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Vocational values scale: initial development and testing of the student form (VVS–S)

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Abstract

This manuscript aimed to develop an instrument assessing vocational values among students (VVS–S). The scale was developed in French using three different samples of Togolese participants for item development ($N = 140$), exploratory ($N = 308$) and confirmatory analyses ($N = 300$). It consists of 17 items divided into the five subscales of Power, Family, Helping, Salary, and Creativity. The correlational, higher-order, and bifactor models showed that these values could be considered independently. Moreover, four of the values correlated positively but weakly with life satisfaction. The VVS–S's usefulness for research and practice in counseling, particularly in sub-Saharan Africa, is discussed.

Keywords Scale development · Occupational preferences · Sub-Saharan Africa

Résumé

Échelle des valeurs professionnelles: Développement initial et test du formulaire étudiant (VVS-S) Ce manuscrit visait à développer un instrument d'évaluation des valeurs professionnelles chez les étudiant·e·s (VVS-S). L'échelle a été développée en français à partir de trois échantillons différents de participant·e·s togolais·es pour l'élaboration des items ($N = 140$), les analyses exploratoires ($N = 308$) et confirmatoires ($N = 300$). Elle est composée de 17 items répartis en cinq sous-échelles: Pouvoir, Famille, Aide, Salaire et Créativité. Les modèles corrélationnels, d'ordre supérieur et bifactoriels ont montré que ces valeurs pouvaient être considérées indépendamment. De plus, quatre des valeurs sont corrélées positivement mais faiblement avec la satisfaction de vie. L'utilité du VVS-S pour la recherche et la pratique du conseil, en particulier en Afrique sub-saharienne, est discutée.

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Zusammenfassung

Skala beruflicher Werte: Entwicklung und Überprüfung der Version für Studierende (VVS-S) Ziel dieses Manuskripts war die Entwicklung eines Instruments zur Erfassung von beruflichen Werten von Studierenden (VVS-S). Die Skala wurde in französischer Sprache entwickelt, wobei drei verschiedene Stichproben togoischer Teilnehmenden für die Itementwicklung ($N = 140$), exploratorische ($N = 308$) und konfirmatorische Analysen ($N = 300$) verwendet wurden. Sie besteht aus 17 Items, die in die fünf Subskalen Macht, Familie, Helfen, Gehalt und Kreativität unterteilt sind. Die Korrelations-, Higher-Order- und Bifaktormodelle zeigten, dass diese Werte unabhängig voneinander betrachtet werden können. Außerdem korrelierten vier der Werte positiv, aber schwach mit der Lebenszufriedenheit. Die Nützlichkeit des VVS-S für Forschung und Praxis in der Beratung, insbesondere in Afrika südlich der Sahara, wird diskutiert.

Resumen

Escala de Valores Vocacionales: Desarrollo Inicial y Prueba del Formulario del Estudiante (VVSS) Este manuscrito tuvo como objetivo desarrollar un instrumento de evaluación de los valores vocacionales entre los estudiantes (VVS–S). La escala se desarrolló en francés utilizando tres muestras diferentes de participantes togoleses para el desarrollo de ítems (N = 140), exploratorio (N = 308) y análisis confirmatorios (N = 300). Consta de 17 ítems divididos en las cinco subescalas de Poder, Familia, Ayuda, Salario y Creatividad. Los modelos correlacionales, de orden superior y bifactores mostraron que estos valores podían considerarse de forma independiente. Además, cuatro de los valores se correlacionaron positivamente pero débilmente con la satisfacción con la vida. Se discute la utilidad del VVS–S para la investigación y la práctica en asesoramiento, particularmente en el África subsahariana.

Introduction

Transitions in education are steps through which individuals are systematically confronted with various educational and career choices (e.g., major choice and specialization). Several factors, including personal factors, contextual factors, and social cognition-related factors, have been identified as determining educational and career aspirations, preferences, and choices (Lent et al., 2000; Migunde et al., 2012). Among these different factors, personal attributes such as interests and values have been documented as playing important roles (Dobson et al., 2014). Nevertheless, although the literature on interests and values is abundant, the available studies have mainly been conducted in Western populations (Atitsogbe et al., 2018). Moreover, while the assessment of interests and values seems to be integrated into career guidance services in most industrialized countries, this has not been the case in the less industrialized countries of sub-Saharan Africa, and this limitation has been argued to be the result of the lower development of career services over the years (e.g., insufficient budget and lack of career counselors) and, importantly, the lack of adequate instruments to be used for intervention and research in context (Atitsogbe

et al., 2016; Pari et al., 2020). Most investigations on values conducted in these areas have been cross-cultural studies of universal values using mainstream tools (e.g., Minkov & Hofstede, 2012). Vocational values and, more specifically, those related to occupational preferences and choice are still underinvestigated in African adolescents.

Most studies on values include a general conceptualization of values, which may be called basic or life values, as the primary conceptualization. A second conceptualization of work, career, or vocational values is essentially focused either on workers' organizational environment or populations dealing with career choice issues. However, although basic values have also been used in career choice research (e.g., Sagiv, 2002), not all values should be classified as work or vocational values (Brown & Crace, 1996).

General conceptualizations of values

Several definitions of the concept of values have been proposed over the years. The least sophisticated is probably "what is important to us in life" (Schwartz, 2012, p. 3). Spranger's (1922) typology of personality is widely acknowledged as the first value-based conceptualization. He distinguished six types of idealized values corresponding to six types of personality: theoretical, economic, aesthetic, social, political, and religious. Drawing from Spranger's typology, Vernon and Allport (1931) designed a questionnaire to assess preferences for the above six types of values. Another significant contribution was Rokeach's (1973) classification, which distinguished between 18 terminal values (e.g., equality and wisdom) and 18 instrumental values (e.g., honesty and independence), all assembled within the Rockeach Value Survey. Furthermore, Schwartz's (1992) theory of basic values defines ten values that are argued to likely be universal because they are driven by three requirements of human existence: biological needs, social interaction, and groups' survival and welfare needs. The basic values are benevolence, tradition, conformity, security, power, achievement, hedonism, stimulation, self-direction, and universalism. Schwartz (1992, 2012) distinguished six main features of all values used across the literature: (1) they are considered beliefs, (2) they refer to desirable goals, (3) they transcend specific actions and situations, (4) they serve as standards or criteria, (5) they are ordered by importance, and (6) their relative importance underlies action. As Schwartz (1992) stated, basic values can help explain individuals' attitudes, behavior, and decision-making. They have been linked to several constructs, such as vocational interests, and have been acknowledged as important in the development of meaning in life and work domains (Bernaud, 2018; Sagiv, 2002).

