BILINGUAL PUBLISHING CO.
Pioneer of Global Academics Since 1984

Journal of Psychological Research

Volume 4·Issue 2·April 2022 ISSN 2630-5143(Online)

BILINGUAL PUBLISHING CO.
Pioneer of Global Academics Since 1984

Volume 4 Issue 2 · April 2022 · ISSN 2630-5143

Journal of Psychological Research

BILINGUAL PUBLISHING CO.
Pioneer of Global Academics Since 1984

BILINGUAL PUBLISHING CO.
Pioneer of Global Academics Since 1984

Volume 4 | Issue 1 | April 2022 | Page1-32
Journal of Psychological Research

Contents

Articles

Reviews

BILINGUAL PUBLISHING CO.
Pioneer of Global Academics Since 1984

Journal of Psychological Research
https://ojs.bilpublishing.com/index.php/jpr

REVIEW

Current Evidence and Diverse Perspectives on Attention-Deficit/Hyperactivity Disorder: A Systematic Review

Asrat Genet Amnie*

Health Education Unit, Education Department, Eugenio María de Hostos Community College of The City University of New York, Bronx, NY 10451, the United States

Abstract: Introduction: ADHD is one of the most common neurodevelopmental disorders in childhood and adolescence. Although the disorder starts to manifest early in childhood, a significant proportion of cases often persists into adulthood. ADHD negatively and significantly impacts social and occupational functioning and academic performance. A number of extant theories and scientific evidence provide insight into the genesis and manifestations of ADHD and the attendant challenges of significant dysfunction that individuals may encounter at home, school, and the workplace. **Method:** This systematic review was conducted through a literature search for published peer-reviewed articles using standard PRISMA guidelines. The goal of the study was to explore current theories, models, concepts, and risk factors about ADHD published in peer-reviewed literature. We made use of use several online databases—including PsycINFO, PubMed, Web of Science, ScienceDirect, and Medline in the process of searching for relevant studies. Relevant peer-reviewed publications since the 1980s when the term Attention-Deficit/Hyperactivity Disorder (ADHD) was introduced in DSM-III-R were included. Non-peer-reviewed publications, including dissertations, editorials, commentaries, and materials published in languages other than English were excluded. **Results and Discussion:** The results of the review indicated that ADHD is characterized by a behavioral reaction that interferes with personal and social functioning. The factors associated with ADHD fall into several major thematic areas, including genetic and hereditary factors; dietary and nutritional factors; parenting and behavioral factors; adverse early life events, and high-risk environmental factors, crystallized by a number of developmental and behavioral theories. The review also identified a number of extant models and theories that attempt to explain the diverse perspectives associated with ADHD. **Conclusions:** This study has attempted to identify the major risk factors and diverse models and theories associated with ADHD. The thematic risk factors include genetic and hereditary factors; dietary and nutritional factors; parenting and behavioral factors; adverse early life events, and high-risk environmental factors. The most prominent models identified include the biomedical model and the bio-psycho-social models, the latter being a more holistic approach which aims to treat both the patient and the disease. This review would provide an additional evidence base to individuals, families, and educators to make informed choices and decisions in the best interest of the affected children, including their personal growth, healthcare, and medical needs, academic performance, and social skills development.

Keywords: ADHD; Developmental disorders; Mental health; Behavioral disorders

*Corresponding Author:
Asrat Genet Amnie,
Health Education Unit, Education Department, Eugenio María de Hostos Community College of The City University of New York, Bronx, NY 10451, the United States;
Email: aamnie@hostos.cuny.edu

Received: 15 January 2022; **Revised:** 16 March 2022; **Accepted:** 25 March 2022; **Published Online:** 12 April 2022

Citation: Asrat Genet Amnie. Current Evidence and Diverse Perspectives on Attention-Deficit/Hyperactivity Disorder: A Systematic Review. *Journal of Psychological Research*, 2022, 4(2), 4384. https://doi.org/10.30564/jpr.v4i2.4384

DOI: https://doi.org/10.30564/jpr.v4i2.4384

1. Introduction

The condition called ADHD is one of the most common neuro-developmental disorders in childhood and adolescence. ADHD was first described in 1902 as a hyperkinetic syndrome. With further understanding and recognition of the condition, the disorder was termed Hyperkinetic Reaction of Childhood when it was included in DSM II in 1968 [1].

ADHD is persistent across the life span with varying degrees of manifestation, multimorbidity, co-morbidity, and significant levels of personal and social impairment. The major manifestations that characterize the disorder include inattention and impulsivity. The DSM- V ADHD diagnostic criteria require symptoms and/or behaviors that have persisted ≥ 6 months in ≥ 2 settings (e.g., school, home, church). Symptoms have negatively impacted academic, social, and/or occupational functioning. For patients aged < 17 years, ≥ 6 symptoms are necessary; in those aged ≥ 17 years, ≥ 5 symptoms are necessary. The most notable modifications in DSM-V diagnostic criteria pertains to the age of onset, which was changed from *onset of symptoms and impairments* before age 7 to *onset of symptoms* before age 12 [2].

The number of children affected by the disorder is estimated to be more than 6.4 million [3]. The prevalence of ADHD in the USA (4% to 10%) is comparable to its worldwide prevalence (3% to 9.5%) [4]. ADHD predominantly affects children although millions of adults also suffer from ADHD and associated social and occupational dysfunction, including high work impairment and loss of household income [5-7].

ADHD poses a significant challenge to affected children in their personal development and academic performance. Persons with ADHD often have problems with maintaining attention, cognitive function, and memory processing [8]. An established body of research indicates that children with ADHD had experienced much higher rates of adversity than those without ADHD [3]. Adverse life events like family dysfunction, suboptimal parenting, diminished economic opportunities, high level of family disruption, poor family functioning, parental substance abuse or criminality, socially disorganized neighborhoods often characterize children with ADHD [9]. The significance of eliciting the relevant family history including any possible exposure to physical injury or psychological trauma in affected children and its importance in subsequent therapeutic interventions cannot be overemphasized [3].

The usual age range for peak diagnosis of ADHD is 3-6 years with global prevalence rates estimated at 9.5% for children and adolescents and 3% in adults [10,11]. Three major subtypes of ADHD are identified: predominantly inattentive, predominantly hyperactive-impulsive, and combined [12]. The most significant risk factors for ADHD include genetics and hereditability accounting for 60-80% and epigenetic factors in the rest of instances [13].

A recent study posited that a tendency to impulsive and risky decision making, including trying drugs, driving under the influence, high-risk sexual behavior, and delinquency already present in adolescents is exacerbated by ADHD [14]. On the other hand, ADHD has also been found to be a risk factor for COVID-19 infection, as affected individuals appear to have difficulty in complying with available public health measures [15]. Individuals with manifest ADHD appear to have much lower levels of adherence to preventive measures and adaptation to the COVID-19 outbreak and exhibit higher levels of stress [16].

To dismiss ADHD as a non-disease entity, a social construct, or normal variation in development amounts to denying affected individuals the effective interventions, including existing pharmacologic and cognitive behavioral therapies for ADHD and the potential to restore individuals' academic performance and social functioning [17].

It is helpful to keep the lifespan perspective on ADHD. In the pre-teen years, ADHD is associated with low self-esteem, disruptive behavior, and poor social and academic performance. During the years of adolescence and beyond, ADHD is often associated with conduct disorder, substance abuse, and school exclusion, among other things [18]. An important consideration with regard to ADHD is the remarkable level of stigma associated with it. Stigma continues to be a significant risk factor affecting the mental wellbeing of persons with ADHD and the quality of their lives [19,20].

The successful management of ADHD requires an interdisciplinary and integrated approach, involving medical providers, counselors, teachers, parents, and other family members. Assistive technology coupled with personalized support could help individuals achieve success at home, school, and/or work.

ADHD being a complex disorder with multifactorial etiology calls for the personalization of its treatment, including both pharmacologic and non-pharmacologic treatment approaches. Some of the medications found to be effective to varying degrees in the treatment of ADHD include methylphenidate and atomoxetine. Non-pharmacologic therapies include behavioral parental training, cognitive behavioral therapy, attention training techniques, neurofeedback, and other non-pharmacologic approaches [12].

Over the years, a number of extant models and theories

have been proposed to understand ADHD, among which are the biomedical model [21-23] and the biopsychosocial model [24,25]. According to the biomedical model, ADHD is a disease, a disorder, or a disability [26,27]. It is neither a sociocultural construct nor a hoax invented by pharmaceutical companies for the purpose of selling drugs. The bio-psycho-social model is a more holistic approach which aims to treat both the patient and the disease.

Advanced by some proponents of the biopsychosocial model, the social construct theory, mostly critical of having ADHD included in the DSM III, posits that ADHD should be identified as neurodiversity and not inherently a neurological pathology [28-30]. According to this theory, other examples of neuro-divergent individuals include persons with Autism Spectrum Disorder, Dyslexia, Tourette Syndrome, and individuals with learning disabilities.

This review will focus on unpacking the prevailing current evidence and diverse perspectives on ADHD, including causes and the origins of ADHD and different models and theories developed to understand ADHD [31].

The stress associated with the care of children with ADHD, including emotional effects, social effects, and the impact of the educational challenges make it all the more difficult for parents to cope with [32].

The rationale for this study is founded in our collective responsibility to promote evidence-based practice. We live at time where research evidence may be eclipsed by uninformed consensus, science by suspicion; information by misinformation, and health literacy by hesitancy. A dearth of information or exposure to disinformation may lead to adverse health outcomes in children and adults by negatively impacting health-seeking behavior.

Objectives of the Review

The objectives of this review include, (1) critically examining the current evidence-based literature on the causes and risk factors of ADHD, (2) critically examining psychosocial models, theories and perspectives on ADHD, (3) summarizing significant findings in the existing literature, underscoring the importance of making informed choices for children, adolescents, and adults living with ADHD.

2. Method

This review was conducted through a literature search for published peer-reviewed articles using standard PRISMA guidelines. The goal of the study was to explore current theories, models, concepts and perspectives related to ADHD published in peer-reviewed literature. We made use of several online data bases— including PsycINFO, PubMed, Web of Science, ScienceDirect, and Medline in the process of searching for relevant studies. The terms used to search articles include ADHD causes and perceptions; nutrition and diet; heredity, and genetics; adversity, and environment. Searches were also conducted using ADHD-related theories, models, and perspectives designed to better understand the disorder.

Relevant peer-reviewed publications since 1980s, when the term Attention-Deficit/ Hyperactivity Disorder was introduced in *DSM-III-R* were included. The selection of published articles for review was conducted in multiple stages. First, non-peer reviewed publications, including dissertations, editorials, commentaries, and factsheets were eliminated from those identified through database search. Second, duplicate publications were excluded. Third, abstract-only publications, case reports, and articles presumed to be non-peer reviewed were excluded. The reference period for the review spans the years 2019 through 2020.

Accordingly, a total of 560 publications addressing current diverse perspectives on Attention- Deficit/ Hyperactivity Disorder were selected. After 255 duplicate articles were excluded, an additional 91 of the 305 manuscripts were removed after abstract evaluation for relevance. Subsequently, 138 manuscripts were re-evaluated for eligibility and 67 publications were selected to be included in this study. The PRISMA flow chart is presented in Figure 1.

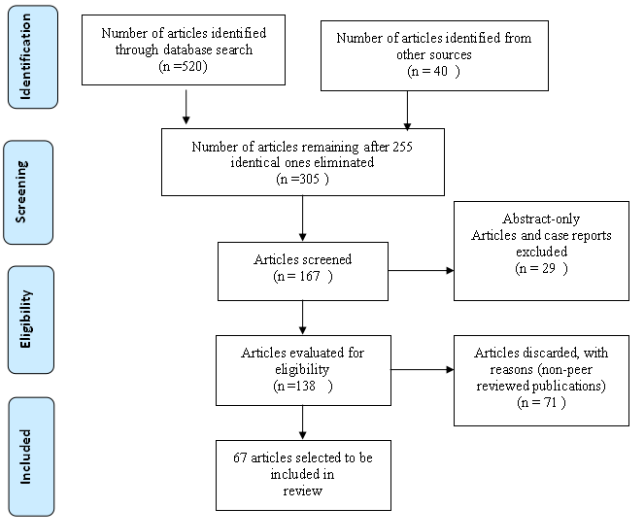

Figure 1. PRISMA* flow chart diagram of publications selection.

*PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analysis.

3. Results and Discussion

Emerging themes from the systematic analysis revealed

findings that relate mainly to the causes and risk factors of ADHD, including the models and theories that attempt to expand our understanding of ADHD. The review included thematic perspectives and risk factors as well as models and theories related to ADHD obtained from referenced publications.

(1) Genetic and hereditary factors

The development of ADHD is influenced by a number of factors, including genetic factors. A number of genetic studies on ADHD led to the discovery of several distinct chromosomal loci associated with ADHD. Paternal transmission of ADHD is significantly higher than maternal transmission, even more significantly higher to males than females [33]. Maternal substance abuse, including excessive alcohol consumption [34,35] and use of tobacco products increases the risk of ADHD [36-38]. A study on the developmental course of children with ADHD and identified multiple risk factors for ADHD posits that prenatal adversity and genetics significantly increase the risk for ADHD [39,40].

Evidence from twin studies demonstrates that genetic and hereditary factors accounted for as high as three-quarters of the population variance. There are three important factors that influence school-age and long term outcomes: severity of the manifestations, family-related factors, and co-morbid disorders [41-43]. Persons diagnosed to have ADHD and their parents, offspring, and siblings have a high risk of drug use disorders compared with controls [44]. The sharing of multiple genetic pathways is also a characteristic of ADHD and Autism Spectrum Disorders co-morbidity [45,46].

