionary classification trees are especially useful for praxis because they identify combinations of predictors that show the highest certainty of correctly classifying participants to their respective group (Grubinger et al., 2014). Hence, not all variables that are associated with school engagement (Fredricks et al., 2004, 2016), or that seemed to significantly differentiate between the two clusters in the preliminary analyses, were included in the final tree. However, since the likelihood for correctly classifying participants to the stable high trajectory was lower (i.e., 60–80%) than for the stable low trajectory (85–100%), future survey studies should include a larger pool of predictors that are important for school engagement to derive combinations that better predict high school engagement trajectories.

In addition, our data were generated by a small sample of SA adolescents ($n = 172$) from a single risk-challenged municipality. The data were further limited in that they excluded objective academic measures (e.g., students' marks or school attendance records) and reflected only students' perceptions (i.e., parent/caregiver and teacher inputs were not invited). Whilst students' subjective reports of the PPFPs associated with school engagement are valuable (D'Angelo & Kaye, 2018), the complex, social-ecological nature of school engagement means that other stakeholders' insights and/or objective measures would be valuable too (Quin, 2017). The data were also limited in that they only spanned a three-year period (2018–2020) with measurements at two time-points. A longer period and measurements at three (or more) time-points would have increased confidence in the predictive associations between the PPFPs and school engagement (Quin et al., 2018).

Finally, the quantitative data cannot explain why such high levels of parent/caregiver warmth mattered for school engagement. Likewise, the quantitative data provide little detail about teacher competence and its potential to compensate for lower levels of parent/caregiver warmth in ways that support older students' high engagement in schooling. Although it was possible to theorize about these results, future studies of school engagement among SA and other African adolescents should ideally include qualitative methods to better understand the protective

function of these factors.

4.2. Implications

Theoretical implications. School engagement theory encourages attention to PPFPs associated with students themselves and their social ecologies, particularly students' relationships with their caregivers, teachers, and peers (Fredricks et al., 2004; Lam et al., 2014; Quin, 2017; Sinatra et al., 2015; Wang & Eccles, 2012). While our results align with the theoretical understanding that multiple PPFPs across multiple systems co-facilitate students' school engagement, they also show that under specific conditions certain PPFPs matter more, or less, for specific students (Wang et al., 2020), while some might not matter at all. For example, in the context of our study, older students were more likely to be school engaged when they experienced very warm parenting and competent teaching; younger students were more likely to be school engaged when they attended a resourced school and experienced very warm parenting; and some commonly reported PPFPs (e.g., peer support) appeared not to matter for school engagement trajectories. Neighbourhood conditions could perhaps explain the latter: prior South African studies have questioned peer capacity to advance school engagement and other positive outcomes in resource constrained/ structurally disadvantaged communities (Maarman & Lamont-Mbawuli, 2017; Mampane & Bouwer, 2011). In short, our results highlight the need for a theory of school engagement that is attentive to the differential value of PPFPs.

Some school engagement studies have been attentive to the differential value of PPFPs. For example, Xie et al. (2019) demonstrated that in the context of out-of-classroom learning (i.e., a mobile learning environment), specific contextual factors (i.e., the study location and reasons for studying) moderated the association between college students' task-specific self-efficacy and cognitive engagement. Still, theories of school engagement typically do not foreground the variable value of PPFPs relative to a student's context and other factors. Just as resilience science accounts for contextually responsive, multisystem resources in theories of stress-exposed young people's capacity for positive outcomes (e.g., Höltge, Theron, et al., 2021; Masten & Motti-Stefanidi, 2020; Masten et al., 2021; Ungar, 2021; Ungar & Theron, 2019), school engagement theory needs to direct attention to those PPFPs that are most useful to specific students in specific contexts. Put differently, theories of school engagement need to explicate that school engagement is co-informed by resources in the systems that students are connected to, but that the value of those co-occurring resources will vary depending on the students in question (e.g., younger versus older students) and their contextual reality (e.g., resource-constrained versus resourced communities/schools). Theorising school engagement as a process informed by resources that are relevant to specific students in specific contexts has the potential to inform better practical support of students' involvement in and commitment to their schooling.