Work/vocational values

There is empirical evidence that individuals are likely to choose jobs with value content that is in line with their own value orientation (Judge & Betz, 1992). Of the multitude of conceptualizations and classifications of work values, Super's (1970) Work Values Inventory (SWVI) and Dawis and Lofquist's Minnesota Importance

Questionnaire (MIQ; 1984) are two important references that allow value assessment within the work domain (Abessolo et al., 2021). Super defined values as "a refinement of personal needs through interaction with one's environment" (Hammond et al., 2010, p. 266). According to Dawis and Lofquist's (1984) theory of work adjustment, work is an interaction between individuals and their working environments in which both sides of the interaction have requirements of the other. This interaction will be maintained as long as the requirements are met on each side; otherwise, the interaction will be terminated. In this theory, values are considered work needs that are determinant of satisfaction attainment. It is worth noting that all conceptualizations of work values are related to attraction to work. The SWVI assesses 15 work values (i.e., altruism, esthetics, creativity, intellectual stimulation, independence, achievement, prestige, management, economic returns, security, surroundings, supervisory relations, associates, variety, and way of life), while the MIQ assesses six (i.e., achievement, comfort, status, altruism, safety, and autonomy). As such, work values are determinant of occupational or work environment preferences and choices, as proposed by Choi (2017). Recently, several work values measures have emerged. Some are derived from the general conceptualization of values (e.g., The Work Values Questionnaire [WVal]; Consiglio et al., 2017) while others attempted to propose a more integrative value model (e.g., Abessolo et al., 2021; Busque-Carrier et al., 2021). Abessolo et al.'s Career Value Questionnaire measured the eight values of social, management, specialization, mobility, independence, salary, work–life balance, and variety. Moreover, Busque-Carrier et al.'s model included intrinsic, social, extrinsic, and status work values.

Education in Sub-Saharan Africa: from cultural to vocational values

Value transmission is part of individuals' normal development in African societies, as values are inextricably linked to parenting, raising children, and traditional education. Children, young people, and even adults are nourished with life values in their daily lives through social interactions. The environment is shaped by cultural values embedded in customs, beliefs, and practices, some of which are observed as standards (e.g., humanity and brotherhood) (Gyekye, 2003). Although these values are present in most societies, their importance can "vary widely among populations and become firmly established in the personal preferences and inner regulations of individuals who seek to re-establish them in the next generation" (LeVine, 1974, p. 226). One of the popular ways through which life values are conveyed in traditional education in Africa is proverbs. For instance, Awoniyi (2015) recently reported several values derived from Yoruba (Nigeria) and Akan (Ghana) proverbs, such as respect and honor for elders, regard and appreciation for one's family and benefactors, self-control, courtesy, forgiveness, harmony, peaceful coexistence, diligence, truth, honesty, unity, and cooperation. African researchers such as Nsamenang (1992) demonstrated the role of cultural values from a developmental point of view. According to Nsamenang (1992), from childhood to adulthood, "children learn vocational, marital and citizenship roles under the tutelage of their parents or fostering kin who must ensure that they are properly socialized into those attitudes, values, skills, expectations, and aspirations necessary for effective

group membership" (p.17). Throughout individuals' development, values intervene not only as a cement that binds them to the society but also as a motivator in the development and expression of their vocational interests, preferences, and career choices. Differentiation in values has been documented to have added value in counseling for choice-making (Zunker, 2012). Zunker (2012) argued that values are part of viable factors that are discussed and clarified within the career choice process. However, values related to career development or work settings have rarely received attention from African researchers. To our best knowledge, how cultural and personal values influence vocational preferences has not been investigated among sub-Sahara African students. Moreover, the fact that existing measures of work/vocational values mostly developed in westernized contexts (e.g., the Work Values Inventory-Revised; Hammond et al., 2010; Super, 1970) do not capture attachment to family, one of the important values in sub-Saharan Africa make the development of a new measure necessary in such a specific context. Some authors have suggested that an indigenous approach (bottom-up methodology) might be relevant for such investigations (Leong & Pearce, 2011).

The present research

To be realistic in investigating phenomena in context, several researchers have advised the development of instruments based on local specificities rather than the systematic importation of tools originally developed in very different contexts (e.g., Kim & Berry, 1993; Leong & Pearce, 2011). The use of tools developed for very distant cultures has been acknowledged as likely to increase the risk of missing local specificities (Van de Vijver, 2016). Based on this conception and guided by the aim of investigating local specificities, the present study sought to develop an instrument to assess vocational values among high school students in a context of sub-Saharan Africa using a bottom-up methodology. To reach this goal, three studies were conducted to provide updated knowledge regarding Togolese high school students' occupational preferences (career occupations they would like to pursue in the future) and develop an item pool assessing vocational values (what is important for them in choosing such occupations) (study 1), identify the structure of vocational values (study 2), and perform confirmatory analyses and evaluate some nomological relations between the developed scale and another construct such as satisfaction with life (study 3). Indeed, longitudinal research has shown that work values are significantly (and positively) associated with life satisfaction in adulthood rather than in adolescence (Chow et al., 2017). However, it is reasonable to expect such positive relations within the current study as the identified values are inextricably linked to the students' career aspirations.

Study 1: students' occupational preferences and item pool development

The ultimate goal of Study 1 was to identify categories of vocational values among high school students and generate items for each category. In addition, it aimed to provide updated information about the occupational preferences of high school

students. As Atitsogbe et al. (2016) highlighted, the number of available studies in the region is dramatically low, and little is known about the occupational preferences of adolescents in this context. The only study available was conducted more than 40 years ago (Devauge, 1973). Since that time, several occupations have undergone major transformations, and new occupations have appeared due to globalization and rapid social, economic, and technological changes in the twenty-first century. Study 1 will contribute to expanding the literature regarding adolescents' occupational preferences in these specific contexts.

Methods

Participants

An exploratory questionnaire survey was conducted among 140, 12th grade ($n=99$; 70.7%) and 13th grade ($n=41$; 29.3%) general education high school students, including men ($n=79$; 56.4%) and women ($n=61$; 43.6%) aged 15 to 26 ($M=18.66$; $SD=2.08$). The Togolese educational system comprises 13 grades and the completion of the 13th (high school diploma) allows access to university. Students have to take four national exams along the 13 grades (6th grade, 10th grade, 12th grade and 13th grade). These exams are very challenging, and over the past decade, some students have usually managed to take the 12th grade exam simultaneously in Togo and Bénin (a bordering country), to maximize their chance of success. Moreover, most countries in the region have cancelled the 11th grade national exam but this is still maintained in Togo. For example, the national success rates for the year 2021 were approximately 81.8%, 65.1%, 76.6%, and 69.6% for the 6th, 10th, 12th, and 13th grade exams, respectively (Ministry of primary, secondary, and technical education and handicrafts, 2021). Unfortunately, it follows that many students repeat classes for several times during their education, which may explain a large age gap between the students, especially in their 12th and 13th grades.