(2) Dietary and nutritional factors

Unlike genetic and hereditary factors, dietary and nutritional factors can be modified or strictly regulated. The therapeutic advantages of food restriction and exclusion of food additives in diets for children with ADHD are not significant. Research studies seem to support the assertion that food, if not the cause of ADHD, can certainly play a role in exacerbating ADHD manifestations; the major culprits considered being gluten, dairy, and artificial food dyes. On the other hand, certain nutrients such as vitamins and minerals appear to have substantial effects on ADHD manifestations. In some studies, excessive consumption of fat, refined sugars

Table 1. Selected Research Findings on the Influence of Genetic and Hereditary Factors and Dietary and Nutritional Factors on ADHD

Thematic Factors Associated with ADHD	Major Findings of Selected Studies	Authors, Year of Publication. Study Design
Genetic and Hereditary Factors	Parents, offspring, and siblings of persons with ADHD have an elevated risk of drug use disorders, resulting from genetic factors shared between the two disorders. Both genetic and epigenetic factors play a significant part in the complex etiology of ADHD [47].	47. Martin, J., Taylor, M. J., Rydell, M., Riglin, L., Eyre, O., Lu, Y., ... & Lichtenstein, P. (2018).Longitudinal Cohort Study [47].
	High levels of stress during pregnancy are associated with an elevated risk of ADHD among siblings, compared to unaffected siblings [48].	48. Grizenko, N., Fortier, M. E., Zadorozny, C., Thakur, G., Schmitz, N., Duval, R., & Joober, R. (2012). A Cross-sectional Study [48].
	Females who have anxiety and depression have a higher likelihood of being diagnosed with ADHD and the chances of misdiagnosing ADHD is higher in females [49].	49. Quinn, P. O., & Madhoo, M. (2014). A Review [49].
Dietary and Nutritional Factors	The intrauterine level of cholecalciferol (Vitamin D3) between ADHD-affected children and controls has no significant difference. Maternal age is linked to ADHD prevalence. Brain health largely benefits from Vitamin B6 and certain minerals which also affect ADHD manifestations [50,51].	Nigg, J. T., & Holton, K. (2014). A Review [50]. Gustafsson, P., Rylander, L., Lindh, C. H., Jönsson, B. A., Ode, A., Olofsson, P., ... & Källén, K. (2015) [51]. A Review
	The exclusion of food additives in the diets of children affected with ADHD does not have significant therapeutic benefits when used as a stand-alone treatment. Excessive consumption of dietary fat, refined sugar, and dietary salt result in elevated risk for the development of ADHD [52-54].	Greenblatt, J. M., & Delane, D. D. (2017). A Review [52]. Ly, V., Bottelier, M., Hoekstra, P. J., Arias Vasquez, A., Buitelaar, J. K., & Rommelse, N. N. (2017). A Review [53]. Brunault, P., Frammery, J., Montaudon, P., De Luca, A., Hankard, R., Ducluzeau, P. H., ... & Ballon, N. (2019). Cross-Sectional [54].

and salt as well as food addiction resulted in increase of an ADHD diagnosis [50-54]. Selected publications on the influence of dietary and nutritional factors on ADHD are displayed in Table 1.

(3) Adverse Early Life Events, Parenting, Behavioral, and Environmental Factors, Including Challenges in Families

A growing body of scientific evidence demonstrates that adverse childhood experiences that threaten child development at home and in the school environment can lead to long-term negative health outcomes in later life, significantly impacting behavioral and physical health outcomes [55-57]. Studies indicate that at-risk first-degree relatives of ADHD have significantly higher rates of post-traumatic stress disorder [58]. ADHD is more common in males than females but ADHD could be missed or miss understood or misdiagnosed in females as generalized anxiety disorder or depression [59].

Many of the developmental and intellectual disorders in children such as Autism Spectrum Disorder and ADHD have causal influences related to genetic, environmental, medical and, sociocultural factors during the prenatal, infancy, and childhood periods [60]. Moreover, clinical conditions such as significant maternal stress [61]; maternal anxiety [62]; and environmental risk factors such as family adversity [63] are significantly associated with developments of ADHD. On the other hand, ADHD imposes significant stress on parents and parenting [64]. ADHD persists into adolescence and even into adulthood in 50-80% of children with the disorder, co-occurring mood anxiety, substance use, and conduct disorders are common with ADHD. Adults who reported childhood abuse had significantly higher levels of ADHD [65-67].

On the other hand, concerns about a potential association between ADHD and immunizations/ vaccinations are unsupported by robustly designed research, including longitudinal studies [68]. Selected publications on prenatal, perinatal, adverse early life events, parenting, behavioral and environmental factors associated with ADHD are displayed in Table 2.

(4) Theories and Models with Diverse Perspectives Associated with ADHD.

This review has included three key models and four theories of dysfunction associated with ADHD: the

Table 2. Prenatal, perinatal, Adverse Early Life Events, Parenting, Behavioral and Environmental Factors Associated with ADHD

Thematic Factors Associated with ADHD	Major Findings of Selected Studies	Authors, Year of Publication, Study Design,
Adverse Early Life Events, Parenting, Behavioral, and Environmental Factors	The degree of severity of ADHD highly impacts parenting patterns, often leading to inappropriate practices that negatively influence a child's growth and development [69,70].	Deault, L. C. (2010). A systematic review [69]. Ellis, B., & Nigg, J. (2009). A Cross-Sectional study [70].
	Early childhood attachment issues have a significant correlation with ADHD; Appropriate parental training may prevents the development of insecure attachment [71].	Storebø, O. J., Rasmussen, P. D., & Simonsen, E. (2016). A Review [71].
	Elevated blood lead levels resulting from exposure to environment lead is significantly associated with ADHD outcomes [72,73].	Geier, D. A., Kern, J. K., & Geier, M. R. (2018). A cross-sectional study. [72.] Chronis-Tuscano, et al. (2011). Pre/Post-Intervention [73]. A Cross-sectional study
	Maternal and fetal exposure to certain environmental chemicals such as phthalates during pregnancy is significantly associated with the development of ADHD in childhood [74].	Barrett, J. R. (2019). A Case Control Study [74].
	Maternal obesity, gestational hypertension, and tobacco use during pregnancy are significantly associated with ADHD, independent of genetic and familial factors [75,76].	Mick, E., Biederman, J., Faraone, S. V., Sayer, J., & Kleinman, S. (2002). Case- control study [75]. Pohlabeln, H., Rach, S., De Henauw, S., Eiben, G., Gwozdz, W., Hadjigeorgiou, C., ... & Pigeot, I. (2017). A Cross Sectional Study [76].
	Statistically significant associations with unwanted/unplanned pregnancies, antenatal stress, mode of delivery, perinatal bonding, and quality of mother–child and father–child bonding [77].	Tole, F., Kopf, J., Schröter, K., Palladino, V. S., Jacob, C. P., Reif, A., & Kittel-Schneider, S. (2019). A Cross Sectional Study [77].

Biomedical, Biopsychosocial, and the State Regulation Model as well as The Executive Dysfunction Theory, The Delay Aversion Theory, The Dynamic Developmental Theory, and The Social Construct Theory, each of which has undergone varying levels of transformation over the years [78-83].

The Social Construct Theory is particularly interesting as its hypotheses do not conform to mainstream scientific thinking. The proponents contend that diverse neurological conditions, including ADHD are social constructs created by a culture that does not recognize neuro-divergent individuals as normal or variations of normal, and not real disorders [79,80]. Moreover, proponents of the social construct theory argue that impulsivity and hyperactivity are part of the normal process of growth and development in children. The social construct theory of ADHD contends that we live in a society where children are boxed into cultural expectations not commensurate with a child's growth and developmental milestones.

According to proponents of the social construct theory, ADHD is a sociocultural construct, and not a "mental disorder" at all [80,81]. Appropriate interventions can help affected individuals manage ADHD challenges at home, school, and work place and help lead a productive and constructive personal and social life. Parents, guardians, teachers, and students dealing or affected with ADHD directly or indirectly should have access to appropriate resources and be cognizant of current evidence to make informed choices and decisions regarding ADHD prevention and management education. The different models and theories related ADHD along with selected publications are displayed in Table 3.

Table 3. Selected Models and Theories of Attention-Deficit /Hyperactivity Disorder

Models and Theories Associated with ADHD	Major Descriptions of Models and Theories Related to ADHD	Authors, Year of Publication, Study Design
The Bio-Medical Model	Posits that the disability problem is contained in the individual and seeks to cure a person by medical professionals who can treat the effect of the disability with medications so that they can return to an able-bodied state [78].	Talbot, P., Astbury, G., & Mason, T. (Eds.). (2010). *Key concepts in learning disabilities*. Sage [78]. (A Book).
The Bio-Psycho-Social Model	Reflects the development of an illness through the complex interaction of biological, psychological, and social factors; for instance, a person's genetic predisposition to an illness may require cognitive and social factors to trigger the illness [79].	Wade, D. T., & Halligan, P. W. (2017). A Review [79].
The State Regulation Model	Posits that the efficiency with which a task is performed is considered to be a product of elementary cognitive stages such as stimulus encoding, memory search, binary decision and motor preparation, and their energy distribution. Children with ADHD have difficulty in keeping an optimal activation state [80].	Johnson, K. A., Wiersema, J. R., & Kuntsi, J. (2009). A Review [80].
The Executive Dysfunction Theory	Suggests that the symptoms of ADHD arise wholly as a result of a reduction in executive control, caused by abnormalities in the structure, function, and biochemical operation of the frontoparietal and frontostriatal neural networks [80].	Johnson, K. A., Wiersema, J. R., & Kuntsi, J. (2009). A Review [80].
The Delay Aversion Theory	Posits that children with ADHD are not impulsive in the sense of always opting for an immediate reward at the expense of overall rewards, but that they do so only in circumstances where this leads to a shorter overall delay [80].	Johnson, K. A., Wiersema, J. R., & Kuntsi, J. (2009). A Review [80].
The Dynamic Developmental Theory	Suggests that ADHD manifests because of altered reinforcement of novel behavior and deficient extinction of inadequate behavior. In ADHD socially desirable behavior is not reinforced in time as a result of a shorter window of opportunity than normal for the reinforcer to take effect [80].	Johnson, K. A., Wiersema, J. R., & Kuntsi, J. (2009). A Review [80].
The Social Construct Theory	Argues that attention deficit hyperactivity disorder is not necessarily an actual pathology, but that an ADHD diagnosis is a socially constructed explanation to describe behaviors that simply do not meet prescribed social norms [81,82].	Mather, B. A. (2012). A Review [81]. Timimi, S., & Taylor, E. (2004). A review [82].

4. Limitations of the Study

This systematic review has provided the current evidence on the diverse perspectives, risk factors, models, and theories about ADHD, one of the most common cognitive developmental disorders. However this study is not without limitations. The review consists of a number of both original research studies and systematic reviews but does not include a quality assessment and detailed characteristics of each of the articles included in the study. The evidence presented by the studies included in the review was not critically evaluated, thus treating the results of each study as equally relevant. Current evidence on the treatment of ADHD and/or assisted technology to help children or college students with ADHD challenges was not included in this study.

5. Conclusions

Millions of children and adults suffer from ADHD and associated social and occupational dysfunction and suboptimal academic performance. This study has attempted to identify the major risk factors and diverse models and theories associated with ADHD. The thematic risk factors include genetic and hereditary factors; dietary and nutritional factors; parenting and behavioral factors; adverse early life events, and high-risk environmental factors. The most prominent models include the biomedical model and the bio-psycho-social models, the latter being a more holistic approach which aims to treat both the patient and the disease. This review will provide additional evidence base to individuals, families, and educators to make informed choices and decisions in the best interests and diverse needs of the affected children and youth, including personal growth, healthcare and medical needs, academic performance, and social skills development.

Author Contributions

The corresponding author is the sole author of this systematic review.

Conflict of Interest

The author declares to have no conflict of interest.

Funding

This research received no external funding.

Acknowledgments

I would like to sincerely thank Yanna Almonte, Olakunbi Famuyiwa, and Yessica Liriano, for their immense contribution in the search for relevant peer-reviewed published articles for this study. Your individual and collective contribution is greatly appreciated.

References

[1] Charach, A., Dashti, B., Carson, P., et al., 2011. Attention deficit hyperactivity disorder: effectiveness of treatment in at- risk preschoolers; long-term effectiveness in all ages; and variability in prevalence, diagnosis, and treatment.

[2] Epstein, J.N., Loren, R.E., 2013. Changes in the definition of ADHD in DSM-5: subtle but important. Neuropsychiatry. 3(5), 455.

[3] Brown, N.M., Brown, S.N., Briggs, R.D., et al., 2017. Associations between adverse childhood experiences and ADHD diagnosis and severity. Academic pediatrics. 17(4), 349-355.

[4] Jensen, P.S., Hinshaw, S.P., Swanson, J.M., et al., 2001. Findings from the NIMH Multimodal Treatment Study of ADHD (MTA): implications and applications for primary care providers. Journal of Developmental & Behavioral Pediatrics. 22(1), 60-73.

[5] Loe, I.M., Feldman, H.M., 2007. Academic and educational outcomes of children with ADHD. Journal of pediatric psychology. 32(6), 643-654.

[6] De Graaf, R., Kessler, R.C., Fayyad, J., et al., 2008. The prevalence and effects of adult attention-deficit/hyperactivity disorder (ADHD) on the performance of workers: results from the WHO World Mental Health Survey Initiative. Occupational and environmental medicine. 65(12), 835-842.

[7] Biederman, J., Faraone, S.V., 2006. The effects of attention-deficit/hyperactivity disorder on employment and household income. Medscape General Medicine. 8(3), 12.

