

# Socioeconomic Status and Executive Function as Determinants of Vocational Choices among School Leavers in Luanshya District, Zambia

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## ABSTRACT

The aim of the paper was to determine the effects of socioeconomic status and executive function on vocational choice among school leavers in Luanshya District. The study adopted a quantitative approach by utilised a correlational design. A total sample size of 475 (n=371, 78% male and n=104, 22 % female) were used in the study. This was done for a period of three (3) months in order to better understand the relationship of socioeconomic status and executive function on vocational choice. The results of the study demonstrated that there were statistically significant correlation ( $p < 0.001$ ) between socioeconomic status and realistic. Similarly, another statistically significant correlation ( $p = 0.05$ ) between executive function and realistic was observed. However, there were no statistically significant correlation ( $p = 0.09$ ) between socioeconomic status and investigative; socioeconomic status and artistic ( $p = 0.20$ ); socioeconomic status and social ( $p = 0.7$ ); socioeconomic status and enterprising ( $p = 0.21$ ); socioeconomic status and conventional ( $p = 0.6$ ). Equally, between Executive function (EF) and investigative ( $p = 0.08$ ); Executive function (EF) and artistic ( $p = 0.57$ ); Executive function (EF) and social ( $p = 0.07$ ); Executive function (EF) and enterprising ( $p = 0.23$ ); Executive function (EF) and conventional ( $p = 0.6$ ). The study further found that SES was a stronger predictor ( $SMD = 1.3$ ) than EF ( $SMD = 0.5$ ).

**Keywords:** *Socioeconomic status, Executive function and Vocational choice.*

## INTRODUCTION

Multiple studies have demonstrated that vocational choice has a strong relationship with socioeconomic status and executive function (Lawson and Farah, 2017; Last, Lawson, Steinberg and Farah, 2018; Liu, Peng and Luo, 2020; Li, Xu and Xia, 2020). Career decision-making and self-efficacy are pivotal constructs in understanding individuals' career behaviors (Betz, 2007; Hackman, Gallop, Evans and Farah, 2015). Family, as a primary source of socioeconomic support, exerts a substantial influence on adolescents' career development and decision-making process (Crook and Evans, 2013). Further, Xing and Rojewski (2018) argue that parental general economic and psychosocial support were statistically significant factor in predicting career decision-making self-efficacy, explaining 38.3% of the variance of this construct for Chinese secondary vocational students.

Vocational choice refers to the level of aspiration of a person to achieve a particular job, profession or vocation (Whiston and Keller, 2004; Lurie, Hagen, McLaughlin, Sheridan, Meltzoff, Rosen, 2021). The

practice is guided by the philosophy that if a young adult has a sound understanding of self, the world of work, career and life influencers then, they may make informed and positive decisions regarding their vocational choices (Betz, 2007). This may enable them to transition effectively from education into the world of work and use their knowledge and the tools provided to transition well throughout different stages of their lives (Solano and Weyer, 2017; Palermo, Ispa, Carlo, and Streit, 2018). However, before all aspects are demonstrated, there is need for the family to prepare children to be ready for school using its socioeconomic status standing. In view of this, school readiness refers to the behavioral, socio emotional, and academic preparedness of young children to learn in school and forecasts later academic success, employment, and health (Duncan, Dowsett, Claessens, Magnuson, Huston, Klebanov and Japel, 2007; Quirk, Grimm, Furlong, Nylund-Gibson, and Swami, 2016).

Individual differences in children's skills emerge early in development and research indicates that this variability may be due to complex interactions between children and their surroundings (Bronfenbrenner and Morris, 2006). Therefore, early identification of a children's attributes and familial characteristics that support school readiness and vocational choices may help to recognize those who may benefit from additional support prior to formal school entry and can serve to isolate targeted avenues for that support (Dilworth-Bart, 2012; Nesbitt, Baker-Ward and Willoughby, 2013; Wright, Perrone-McGovern, Boo and White, 2014; Mackey, Finn, Leonard, Jacoby-Senghor, West, Gabrieli, Gabrieli, 2015). Due to their theoretical relevance and observed associations with vocational choices, socioeconomic status (SES), and executive function have emerged as potential targets for interventions aimed at promoting vocational choices (Blair, 2002; Evans, 2006; Lee and Burkham, 2002).