Among our sample, 102 students (72.9%) attended a public school, and 38 students (27.1%) attended a private school. Fifty-three participants (37.9%) were enrolled in philosophy and literature, and 86 (61.4%) were enrolled in mathematics and life sciences; one student did not provide information regarding major. The sample was relatively representative of the high school student population in Togo, where 73.9% attend public institutions (16.5% in private and the remainder in other institutions), 61.4% are men (38.6% women), and 56.7% are enrolled in philosophy and literature (42.4% in mathematics and life sciences and the remainder in other fields) (Ministry of primary, secondary, and technical education and handicrafts, 2020).

Procedure

Data collection was carried out in two schools (one public and one private) with the help of career counseling psychologists working at the National Centre for

Information and Vocational Guidance (NCIVG) in Lomé. These counselors are usually commissioned by the NCIVG to provide middle and high school students with information about university majors and knowledge about occupations. The participants had benefited from such a program (two to four hours per month) during past years and thus may have had broad knowledge about occupations. The NCIVG agreed to assist with the study and allowed career counselors to collect data. The data collection sessions were organized with the permission of the schools' staff. According to Togo national guidelines, questionnaire-based research conducted by or in collaboration with public institutions does not currently require ethics committee approval. However, we complied with codes of practice and ethics in research, such as the Declaration of Helsinki. The students were informed about the objectives of the study, and those who volunteered to participate responded to the questionnaires.

The participants were asked to first list and rank three occupations they would like to pursue in the future, starting with their most preferred (i.e., first, second, and third). Next, for each of the three occupations they listed, they were asked to specify in a few lines why they chose it. All justifications for occupational preferences were entered in a spreadsheet and content analyzed (Bardin, 1977).

Results and discussion regarding occupational preferences

In total, 79 occupations were listed, 43 of which were ranked first (Table 1). The most highly ranked occupations were physician, trader, football player, computer specialist, midwife, lawyer, businessman/woman, engineer, stewardess, nurse, secretary, architect, fashion designer, pilot, forwarder, electrician, priest/religious sister, teacher, military, journalist, accountant, screen actor, athlete, and civil servant. Moreover, the most frequently cited preferred occupations were physician (14.14%), trader (7.94%), lawyer (4.22%), architect (3.97%), teacher (3.97%), football player (3.47%), computer specialist (3.23%), journalist (3.23%), military personnel (3.23%), stewardess (3.23%), businessman/woman (2.98%), fashion designer (2.98%), cook (2.48%), pilot (2.23%), accountant (1.99%), forwarder (1.99%), agronomist (1.74%), midwife (1.74%), nurse (1.74%), secretary (1.74%), banker (1.49%), and customs official (1.24%). The findings were in line with those of Moumoula (2013), who reported physician to be the most preferred occupation among Burkinabe adolescents. Our findings also supported those of Devauge (1973), which, to the best of our knowledge, is the only study that has formally investigated occupational preferences among Togolese adolescents. Devauge's findings indicated that 35% of adolescents preferred occupations accessible through higher education, which was the case in our study for several occupations, such as physician, accountant, banker, lawyer, and architect.

Comparable with our findings, Devauge's findings showed physician to be the most preferred occupation in adolescents, with 24.8% of our sample vs 20% of Devauge's sample rating this occupation first, 8.7% of our sample vs 11.5% of Devauge's sample rating it second, and 8.6% of our sample vs 7% of Devauge's sample rating it third. Forty-seven years later, our study seems to replicate the previous findings. Moreover,

Table 1 Ranking and Frequency of the 43 Most Preferred Occupations—Study 1

Occupations	Frequency (% of response)				Occupation	Frequency (% of response)			
	First	Second	Third	Total		First	Second	Third	Total
Physician	34 (24.81)	11 (8.73)	12 (8.57)	57 (14.14)	Athlete	2 (1.46)	0	0	2 (0.50)
Trader	7 (5.11)	6 (4.76)	19 (13.57)	32 (7.94)	Civil servant	2 (1.46)	0	0	2 (0.50)
Football player	7 (5.11)	4 (3.17)	3 (2.14)	14 (3.47)	Cook	1 (0.73)	7 (5.55)	2 (1.43)	10 (2.48)
Computer specialist	6 (4.38)	4 (3.17)	3 (2.14)	13 (3.23)	Agronomist	1 (0.73)	3 (2.38)	3 (2.14)	7 (1.74)
Midwife	6 (4.38)	1 (0.79)	0	7 (1.74)	Banker	1 (0.73)	3 (2.38)	2 (1.43)	6 (1.49)
Lawyer	5 (3.65)	6 (4.76)	6 (4.28)	17 (4.22)	Customs official	1 (0.73)	1 (0.79)	3 (2.14)	5 (1.24)
Business man/woman	5 (3.65)	1 (0.79)	6 (4.28)	12 (2.98)	Graphic designer	1 (0.73)	0	2 (1.43)	3 (0.74)
Stewardess	4 (2.92)	4 (3.17)	5 (3.57)	13 (3.23)	Manager	1 (0.73)	1 (0.79)	1 (0.71)	3 (0.74)
Nurse	4 (2.92)	1 (0.79)	2 (1.43)	7 (1.74)	Civil engineer	1 (0.73)	2 (1.59)	0	3 (0.74)
Secretary	4 (2.92)	1 (0.79)	2 (1.43)	7 (1.74)	Marketing officer	1 (0.73)	1 (0.79)	0	2 (0.50)
Architect	3 (2.19)	7 (5.55)	6 (4.28)	16 (3.97)	Economist	1 (0.73)	1 (0.79)	0	2 (0.50)
Fashion designer	3 (2.19)	4 (3.17)	5 (3.57)	12 (2.98)	Registrar	1 (0.73)	1 (0.79)	0	2 (0.50)
Pilot	3 (2.19)	4 (3.17)	2 (1.43)	9 (2.23)	NGO representative	1 (0.73)	0	0	1 (0.25)
Forwarder	3 (2.19)	2 (1.59)	3 (2.14)	8 (1.99)	Ambassador	1 (0.73)	0	0	1 (0.25)
Electrician	3 (2.19)	0	4 (2.86)	7 (1.74)	Assistant medical officer	1 (0.73)	0	0	1 (0.25)
Priest/Religious sister	3 (2.19)	0	1 (0.71)	4 (0.99)	Refrigeration expert	1 (0.73)	0	0	1 (0.25)
Teacher	2 (1.46)	8 (6.35)	6 (4.28)	16 (3.97)	Geologist	1 (0.73)	0	0	1 (0.25)
Military	2 (1.46)	7 (5.55)	4 (2.86)	13 (3.23)	Surveyor	1 (0.73)	0	0	1 (0.25)
Journalist	2 (1.46)	9 (7.14)	2 (1.43)	13 (3.23)	Mathematician	1 (0.73)	0	0	1 (0.25)
Accountant	2 (1.46)	3 (2.38)	3 (2.14)	8 (1.99)	Notary	1 (0.73)	0	0	1 (0.25)
Engineer	4 (2.92)	2 (1.59)	1 (0.71)	7 (1.74)	Parliament member	1 (0.73)	0	0	1 (0.25)
Screen actor	2 (1.46)	1 (0.79)	1 (0.71)	4 (0.99)					

Devauge reported findings on high prestige occupations in the study context in the 1970s, such as pilot; stewardess; ambassador; Parliament member; architect; lawyer; engineer; mathematician; teacher/professor; manager; other occupations, such as army personnel, journalist, priest, midwife, nurse, secretary, agronomist, and cook; and some nonprofessional activities, such as sports champion (athlete and football player were reported in our sample). Low-prestige occupations that Devauge reported on, such as plumber, hairdresser, and scrap dealer, were not cited by any of our participants. Another fundamental difference between our study and Devauge's study was that occupations requiring the use of computers, such as computer specialist, graphic designer, fashion designer, and surveyor, were not cited by adolescents in the 1970s.