[8] American Psychiatric Association, 2013. Diagnostic and statistical manual of mental disorders (DSM-5®). American Psychiatric Pub.

[9] Borum, R., Lodewijks, H.P., Bartel, P.A., et al., 2020. The structured assessment of violence risk in youth (SAVRY). In Handbook of violence risk assessment. Routledge. pp. 438-461.

[10] Cagigal, C., Silva, T., Jesus, M., et al., 2019. Does diet affect the symptoms of ADHD? Current Pharmaceutical Biotechnology. 20(2), 130-136.

[11] American Psychiatric Association, 2015. Neurodevelopmental disorders: DSM-5® selections. American Psychiatric Pub.

[12] Núñez-Jaramillo, L., Herrera-Solís, A., Herrera-Mo-

rales, W.V., 2021. ADHD: Reviewing the causes and evaluating solutions. Journal of personalized medicine. 11(3), 166.

[13] Kooij, J.J.S., Bijlenga, D., Salerno, L., et al., 2019. Updated European Consensus Statement on diagnosis and treatment of adult ADHD. European psychiatry. 56(1), 14-34.

[14] Dekkers, T.J., de Water, E., Scheres, A., 2022. Impulsive and risky decision-making in adolescents with attention-deficit/hyperactivity disorder (ADHD): The need for a developmental perspective. Current opinion in psychology. 44, 330-336.

[15] Merzon, E., Manor, I., Rotem, A., et al., 2021. ADHD as a risk factor for infection with Covid-19. Journal of Attention Disorders. 25(13), 1783-1790.

[16] Pollak, Y., Shoham, R., Dayan, H., et al., 2021. ADHD symptoms predict lower adaptation to the COVID-19 outbreak: financial decline, low adherence to preventive measures, psychological distress, and illness-related negative perceptions.

[17] van de Glind, G., Konstenius, M., Koeter, M.W., et al., 2014. Variability in the prevalence of adult ADHD in treatment seeking substance use disorder patients: results from an international multi-center study exploring DSM-IV and DSM-5 criteria. Drug and alcohol dependence. 134, 158-166.

[18] Harpin, V.A., 2005. The effect of ADHD on the life of an individual, their family, and community from preschool to adult life. Archives of disease in childhood. 90(suppl 1), i2-i7.

[19] Mueller, A.K., Fuermaier, A., Koerts, J., et al., 2012. Stigma in attention deficit hyperactivity disorder. ADHD attention deficit and hyperactivity disorders. 4(3), 101-114.

[20] Bisset, M., Winter, L., Middeldorp, C.M., et al., 2021. Recent attitudes toward ADHD in the broader community: A systematic review. Journal of Attention Disorders.
DOI: https://doi.org/10.1177/10870547211003671

[21] Killeen, P.R., 2019. Models of attention-deficit hyperactivity disorder. Behavioral processes. 162, 205-214.

[22] Clare, A., 2012. Psychiatry in Dissent: Controversial issues in thought and practice second edition. Routledge.

[23] Lehman, B.J., David, D.M., Gruber, J.A., 2017. Rethinking the biopsychosocial model of health: Understanding health as a dynamic system. Social and personality psychology compass. 11(8), e12328.

[24] Engel, G.L., 1981 January. The clinical application of the biopsychosocial model. In The Journal of Medicine and Philosophy: A Forum for Bioethics and Philosophy of Medicine. Oxford University Press. 6(2), 101-124.

[25] Cooper, P., 2008. Like alligators bobbing for poodles? A critical discussion of education, ADHD and the biopsychosocial perspective. Journal of Philosophy of Education. 42(3-4), 457-474.

[26] Salamanca, L.M., 2014. Biopsychosocial perspective of ADHD. Open Journal of Epidemiology.

[27] Deacon, B.J., 2013. The biomedical model of mental disorder: A critical analysis of its validity, utility, and effects on psychotherapy research. Clinical psychology review. 33(7), 846-861.

[28] Spitzer, R.L., Williams, J.B., Skodol, A.E., 1980. DSM-III: the major achievements and an overview. The American Journal of Psychiatry.

[29] Armstrong, T., 2011. The Power of Neurodiversity: Unleashing the Advantages of Your Differently Wired Brain (published in Hardcover as Neurodiversity). Da Capo Lifelong Books.

[30] Jaarsma, P., Welin, S., 2012. Autism as a natural human variation: Reflections on the claims of the neurodiversity movement. Health care analysis. 20(1), 20-30.

[31] Graham, L.J., 2008. From ABCs to ADHD: the role of schooling in the construction of behaviour disorder and production of disorderly objects. International Journal of Inclusive Education. 12(1), 7-33.

[32] Mofokeng, M., van der Wath, A.E., 2017. Challenges experienced by parents living with a child with attention deficit hyperactivity disorder. Journal of Child & Adolescent Mental Health. 29(2), 137-145.

[33] Hawi, Z., Kent, L., Hill, M., et al., 2010. ADHD and DAT1: Further evidence of paternal over transmission of risk alleles and haplotype. American Journal of Medical Genetics Part B: Neuropsychiatric Genetics. 153(1), 97-102.

[34] Mick, E., Biederman, J., Faraone, S.V., et al., 2002. Case-control study of attention-deficit hyperactivity disorder and maternal smoking, alcohol use, and drug use during pregnancy. Journal of the American Academy of Child & Adolescent Psychiatry. 41(4), 378-385.

[35] Linnet, K.M., Dalsgaard, S., Obel, C., et al., 2003 Jun 1. Maternal lifestyle factors in pregnancy risk of attention deficit hyperactivity disorder and associated behaviors: review of the current evidence. Am J Psychiatry. 160(6), 1028-1040.

[36] Thapar, A., Cooper, M., Jefferies, R., et al., 2012. What causes attention deficit hyperactivity disorder? Archives of disease in childhood. 97(3), 260-265.

[37] Motlagh, M.G., Sukhodolsky, D.G., Landeros-Weisenberger, A., et al., 2011. Adverse effects

of heavy prenatal maternal smoking on attentional control in children with ADHD. Journal of Attention Disorders. 15(7), 593-603.

[38] Pelham, W.E., Lang, A.R., Atkeson, B., et al., 1998. Effects of Deviant Child Behavior on Parental Alcohol Consumption Stress-Induced Drinking in Parents of ADHD Children. American Journal on Addictions. 7(2), 103-114.

[39] Thapar, A., Fowler, T., Rice, F., et al., 2003. Maternal smoking during pregnancy and attention deficit hyperactivity disorder symptoms in offspring. American Journal of Psychiatry. 160(11), 1985-1989.

[40] Motlagh, M.G., Sukhodolsky, D.G., Landeros-Weisenberger, A., et al., 2011. Adverse effects of heavy prenatal maternal smoking on attentional control in children with ADHD. Journal of Attention Disorders. 15(7), 593-603.

[41] Thapar, A., Holmes, J., Poulton, K., et al., 1999. Genetic basis of attention deficit and hyperactivity. The british journal of psychiatry. 174(2), 105-111.

[42] Pondé, M.P., Novaes, C.M., Losapio, M.F., 2010. Frequency of symptoms of attention deficit and hyperactivity disorder in autistic children. Arquivos de Neuro-psiquiatria. 68(1), 103-106.

[43] Cherkasova, M., Sulla, E.M., Dalena, K.L., et al., 2013. Developmental course of attention deficit hyperactivity disorder and its predictors. Journal of the Canadian Academy of Child and Adolescent Psychiatry.

[44] Skoglund, C., Chen, Q., Franck, J., et al., 2015. Attention-deficit/hyperactivity disorder and risk for substance use disorders in relatives. Biological psychiatry. 77(10), 880-886.

[45] Sokolova, E., Oerlemans, A.M., Rommelse, N.N., et al., 2017. A causal and mediation analysis of the comorbidity between attention deficit hyperactivity disorder (ADHD) and autism spectrum disorder (ASD). Journal of autism and developmental disorders. 47(6), 1595-1604.

[46] Banaschewski, T., Hollis, C., Oosterlaan, J., et al., 2005. Towards an understanding of unique and shared pathways in the psychopathophysiology of ADHD. Developmental science. 8(2), 132-140.

[47] Martin, J., Taylor, M.J., Rydell, M., et al., 2018. Sex-specific manifestation of genetic risk for attention deficit hyperactivity disorder in the general population. Journal of Child Psychology and Psychiatry. 59(8), 908-916.

[48] Grizenko, N., Fortier, M.E., Zadorozny, C., et al., 2012. Maternal stress during pregnancy, ADHD symptomatology in children and genotype: gene-environment interaction. Journal of the Canadian Academy of Child and Adolescent Psychiatry. 21(1), 9.

[49] Quinn, P.O., Madhoo, M., 2014. A review of attention-deficit/hyperactivity disorder in women and girls: uncovering this hidden diagnosis. The primary care companion for CNS disorders. 16(3), 27250.

[50] Nigg, J.T., Holton, K., 2014. Restriction and elimination diets in ADHD treatment. Child and Adolescent Psychiatric Clinics. 23(4), 937-953.

[51] Gustafsson, P., Rylander, L., Lindh, C.H., et al., 2015. Vitamin D status at birth and future risk of attention deficit/hyperactivity disorder (ADHD). PloS one. 10(10), e0140164.

[52] Greenblatt, J.M., Delane, D.D., 2017. Micronutrient deficiencies in ADHD: A global research consensus. Journal of Orthomolecular Medicine. 32(6).

[53] Ly, V., Bottelier, M., Hoekstra, P.J., et al., 2017. Elimination diets' efficacy and mechanisms in attention deficit hyperactivity disorder and autism spectrum disorder. European child & adolescent psychiatry. 26(9), 1067-1079.

[54] Brunault, P., Frammery, J., Montaudon, P., et al., 2019. Adulthood and childhood ADHD in patients consulting for obesity is associated with food addiction and binge eating, but not sleep apnea syndrome. Appetite. 136, 25-32.

[55] Froehlich, T.E., Anixt, J.S., Loe, I.M., et al., 2011. Update on environmental risk factors for attention-deficit/hyperactivity disorder. Current psychiatry reports. 13(5), 333.

[56] Singh, A., Yeh, C.J., Verma, N., et al., 2015. Overview of attention deficit hyperactivity disorder in young children. Health psychology research. 3(2).

[57] Germán, M., Belamarich, P.F., Oyeku, S.O., 2016. Associations between adverse childhood experiences and ADHD diagnosis and severity. Academic Pediatrics. 1(7).

[58] Antshel, K.M., Kaul, P., Biederman, J., et al., 2013. Posttraumatic stress disorder in adult attention-deficit/hyperactivity disorder: Clinical features and familial transmission. The Journal of Clinical Psychiatry. 74(3), 14855.

[59] Bilbow, A., Berry, C., Brunet, J., et al., 2021. Understanding ADHD in Girls and Women. Jessica Kingsley Publishers.

[60] Herbert, M., 2008. Developmental problems of childhood and adolescence: Prevention, treatment and training.

[61] Ronald, A., Pennell, C.E., Whitehouse, A.J., 2011. Prenatal maternal stress associated with ADHD and autistic traits in early childhood. Frontiers in psychology. 1, 223.

[62] Vizzini, L., Popovic, M., Zugna, D., et al., 2019. Ma-

ternal anxiety, depression and sleep disorders before and during pregnancy, and preschool ADHD symptoms in the NINFEA birth cohort study. Epidemiology and psychiatric sciences. 28(5), 521-531.

[63] Counts, C.A., Nigg, J.T., Stawicki, J.A., et al., 2005. Family adversity in DSM-IV ADHD combined and inattentive subtypes and associated disruptive behavior problems. Journal of the American Academy of Child & Adolescent Psychiatry. 44(7), 690-698.

[64] Munoz-Silva, A., Lago-Urbano, R., 2016. Child ADHD severity, behavior problems and parenting styles. Ann Psychiatry Ment Health. 4(3), 1066.

[65] Frodl, T., Skokauskas, N., 2012. Meta analysis of structural MRI studies in children and adults with attention deficit hyperactivity disorder indicates treatment effects. Acta Psychiatrica Scandinavica. 125(2), 114-126.

[66] Froehlich, T.E., Anixt, J.S., Loe, I.M., et al., 2011 Oct 1. Update on environmental risk factors for attention-deficit/hyperactivity disorder. Current Psychiatry Reports. 13(5), 333.

[67] Wilens, T.E., Spencer, T.J., 2010. Understanding attention-deficit/hyperactivity disorder from childhood to adulthood. Postgraduate medicine. 122(5), 97-109.

[68] Smith, M.J., Woods. C.R., 2010 Jun 1. On-time vaccine receipt in the first year does not adversely affect neuropsychological outcomes. Pediatrics. 125(6), 1134-1141.

[69] Deault, L.C., 2010. A systematic review of parenting in relation to the development of comorbidities and functional impairments in children with attention-deficit/hyperactivity disorder (ADHD). Child Psychiatry & Human Development. 41(2), 168-192.

[70] Ellis, B., Nigg, J., 2009. Parenting practices and attention-deficit/hyperactivity disorder: New findings suggest partial specificity of effects. Journal of the American Academy of Child & Adolescent Psychiatry. 48(2), 146-154.

[71] Storebø, O.J., Rasmussen, P.D., Simonsen, E., 2016. Association between insecure attachment and ADHD: environmental mediating factors. Journal of Attention Disorders. 20(2), 187-196.

[72] Geier, D.A., Kern, J.K., Geier, M.R., 2018. A cross-sectional study of the relationship between blood lead levels and reported attention deficit disorder: an assessment of the economic impact on the United States. Metabolic Brain Disease. 33(1), 201-208.