Families are key contexts in which children's executive function and vocational choices develop, but it remains unknown if the well-documented associations between SES, executive function, and vocational choice (Blair and Raver, 2015; Sarsour, Sheridan, Jutte, Nuru-Jeter, Hinshaw and Boyce, 2011; Sirin, 2005), are the same for all children, or if the relations differ as a function of level of choice in the home, for instance, if family choice moderates these associations. This is an important question, as findings may shed light on potentially differing mechanisms that propel associations between SES and executive function (NICHD Early Child Care Research Network, 2003) for children living in families with varying levels of vocational choices. If a differential pattern of effects emerges for children living in muddled vocational choices, interventions may address families' vocational choices prior to interventions focused on socioeconomic status and executive function (Blair and Raver, 2015).

### **Socioeconomic Status and Vocational Choices**

Research points to links between familial socioeconomic standing and child's academic outcomes and career aspirations (Palermo, Ispa, Carlo, and Streit, 2018; Solano and Weyer, 2017). For instance, children from families with low SES lag behind higher-SES peers in vocational choices and school readiness (Browne, Wade, Prime, and Jenkins, 2018; Larson, Russ, Nelson, Olson, and Halfon, 2015) an effect that is amplified as children progress through school (The Family Life Project Key Investigators, 2018). A meta-analysis revealed a medium effect size for the relation between SES and academic achievement (Sirin, 2005), indicating that social and economic contexts appear to be key in understanding why some children do not succeed academically and make sound vocational choices.

SES-related achievement gaps are also evident prior to formal schooling (Lee and Burkham, 2002), underscoring the need for examinations of SES-related achievement gaps before school entry. Further, although the links between SES and child outcomes are often examined in children living at or near the poverty line, SES effects have been demonstrated for academic achievement across the full SES spectrum (Lawson and Farah, 2015). There is a widening achievement gap across the top 50% of the socioeconomic spectrum, such that the gap between families with incomes in the 90<sup>th</sup> percentile and families with incomes

in the 50<sup>th</sup> percentile is greater than the gap between the 50<sup>th</sup> and 10<sup>th</sup> percentiles (Reardon, 2011). Therefore, it is important to examine how SES is related to individual differences in lower-middle-to upper-socio economic strata to better understand vocational choices across the full SES spectrum. The current study advances this effort.

### **Socioeconomic Status and Executive Function**

Accumulating evidence indicates that SES indirectly influences child academic outcomes through executive functions (Dilworth-Bart, 2012; Namushi and Kabundula, 2023). Executive function is the capacity to plan, organize, and monitor the execution of behaviors that are strategically directed in a goal-oriented manner (Zelazo, Anderson, Richler, Wallner-Allen, Beaumont and Weintraub, 2013; Namushi, 2021). Three foundational and commonly indexed components of executive function include: (1) set-shifting, the ability to flexibly switch among multiple tasks to meet changing environmental demands; (2) inhibitory control, the suppression or delay of a prepotent, salient response for one that is less dominant to achieve a goal and (3) working memory, the ability to grasp, store and retrieve information when on demand (Miyake, Friedman, Emerson, Witzki, Howerter and Wager, 2000; Wiebe, Sheffield, Nelson, Clark, Chevalier and Espy, 2011). Attention also plays a critical role in executive function, as it allows children to control the internal and external information that they process for a discussion of attention development in self-regulation, a broader construct that is subserved by executive function; (Hofmann, Schmeichel, and Baddeley, 2012; Posner and Rothbart, 2013). Substantial development in executive function occurs across the preschool period (Carlson, 2005). Therefore, it is particularly vulnerable to early environmental impacts, such as SES (Blair, 2010; Hackman, Farah, and Meaney, 2010). Lower SES children tend to perform more poorly on executive function tasks across development (Hackman, Gallop, Evans, and Farah, 2015).