Results of the item pool development

A total of 185 indicators of occupational preferences were identified based on the content analyses of the participants' preference justifications and grouped into 20 categories: Autonomy, Control, Prestige, Salary, Help and care for family, Creativity, Helping/serving others, Self-development/serving oneself, Opportunities, Mobility/traveling, Fulfillment of one's wishes, Job agreeableness, Resemble to one's model, Passion for the occupation, Job attractiveness, Self-efficacy, Experience in the job, Use of a computer, Ability to serve God, and Ecological sensitivity. The indicators have also been subjected to the grouping into the 20 categories by a Master's level student in counseling psychology. Inter-rater reliability was assessed through Cohen's Kappa (Cohen, 1960), which was 0.68, $p < 0.001$. Such a value was moderate (probably due to the large number of the identified categories); a strong Kappa should range from 0.80 to 0.90 (McHugh, 2012). Thus, based on the observation semantic proximity between some categories, the most similar were merged. For example, the Help and care for family category was assigned to Helping/serving others. Moreover, as we were mainly interested in values, we excluded categories that did not adhere to this criterion (Worthington & Whittaker, 2006) as well as two others that appeared to be of minor importance, i.e., Serve God and Ecological sensitivity, which were quoted only by three and four participants who had preferences for the religious or agro-pastoral domains, respectively. Subsequently, seven categories remained and were considered for item pool generation: Autonomy, Control, Prestige, Salary, Family links, Creativity, and Helping/serving others. Forty-two items were generated based on the above categories' indicators avoiding overlaps (5 to 7 items per category). The items (content validity, phrasing, and comprehensibility) and response format were reviewed by three experts (1 Master's student, 1 doctoral student, and 1 academic) who were skilled in career counseling psychology and work and organizational psychology. Minor adjustments were made based on expert consensus.

Study 2: item selection and exploratory factor analyses

Methods

Participants and procedure

A sample of 308 high school students was used for exploratory factor analyses. It included 155 men (50.3%), 151 women (49.0%), and 2 students (0.7%) who did not provide information on sex. They responded to a paper–pencil questionnaire. All participants were aged 15 to 25 ($M = 18.44$; $SD = 2.12$). Regarding education level, 151 (49.0%) were in the 11th grade, 154 (49.7%) were in the 12th grade, and 4 students (1.3%) did not mention their grade or major. Ninety-seven (31.5%) participants were enrolled in literature and philosophy, 84 (27.3%) were enrolled in mathematics and physics, and 123 (39.9%) were enrolled in mathematics and life sciences.

The participants were surveyed by two career counseling psychologists in two other public schools than those in Study 1 but under the same conditions described in Study 1.

Instrument

The questionnaire included the 42 vocational value items generated in Study 1. Sample items are "I do not like to depend on others" for Autonomy, "I feel able to direct and guide others" for Control, "I would like to become famous through my future career" for Prestige, "I tend to avoid jobs that are not well paid" for Salary, "I intend to have a job that will be useful to my family" for Family links, "I have lots of new ideas that I want to concretize in my future work" for Creativity, and "I like serving others" for Helping/serving others. All items were rated on a Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5).

Analyses and results

To identify the underlying factor structure of vocational values, we conducted exploratory factor analyses (EFA) in which data were subjected to principal axis factoring (PAF) with promax rotation using SPSS 25.0. These choices were guided by our goal to extract common variance, assuming that factors would be correlated (Abessolo et al., 2021; Kahn, 2006). Our sample size adhered to the recommendation of Worthington and Whittaker (2006), who indicated that at least 300 cases are necessary to run an exploratory factor analysis. Moreover, these authors suggested assessing the factorability of data by means of the Kaiser–Meyer–Olkin (KMO) index, which should be above 0.60, and the Bartlett test of sphericity if the cases-per-item ratio is between 3 and 5. The ratio for this study was 7.33. To reduce the number of items, we applied criteria such as selecting

items that have a factor loading of |.32| or above, excluding items that presented cross-loadings below 0.15 difference from its' higher loading, and items that did not reflect the associated factor (Worthington & Whittaker, 2006).

The number of factors to be retained was explored based on the Eigenvalues greater than 1 criterion and parallel analysis (Kahn, 2006) using JASP 0.16. The Eigenvalues criterion suggested a four-factor solution, whereas parallel analysis suggested seven factors. We then proceeded by testing four-factor, five-factor, six-factor, and seven-factor solutions. It is worth noting that the developed items were initially grouped into seven categories (Study 2). We retained the five-factor solution as the four-factor solution appeared to be restrictive; the six and seven-factor solutions presented one and two inconsistent factors, respectively, that had to be excluded to the benefit of five factors. The initial five-factor solution yielded a KMO index value of 0.73, indicating the suitability of the data for factor analysis. Twenty-four items were removed using criteria mentioned earlier through seven successive rounds of PAF analyses. These procedures led to 18 items distributed on the factors (4–4–4–3–3). The five factors explained 53.22% of the cumulative variance, with single factors explaining 18.20%, 11.77%, 8.95%, 7.62%, and 6.68% of the variance. The factors were named Power, Family, Helping, Salary, and Creativity. The loadings for items on the corresponding factors ranged from 0.326 to 0.825 ($Mdn = 0.545$), as reported in Table 2.

Study 3: confirmatory factor analysis and the psychometric properties of the VVS–S

The aim of study 3 was to assess the psychometric properties of the Vocational Values Scale – student form (VVS–S). We expected to confirm the five-factor structure derived from the EFA (Hypothesis 1) and further evaluate the relations between the VVS–S subscales and life satisfaction. We expected the VVS–S subscales to positively correlate with one another (Hypothesis 2) and with life satisfaction (Hypothesis 3). Indeed, a past investigation in Togo highlighted the importance of money/salary (which can also confer power) and family/relatives' well-being in the achievement of individuals' satisfaction with life (Atitsogbe, Kossi, et al., 2021; Sovet et al., 2016). Furthermore, the country is categorized as a collectivistic culture where helping others is highly valued (Nsamenang, 1992), and where creativity is being supported (e.g., entrepreneurship) through development public policies (OECD, 2016; Atitsogbe, Pari, et al., 2021). Regarding the hypothesized positive relations between vocational values and life satisfaction, very few researchers have investigated such linkages. The available rare studies have reported their relatedness in adulthood rather than in adolescence (i.e., Chow et al., 2017). However, as high school students are at a distal step regarding real involvement in working, their currently expressed work values in line with their future occupational preferences might contribute to their satisfaction with life. Therefore, it is reasonable to expect positive relations between vocational values and life satisfaction in this specific population.