[73] Chronis-Tuscano, A., O'Brien, K.A., Johnston, C., et al., 2011. The relation between maternal ADHD symptoms & improvement in child behavior following brief behavioral parent training is mediated by change in negative parenting. Journal of abnormal child psychology. 39(7), 1047-1057.

[74] Barrett, J.R., 2019. Attention worthy: Prenatal phthalate exposure and subsequent ADHD diagnosis. Environmental health perspectives. 127(3), 034001.

[75] Mick, E., Biederman, J., Faraone, S.V., et al., 2002. Case-control study of attention-deficit hyperactivity disorder and maternal smoking, alcohol use, and drug use during pregnancy. Journal of the American Academy of Child & Adolescent Psychiatry. 41(4), 378-385.

[76] Pohlabeln, H., Rach, S., De Henauw, S., et al., 2017. Further evidence for the role of pregnancy-induced hypertension and other early life influences in the development of ADHD: results from the IDEFICS study. European child & adolescent psychiatry. 26(8), 957-967.

[77] Tole, F., Kopf, J., Schröter, K., et al., 2019. The role of pre-, peri-, and postnatal risk factors in bipolar disorder and adult ADHD. Journal of Neural Transmission. 126(9), 1117-1126.

[78] Talbot, P., Astbury, G., Mason, T., (Eds.), 2010. Key concepts in learning disabilities. Sage.

[79] Wade, D.T., Halligan, P.W., 2017. The biopsychosocial model of illness: a model whose time has come. Clinical rehabilitation. 31(8), 995-1004.

[80] Johnson, K.A., Wiersema, J.R., Kuntsi, J., 2009. What would Karl Popper say? Are current psychological theories of ADHD falsifiable? Behavioral and Brain Functions. 5(1), 1-11.

[81] Mather, B.A., 2012. The social construction and reframing of attention-deficit/hyperactivity disorder. Ethical Human Psychology and Psychiatry. 14(1), 15. Psychiatry. 16(2), 57.

[82] Timimi, S., Taylor, E., 2004. ADHD is best understood as a cultural construct. The British Journal of Psychiatry. 184(1), 8.

BILINGUAL PUBLISHING CO.
Pioneer of Global Academics Since 1984

Journal of Psychological Research
https://ojs.bilpublishing.com/index.php/jpr

REVIEW

There is No Mystery in Social System

Haitao Liu*

School of Marxism, Shanghai Jiao Tong University, Shanghai, 200240, China

Abstract: There is a gap between the properties of social reality and the natural properties of the material bearer that carries it. Language constructivism uses language representations to bridge this gap, arguing that language constructs social reality. Emergence theory holds that the attributes of social reality cannot be reduced to the physical attributes of the carrier. This process is emergent. Language constructivism regards the process from mental reality to social reality as the product of language's own operation and the secret is hidden in language itself. Emergentism directly led social reality to mysticism. Mental reality is an initial existence, which includes both innate desires and needs and acquired values. Social reality is the external reality created by the subject through action according to his internal needs and desires. Mental reality and social reality are dynamically integrated into each other, which is achieved through rule-based action.

Keywords: Mental reality; Social reality; Rules; Action

1. Introduction

Human society is composed of social realities such as currency and law, many theories explain the construction of social realities. Among them, the relationship between social reality and the material carrier that carries that social reality is a very meaningful theme. Assuming that the physical property of the paper used to make a five-dollar bill is X and the property of a five-dollar bill is Y, how is Y generated from X, or how is the property X of paper instantiated into banknote Y [1]? Similarly, why a person's physical act X of walking across a road is considered an illegal red light-running act Y? Searle believes that the functional attributes of Y only exist within the scope of

*Corresponding Author:
Haitao Liu,
School of Marxism, Shanghai Jiao Tong University, Shanghai, 200240, China;
Email: liuhaitao907@163.com

Received: 12 April 2022; **Accepted:** 15 May 2022; **Published Online:** 18 May 2022

Citation: Haitao Liu. There is No Mystery in Social System. *Journal of Psychological Research*, 2022, 4(2), 4621. https://doi.org/10.30564/jpr.v4i2.4621

DOI: https://doi.org/10.30564/jpr.v4i2.4621

language representation, the process from X to Y is language construction [2]. The foundation of social reality is collective intentionality (collective acceptance and recognition) [3]. Silver maintains that X emerges from Y and this emergence which including downward causality is strong emergence [1]. Language constructivism transfers the contradiction between mental reality and social reality to the operation of language, as if social reality is the power of language itself. Emergentism completely places social reality outside mental reality and makes social reality incomprehensible by the dichotomy of subject and object. They all lead to the mystification. This paper takes the subject's desire, instinct, needs and other mental reality as the basic natural fact to analyze how to achieve the construction from mental reality to social reality. The creation of social reality is the externalization of inner mental reality, there is no absolute objective social reality and absolute subjective mental reality, they are dynamic integration process which the structure is realized through the action of the subject. Accordingly, this paper proposes a kind of rules-centered social realism based on the structure of action.

2. Social Reality in Language Constructivism

Searle holds that: first, all institutional facts of human beings, and even all human civilizations in this sense, are built by simple language operations in their initial existence and maintenance. Second, the language operation is essentially a declaration of status function. Third, the recurrent use of language operations in a recursive way constitutes the complex structure of social civilization [2]. People create or change events in the social world through declaration, such as declaration of war, marriage, etc. Language consists of representational forms. In the case of human natural language, the syntactic structure of these representations contains semantic content and gives us expressions about states of affairs and objects in the world. Society is an organization of human beings in the form of collective intentionality. Collective intentionality which is the ability of humans and other animals has to cooperate with each other in various forms of activity is the basic condition of society. Whether it is human society or animal society, all social facts are composed of phenomena that contain factors of collective intentionality. The remarkable feature of human civilization is that collective intentionality can be expanded by various linguistic representations, which is the creation of deontology. Humans have a rich system of linguistic signs, while animals do not. Language constructivism describes the representational structure of human civilization as opposed to animal society. Human civilization is composed of various institutional facts, which are also status functions. Status functions give people moral rights and reasons for action independent of their desires. At the same time, institutional facts are also subject to the human rationality that motivates people to act.

Searle attaches importance to collective intentionality and linguistic representation. The intentionality among individuals is expressed through desires, needs, beliefs and so on, thus forming collective intentionality. It is the internal process of human brain, while language is the external presentation of the internal mental state. The constructive process of social reality manifests the inner mental reality through linguistic representation, which may be an important feature of language constructivism. But using intentionality and language alone to explain social reality produces the following problems: First, collective intentionality might produce group irrational consequences. Social fact is constructed by people's common recognition and acceptance through collective intentionality, so it is the result of people's rationality. However, the society as a complex system, there are a lot of seemingly rational but actually irrational phenomena. For example, in financial activities, different organizations and individuals rationally choose to maximize their interests within jointly accepted rules, but often leads to unexpected economic crises. In turn, these unexpected social realities become the background of people's activities, further forming new social reality. In other words, the social reality that the collective recognition or acceptance gives rise to the reality that the collective does not accept. This is beyond the bounds of intentionality itself. Second, linguistic representations ultimately need to be indicated in actions and sustained in collectively accepted actions. Therefore, if discourse pronouncements cannot produce or presupposition appropriate commitments or non-verbal actions, it cannot perform functions other than language and cannot be used to create intersubjective institutional facts, at most to create some concepts or conceptual features about them [3].

Language describes the superficial process of social reality, but there should be deeper reasons behind it. Linguistic acts are only the forms of actions, which cannot be separated from the preexisting social system. The discourse of following rules is rooted in life practice. Language has almost infinite generativity and creativity, but it itself is a system of rules. Linguistic signs are only the representation of social reality which is fundamentally a series of action system and sets the possibility and norm of action. Language is the direct expression of the mind, but is not the whole about it. The potential for action is beyond the representation of language. People's actions, on the one hand, repeat and strengthen the existing social

reality, on the other hand, create new social reality. Language is both the representation and the product of this process.

Social reality has the dual characteristics of objectivity and subjectivity. First, the objectivity has two meanings. The social system is outside the individual will. The life of the individual is only a fragment of the whole society, which existed before he was born and continues to exist after he dies. The established social system is the external environment that each individual must face and is the order of meaning for survival, which are strongly placed in front of the individual. Thus, preexisting social systems precede individual experience and knowledge. Although social reality is constructed by people, it is immobilized and legalized through specific procedures and gradually integrates with nature, exerting coercive force similar to nature facts. This objectivity makes it impossible for the individual to easily change it according to his own desires. The social reality is objective in that it is the overall force of collective acceptance and recognition [4]. It has no fixed logical form and exists as long as people accept it to exist.

The second is the subjectivity. Social realities are essentially created by human to satisfy his needs. They are mutually shared objects of meaning and mutually subjective realities. The objectification of social facts is maintained mainly through the signification of language. Language has the ability to transcend the "here and now", which make it span the different fields of life and integrate them into a meaningful whole [5]. Language has a powerful function of constructing social facts. However, when language is separated from the needs of life, the process of constructing will become dramatic and mysterious. It seems that social facts are the secret of language itself and the result of its operation.

3. Social Reality in Emergentism

Silver pays attention to the instantiated attributes of elements in the social system, such as a five-dollar bill or a pawn event, which he believes appear in a unique way. The banknote and its material carrier are the same piece of paper. To a certain extent, the property Y of the banknote comes from the physical property X of the paper, but the Y instantiated by X cannot be reduced to X, so it must be emergent in a sense. Silver is not saying that the physical property Y will suddenly and miraculously generate a new irreducible property Y. The emergence of social properties depends in part on the system to which it belongs. The characteristic of emergence is caused by the elements in its supervenient foundation. The system not only contains many elements, but also contains rules for how these elements interact in time, so emergence is diachronic. The social attributes based on a system can at least lead to the instantiation of further attributes in that system. A serious ontological conclusion is that the social properties are strongly emergent [1]. Compared with language constructionism, which hides the creation of social reality in the secret of language, emergentism straightforwardly leads social reality to mystification.

Strictly speaking, the mind can only know the "manifested world" within it and from the "manifested world" it can infer that there must be a "causal world" outside the mind. The mind can never know the "causal world". It is only a necessary setting to satisfy the logic of causation. The world of manifestation is internal subjectivity and the world of cause is external objectivity. There is a chasm between them: the mind can know only what it produces within itself, which in a sense is still within itself, though it needs external causes for its origin and to define its behavioral characteristics [6]. When X, the material carrier of the "manifested world", cannot fully deduce the "causal world" of Y, the easy solution is to say that Y emerges from X, or that Y is created by language, even if the realization of Y requires a larger system to support it.

In understanding the world of cause, it is necessary to ensure the "objective reality", so that human is abstracted as an observer dissociating from the world. When the world becomes the "picture" in front of the observer, human is the existence outside the "picture" and the world also becomes the object to be known. Human solidifies as an absolute subject in front of the world and the world becomes an absolute object apart from human. Once people disengage themselves from the world, the relationship between human and the world becomes an epistemological relationship. This is the inevitable result of the subject-object binary world view. However, if a certain reality is to be explained, it has to be placed in a larger system, that is, a specific reality is only possible in the system to which it belongs, its function and meaning can only be realized in the system. Thus, this observed reality can only become some concrete being and the world behind the Being has no boundaries. As a result, the world of cause only becomes the context of other beings and cannot settle itself. In this sense, the "causal world" is impossible to understand and the "picture" observed by the subject is only the apparent phenomenal world. Phenomenology interprets reality as a process of self-generation, which is self-presented based on the self-revelation of experience. Self-presented reality is neither the entity of mechanical materialism, nor can it be understood as an intuitive object under the framework of subject and object dichotomy [7]. From this point of view, what is revealed to us is the property Y of money and the property X of paper, but the "causal world"

of how X produces Y is classified as a mystery.

What does the world mean when we think about the "world"? In fact, when we regard the world as an object of cognition, we are already in the world and have "dealings" with it. Therefore, the world is rather understood as the "environment" in which we have always been [8]. Environment is not the object of intuition, but the presence of activities. In a word, what the environment calls out is "being" of human, which is not exactly an object of knowledge, nor can it be exhausted by human's rational thinking. Mechanical materialism regards the relationship between human and the world as a directly cognitive relationship. When explaining how natural facts have social attributes, it will produce linguistic representation or mystification in emergentism, because the bounded rationality of the subject faces the boundless world. However, the relationship between human and the world is not the original static relationship of "unity of hunan and nature" advocated by Chinese philosophy, because it goes to the opposite of mechanical materialism and covers human's understanding and creating of the world. That is to say, the pure nature which has nothing to do with human and the unity of man and nature are not the real subject-object relationship. For Marx, the consistency of environmental change and human activity or self-change can only be regarded and reasonably understood as revolutionary practice [9]. Marx attempts to dynamically combine subject and object dynamically. The contradiction between subject and object makes the world a cognitive object outside the subject, which in turn leads to the fact that the world cannot be exhausted by reason, so knowledge is always on the way. Phenomenology endows reality with self-illumination, but the self-presentation of reality also needs to be grasped by the subject in the "dealing" with the world. Their purpose is to bridge the conflict between inner mental reality and outer social reality.