Behavioral evidence of SES-related differences in executive function is bolstered by brain-based assessments that reveal differences in brain function and structure associated with executive function abilities across high, middle and low SES children (Blair, 2010; Kishiyama, Boyce, Jimenez, Perry, and Knight, 2008; Noble, Houston, Kan, and Sowell, 2012). For instance, low SES children show reduced extrastriate and novelty-related potential responses, indicating altered prefrontal function (Kishiyama et al., 2008). However, as has been demonstrated for academic achievement (Lawson and Farah, 2015), SES effects on executive function have emerged across the full SES spectrum (Noble, McCandliss, and Farah, 2007; Sarsour et al., 2011). Again, this highlights the need for examinations of the links between SES, executive function, and vocational choices in children.

### **Executive Function and Vocational Choices**

The importance of executive function to academic competence and later vocational choice is indisputable; better executive function skills are associated with better vocational choice level and improvement in academic success (Blair, 2002; Namushi and Kabundula, 2023). The association between executive function and a choice of vocation is so robust that the relation withstands control for cognitive abilities (Espy, McDiarmid, Cwik, Stalets, Hamby and Senn 2004), baseline academic capacities (McClelland, Cameron, Connor, Farris, Jewkes and Morrison 2007) and maternal education (Espy et al., 2004). In fact, good executive function is so essential for academic achievement that research indicates that executive function is often a better predictor of academic achievement than IQ (Blair and Raver, 2015; Namushi and Kabundula, 2023) and executive function interventions improve vocational and academic outcomes (Bierman, Nix, Greenberg, Blair, and Domitrovich, 2008).

## **PRESENT STUDY**

This study extends existing research aiming to identify individual characteristics and qualities of families'

vocational choice outcomes in young children by exploring pathways that may explain how socio-economic status and executive function determine vocational choices among school leavers in Luanshya District. In doing so, we investigated if the associations between SES, executive function and vocational choices are present and vary as a function of relatively economically advantaged families. Luanshya District is predominantly characterised by massive mining activities which provide employment opportunities to the local people and determine the socio-economic status for majority families. Based on literature and theory indicating the importance of familial characteristics and executive function to aid vocational choices, the hypotheses were as follows: 1) SES is a predictor of vocational choices (for instance, higher SES is associated with better vocational choices); 2) higher scores on set-shifting and inhibitory control tasks are associated with more advanced vocational choices; 3) SES influences vocational choices through set-shifting and inhibitory control (for instance., higher SES is related to increased executive function and, in turn, better executive function is related to more advanced vocational choices). The current approach allows novel insights to be drawn from results that may be used to tailor intervention programs that may differ for families living with different levels of socio-economic status and executive function.

## METHODS AND MATERIALS

**Study Design and setting:** We conducted a quantitative study by utilising a correlational design in Luanshya District, Zambia

**Respondents:** Eligible respondents included school leavers with first two years of work experience, primarily from Lower-middle-to upper class families who were working in Luanshya Mining industries, Government departments and other Private institutions.

**Inclusion/Exclusion Criteria:** Respondents were excluded on the basis of them being in school and had no working experience within Luanshya District or if they were school leavers but working outside Luanshya District. Only school leavers who completed school within Luanshya District and working in the Mines, Government departments and other Private institutions were included in the present study.

**Procedure:** Respondents were recruited from the Mines, Government departments and other Private institutions within Luanshya District. The study protocol included scheduled off-days, during working breaks and additional weekends if requested by respondents. In addition, research assessors were trained to identify signs of tiredness and gave respondents additional breaks as needed throughout the session. Different assessors individually assessed each respondent member using PEKAS' Modified National Institute of Health Toolbox; an iPad-based Cognitive Battery (NIHTB-CB; 95% CI: 0.80-0.90) of Executive function and a standardized assessment of vocational choice (**described below**). PEKAS' Modified NIHTB-CB is a Zambian Validated iPad-based battery of cognitive tests that measures multiple domains of cognitive function skills of people across a broad age spectrum from 3-85 years. This innovation is a precursor of digital technology that enables the assessment of cognitive tasks in health and education systems across the world, including Zambia (Kabundula and Namushi, 2023). Prior to visiting the Mines, Government departments and other Private institutions, respondents completed a questionnaire about vocational choice. All procedures were approved by the local authorities, Mining management and participating Institutions in Luanshya District.