Table 2 The Student Vocational Values Scale Factor Loadings from Exploratory Factor Analysis—Study 2

	1	2	3	4	5
Power					
24. I would like to be designated through a respected and appreciated credential	**.825**	.015	–.037	–.103	–.054
5. I would like to become famous through my future career	**.547**	–.031	.095	.132	–.002
41. It is important for me to hold a high position in society	**.476**	.112	.005	.143	–.068
3. I would like to hold a leader position in the future	**.474**	–.222	–.072	.046	.139
Family					
32. My future career will allow me to take care of my family	.072	**.579**	–.038	.051	–.060
25. I feel that I have an obligation to help my family members	–.065	**.561**	.031	–.039	.116
10. Fulfilling the needs of my family will be my priority	–.094	**.543**	.020	.012	.056
19. It is important for me to take a job that will allow me to fulfill family responsibilities	–.036	**.529**	.001	.055	–.041
Helping					
21. I care about others' the well-being	–.149	–.063	**.753**	.184	–.066
16. I feel concerned about other people's problems	–.018	–.022	**.693**	–.116	.015
31. I like defending others	.106	.086	**.363**	–.014	.038
9. I always do something to help people experiencing difficulties	.270	.147	**.333**	–.185	.036
Salary					
29. High salary is very important in the choice of my future occupation	–.014	.039	.014	**.707**	.001
18. It's important for me to have a job that will make me earn a lot of money	.160	.053	–.078	**.595**	–.010
36. I tend to avoid jobs that are not "well-paid"	–.007	–.017	.029	**.439**	.008
Creativity					
4. I like creativity	–.116	.063	–.049	.053	**.700**
12. I'm not frightened of doing jobs that requires a lot of creativity	.075	.029	.000	–.101	**.531**
42. I want to be author of new inventions	.179	–.070	.132	.163	**.326**

Note. $N = 301$

Here's why significance could be computed in Confirmatory Factor Analysis (CFA): because in CFA, one item per factor is fixed, allowing to compute a standard error for others and therefore significance for each

Methods

Participants and procedure

A validation sample of 300 high school students was used in this study. It consisted of 166 (55.3%) men, 131 women (43.7%), and 3 participants (1.0%) who did not provide sociodemographic information. All participants were aged 14 to 25 ($M = 18.07$; $SD = 1.98$). Regarding their grade, 75 (25%) were in the 12th grade, and 219 (73%) were in the 13th grade (nonresponders = 6; 2%). One hundred and eleven participants (37.0%) were enrolled in literature and philosophy, 46 (15.3%) were enrolled in mathematics and physics, and 140 (46.7%) were enrolled in mathematics and life sciences (nonresponders = 3; 1%).

Data collection was continued within the framework of career counseling interventions in the Lomé-Golfe educational region. The present validation data were collected by two other career counseling psychologists who were responsible for vocational guidance interventions in these schools. Similar to previous responding sessions, the participants who volunteered for the study completed the questionnaire.

Instruments

Vocational values

The developed Vocational Values Scale for Students (VVS–S) derived from the EFA was used to collect new data. This 18-item measure assesses five values related to future occupational preferences: Power (4 items; e.g., "It is important for me to hold a high position in society"), Family (4 items; e.g., "It is important for me to take a job that will allow me to fulfill family responsibilities"), Helping (4 items; e.g., "I always do something to help people experiencing difficulties"), Salary (3 items; e.g., "It's important for me to have a job that will make me earn a lot of money"), and Creativity (3 items; e.g., "I want to be author of new inventions"). Items were rated on a Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). Cronbach alpha reliabilities for the 18-item VVS–S subscales were 0.73 for Power, 0.79 for Family, 0.63 for Helping, 0.74 for Salary, and 0.61 for Creativity.

Life satisfaction

Life satisfaction was assessed using the Satisfaction with Life Scale (SWLS; Diener et al., 1985), a 5-item scale evaluating subjective well-being. In the present study, each item was rated on a 5-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). The mean of the five item scores provides an overall life satisfaction score. Adaptation of this scale to the Togolese context was previously performed with university students (Sovet et al., 2016). These authors found the first item of the original scale, "In most ways, my life is close to my ideal", to have a poor factor loading and proposed an alternative formulation, "Globally, my life

is close to the ideal life I imagine", which showed good reliability with the other scale items ($\alpha = 0.81$). Furthermore, the scale was found to be appropriate for use in adult workers (Atitsogbe, Kossi, et al., 2021). The present study is the first published research to use the SWLS among Togolese high school students. The Cronbach's alpha value was 0.80.

Structure of the VVS–S: confirmatory factor analyses

The structural validity of the VVS–S was assessed using confirmatory factor analysis (CFA) with maximum likelihood rotation in JASP. (Table 3). Several model fit indices were considered: χ^2 per degree of freedom (χ^2/df), the comparative fit index (CFI), the Tucker–Lewis index (TLI), and the root mean square error of approximation (RMSEA). A well-fitting model should have $\chi^2/df < 3$, CFI and TLI ≥ 0.90 (Byrne, 2010), and RMSEA ≤ 0.08 or 0.05 (Hu & Bentler, 1999).

At first, we established a five-factor model allowing each of the 18 items to load on its specific factor, and factors to correlate with one another. This correlational model yielded acceptable fit indices: $\chi^2/df = 1.71$, CFI = 0.933, TLI = 0.918 and RMSEA = 0.049 with standardized loadings from items to corresponding factors ranging from 0.48 to 0.84 ($Mdn = 0.64$). Secondly, we tested a higher-order model allowing a second-order factor to predict the five specific factors. This model presented a decrease in fit compared to the correlational model: $\chi^2/df = 1.89$, CFI = 0.912, TLI = 0.897 and RMSEA = 0.055. Furthermore, we tested a bifactor model allowing each item to load on its specific factor as well as on a general common factor while setting the specific factors to be non-correlated. The bifactorial model outperformed the higher-order model ($\Delta\chi^2(13) = 26.38$, $p < 0.05$; ΔCFI = 0.01)) but presented nearly acceptable fit indices: $\chi^2/df = 1.88$, CFI = 0.922, TLI = 0.898 and RMSEA = 0.054. The standardized loadings from items to specific factors ranged from 0.28 to 0.84 ($Mdn = 0.50$) and those from items to the general common factor ranged from 0.04 to 0.79 ($Mdn = 0.33$). Although item 21 loaded strongly on its factor (0.84), it presented the weakest loading on the general common factor (0.04). Thus, we proceeded by removing this item (to improve the fit) and tested the