4. The Relationship between Mental Reality and Social Reality

The mental reality includes not only the innate desire and instinct of the subject, but also the cultural habits and values formed through the acquired education. Social reality is established according to the needs of the subject and the needs, desires, instincts and cognitive framework of the subject have a decisive impact on the production of social reality. The mental needs are objective. Both Marx and Nietzsche accept that the physical and psychological needs of human beings are basic natural facts. However, Marx paid more attention to the impact of economic, historical and other social conditions on human beings, while Nietzsche regarded human desires and other natural instincts as the starting point, human beings created external realities according to their own needs and desires. In other words, social realities are really the external counterparts of internal mental needs. All external reality is related to internal reality, which means that there is no such thing as an absolutely independent internal reality or an absolutely independent external reality. For Nietzsche, the absolute external reality corresponds to the absolute subject: neither exists, so far as its actuality is concerned. The external realities which are absolutely perfect and free from any subjective influence can only be understood by God. The subject is not something inherent, but something added by fiction, something hidden behind it [10]. The constant "reality" corresponds to the absolute "subject" and is determined by the absolute subject. Without such absolute subject, there is no such fixed reality. Although the reality and the symbol describing the reality are different, the symbol is increasingly replacing the reality it wants to depict. The absolute external reality corresponds to the subject who is incapable and therefore needs to hold on to it once and for all. Just as Christianity constructs the world to meet the needs of the subject, it reflects the weakness of the subject.

Because the external social reality is the presentation of the internal reality, it needs the active action of the subject, through which the externalization of mental reality can be effectively realized. Marx endows the proletariat with the main body of action so as to achieve his goal of social revolution. Nietzsche interprets the external reality according to the needs of the subject, transforms the external reality into the existence related to the subject, thus bringing the external existence into the dominant domain of the subject. The dominant force of the subject is the will to life. The purpose of reasonable settlement of external reality according to one's own needs is not to better explain external reality, but to adapt to the needs and cognitive structure of the subject, so it can be said that the mental reality into projection of the external world that forms the social reality. Any understanding of social reality cannot be separated from the cultural background and psychological structure of the subject. If we grasp the social reality directly without the internal reality, we will regard the subject as the God who controls everything or the perfect machine [11]. The result is that the subject does not know how social reality magically emerges from natural objects.

From the perspective of evolution, the evolution of nature produces human and society is formed among people. Modern science offers a worldview that everything in the world is ultimately physical. Thus, the explanation of all

objects depends on whether the causal principle that explains the object can be provided. It is undeniable that the natural environment and human physiological factors will affect the society, but the social order is by no means the biological result of the organism. The society will also shape people. Physicallation is a form of objectification of the human world, but even in the case of objectification, human continues to create the world. Human beings have a paradoxical capacity to create a reality that negates itself [5]. This means that there is no absolute subjectivity and absolute objectivity. The society is the result of the interaction between subject and object. In essence, social reality is the social representation of mental reality. Between the subject and the society is a two-way adjustment process, people in life practice according to their own needs to create social reality, but also create themselves. However, it is not enough to clarify this point. It is necessary to further analyze how mental reality is externalized into social reality and how social reality shapes the subject. In this paper, a rules-centered social realism is proposed.

5. Rules-centered Social Realism

Language constructivism dramatizes the creation of social reality while emergent theory mystifies it based on the radically dichotomous position of subject and object. Between mobility and stability, society really remains dynamic. The process from mental reality to social reality is achieved by rule-based action. Following the rules itself is a reflective double act, which is not only the interpretation of the current rules but also the construction of new rules in the interpretation. Therefore, the construction of social reality and the construction of rules are identical. At the same time, because the essence of social reality is a set of norms of action, it contains deontological relations such as power, responsibility and obligation. Thus, this paper defines social reality as a rules-centered structure of action. This could be explained from the following two aspects:

First, social reality provides the space of possibility for action and it contains rules inherently. Wittgenstein linked the meaning of words with its rules [12]. Austin's speech act theory focuses on the different types and appropriateness conditions of speech acts, which uses it as a tool to analyze the traditional philosophical issues, without paying much attention to the rules and social conventions of language [13] Searle divided rules and conventions into two categories: one is a regulatory rule. It regulates preexisting behavior, like traffic rules, it regulates preexisting traffic behavior. The other is constructive rules. Such rules not only regulate behavior, but also create it, making certain behavior possible, such as sports rules, without corresponding rules, there is no sports action. The creation of social facts is a constructive rule [14]. Behind the focus of speech acts on communication is the emphasis on the actual effect of semantics. It seeks to flesh out the construction of meaning into the norms of practice. Here, the rules themselves are defended in the relativity of society. Speech act itself cannot be divorced from existing social rules and habits. It is concerned with what has already happened. That is to say, the successful implementation of the action is due to the compliance of social rules. However, action is open at the end, and new rules potentially maintain tension with existing rules, which can be broken from the original rules. Otherwise, people will not be able to obtain a relatively independent creative space. Any innovation that is contrary to the current social norms will become impossible. Therefore, not only the compliance with norms is successful communication, but violation of norms is also communication. Action provides the rules of communication and creative space, which are also the possibility space of free between the restriction and the generation.

Second, the norm of action is the core content of social reality. The internal unity of society is formed through the structure of action. Individuals always live in a specific social community. The relationship between individuals and others is a specific deontological relationship. Large communities, such as the state and government, and small ones, such as families and schools, are essentially deontological relations between each other. In the dualist context of subject and object opposition, social reality is neither purely objective nor purely subjective, it has the dual structure of objectivity and subjectivity. In ontology, the objectivity of social reality is different from natural fact, which is permeated with the desire and demand of the subject. However, once the social reality is formed, it becomes the external objective cause to play functions, individual recognition or resistance cannot fundamentally maintain or deny it. Although the foundation and premise of human society is nature and cannot be separated from the basic material environment provided by it, human civilization cannot be generated directly by nature. The real social civilization and the norms of behavior can only be created by the participation of human activities. In this sense, it may be said that action rules are the essence of social reality, the process of social progress is the continuous rationalization process of action rules. Starting from the idea that speech acts can create a new social reality, language constructivism connects the internal reality with the external reality, thus connecting the mind, language and society. The speech act is consistent with the mental state of the subject, so the social reality contains factors about subjectivity and linguistic signs. However, the im-

plementation of a speech act is also the implementation of a rule regulated action. Obviously, human activities cannot be freed from existing social norms and habits. But the action is open and uncertain, the interpretation of the current rules includes the construction of new rules, which is the space of the subject's free will. The creation of social reality and the formation of rules are united in the actions of the subject.

Society changes constantly and maintains its structure and order. This change is rooted in the actions of the subject. Social reality is essentially a system of norms for action. Action contains the inner understanding of rules. In practice, the subject repeatedly interprets the rules while constantly reconstructing the old rules, and this reconstructing process constructs the social reality. It provides the possibility for the development of society. Restricted by the existing rules, the subject does not have complete freedom, but has relative freedom to make history, because the interpretation of the rules has a certain autonomy. The key to understanding this is to realise that new rules arise from the interpretation of old ones. It is possible because the rules themselves have an open structure. The openness of rules stems from the fact that rules arise from actions that result in openness. Because of this, the interpretive behavior of actors also provides the basis for the continuity and discontinuity of social life. So human society is characterized by its uncertainty, which is rooted in the openness of the structure of desire in face of reality. It is such action driven by the structure of desire that creates social reality and promotes social change. This process is neither a gamified linguistic construction nor a mystical emergence.

6. Conclusions

Individuals are subject to collective morality and norms not because they refer to a collective concept, but because of the universality of the subject's internal nature and needs [15]. As rational actor, the subject can understand the meaning of actions and anticipate the actions of others because of the universal criterion of action of the community, rather than because the criterion is a linguistic construct or an irreducible existence that emerges. The necessity and possibility of the norm of action is both the reason and the result of the community. The vitality and stability of social reality lie in: on the one hand, the actor has relative freedom to construct external reality according to his desires and needs. On the other hand, the actor is subject to the established external reality. The mental realities such as desire, instinct and need are the basic existence. To explain the social reality without the mental reality of the subject will place the social reality in the mysterious domain, because the social reality which has nothing to do with the mental reality can only be realized by God and understood by God alone. There is no such thing as an absolutely objective social reality unaffected by the desires and values of the subject. At the same time, as a secular individual, it is impossible to get absolutely mental reality away from external reality. The result, therefore, is the coordination of mental reality and social reality. To define social reality as an action structure centered on rules is actually to regard the creation of social reality as a process of constant interpretation and reconstruction of rules in the action of the subject, so as to establish a dynamic connection from mental reality to social reality.

Conflict of Interest

The author declares to have no conflict of interest.

References

[1] Silver, K., 2021. Emergence within social systems. Synthese. 198(4), 1-23.

[2] Searle, J., 2010. Making the social world: the structure of human civilization. New York: Oxford University Press.

[3] Tuomela, R., 2007. The philosophy of sociality: the shared point of view. New York: Oxford University Press.

[4] Haitao, L., 2020. Wholeness and Collective Intention. Integrative Psychological and Behavioral Science. 55(1), 1-13.

[5] Berger, P.L., Luckmann, T., 2009. The Social Construction of Reality. translated by Wang Yong, Beijing: Beijing Press. (in Chinese). (Original work published in English in 1967).

[6] Whitehead, A.N., 1978. Process and Reality. New York: The Free Press.

[7] Whitehead, A.N., 1961. Alfred North Whitehead Anthology. New York: The Macmillan Company.

[8] Heidegger, M., 1996. Elected Works of Heidegger (Part 2). edited by Sun Zhouxing, Shanghai: Sanlian Bookstore. (in Chinese). (Original work published in German in 1927).

[9] Marx, K., Engels, F., 2009. Collected Works of Marx and Engels, Vol. 1. Beijing: People's Press. (in Chinese). (Original work published in German in 1847).

[10] Nietzsche, F.W., 2013. Revaluation of All Values, Ed. Witzbach, translated by Lin Jia, Shanghai: East China Normal University Press. (in Chinese). (Original work published in German in 1867).

[11] Liu, S.L., 2020. Inner Reality and External Reality: Rethinking Marx's Concept of Reality. Social Sciences in Chinese Universities. (1), 17-26. (in Chinese).

[12] Vitgenstein, L.J., 2004. Philosophical Research. translated by Li Bulou, Beijing: Commercial Press. (in Chinese). (Original work published in German in 1945).

[13] Austin, J.L., 2012. How to Do things with Words. Translated by Yang Yucheng et al., Beijing: The Commercial Press. (in Chinese). (Original work published in English in 1955).

[14] Searle, J., 1995. The construction of social reality. London: Penguin Press.

[15] Swindler, J.K., 1996. Social Intentions: Aggregate, Collective, and General. Philosophy of Social Science. (3), 61-76.

BILINGUAL PUBLISHING CO.
Pioneer of Global Academics Since 1984

Journal of Psychological Research
https://ojs.bilpublishing.com/index.php/jpr

ARTICLE

Science Teaching Efficacy Beliefs of Palestinian Elementary Education Students

Haitham M. Alkhateeb[1*] **Ayal H. Alkhateeb**[2]

1. Yale Gordon College of Arts and Sciences, University of Baltimore, Baltimore, MD 21201, USA
2. Department of Chemistry, Jess & Mildred Fisher College of Science & Mathematics, Towson University, Towson, MD 21252, USA

Abstract: To assess elementary education students' self-efficacy beliefs in science teaching, the Science Teaching Efficacy Belief Instrument developed by Enochs and Riggs was used. The instrument consisted of two scales, Personal Science Teaching Efficacy Belief Scale and the Outcome Expectancy Scale. It was administered to 90 undergraduate university students majoring in elementary education at a large public Palestinian university. Results indicated that students' self-efficacy beliefs in science teaching were comparable to those reported in the original study by Enochs and Riggs. Overall, the participants presented moderate to high self-efficacy in science teaching.

Keywords: Self-efficacy; Elementary education; Science teaching; Palestinian

1. Introduction

Besides research on teachers' knowledge and development, researchers acknowledge the importance and influence that beliefs have on teaching and learning, specifically in developing accurate descriptions of the teaching process. According to Kagan [1], teachers' belief is a personal knowledge that lies at the very heart of teaching. Teachers' self-efficacy beliefs, which indicate the way teachers evaluate their abilities to facilitate positive change in students [2], are identified as critical in teachers' effectiveness [3]. Bandura [4] stated that self-efficacy refers to "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments." In this context, Bandura [5] indicated

*Corresponding Author:
Haitham M. Alkhateeb,
Yale Gordon College of Arts and Sciences, University of Baltimore, Baltimore, MD 21201, USA;
Email: halkhateeb@ubalt.edu

Received: 30 April 2022; **Accepted:**14 June 2022; **Published Online:** 14 June 2022

Citation: Haitham M. Alkhateeb, Ayal H. Alkhateeb. Science Teaching Efficacy Beliefs of Palestinian Elementary Education Students. *Journal of Psychological Research*, 2022, 4(2), 4686. https://doi.org/10.30564/jpr.v4i2.4686

DOI: https://doi.org/10.30564/jpr.v4i2.4686

that self-efficacy is how one perceives what they can do. Naidoo and Naidoo [6] indicated that teachers' self-efficacy beliefs relate to teacher effectiveness, student learning, and predict future teaching practices. Researchers (e.g., [7]) identified personal teacher efficacy beliefs and general teacher efficacy beliefs as two teaching effectiveness beliefs. Personal teacher efficacy beliefs are a teacher's belief in their teaching abilities. General teacher efficacy beliefs are general beliefs about teaching. Tella [8] found teachers with high self-efficacy persist in circumstances of failure, take more curriculum risks, incorporate innovative teaching approaches toward students' achievement, and have more motivated students.