**Socioeconomic Status:** Family SES was computed using the *Hollingshead Four-Factor Index of Social Status* (Hollingshead, 1975). The Hollingshead index comprises a composite of maternal and paternal education and occupation status. Level of education is assigned a score of 1-7 with 7 representing the highest level. Occupation scores range from 1-9, with 9 representing the highest level. The final SES index is obtained by multiplying each parent's education rank by 3 and occupational rank by 5, then summing the resultant scores and dividing by 2. The possible SES range on the Hollingshead is 8-66, with a cutoff of 30 for

‘low SES’ (Cirino, Chin, Sevcik, Wolf, Lovett and Morris, 2005).

**Executive Function:** Objective measures of executive function, inhibitory control, set-shifting/cognitive flexibility and Working memory, were assessed using a Zambian validated and Modified PEKAS; NIHTB-CB; **described** in Kabundula, 2022). PEKAS’ Modified NIHTB-CB is a computerized battery of multidimensional measures normed for administration from ages  $\leq 25$  years. (Measures demonstrate excellent reliability with Cronbach’s Alpha score of  $\alpha \geq .9$  and validity;  $0.80-0.90$ ; Kabundula, 2022).

### **Inhibitory Control**

*Executive Function – Response Inhibition:* The NIHTB-CB measure: This is a test of attention and inhibitory control. On this test, respondents focused on a given stimulus shown on the screen while inhibiting attention to stimuli flanking it (Delis, Kaplan and Kramer, 2001). For example, an arrow appeared on the left side of the screen but pointing toward the right. Respondents pressed a button on a keypad to correctly select the target or focus stimuli. Further, respondents were instructed to choose the button to indicate “left” because of the arrow’s position on the screen rather than the “right” button because of the direction the arrow was facing (Zelazo, 2006). PEKA’s Modified NIHTB-CB generated computed scores combine accuracy and reaction time on the Flanker task. If accuracy levels were less than 80%, the computed score was equal to the accuracy score. In cases where accuracy levels reached or exceeded 80%, the reaction time and accuracy scores were combined to create the computed score. The computed scores were converted to unadjusted scale scores that compare the performance of the individual to the entire NIHTB-CB normative sample regardless of age or any other variable, providing a measure of overall performance. Higher unadjusted scale scores indicate better executive function.

### **Dimensional change card sorting task (DCCST)**

*Executive Function – Set Shifting / Cognitive Flexibility:* The NIHTB-CB Measures: Dimensional change card sort test (DCCS): This is a test of cognitive flexibility and attention. Set-shifting/cognitive flexibility was assessed with a modified version of the *Dimensional Change Card Sort* (DCCS; Zelazo, 2006). The DCCS included four blocks: practice, pre-switch, post-switch, and mixed trials. In the practice block, participants were presented with pictorial stimuli on a computer monitor and were instructed to match a test stimulus (for instance, a blue ball) to one of two target stimuli (for instance, a yellow ball or a blue truck). Respondents were required to match either by shape or color by pointing to the target stimulus that matches the test stimulus on the relevant dimension. Following fixation cues to attend to the screen, the test stimulus appeared on the screen and children responded by pointing to one of two of the test stimuli. In the practice block, respondents received feedback on their responses. Respondents needed to correctly answer 3 out of 4 practice trials. If they failed, four practice trials were repeated up to three times. Once they successfully completed 3 out of 4 of the practice trials, respondents proceeded to practice trials for the other dimension. Respondents who met criterion on this dimension proceeded to test trials that were similar in structure but involved different stimuli.

Test trials began with a pre-switch block that consists of five trials in which respondents sorted by the last dimension used in the practice block. No feedback was provided during test trials. Respondents needed to correctly match on 4 out of 5 trials to proceed to the next block, which consisted of five trials in which respondents were instructed to sort by the other dimension. The transition between blocks was noted explicitly by instructions from the experimenter to switch (For instance, “Now we are going to play the color game. In the color game, we choose the picture on the bottom that is the same color as the picture in the middle. If it experimenter points to middle picture is blue, we choose this picture experimenter points to target stimulus, because they are both blue, they are the same color”. Respondents who correctly matched on at least four trials in the post-switch block proceeded to the mixed block. The mixed block consists of 30 trials of mixed shape and color matches. Scoring for the DCCS task was identical to the Flanker task.