Table 3 Fit Indices for Confirmatory Factor Analyses of the VVS–S—Study 3

VVS–S 5 correlated factor model	χ^2	df	χ^2/df	P	CFI	TLI	RMSEA
18-item measure							
Five-factor-correlated model	213.23	125	1.71	< .001	.933	.918	.049
Higher-order model	246.04	130	1.89	< .001	.912	.897	.055
Bifactor model	219.66	117	1.88	< .001	.922	.898	.054
17-item measure							
Five-factor-correlated model	166.77	109	1.53	< .001	.953	.942	.042
Higher-order model	194.63	114	1.71	< .001	.935	.923	.049
Bifactor model	168.43	102	1.62	< .001	.947	.929	.047

$N = 300$

17-item correlational model, higher-order model, and bifactor model. The 17-item correlational model fitted well, $\chi^2/df = 1.53$, CFI = 0.953, TLI = 0.942 and RMSEA = 0.042, compared to the 18-item one ($\Delta\chi^2(16) = 46.46$, $p < 0.001$; ΔCFI = 0.02)) (see Figure 1). Findings were similar for the higher-order model, $\chi^2/df = 1.71$, CFI = 0.935, TLI = 0.923 and RMSEA = 0.049, compared to the one previously tested (($\Delta\chi^2(16) = 51.41$, $p < 0.001$; ΔCFI = 0.023)). Likewise, the 17-item bifactorial model significantly outperformed the 18-item one ($\Delta\chi^2(15) = 51.23$, $p < 0.001$; ΔCFI = 0.025)) with acceptable fit indices: $\chi^2/df = 1.62$, CFI = 0.947, TLI = 0.929 and RMSEA = 0.047 (see Figure 2). We calculated the 17-item VVS–S bifactor indices such as the Explained Common Variance (ECV) index, Percent of Uncontamibated Correlations (PUC), and Omega for the overall scale and the subscales using Dueber's calculator (Dueber, 2017). ECV index represents the proportion of all common variance explained by the general factor; PUC represents how much of covariance terms that reflect unbiased variance from the general dimension; Omega (ω) represents the factor-analytic model-based composite estimate of internal reliability; Omega for factors accounts for items loading on each specific factor whereas Omega Hierarchical (ω_H) is the systematic percentage of variance in the VVS–S total score attributable to the general factor (Dueber, 2017; Rodriguez et al., 2016). Rodriguez et al. (2016) stated that "when ECV > 0.70 and PUC > 0.70, relative bias will be slight, and the common variance can be regarded as essentially unidimensional" (p. 10); and when $\omega_H > 0.80$, the total score can be considered unidimentional as "the vast majority of reliable variance is attributable to a single common source" (p. 3). We found ECV = 0.38 and PUC = 0.85, meaning that 38% of the common variance is explained by the VVS–S general factor and 62% by the five VVS–S factors together. Furthermore, Omega was high (ω = 0.85), those for the specific factors were $\omega_{Power} = 0.74$. $\omega_{Family} = 0.80$, $\omega_{Helping} = 0.62$, $\omega_{Salary} = 0.76$, and $\omega_{Creativity} = 0.64$, and $\omega_H = 0.60$ which is below 0.80. Based on Rodriguez et al.'s standards, our findings supported the multidimensionality of VVS–S (Hypothesis 1). The 17-item five-correlated factor model should then be retained as the VVS–S best fitting model (see Table 3).

Intercorrelations among VVS–S subscales and relations with life satisfaction

Regarding Hypothesis 2, most of the VVS–S subscales were positively correlated with one another (Table 4). The significant correlations among the five value scores ranged from 0.12 (Creativity–Salary) to 0.47 (Power–Salary). However, correlations Power–Helping ($r = 0.11$), Family–Creativity ($r = 0.09$), and Helping–Salary ($r = 0.05$) were nonsignificant. Furthermore, four of the five VVS–S subscales correlated significantly with life satisfaction (Hypothesis 3): Power ($r = 0.16$, $p < 0.01$), Family ($r = 0.24$, $p < 0.001$), Salary ($r = 0.15$, $p < 0.05$), and Creativity ($r = 0.15$, $p < 0.05$). However, Helping showed a nonsignificant correlation with life satisfaction ($r = 0.10$). These findings showed that the most VVS–S subscales correlated positively but weakly with life satisfaction.