Further, researchers (e.g., [9]) found a positive relationship between teacher productivity and high self-efficacy ratings. Practices indicated growing persistence with students in circumstances of failure, less didactic teaching, higher professional commitment, and commitment to identifying more effective instructional strategies. Also, Haatainen, Turkka and Aksela [10] reported that teachers' experiences with integrated activities and classroom practices correlated with self-efficacy. Boz and Cetin-Dindar [11] investigated the relationship among teaching concerns, efficacy, and classroom preference for pre-service science teachers. Their sense of self-efficacy was negatively correlated with teaching concerns. However, their sense of efficacy was positively correlated with the constructivist learning environment. In their research [12] on self-efficacy and support strategies for teachers, experienced teachers reported higher self-efficacy in the areas of instructional strategies and classroom management and lower for student engagement. In the same perspective, Yesilyurt, Deniz and Kaya [13] studied the instructional strategies and learning experiences that worked to improve pre-service elementary teachers' use of engineering education intervention. Their study indicated that incorporating engineering design activities with explicit-reflective instruction for engineering concepts has the potential to improve pre-service teachers' personal engineering teaching efficacy beliefs.

Caprara et al. [14] assessed the relationship between teacher efficacy beliefs and student academic achievement and found positive correlations between teacher efficacy beliefs and student achievement. Although Klassen et al. [15] found there to be only "modest" support that teacher efficacy beliefs and student achievement are positively related. According to Austin [16], it is premature to assert that positive relations found between teacher efficacy beliefs and desirable teaching practices or outcomes support the claim that stronger teacher efficacy beliefs result in improved teaching, pointing to further study. Nevertheless, self-efficacy is considered a key component of motivation [17] and predicts academic achievement and contributes to students' performance [8,18-21]. Moreover, it is also revealed that teachers with a high sense of self-efficacy beliefs will introduce teaching innovations in educational reform enactment [22,23].

Elementary science teaching is neglected as more time is spent on other subjects, although teaching elementary science is very important, especially in a technologically cultured era. Over the past three decades or so, there has been research in self-efficacy beliefs but very few studies have studied this area with respect to science teaching. The concept of self-efficacy is minimally investigated in the Middle East region. Among Palestinian students, little or no research has been done, to date, on science teaching self-efficacy. Research on teacher's self-efficacy is needed because it is one of the determinants of teacher's quality in the classroom. The purpose of this study was to assess self-efficacy beliefs in science teaching of Palestinian university students majoring in elementary education who were enrolled in a science methods course for elementary school teachers. To achieve the purpose of this study, the following research question was answered: what were the self-efficacy beliefs in science teaching of Palestinian university students majoring in elementary education?

2. Materials and Methods

Participants were 90 Palestinian students in a public Palestinian university monitored by the Palestinian Authority. This university was selected for this study because of its convenient location to the researcher and its recognition as a deeply rooted and esteemed university. They were students majoring in elementary education and were admitted into the teacher education program. They were enrolled in education courses, some of which included a field component. For the purpose of this study, participants were recruited from the methods of teaching science course for elementary school teachers, a course focusing mainly on science methods for teaching elementary science. Participants completed a core science content course in the first year of the program. The participants consisted of 35 men (38.9%) and 55 women (61.1%), all of whom volunteered their participation, remained anonymous, and were not offered any incentives for participating. Their ages ranged from 20 to 25 years (mean = 21.3 years, SD = 1.09). Of the participants, 48.9% of them were in their third year and 51.1% of them were fourth year students in a four-year undergraduate teacher education program. Students in these two years are usually few, which explains the relatively small sample size. Students were Palestinians. All were Arabic speaking

and Arabic was the language of instruction.

To measure the elementary education students' self-efficacy beliefs in science teaching, the Science Teaching Efficacy Belief Instrument developed specifically for elementary science by Enochs and Riggs [24] was used. The Science Teaching Efficacy Belief Instrument is considered a useful tool for observing teachers' science teaching self-efficacy beliefs at different points in their career. It is a valid and reliable instrument designed for use by preservice teachers of elementary science. It has 23 items, 13 positive statements about science (e.g., I know the steps necessary to teach science concepts effectively) and 10 negative statements (e.g., I will not be very effective in monitoring science experiments). It consists of two scales, the Personal Science Teaching Efficacy Belief Scale composed of 13 items designed to address preservice teachers' level of belief in their ability to teach science, and the Outcome Expectancy Scale composed of 10 items to assess participants' belief that their teaching will positively impact their students. Elementary education students in this study were surveyed to determine their self-efficacy beliefs according to the Teaching Efficacy Belief Instrument. Responses were recorded on a 5-point rating scale anchored by 1: Strongly Disagree and 5: Strongly Agree. Negatively worded statements were scored in reverse with "strongly agree" receiving a score of one. High scores on the Personal Science Teaching Efficacy Belief show a strong belief in teaching science. Scores can range from 13 to 65. High scores on the Outcome Expectancy show high expectations regarding the outcomes of science teaching. Scores on the scale can range from 10 to 50. Results of Enochs and Riggs [24] provided support for the construct validity of the instrument. The validity of the instrument was also investigated [25] and results supported the two-factor structure presented by the original authors. On this basis, construct validity of the instrument was accepted as a priority in the present study. The instrument was translated from English to Arabic. A formal back translation was not done; however, three education professors who are native Arabic speakers attested to the translation's adequacy. A demographic information sheet was used to gather information of participant characteristics including gender, year in the university, and age. Quantitative methods were used for data analysis in this study. The researcher entered the collected data into SPSS. Descriptive statistics provided answers to the research question.

3. Results

Enochs and Riggs [24] indicated that the Science Teaching Efficacy Belief Instrument is a valid and reliable instrument; and reported an internal consistency reliability of 0.90 for the Personal Science Teaching Efficacy Belief Scale and 0.76 for the Outcome Expectancy Scale. In the current study, Cronbach alpha [26] values of 0.78 and 0.65 were obtained for the two scales, respectively. The lower reliability of the Science Teaching Efficacy Belief Instrument scales is relatively consistent with previous research findings [3]. The widely recognized threshold for Cronbach alpha is 0.7 [27], nonetheless additional research is needed in this area. Moss et al. [28] considered a value of 0.6 as acceptable and DeVellis [29] considered it as undesirable. The low alpha of the Outcome Expectancy Scale can also be interpreted by the relatively small number of items (10) that constitute this scale.

The means and standard deviations for the measure items are in Table 1. Scores for the science teaching efficacy belief instrument ranged between 2.19 to 4.28. The negatively stated items were not reversed in the item mean calculations below. Thus, items in this table are presented as they appeared in the instrument. The overall mean and standard deviation for the 13 items of the Personal Science Teaching Efficacy Belief Scale scores were 3.34 and 0.57. The overall mean and standard deviation of the 10 items of the Outcome Expectancy Scale scores were 3.40 and 0.57. The medians for both scales were 3.4 for the Personal Science Teaching Efficacy Belief Scale and 3.53 for the Outcome Expectancy Scale. It is noted that the negatively stated items were reverse scored in the overall mean and median calculations. Overall, the elementary education students presented moderate to high self-efficacy in science teaching. Similar results were found in Riggs and Enochs [3] study, who developed the Science Teaching Efficacy Belief Instrument. There was not a statistically significant difference between the mean scores of female students and the mean scores of male students in elementary science teaching efficacy beliefs. Therefore, gender may not have meaningful influence on participants' science teaching efficacy beliefs.

Table 1. Item Means and Standard Deviations

Item	Measure	*Mean*	*Std Dev*
	Personal Science Teaching Efficacy Belief Scale		
2	I will continually find better ways to teach science	4.24	0.71
3	Even if I try very hard, I will not teach science as well as I will most subjects	2.93	0.95
5	I know how the steps necessary to teach science concepts effectively	3.52	0.92
6	I will not be very effective in monitoring science experiments	2.94	1.02
8	I will generally teach science ineffectively	2.19	1.21

Table 1 continued

Item	Measure	*Mean*	*Std Dev*
12	I understand science concepts well enough to be effective in teaching elementary science	3.53	1.12
17	I will find it difficult to explain to students why science experiments work	3.07	1.07
18	I will typically be able to answer students' science questions	3.53	0.80
19	I wonder if I will have the necessary skills to teach science	3.10	1.02
20	Given a choice, I will not invite the principal to evaluate my science teaching	3.09	1.24
21	When a student has difficulty understanding a science concept, I will usually be at a loss as to how to help the student understand it better	3.74	1.09
22	When teaching science, I will usually welcome student questions	4.28	0.84
23	I do not know what to do to turn students on to science	2.60	1.20
	Outcome Expectancy Scale		
1	When a student does better than usual in science, it is often because the teacher exerted a little extra effort	3.60	1.01
4	When the science grades of students improve, it is often due to their teacher having found a more effective teaching approach	3.91	0.87
7	If students are underachieving in science, it is most likely due to ineffective science teaching	3.42	1.02
9	The inadequacy of a student's science background can be overcome by good teaching	4.03	0.76
10	The low science achievement of some students cannot generally be blamed on their teachers	3.48	1.00
11	When a low-achieving child progresses in science, it is usually due to extra attention given by the teacher	3.46	0.96
13	Increased effort in science teaching produces little change in some students' science achievement	3.66	0.84
14	The teacher is generally responsible for the achievement of students in science	3.16	1.13
15	Students' achievement in science is directly related to their teacher's effectiveness in science teaching	3.68	0.96
16	If parents comment that their child is showing more interest in science at school, it is probably due to the performance of the child's teacher	3.82	1.01

Negatively stated items (3, 6, 8, 10, 13, 17, 19, 20, 21, 23) were not reverse scored in this table.

4. Discussion

The present study assessed the self-efficacy beliefs in science of elementary students majoring in education. Overall, participants presented moderate to high self-efficacy beliefs. It is worth noting that educational experiences contribute to the reported results in this study. Research supports beliefs that science teaching self-efficacy increase when teachers have more education on a content area [30,31]. Morrell and Carroll [32] found that the methods course used in their study positively impacted the elementary preservice teachers' self-efficacy beliefs. They also found that the science teaching self-efficacy beliefs of preservice elementary teachers, specifically those whose efficacy is low, can possibly be improved through an increase in science content or knowledge as it may positively affect how they regard their abilities to teach science. To understand how efficacy beliefs vary in differing content areas, a more closely crafted analysis of the effects of teacher efficacy beliefs are needed [16]. In mathematics, teachers with higher levels of mathematical teaching knowledge exhibited a strong conceptualization of teacher efficacy beliefs. Teachers with additional mathematical knowledge may indicate feelings of being better prepared to teach [33]. Moreover, the assessment of science teaching efficacy beliefs can contribute to the training of preservice elementary education students. If found early on, low self-efficacy in science teaching can be used to provide activities to preservice elementary education students [24]. They added that field experience, peer teaching, and microteaching self-evaluations may improve science teaching self-efficacy beliefs. Studying additional contextual factors that can potentially affect teacher efficacy beliefs are needed for understanding them. Stipek [34] research on administrative support showed teachers to have a stronger sense of teacher efficacy when they feel supported by administration. Knoblauch and Hoy [35] noted that school setting (rural, urban, or suburban) can affect teacher efficacy beliefs. Raudenbush et al. [36] found that teacher efficacy beliefs differ based on student populations. Content area high school teachers feel most effective when teaching honors courses and least effective in general student population courses.

In terms of limitations, participants were from one Palestinian university. The study's scope and generalizability include only the elementary education program's students for this university when the data were gathered. In addition, the measurement of self-efficacy beliefs was limited to the instruments' validity and reliability. To complete the instrument included in the study, participants were asked to choose provided responses. Responses were restricted by the structure of the instrument. Further and more systematic research is needed to better understand self-efficacy beliefs in elementary education students. Since self-efficacy beliefs are likely to relate to the ef-

fectiveness of elementary education students, thorough study of self-efficacy beliefs has a potential benefit for effectiveness of education students' training and quality of elementary education. Especially for Palestinians, little research has been conducted on elementary education students and teachers and a need exists for studies in every subject that deal concerning elementary education. Interest from society in elementary education is moving towards the improvement of elementary education in general. In further study, interviews where elementary education students explain their self-efficacy beliefs and their learning experiences in elementary science teaching may provide a better perspective on the results reported here.

Conflict of Interest

The authors declare to have no conflict of interest.

Funding

This research received no external funding.

References

[1] Kagan, D.M., 1992. Implication of research on teacher belief. Educational Psychologist. 27(1), 65-90. DOI: https://doi.org/10.1207/s15326985ep2701_6

[2] Gibson, S., Dembo, M.H., 1984. Teacher efficacy: A construct validation. Journal of Educational Psychology. 76(4), 569-582. DOI: https://doi.org/10.1037/0022-0663.76.4.569

[3] Riggs, I.M., Enochs, L.G., 1990. Toward the development of an elementary teacher's science teaching efficacy belief instrument. Science Education. 74(6), 625-637. DOI: https://doi.org/10.1002/sce.3730740605

[4] Bandura, A., 1997. Self-efficacy: The exercise of control. Macmillan: New York.

[5] Bandura, A., 2007. Much ado over a faulty conception of perceived self-efficacy grounded in faulty experimentation. Journal of Social and Clinical Psychology. 26(6), 641-658. DOI: https://doi.org/10.1521/jscp.2007.26.6.641

[6] Naidoo, K., Naidoo, L.J., 2021. Designing teaching and reflection experiences to develop candidates' science teaching self-efficacy. Research in Science & Technological Education. DOI: https://doi.org/10.1080/02635143.2021.1895098

[7] Swars, S.L., 2005. Examining perceptions of mathematics teaching effectiveness among elementary preservice teachers with differing levels of mathematics teacher efficacy. Journal of Instructional Psychology. 32(2), 139-147.

[8] Tella, A., 2008. Teacher variables as predictors of academic achievement of primary school pupils mathematics. International Electronic Journal of Elementary Education. 1(1), 16-33.