Similarly, higher unadjusted scale scores on the DCCS are indicative of better performance.

**List sorting working memory task (LSWMT)**

*Attention / Working Memory:* The NIHTB-CB Measure: List sorting working memory test evaluated attention and working memory (Bull, Espy, and Wiebe, 2008). Respondents were shown a series of pictures on the iPad screen accompanied by a voice-over stating the name of the item. They were then asked to verbally re-sequence the pictures according to a pre-specified rule, for instance, in order from smallest to largest item. The sequences became longer as the test progressed and the dependent variable was the total number of items passed (for instance, accuracy). Again, higher unadjusted scale scores on the DCCS are indicative of better performance.

**Vocational Choice:** Vocational choice was measured using Holland (1997)’s theory of career choice. This theory holds that people fall into either one of the six importance categories all leading to vocational choice which range from realistic, investigative, artistic, social, enterprising, and conventional where they can fit best with their environment to best use their abilities, values, attitudes and skills. Each category of the six Holland’s theory of vocational choice has four subcategories where the respondents were required to indicate by ticking a key category which best describe their vocational choice as tabulated in the table below;

	Categories	Interest area	Key skills	Occupations	Subjects & skills	Tick your category of choice (n/%)
1	Realistic	Working with hands, making, fixing, assembling or building things, using and operating equipment, tools or machines. Working outdoors.	Operating tools, equipment machinery, designing, building, repairing, maintaining, measuring, working in detail, driving, moving, caring for animals, working with plants.	Pilot, farmer, horticulturist, builder, engineer, armed services personnel, miners, mechanic, upholsterer, electrician, computer technologist, park ranger, sports person.	English, Maths, Science, Workshop, Technology, Computing, Business Studies, Agriculture, Horticulture, Physical Education.	320 (67%) respondents
2	Investigative	Discover and research ideas, observe, investigate and experiment, ask questions and solve questions.	Thinking analytically and logically, computing, communicating by writing and speaking, designing, formulating, calculating, diagnosing, experimenting and investigating.	Science, research, medical and health occupations, chemist, marine scientist, forestry technician, medical or agricultural laboratory technician, zoologist, dentist and GP.	English, Maths, Science, Computing and Technology.	50 (11%) respondents

3	Artistic	Using words, art, music or drama to express yourself, communicate or perform or you like to create or design things.	Expressing artistically or physically, communicating by speaking, writing and singing, performing, designing, presenting, planning, composing, playing and dancing.	Artist, illustrator, sign photographer, sign writer, composer, singer, instrument player, dancer, actor, reporter, writer, editor, hairdresser and fashion designer.	English, Social Studies, Music, Drama, Art, Graphic Design, Computing, Business Studies and Languages.	0 (0) None
4	Social	Working with people, teach, train, inform, help, treat, heal, cure, serve and greet. You are concerned for others' well-being and welfare.	Communicating by writing and speaking, caring and supporting, training, meeting, greeting, assisting, teaching, informing, interviewing and coaching.	Teacher, nurse, counsellor, police officer, social worker, salesperson, customer secretary, service officer and waiter.	English, Social Studies, Maths, Science, Health, Physical Education, Art, Computing, Business Studies and Languages.	45 (10%) respondents
5	Enterprising	Meeting people, leading, talking to and influencing others, encouraging others and working in business.	Selling, promoting and persuading, developing ideas, public speaking, managing, organising, leading and captaining, computing and planning.	Salesperson, lawyer, politician, accountant, business owner, executive or manager, travel agent, music or sports promoter.	English, Maths, Business Studies, Accounting, Economics, Social Studies, Drama, Computing and Languages	20 (4%) respondents
6	Conventional	Working indoors and at tasks that involve organising and being accurate, following procedures, working with data or numbers, planning work and events.	Computing and keyboarding, recording and keeping records, paying attention to detail, meeting and greeting, doing calculations, handling money, organizing, arranging and working independently.	Secretary, receptionist, office worker, librarian, bank clerk, computer operator, stores and dispatch clerk.	English, mathematics, business studies, accounting, economics and computing.	40 (8%) respondents

Source: Adapted from Holland (1997)'s Theory of Vocational Choice

**Sample Size:** The study used a total sample size of 475 (n=371, 78% male and n=104, 22 % female) who were recruited from various Luanshya Mine industries, Government departments and other Private institutions. The sample comprised school leavers and those with first two years of work experience, primarily from Lower-middle-to upper class families (see **Measures** and **Results** for more detailed information about SES of the sample). Race and ethnicity of the analytic sample was 100% Black and generally representative of Luanshya Mine industries, Government departments and other Private

institutions.