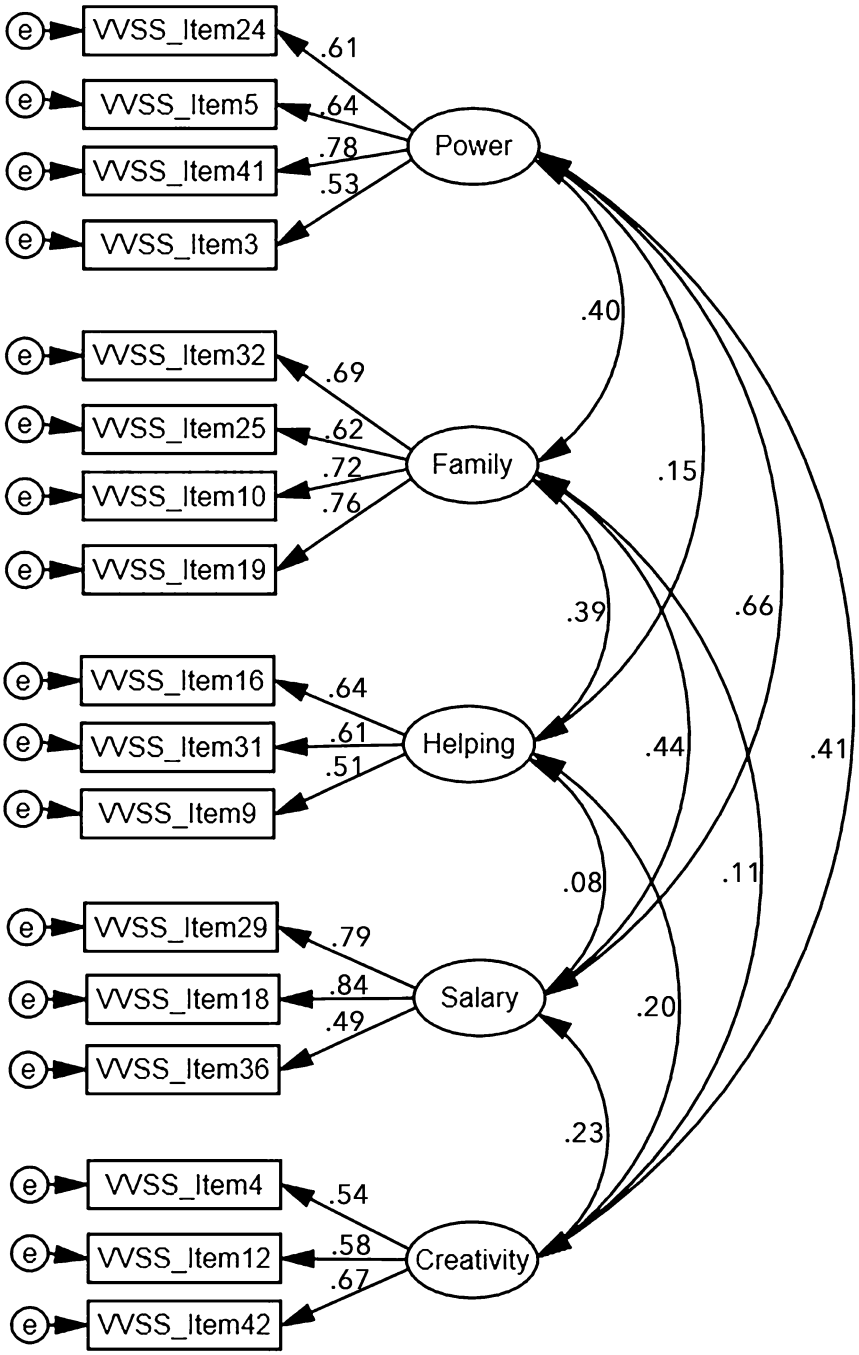


Figure 1 Final confirmatory VVS–S correlational model (17 items). Fit indices: $\chi^2/df = 1.53$; Comparative Fit Index (CFI) = .953; Tucker-Lewis Index (TLI) = .942; Root Mean Square Error of Approximation (RMSEA) = .042

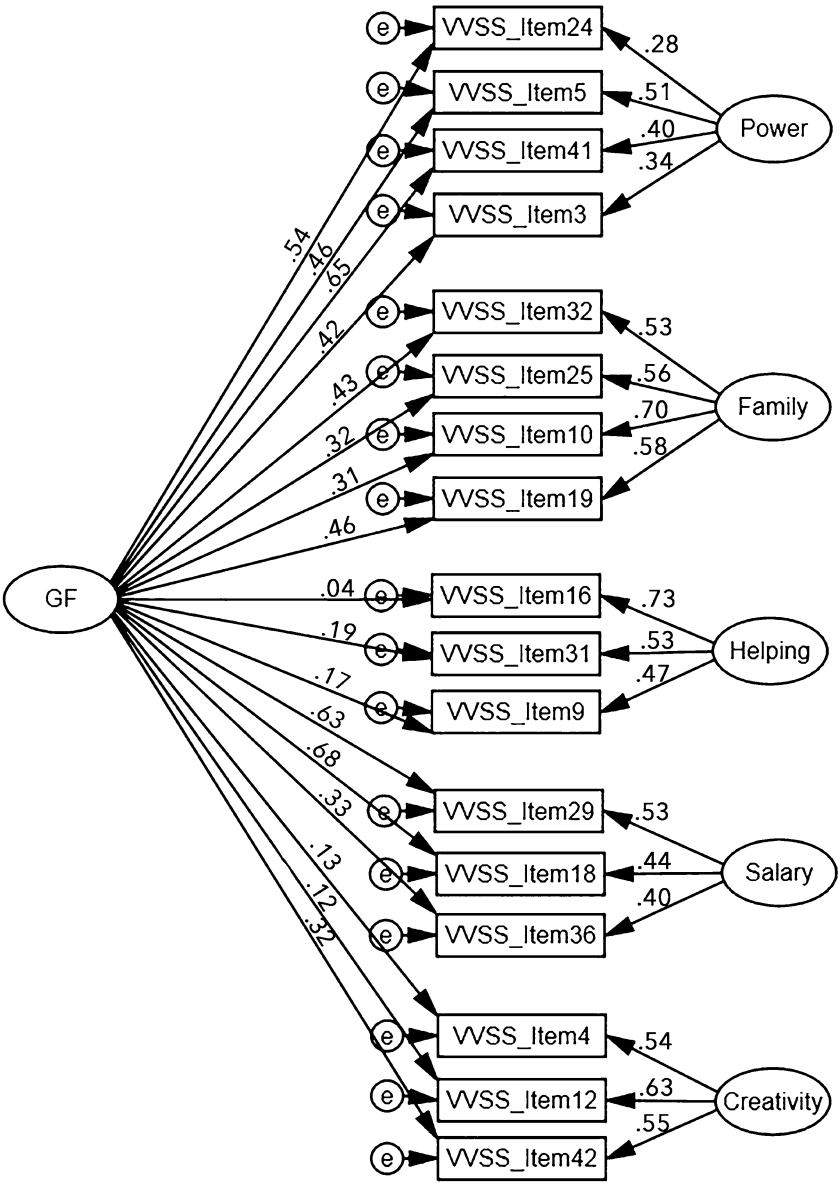


Figure 2 Final confirmatory VVS–S bifactor model (17 items). Fit indices: $\chi^2/df = 1.62$; Comparative Fit Index (CFI) = .947; Tucker-Lewis Index (TLI) = .929; Root Mean Square Error of Approximation (RMSEA) = .047; GF = General factor

General discussion

The main objective of the present study was to develop a measurement instrument assessing vocational values among high school students in a sub-Saharan African

Table 4 Intercorrelations, Reliability Scores, Mean, and Standard Deviation of the VVS–S Subscales

Subscales	1	2	3	4	5	6	A	M	SD
VVS–S									
1. Power	–						.73	4.19	0.79
2. Family	.30***	–					.79	4.42	0.68
3. Helping	.11	.27***	–				.60	4.08	0.74
4. Salary	.47***	.31**	.05	–			.74	3.82	1.01
5. Creativity	.27***	.09	.13*	.12*	–		.63	4.35	0.70
6. Life satisfaction	.16**	.24***	.10	.15*	.15*	–	.80	3.10	1.00

***$p < .001$; **$p < .01$; *$p < .05$

context. To our knowledge, this study is the first attempt to achieve this goal based on an indigenous methodology (Leong & Pearce, 2011). In so doing, we explored students' occupational preferences in context and their justifications beforehand, and further developed the VVS–S based on the content analysis of those justifications. Finally, we evaluated the instrument, which showed relatively good psychometric properties.

Occupational preferences in Togolese adolescents

Regarding occupational preferences in Togolese adolescents, drawing on the only available study (i.e., Devauge, 1973), our investigation revealed adolescents' preferences for occupations that may provide jobholders with prestige, financial security, or high social status (e.g., physician, trader, lawyer, architect, teacher, football player, computer specialist, journalist, military personnel, and stewardess) over occupations that may be perceived as less prestigious, such as plumber, hairdresser, and scrap dealer (Devauge, 1973; Moumoula, 2013). It is worth noting that most of the preferred occupations were almost all accessible through the completion of a higher education degree. One explanation for these results could be that sustainable employment in the Togolese context is accessible mostly through higher education (OECD, 2016), and consequently, students may be more encouraged to move in that direction. Such encouragement by students' significant others could be explained by a need to maintain family status or achieve a higher level, which could be very important in economically constrained contexts (Moumoula & Bakyono/Nabalou, 2005). Contrary to Devauge's (1973) findings, occupations requiring the use of a computer (i.e., computer specialist, graphic designer, fashion designer, and surveyor) were reported, denoting attraction to new professions. This study provides updated knowledge on Togolese adolescents' occupational preferences.