[9] Tschannen-Moran, M., Hoy, A.W., Hoy, W.K., 1998. Teacher efficacy: Its meaning and measure. Review of Educational Research. 68(2), 202-248. DOI: https://doi.org/10.3102/00346543068002202

[10] Haatainen, O., Turkka, J., Aksela, M., 2021. Science teachers' perceptions and self-efficacy beliefs related to integrated science education. Education Sciences. 11, 272. DOI: https://doi.org/10.3390/ educsci11060272

[11] Boz, Y., Cetin-Dindar, A., 2021. Teaching concerns, self-efficacy beliefs and constructivist learning environment of pre-service science teachers: a modelling study. European Journal of Teacher Education. DOI: https://doi.org/10.1080/02619768.2021.1919079

[12] Gale, J., Alemdar, M., Cappelli, C., et al., 2021. A mixed methods study of self-efficacy, the sources of self-efficacy, and teaching experience. Frontiers in Education. 6, 750599. DOI: https://doi.org/10.3389/feduc.2021.750599

[13] Yesilyurt, E., Deniz, H., Kaya, E., 2021. Exploring sources of engineering teaching self-efficacy for pre-service elementary teachers. International Journal of STEM Education. 8, 42. DOI: https://doi.org/10.1186/s40594-021-00299-8

[14] Caprara, G.V., Barbaranelli, C., Steca, P., et al., 2006. Teachers' self-efficacy beliefs as determinants of job satisfaction and students' academic achievement: A study at the school level. Journal of School Psychology. 44(6), 473-490. DOI: https://doi.org/10.1016/j.jsp.2006.09.001

[15] Klassen, R.M., Tze, V.M.C., Betts, S.M., et al., 2011. Teacher efficacy research 1998-2009: Signs of progress or unfulfilled promise? Educational Psychology Review. 23(1), 21-43. DOI: https://doi.org/10.1007/s10648-010-9141-8

[16] Austin, J., 2013. The role of contextual factors in understanding mathematics teacher efficacy beliefs. Journal of Mathematical Sciences & Mathematics Education. 8(2), 46-60. DOI: https://doi.org/10.13016/M22H6Q

[17] Linnenbrink, E.A., Pintrich, P.R., 2003. The role of self-efficacy beliefs in student engagement and learning in the classroom. Reading & Writing Quarterly: Overcoming Learning Difficulties. 19(2), 119-137. DOI: https://doi.org/10.1080/10573560308223

[18] Ahmadi, S., 2020. Academic self-esteem, academic self-efficacy and academic achievement: A path anal-

ysis. Journal of Forensic Psychology. 5(1), 155.
DOI: https://doi.org/10.35248/2475-319X.20.5.155

[19] Bandura, A., Locke, E.A., 2003. Negative self-efficacy and goal effects revisited. Journal of Applied Psychology. 88(1), 87-99.
DOI: https://doi.org/10.1037/0021-9010.88.1.87

[20] Martin, D.P., Rimm-Kaufman, S.E., 2015. Do student self-efficacy and teacher-student interaction quality contribute to emotional and social engagement in fifth grade math? Journal of School Psychology. 53(5), 359-373.
DOI: https://doi.org/10.1016/j.jsp.2015.07.001

[21] Pumptow, M., Brahm, T., 2020. Students' digital media self-efficacy and its importance for higher education institutions: development and validation of a survey instrument. Technology, Knowledge and Learning. 26, 555-575.
DOI: https://doi.org/10.1007/s10758-020-09463-5

[22] Evers, W.J.G., Brouwers, A., Tomic, W., 2002. Burnout and self-efficacy: A study on teachers' beliefs when implementing an innovative educational system in the Netherlands. British Journal of Educational Psychology. 72, 227-243.
DOI: https://doi.org/10.1348/000709902158865

[23] Duran, E., Ballone-Duran, L., Haney, J., et al., 2009. The impact of a professional development program integrating informal science education on early childhood teachers' self-efficacy and beliefs about inquiry-based science teaching. Journal of Elementary Science Education. 21, 53-70.
DOI: https://doi.org/10.1007/BF03182357

[24] Enochs, L.G., Riggs, I.M., 1990. Further development of an elementary science teaching efficacy belief instrument: A preservice elementary scale. School Science and Mathematics. 90(8), 694-706.
DOI: https://doi.org/10.1111/j.1949-8594.1990.tb12048.x

[25] Slater, E.V., Norris, C.M., Morris, J.E., 2021. The validity of the science teacher efficacy belief instrument (STEBI-B) for postgraduate, pre-service, primary teachers. Heliyon. 7(9), e07882.
DOI: https://doi.org/10.1016/j.heliyon.2021.e07882

[26] Cronbach, L.J., 1951. Coefficient alpha and the internal structure of tests. Psychometrika. 16, 297-334.
DOI: https://doi.org/10.1007/BF02310555

[27] Nunnally, J.C., 1978. Psychometric theory. McGraw-Hill: New York.

[28] Moss, S., Prosser, H., Costello, H., et al., 1998. Reliability and validity of the PAS–ADD Checklist for detecting psychiatric disorders in adults with intellectual disability. Journal of Intellectual Disability Research. 42, 173-183.
DOI: https://doi.org/10.1046/j.1365-2788.1998.00116.x

[29] DeVellis, R.F., 1991. Scale Development: Theory and Applications. Sage: England.

[30] Kind, V., 2009. A conflict in your head: An exploration of trainee science teachers' subject matter knowledge development and its impact on teacher self-confidencev. International Journal of Science Education. 31(11), 1529-1562.
DOI: https://doi.org/10.1080/09500690802226062

[31] Markic, S., Valanides, N., Eilks, I., 2006. Freshman science student teachers' beliefs on science teaching and learning - a mixed methods study. I. Eilks, and B. Ralle (Eds.), Towards research-based science teacher education. Shaker Verlag: Herzogenrath. pp. 29-40.

[32] Morrell, P.D., Carroll, J.B., 2003. An extended examination of preservice elementary teachers' science teaching self-efficacy. School Science and Mathematics. 103(5), 246-251.
DOI: https://doi.org/10.1111/j.1949-8594.2003.tb18205.x

[33] Hill, H.C., Rowan, B., Ball, D.L., 2005. Effects of teachers' mathematical knowledge for teaching on student achievement. American Educational Research Journal. 42(2), 371-406.
DOI: https://doi.org/10.3102/00028312042002371

[34] Stipek, D., 2012. Effects of student characteristics and perceived administrative and parental support on teacher self-efficacy. The Elementary School Journal. 112(4), 590-606.
DOI: https://doi.org/10.1086/664489

[35] Knoblauch, D., Hoy, A.W., 2008. Maybe I can teach those kids. The influence of contextual factors on student teachers' efficacy beliefs. Teaching and Teacher Education. 24(1), 166-179.
DOI: https://doi.org/10.1016/j.tate.2007.05.005

[36] Raudenbush, S.W., Rowan, B., Cheong, Y.F., 1992. Contextual effects on the self-perceived efficacy of high school teachers. Sociology of Education. 65(2), 150-167.
DOI: https://doi.org/10.2307/2112680

BILINGUAL PUBLISHING CO.
Pioneer of Global Academics Since 1984

Journal of Psychological Research
https://ojs.bilpublishing.com/index.php/jpr

ARTICLE

Psychometrics of the SDQ-I for Palestinian Adolescent Students

Haitham M. Alkhateeb[1*] Ramzi Naim Nasser[2] Eiman F. Abushihab[3]

1. Yale Gordon College of Arts and Sciences, University of Baltimore, Baltimore, MD 21201, USA
2. College of Education & Arts, Lusail University, Lusail, Qatar
3. Arabic for Non-Native Speakers Center, Qatar University, Doha, Qatar

Abstract: The Self-description Questionnaire–I (SDQ–I) is a multidimensional instrument that measures eight self-concept facets hypothesized in Shavelson's hierarchical model. This study investigated self-concept in a sample of Palestinian adolescent students using an Arabic version of the SDQ–I. Three-hundred sixty adolescents (163 girls and 197 boys) aged 13 to 16 years (M = 14.3, SD = .87) participated. The 72-item SDQ–I was administered in four Palestinian schools to assess the psychometric properties of the SDQ–I. This included the factor structure and the internal consistency reliability of the SDQ–I subscales and mean score responses of Palestinian self-concept. Factor analysis results, which accounted for the majority of the variance, supported an underlying general self-concept factor structure that demonstrated the eight factors that the SDQ–I is designed to measure. This is consistent with previous studies in similar age groups and the SDQ–I reliabilities were similar to those reported in the literature. Students perceived total self-concept positively (mean = 3.71). Three facets of self-concept (parent relations, reading, and general self-concept) indicated high positive self-concept. Correlations among the different dimensions were consistent with the hierarchical structure in Shavelson's model. Overall, the findings provided compelling support for Shavelson's model, and the structure validity of Western self-concept measure. Interpretations were provided for the discrepancies regarding the Palestinian-Arab culture.

Keywords: Self-concept; Adolescent; Palestinian students; Self-description questionnaire

1. Introduction

Improved self-concept is considered to be a valuable educational outcome; for instance, it helps to explain other constructs and outcomes. Shavelson, Hubner and Stanton [1] defined the term self-concept as a person's perception of himself formed from experiences and relationships with the environment where people play an important role. In addition, Calhoun and Morse [2] specified that self-concept is a personality characteristic

*Corresponding Author:
Haitham M. Alkhateeb,
Yale Gordon College of Arts and Sciences, University of Baltimore, Baltimore, MD 21201, USA;
Email: halkhateeb@ubalt.edu

Received: 29 April 2022; **Revised:** 8 June 2022; **Accepted:** 15 June 2022; **Published Online:** 22 June 2022

Citation: Haitham M. Alkhateeb, Ramzi Naim Nasser, Eiman F. Abushihab. Psychometrics of the SDQ-I for Palestinian Adolescent Students. *Journal of Psychological Research*, 2022, 4(2), 4682. https://doi.org/10.30564/jpr.v4i2.4682

DOI: https://doi.org/10.30564/jpr.v4i2.4682

describing how one feels about oneself regarding their abilities, strengths, and weaknesses. In the past few decades, self-concept and its relation to constructs like academic achievement have attracted attention. This attention was reflected in many studies, such as those that analyzed academic achievement as it relates to various psychological factors, including self-concept (e.g., [3-11]). Additionally, researchers [12,13] that highlighted the relationship between self-concept and academic achievement emphasized that self-concept is closer in proximity to academic achievement than other cognitive variables. To this end, studies [4,14-17] indicated that students assess their self-value through the level of their academic achievement and performing better in academics. Other studies mentioned that high self-concept yields success in educational environments and social and emotional contexts [4,7,9,10,18-21]. In contrast, low self-concept hinders students' academic performance as indicated in cross-cultural studies [22-24]. Some researchers postulated that self-concept and academic performance influence each other mutually. On their [25] review of literature on Reciprocal Effects Model findings, they indicated that the model connects self-concept and academic performance together and suggests that academic self-concept and performance mutually re-enforce each other, with one building off the other. Regarding the predictive ability of self-concept for school achievement, studies [5,25-27] found that self-concept predicts academic achievement. On the other hand, it was found [28] that junior high school students perceived themselves positively; however, self-concept did not directly predict students' academic performance. In the latter study, self-concept influenced students' academic performance when students showed effort in learning.

Much of the research on self-concept also focused on the development and validation of theoretical models, the development of instruments [1,8,29-32] and exploring empirical relations between self-concept and a wide variety of variables, including academic achievement [33]. Shavelson, Hubner and Stanton [1] proposed a multifaceted hierarchical model of self-concept that emphasized the domain specificity of self-concept. The model hypothesized a general self-concept of two facets, academic and nonacademic self-concept. These facets were divided into specific components that evaluate behavior in certain situations. The Self-description Questionnaire–I (SDQ–I, [30,34]) that is based on the Shavelson, Hubner and Stanton [1] model measures the multiple dimensions of self-concept in preadolescents, and it has also been used with early adolescents, such as Grades 7 through 10 [34]. Research showed that the reliability of the SDQ–I constructs is generally high (greater than 0.75) [30,35]. Also, construct validity research [34,36-38] provided support for the multidimensionality of the SDQ–I. For late adolescents, the multidimensional, hierarchical structure of self-concept is well established. For younger students, such as preadolescents and adolescents, a paucity of research and appropriate measures indicated that self-concept is poorly differentiated. Therefore, there is a need for research that discusses younger ages regarding the consistency of self-concept structure. Researchers in the Middle East (Arab region) studied self-concept and its relation to education by investigating the SDQ–I reliability and validity, gender differences and socioeconomic effects, and its relationship to achievement, which showed significant positive correlations [15,35,39,40]. The SDQ–I reliabilities and construct validity of a multidimensional and hierarchical structure were also established [15,35]. Assessing the structure underlying the SDQ–I has vital implications theoretically and practically because if not clearly defined, then using SDQ–I may not be justified.

Self-concept can be a potentially valuable construct for educators as they work to understand students in a social and intellectual context. Numerous studies (using mainly western samples) assessed self-concept, but not for Palestinian school students who are relatively under-represented in the Educational Psychology literature. Overall, there is minimal empirical research on self-concept of nonwestern students. Hence, there is a need for research that assesses self-concept in the Palestinian Territories of a Middle Eastern culture and has potential value for practice. Accordingly, using a Palestinian sample, this study's purpose was to provide empirical data and analysis of the psychometric properties of the Self-description Questionnaire–I, including the factor structure and the internal consistency reliability of the subscales. And also to assess the self-concept of Palestinian students through descriptive analysis. This study is significant in that it provides an assessment of self-concept in the context of different linguistic and cultural practices. The results may produce useful knowledge and an understanding of Palestinian students. The study results, therefore, are likely to be significant for students, teachers, parents, and the Palestinian society in promoting education among students in the Palestinian Territories where education is challenged due to the Israeli occupation.