**Statistical Methods:** All statistical analyses were executed using Stata (Stata Corp 2018, Stata Statistical Software: Release 14.2. Pairwise correlations (Pearson for continuous variables and Spearman for categorical variables) and linear regression were utilised to compare individual domain scores socioeconomic status, executive function and vocational choice.

**Ethical Statement:** The study followed the ethics regulations and guidelines through obtaining of Verbal and written informed consents from respondents and a letter of authority from Luanshya Mine management, Government departments and other Private institutions involved in the study.

## RESULTS

Table 1 and 2 lists the descriptive statistics of correlations among study variables. The study used a total sample size of 475 (n=371, 78% male and n=104, 22 % female) who were recruited from various Luanshya Mine industries, Government departments and other Private institutions. The sample comprised school leavers and those with first two years of work experience, primarily from Lower-middle-to upper class families.

### Correlations between socioeconomic status (SES) and vocational choice

When a correlation was performed between socioeconomic status and vocational choice through its six (6) aspects of realistic, investigative, artistic, social, enterprising and conventional as the main influencers of vocational choice, the study demonstrated a positive statistically significant correlation ( $p < 0.001$ ) between socioeconomic status and realistic. Whereas, between socio economic status and the remaining five (5) aspects of vocational choice, an insignificant difference of no statistical correlations was observed. For instance, socioeconomic status and investigative ( $p = 0.09$ ); socioeconomic status and artistic ( $p = 0.20$ ); socioeconomic status and social ( $p = 0.7$ ); socioeconomic status and enterprising ( $p = 0.21$ ); socioeconomic status and conventional ( $p = 0.6$ ).

### Correlations between executive function (EF) and vocational choice

Another correlation was performed between executive function through its three (3) core skills of Set-shifting/cognitive flexibility, inhibitory control and working memory and vocational choice through its six (6) aspects of realistic, investigative, artistic, social, enterprising and conventional as the main influencers of vocational choice, the study demonstrated a positive statistically significance correlation ( $p = 0.05$ ) between Executive function (EF) and realistic. However, there were no statistically significant correlation between Executive function (EF) and investigative ( $p = 0.08$ ); Executive function (EF) and artistic ( $p = 0.57$ ); Executive function (EF) and social ( $p = 0.07$ ); Executive function (EF) and enterprising ( $p = 0.23$ ); Executive function (EF) and conventional ( $p = 0.6$ ).

### Relationship among socioeconomic status, executive function and vocational choice

To further determine which of the two; SES and EF predicts vocational choice through its six (6) aspects of realistic, investigative, artistic, social, enterprising and conventional among study respondents, a hierarchical linear regression was performed and found that after controlling for EF, Socioeconomic status' *standardised mean difference (SMD)* was 1.3 on vocational choice while controlling for SES, Executive function's *standardised mean difference (SMD)* was 0.5 on vocational choice. This implies that Socioeconomic status is a stronger predictor ( $SMD = 1.3$ ) of vocational choice than Executive function ( $SMD = 0.5$ ) through set-shifting/cognitive flexibility; inhibitory control and working memory.



## DISCUSSION

The discussion part of the paper was supported by other relevant sources of information and literature through the process of contextualization with our results. Based on a quantitative analysis approach, socioeconomic status and executive function as determinants of vocational choices was categorised into three segments;