Similarities and differences between the VVS–S and existing scales and conceptualization

The VVS–S presents similar subscales as those in instruments assessing work or career values originally developed in the U.S. for high school students, such as Super's Work Values Inventory-Revised (SWVI-R; Hammond et al., 2010; Super, 1970). The similar subscales include Income (the Salary subscale in the VVS–S), Prestige (gaining standing in the eyes of others and evoking respect), which is included in some way in the VVS–S Power subscale, and Creativity (innovating, designing new products, or developing new ideas). Moreover, the Minnesota Importance Questionnaire (MIQ) also includes a Social Status subscale, which is described as assessing "tasks that result in respect and social status" (Rounds et al., 1981, p. 6). The Multidimensional Career Values Questionnaire (Abessolo et al., 2021) also includes Social (close to the VVS–S Helping subscale) and Salary subscales. Although some of the five VVS–S dimensions can be found in other instruments, none of the instruments include all of them simultaneously, highlighting the specificity and the added value of the VVS–S. A comparison with a more general conceptualization of values shows that the VVS–S subscales can reflect the basic values of power (i.e., Prestige, Salary, and Status), benevolence (i.e., Helping), and tradition (i.e., Family) (Schwartz, 1992). However, this should be confirmed through further empirical investigations. Finally, contrary to what can be observed regarding scales developed in individualistic cultures, the emergence of the specific Family subscale within the VVS–S reflect the conception that in West Africa (and in sub-Saharan Africa more broadly), "the individual exists in and for the community" (Atado, 1988, p. 7), and caring for others is part of "individual obligations to the commonweal" (Nsamenang, 1992, p. 5). The results are also in line with Brown and Crace's (1996) statement that "values are tied to the normative structure of the social institutions (e.g., family, school) where they are acquired" (p.212). In line with these conceptions, the results suggest adolescents' awareness of and preparedness to adhere to such contextual norms.

The VVS–S structure, subscales and relation with life satisfaction

Concerning the structure of the VVS–S, the results revealed the appropriateness of five independent factor structure (i.e., Power, Salary, Helping, Family, and Creativity), which was the best fitting model over the higher-order model and the bifactor model. Confirmatory factor analyses yielded fit indices that were in the accepted standard ranges as well as most internal reliability coefficients. The VVS–S subscales correlated positively with one another (except for Creativity–Helping and Creativit–Salary), but not to the extent that they would be considered overlapping. These findings supported the dimensionality of vocational values as measured within the VVS–S. Furthermore, four VVS–S subscales (i.e., Power, Family, Salary, and Creativity) correlated positively but weakly with life satisfaction, except Helping, which showed a nonsignificant correlation with life satisfaction. Indeed, very few researchers have investigated the relation between the constructs of work values

and life satisfaction. In some ways, our findings contrast with Chow et al.'s (2017) longitudinal results that work values relate positively to life satisfaction in adulthood rather than in adolescence. In their 25-year follow-up study, Chow et al. found that both intrinsic (composite of three items assessing interest in the job, feeling of accomplishment, and autonomy) and extrinsic work values (composite of three items assessing salary, job security, and career advancement) did not significantly correlate with life satisfaction at age 18 and age 25. However, intrinsic values (age 32) and intrinsic and extrinsic values (age 43) correlated significantly with life satisfaction. The positive relations observed in our adolescent sample might be because the vocational values as assessed by the VVS–S were inextricably linked to students' occupational aspirations (they listed their career aspirations). This was not the case in Chow et al.'s study, where work values were not associated with specific career aspirations. In our research, the fact that the adolescents expressed work values in line with their future occupational preferences might currently contribute to their satisfaction with life. Finally, surprisingly, the Helping scale did not correlate with life satisfaction, which contrasts with what could be expected in a collectivistic culture that values caring for others (Atado, 1988; Gyekye, 2003; Nsamenang, 1992). One explanation for this result might be that contrary to most VVS–S subscale items, the Helping items were more general and not career-oriented. Rewording the Helping subscale items to align with others might provide more insight into the relation between Helping and life satisfaction within the VVS–S.

Usefulness for practice

As documented in career counseling research, values are important in individuals' career choice and satisfaction, and their clarification importantly contributes to self-knowledge and self-understanding (Reardon, Lenz, & Peterson, 2000). Thus, vocational values should be granted a central place in the counseling process (Brown & Crace, 1996). Drawing on this position, the VVS–S could be helpful as a tool that career counselors can use to help clients clarify what is important for them and to encourage them consider those values when making career decisions. Brown and Crace (1996) stressed the importance of high-priority values over low-priority values in career decision-making. Therefore, in addition to the rating of items, career counselors can ask clients to rank the VVS–S subscales, starting with the most important to them. This strategy may provide reliable information on clients' priorities. Thus, the scale can be used in these two ways and as a complementary tool to other assessment instruments. The availability of such an instrument constructed based on the local context could contribute to filling the gap regarding the lack of available instruments adapted to West African youth and African youth more broadly, as the assessment of vocational interests and values remains a luxury for both career counselors and clients in most sub-Saharan African countries.

Limitations and future direction

The current study has several limitations that should be highlighted. At first, results regarding Study 1 should be taken with caution as the sample considered is not representative of the Togolese student population. Subsequently, the findings regarding the occupational preferences of high school students can't be generalized to the targeted population. The second limitation relates to the validity of the developed scale. Although the VVS–S has shown relatively good psychometric properties, the two subscales of Helping and Creativity have shown questionable internal reliabilities (0.63). The items of these scales are too general and need to be phrased in the context of future work to improve the scale. Additionally, the fact that some of the items were general could explain why the hypothesized seven-factor structure was not supported. Another observation is that based essentially on the adolescents' career aspirations, our approach yielded values that tend to be skewed toward high prestige. Previous investigations in West Africa highlighted students' preference for high prestige occupations due to several factors such as parents' motivation or the adolescents' willingness to achieve a higher position in society (e.g., Moumoula, 2013). Such reasons have been documented as important drivers in economically constrained environments (Atitsogbe, 2021). However, the five vocational values of the developed measure may not represent all the relevant values in context. For example, complementing the VVS–S with values depicted from justifications for occupations that the students would not like to take in the future would be a good attempt to have an overreaching model. Moreover, testing the VVS–S's relation with other vocational value measures would have strengthened the results regarding validity. Furthermore, measurement invariance was not evaluated for the scale, as the sample size was small. Further investigations are thus needed regarding the scale's validity. Such further investigation across other African populations would contribute to the internationalization of the developed measure.

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Declarations

Conflict of interest The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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