Practical implications. Despite the limitations reported earlier, our results hold promise for stakeholders wishing to sustain/advance high school engagement among SA adolescents, particularly those living in stressed environments like that of the RYSE study. This promise is strengthened by understanding that the PPFPs that support school engagement are responsive to interventions (Jimerson et al., 2003; Woolley & Bowen, 2007). Similar to students living in non-African countries (Ryan et al., 2019), interventions need to target PPFPs associated with SA adolescents' family and school ecology. This focus fits with contemporary resilience science's emphasis on the resilience-enabling value for adolescents of interventions that are not restricted to PPFPs within the adolescent (Ungar, 2021). Instead, enabling interventions also target PPFPs in systems that adolescents are connected to (Masten et al., 2021), especially family and school systems (Luthar et al., 2020; Matsopoulos & Luthar, 2020). For example, an evaluation of the Healthy Environments and Response to Trauma in Schools (HEARTS) program in four San Francisco schools (Dorado et al., 2016),

showed that it advanced students' school engagement. Importantly, all program supports were provided to students, as well as significant adults in these students' lives (e.g., educators and caregivers).

In particular, the current results argue for practitioner and other stakeholder attention to specific combinations of PPFPs outside of the student and how these combinations relate to students' age. In the RYSE study's SA context, it will be useful to intervene at the level of parents/ caregivers in order to advance/sustain the school engagement of younger (<16 years) *and* older (>16 years) high school students. Parents/caregivers need to be informed that very high levels of emotional warmth matter for high school engagement and sustaining that engagement over time. Given the negative relationship between structural disadvantage (and related challenges) and positive parenting (Conger et al., 2002), parents/caregivers in disadvantaged contexts (such as that of the SA RYSE study) would benefit from support to sustain/enable very high levels of warm parenting. To that end, various evidence-based interventions (e.g., Moretti et al., 2015) could be used to support parents/caregivers – including mothers with limited education (see Lachman et al., 2017) – to develop warmer parenting styles. Simultaneously, parents' resilience needs to be nurtured too; burnt-out, distressed and otherwise vulnerable parents will struggle to parent optimally (Luthar et al., 2020).

Further, teachers need to be reminded that instructional competence has the potential to advance/sustain the school engagement of older students (16 years+) who perceive their parents/caregivers as warm. The focus on competence should not suggest that that teacher caring is immaterial; following Quin (2017), teachers need to demonstrate both competence and caring. However, teachers and the institutions that train them should not underestimate the value of teacher competence to students' school engagement. Likewise, using accessible opportunities for continued professional development and equitable provisioning of teaching resources (Spaull, 2019), national and provincial departments of education must sustain and advance the competence of in-service teachers. Simultaneously, teacher resilience must be nurtured (Theron, 2021), more particularly in resource-constrained schools where high student–teacher ratios and poor infrastructure have the potential to undermine teacher competence and jeopardize teacher wellbeing (Marais, 2016).

The fact that younger students in resource-constrained schools in the RYSE site showed an 84% likelihood of being highly school engaged defies assumptions that students in resource-constrained schools will necessarily disengage from schooling (Wills & Hofmeyr, 2019). Instead, their continued commitment to their schooling needs to be better understood so that it can be better supported. While it is possible that these students' school engagement was galvanised by a desire to improve their and their families' lives (Maila & Ross, 2018; Theron & Van Rensburg, 2018), it is also possible that there were resources within their resource-constrained school context that were not measured by the RYSE survey. In any event, their commitment to their schooling strengthens calls to urgently advance the quality of education provided by SA resource-constrained schools (Maarman & Lamont-Mbawuli, 2017; Maistry & Africa, 2020; Marais, 2016; Motala & Carel, 2019; Spaull, 2019).

5. Conclusion

The analyses reported in this article redress the historic inattention to the school engagement of sub-Saharan African students (Lam et al., 2014). Over a three-year period, specific combinations of multisystemic PPFPs (i.e., student age, parental/caregiver warmth, teacher competence, school quintile ranking) sustained low and high school engagement trajectories for a sample of South African youth. Whilst this is a constructive start to understanding the school engagement trajectories of sub-Saharan students, meaningful support of African youth resilience demands continued and expedited attention to the combinations that matter more for higher school engagement among various groups of sub-Saharan African students. Moreover, given the pervasiveness of stressed

environments in sub-Saharan Africa (Sow, 2018), and the threat of stressed environments to positive parent and teacher functioning (Conger et al., 2002; Luthar et al., 2020; Theron, 2021), efforts to sustain/advance the school engagement of sub-Saharan students should attend to the resilience of their parents/caregivers and teachers too.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgement

Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.cedpsych.2022.102062.

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