### **Correlations between socioeconomic status (SES) and vocational choice**

The study established that there was a positive statistically significant correlation ( $p < 0.001$ ) between socioeconomic status and realistic as it stood out to be main influencer of vocational choice among six the (6) aspects. This finding appears to be peculiar only for the current study as most of the studies by Whiston and Keller (2004); Solano and Weyer, 2017; Lawson and Farah (2017); Last, Lawson, Steinberg and Farah (2018); Xing and Rojewski (2018); (Palermo, Ispa, Carlo, and Streit, 2018; Liu, Peng and Luo (2020); Li, Xu and Xia (2020) argue that there is a strong link between socioeconomic status and vocational choice. This was explained and justified on the premise that the aforementioned studies reported vocational choice as a single variable, while this study considered vocational choice as a composite with multiple variables as measured by Holland (1997)'s theory of career choice. This is also substantiated by the fact that the family was regarded as a primary source of socioeconomic support that exerts a substantial influence on adolescents' vocational development, decision- process and choice making. However, it is imperative to note that what was intriguing on this finding was the fact that the multiple variables of vocational choice demonstrated different significant levels. For instance, between socioeconomic status and realistic ( $p < 0.001$ ); socioeconomic status and investigative ( $p = 0.09$ ); socioeconomic status and artistic ( $p = 0.20$ ); socioeconomic status and social ( $p = 0.7$ ); socioeconomic status and enterprising ( $p = 0.21$ ); socioeconomic status and conventional ( $p = 0.6$ ). This finding is a true reflection of what was obtaining on the ground bearing in mind that most of the respondents' choice of vocations were influenced by the nature of the working environment, facilities and the availability of employment opportunities.

In this sense, for instance, the majority of the respondents chose realistic as a category of vocational choice because they were found working in the mining industries. Their main job-descriptions were working with hands, excavating minerals, making tools, fixing apparatus, assembling or building infrastructure, operating equipment or machines and mainly working outdoors in the mining industries. This was evident as the selected site for the study was predominantly a mining District. Based on this finding, it is right to argue that vocational choice to some extent is influenced by family occupational standing, availability and proximity of employment opportunities and working industries within the environment as the case was for this study.

### **Correlations between executive function (EF) and vocational choice**

The study also performed a correlation between executive function through its three (3) core skills of Set-shifting/cognitive flexibility, inhibitory control and working memory and vocational choice through the six (6) aspects of realistic, investigative, artistic, social, enterprising and conventional as the main influencers of vocational choice and found a positive statistically significant correlation ( $p = 0.05$ ) between Executive function (EF) and realistic; one among other categories of vocational choice as measured by Holland (1997)'s theory of career choice. Similarly, other studies by Blair (2002); Bierman, Nix, Greenberg, Blair, and Domitrovich (2008); Blair and Raver (2015); Lawson and Farah (2015); Last, Lawson, Steinberg and Farah (2018); Li, Xu and Xia (2020) demonstrated that Executive function has a strong relationship with vocational choice. This relationship was founded on the practice that if a young adult has a sound understanding of self-Executive function (EF), the world of work, career and life influencers then, he or she may be helped to make informed and positive decisions regarding their vocational choices.

This enables them to transition effectively from education into the world of work and use their knowledge and skills provided to transition well throughout different stages of their lives with appropriate vocational choices. While this is true about the realistic as one among other categories of vocational choice against executive function, the remaining five (5) aspects of vocational choice, demonstrated an insignificant difference of no statistical correlations. For instance, between Executive function (EF) and investigative ( $p=0.08$ ); Executive function (EF) and artistic ( $p=0.57$ ); Executive function (EF) and social ( $p=0.07$ ); Executive function (EF) and enterprising ( $p=0.23$ ); between Executive function (EF) and conventional ( $p=0.6$ ). The assumption for this kind of a situation could be as a result of lack of stimulative environment to trigger aspects of executive function as observed by Quirk, Grimm, Furlong, Nylund-Gibson, and Swami (2016). This could be true as they further argued that before all aspects of vocational choice are demonstrated, there is need for the family to prepare children to be ready for school in order to develop the behavioral, socio emotional, and academic preparedness for a successful employment and healthy choice of vocational career. This developmental milestone of executive function occurs differently in various groupings; as such one may even end up thinking that there's something wrong with a certain individual especially if one is unable to plan, focus attention, remember instructions, and juggle multiple tasks successfully and this leads to making an informed and sustainable decisions over a vocational choice.

### **Relationship among socioeconomic status, executive function and vocational choice**

The study further determined between the two; SES and EF; the most predictor of vocation choice, and found that SES predicted ( $SMD=1.3$ ) vocation choice the most as opposed to Executive function ( $SMD=0.5$ ); an implication that vocational choice is largely determined by SES than EF. Similarly, Sirin (2005); Lawson and Farah (2015) indicated that social and economic contexts appear to be key in understanding why some children do not succeed in making sound vocational choices. Additionally, studies by Kishiyama, Boyce, Jimenez, Perry, and Knight (2008); Blair (2010); Noble, Houston, Kan, and Sowell (2012) also revealed that SES-related differences in executive function is bolstered by brain-based assessments that reveal differences in brain function and structure associated with executive function abilities across high and low SES children. For instance, low SES children show reduced extra striate and novelty-related potential responses, indicating altered prefrontal function. This has further been substantiated by numerous research that has pointed to links between familial socioeconomic standing and vocational choices (Larson, Russ, Nelson, Olson, and Halfon, 2015; Solano and Weyer, 2017; Palermo, Ispa, Carlo, and Streit, 2018; Browne, Wade, Prime, and Jenkins, 2018). For instance, children from families with low SES lag behind as compared to higher-SES peers in vocational choices which comes as precursor of executive function and academic outcomes.

### **CONCLUSION**

The study demonstrated a positive statistically significant correlation ( $p<0.001$ ) between socioeconomic status and realistic. Similarly, another positive statistically significant correlation ( $p=0.05$ ) between Executive function (EF) and realistic was realised. However, there were no statistically significant correlation between socioeconomic status and investigative ( $p=0.09$ ); socioeconomic status and artistic ( $p=0.20$ ); socioeconomic status and social ( $p=0.7$ ); socioeconomic status and enterprising ( $p=0.21$ ); socioeconomic status and conventional ( $p=0.6$ ). Correspondingly, between Executive function (EF) and investigative ( $p=0.08$ ); Executive function (EF) and artistic ( $p=0.57$ ); Executive function (EF) and social ( $p=0.07$ ); Executive function (EF) and enterprising ( $p=0.23$ ); Executive function (EF) and conventional ( $p=0.6$ ). The study further found that SES was a stronger predictor ( $SMD=1.3$ ) than EF ( $SMD=0.5$ ).

### **LIMITATIONS AND FUTURE DIRECTIONS**

Despite the unique contributions of the present study, these findings should be interpreted in light of the

following limitations. First, the population was primarily black and findings may not to extend to more racially diverse ethnic groups. Second, although the present study benefitted from the assessment of three core facets of executive function, generalization of findings to the other six aspects of executive function such as; self-monitor, emotional control, initiate, plan/organise, task monitor and organisation of materials which were not assessed in this study. The components of executive function and levels of socioeconomic status are differentially predictive of and associated with various aspects of vocational choice across its aspects. Because there is evidence that SES is a robust predictor of vocational choice, it is possible that executive function would parallel the findings observed in the study. Future studies should strive to use more diverse population to permit examination of potential differential effects of socioeconomic status and executive function across components and measures of vocational choice as multiple variables, resonating with Holland (1997)’s theory of career choice as opposed to treating it as a single variable.

**Table 1: Correlation between socioeconomic status and vocational choice**

	Instrument	Variables	Instrument	Correlation Co-efficient	P-value
Socioeconomic status	Hollingshead Four-Factor Index of Social Status (Hollingshead, 1975).	Realistic	Holland (1997)’s theory of career choice.	0.98	<0.001**
		Investigative		0.06	0.09
		Artistic		-0.12	0.2
		Social		0.04	0.7
		Enterprising		0.02	0.21
		Conventional		0.03	0.6

**Table 2: Correlation between executive function skills and vocational choice**

Executive function (EF);	Instrument	Variables	Instrument	Correlation Co-efficient	P-value
Set-shifting/cognitive flexibility, inhibitory control and working memory.	D.KEFS; Condition 1-5	Realistic	Holland (1997)’s theory of career choice.	0.19	<b>0.05*</b>
		Investigative		0.17	0.08
		Artistic		-0.05	0.57
	Digit Span; Forward, Backward and Sequencing	Social		0.13	0.07
		Enterprising		0.11	0.23
		Conventional		0.14	0.06

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