2. Materials and Methods

2.1 Participants

Data were collected from 360 students (163 girls,

197 boys) enrolled in four public schools that are representative of the school system in the Salfit Governorate of the Palestinian Authority in West Bank. The sample was obtained with the cooperation of schools' principals and teachers. Participants ranged in age from 13 to 16 years with a mean age of 14.3 years (SD = .87) and were in Grades 8 to 10 in public schools where Arabic is the language of instruction. By grade level, there were 66 (18.3%) eighth graders, 155 (43.1%) ninth graders, and 139 (38.6) tenth graders. The present study took the last three school years (Grades 8 to 10) of the education stage before students transition to secondary grades that branch to mainly science and arts streams. After 10th grade (11th and 12th grades), the academic (general) education comprises of the literary stream (social studies and languages) and the scientific stream (biology, chemistry, mathematics, and physics) schooling. This group of students (Grades 8 to 10) gives a more informed view compared to the eleventh and twelfth grade students who are already either in the arts or science streams. The governorate serves Palestinian students and could be described as comprising mainly of families from lower-middle to middle socioeconomic class backgrounds according to Hollingshead and Redlich [41] SES classification. Regarding parents' formal educational levels, 121 of the mothers and 79 of the fathers have lower than a high school degree. The participants were living in either towns or villages, and they are of Palestinian nationality and Islamic religion. It is considered that for the interpretations of the results in this study that there is no difference between Palestinian students in villages and towns in terms of the quality of education they receive and resources available to them [42]. The Ministry of Education and Higher Education [43], formed by the Palestinian Authority in 1994, manages education in the Palestinian Territories. In their documents, they did not indicate performance differences between students who came from different geographical regions (e.g., villages and towns) based on the results of the Tawjihi exams (also known as General Secondary Education Certificate Examination).

The Palestinian Authority was established in 1994 as a consequence of the 1993–1995 Oslo Accords. It is an interim self-government body with partial civil rule in the three areas "A" "B" and "C" of West Bank, and its authority includes education for Palestinians in area "C," where Salfit governorate is located [44]. Salfit governorate is one of 16 governorates of the Palestinian Authority. It is situated in the central West Bank, under Israeli occupation. According to the Palestinian Central Bureau of Statistics [45], the governorate had a population of 75,444 in 2017, or 2.6% of the population of the West Bank. The Directorate of Education and Higher Education in Salfit governorate has 71 public schools located in the villages and towns and other private schools. A branch of Al-Quds Open University is situated in the governorate. The construction of Al Zaytona University of Science and Technology is currently ongoing but has opened some of its programs for enrollment. The governorate contains one hospital and 18 clinics and government health centers in all villages and towns. The Jerusalem Legal Aid and Human Rights Center [46] stated that Salfit Governorate is home to 18 villages and towns where half of them are run by village councils and the other half by municipalities. 16 Israeli settlements are located in the same governorate with a population standing at 48,045 persons. As a region [47], it is distinguished into 12 major land use classes. These include Palestinian built-up areas, open spaces, forests, and construction sites; and Israeli settlements, closed Israeli military areas, and military bases.

2.2 Measure

Marsh's Self-description Questionnaire–I (SDQ–I) [30,34] is designed to measure the multiple dimensions of self-concept based on Shavelson's hierarchical multifaceted model of self-concept [1,48]. The SDQ–I assess four areas of nonacademic self-concept (physical ability, physical appearance, peer relations, and parent relations) and three areas of academic self-concept (reading, mathematics, and general school), and general self-concept. In this study, the SDQ–I was used to assess self-concept, including a demographic data sheet that gathered information such as gender, age, grade, and education of the parents. Previous research [35,39,40] adapted the SDQ–I to Arabic and established its reliability and validity in Lebanon, and similarly Abu-Hilal and Bahri [15] verified its reliability and validity in the United Arab Emirates. The Arabic version of the SDQ–I developed in previous research [35,39,40,49] was used. This version is identical to Marsh's SDQ–I [30,34]. The SDQ–I consists of 72 items divided into eight subscales that measure self-concept in reading (10 items), mathematics (10 items), general school (10 items), physical ability (9 items), physical appearance (9 items), peer relations (9 items), parent relations (9 items), and general self-concept (6 items). For reading and mathematics, students' ratings of their skills, ability, enjoyment and interest in the content area were assessed. General school is thought of as students' ratings of their skills, ability, enjoyment and interest in school subjects in general. Physical ability assesses students' ratings of their skills and interest in sports, games, and physical activities. Physical appearance addresses students' ratings of their physical attractiveness, how their appearance compares

with others, and how others think they look. Peer relations are students' ratings of their popularity with peers, how easily they make friends, and whether others want them as a friend. Parental relations checks students' ratings of how well they get along with their parents, whether they like their parents, and the quality of their interactions with their parents. Lastly, general self-concept is students' ratings of themselves as effective and capable individuals who are proud and satisfied with the way they are. Each subscale of the SDQ–I uses a 5-point Likert-type scale to endorse agreement with an item using ratings of 1: False, 2: Mostly false, 3: Sometimes false, sometimes true, 4: Mostly true, or 5: True. Students responded by indicating whether they agree or disagree with the self-descriptive statements related to their competence. The higher the score, the more positive the self-concept. Sample items of the SDQ–I in mathematics are, "I learn things quickly in mathematics," in physical ability, "I like to run and play hard," in general school, "I hate all school subjects," and in general self-concept, "Overall I have a lot to be proud of." The negatively worded items were reverse-scored. The SDQ–I can be administered in individual or group settings and takes approximately 15-20 minutes to complete [48]. A composite score of the eight subscales gives a total that indicates self-concept.

2.3 Procedures

Marsh's Self-description Questionnaire–I (SDQ–I), a multidimensional self-report measure of self-concept, was given to assess students' self-concept. Students completed the questionnaire (the SDQ–I Arabic version) collectively according to a group-class period during normal school hours. Teachers provided participants with instructions in Arabic on the response format and shared brief information about the study. It was communicated to students that there were no right or wrong answers and to respond with honesty. They were also told that these questions will not impact their school grades. They were informed that if they had any questions (for example, not understanding an item), that they can ask for clarification. Participants were volunteers and were limited to students in attendance on the day that the SDQ–I was distributed. Their responses are confidential.

In this study, quantitative methods were used in the process of data analysis. The Statistical Package of Social Sciences (SPSS) software (version 26.0) was used for statistical analysis. To determine the reliability of the measure, internal consistency reliability coefficients were computed for the total self-concept (SDQ–I) and for each of the eight subscales as one indication of the functioning of the subscales. To check for the multidimensionality of self-concept as revealed by the response of the Palestinian participants on the SDQ–I, an exploratory principal axis factoring analysis was performed using extracted communalities and an oblique rotation. Descriptive statistics (means and standard deviations) were utilized to describe the SDQ–I and its subscales for the whole sample.

3. Results

The reliability coefficient alpha for the SDQ–I had a value of 0.92. This is consistent with the coefficient (0.94) reported by El-Hassan [35] and the coefficient (0.96) reported by Alkhateeb [49] in earlier investigations of the SDQ–I with school students. The subscale and the SDQ–I reliabilities ranged between 0.75 and 0.92 (see Table 1) similar to Marsh [30] and El-Hassan [35], with the exception of the General Self-concept subscale where it was 0.65 (consistent with $r = 0.63$ in [35]), who attributed this to the subscale's brevity. Henson [50] indicated that a value of 0.65 may be rather low as a reliability above 0.70 is typically acceptable [51]. To validate and derive the factor structure for self-concept in the Palestinian Territories, the correlation matrix of the 72 items was analyzed by principal axis factoring analysis with oblique Direct Oblimin and delta (δ) set at zero. This procedure is appropriate because it is theoretically and empirically more accurate [52] for factors that are related to each other [53]. Oblique rotation is more appropriate for exploratory principal axis factoring analysis than for principal components analysis because the latter assumes no error, and this is not consistent with social science research as error exists. McGuire and Tinsley [54] argued against using principal components analysis due to the statistical assumption that the measure to be analyzed has nearly perfect reliability. Therefore, the researchers in the present study felt it is inappropriate to use principal components analysis as a factor extraction method for the SDQ–I. Employing the general and accepted factor extraction (Kaiser-Gutman rule of 1.0 as the minimum eigenvalue, and Cattell's scree test), eighteen factors with eigenvalues greater than 1.0 were extracted. They successively accounted for 63.1% of the total variance, and this is consistent with other research studies based on the SDQ–I [34-36,38]. Rotation of factors analysis indicated a solution of 8 factors, as also indicated by the scree test, accounting for 40.7% of the total variance. Extracting more than 8 factors produced factors with non-significant variable loadings. Factor loadings were above .30 and were low on factors that the items were not designed to measure. For the Palestinian students, the factor analysis results generally supported the underlying factors that the SDQ–

I was designed to measure as predicted by the Shavelson model [1]. An examination of a measure's underlying factor structure and its stability across different ethnic groups is one important step in legitimizing the widespread use of any given measure [36]. Failure to attend to such ethnic and cultural considerations can negatively impact the assessment and violates ethical standards [55]. This study has confirmed that the SDQ–I is also valid for Arabic speaking adolescents, as it is with Caucasian samples, for example.

Means and standard deviations for the SDQ–I and its eight subscales for the whole sample are presented in Table 1. The subscale means ranged between 3.25 to 4.15 on a 5.0 scale. The summated item mean for the SDQ–I was 3.71. The mean scores were similar to those reported by El-Hassan [35] in the Lebanese sample. The SDQ–I and its eight subscales had a mean higher than 3, "sometimes false, sometimes true," indicating positive self-concept. Based on the five-point Likert scale type used, a mean score greater than 3.0 was deemed to be perceived as positive. The Parent Relations, Reading, and General Self-concept subscales had a mean of 4 (or slightly higher), "mostly true," indicating high positive self-concept. Pearson's product-moment correlations were used to examine relationships between the SDQ–I subscales. Table 2 reports the matrix of correlations of scores on self-concept subscales. These intercorrelations were similar to those reported by El-Hassan [35] in the Lebanese sample.

Table 1. Means and Standard Deviations of the SDQ–I Subscales, and Cronbach Alpha Coefficients (n = 360)

Subscale	*M*	*SD*	*Alpha*
Physical Ability	3.52	.57	.75
Physical Appearance	3.85	.61	.76
Peer Relations	3.63	.67	.78
Parent Relations	4.00	.74	.81
Reading	4.02	.63	.80
Mathematics	3.25	.85	.86
General School	3.49	.69	.82
General Self-concept	4.15	.58	.65
Self-concept (SDQ–I)	3.71	.43	.92

Self-description Questionnaire–I (SDQ–I, [30,34]).

Table 2. Pearson Correlations Among Subscales of the Self-description Questionnaire–I (n = 360)

Self-concept Subscale	1	2	3	4	5	6	7	8
1. Physical Ability								
2. Physical Appearance	.35†							
3. Peer Relations	.27†	.60†						
4. Parent Relations	.21†	.37†	.34†					
5. Reading	.29†	.25†	.28†	.40†				
6. Mathematics	.15†	.11*	.16†	.19†	.32†			
7. General School	.19†	.20†	.26†	.29†	.61†	.61†		
8. General Self-concept	.26†	.43†	.51†	.43†	.49†	.14†	.35†	
9. Self-concept (SDQ–I)	.50†	.61†	.64†	.63†	.72†	.61†	.74†	.64†

Self-description Questionnaire–I (SDQ–I, [30,34]). *p < .05. †p < .01.

4. Discussion

This study assessed the psychometric properties of the Self-description Questionnaire–I and the mean responses of the Palestinian participants' self-concept. The internal consistency reliability coefficients for the SDQ–I and the subscales were similar to those reported in previous research [15,30,35]. This Research from different cultures showed that reliability of the SDQ–I subscales is generally high (greater than 0.75). Results of this study are in agreement and indicate that responses to the SDQ-I of Palestinian adolescents reliably measures facets of self-concepts that are internally consistent. An exception was the low reliability for the General Self-concept subscale, and this could be because the subscale is short (6 items), and the participants of this study were relatively young and seem less able to evaluate their worth in general. The school system does not seem to give school students the opportunity to evaluate themselves. Marsh [48] argued children have more realistic perceptions of their strengths and weaknesses as they mature. General self-concept is a global perception of self, which students usually receive less feedback on compared to academic self-concepts (general school, reading, and mathematics), where students usually receive feedback on and are hence, more realistic. Reliability affects validity [56] and the low reliability for the General Self-concept subscale can attenuate the regression result, so further research is needed to assure that the general self-concept subscale is reasonably adequate and accurate in the regression analysis. The psychometric and factor analysis findings in this study are a clear support for the use of the SDQ–I with this age of school students. Factor analysis yielded strong evidence for the multidimensionality of self-concept. Except for the General Self-concept subscale, the remaining seven derived factors provided strong support

for the validity of the SDQ–I. However, the self is a wide concept, and the General Self-concept subscale cannot adequately account for the complexity of the self.

Mean responses revealed relatively high values on the SDQ–I subscales, particularly on parent relations, reading, and general self-concept subscales. Family is a central pillar in the Arab society, and it forms the basis for social circles. Education is highly valued among families across the Palestinian society. Accordingly, it is not surprising that these subscales ranked quite high. Students' relatively low mathematics self-concept deserves further empirical investigation. Mathematics programs should be designed to learn mathematics that is more interesting to students and encourage the development of positive self-concept with respect to mathematics abilities. Their physical self-concept was also low, which might be because these students were in the process of transitioning to young adults and they are experiencing developmental changes that may affect the evaluation of their physical ability. Comparison of Palestinian adolescents' mean responses to the Lebanese mean responses [35] reveals slightly higher general self-concept but lower mathematics than the Lebanese. Education is highly valued in the Palestinian and Lebanese societies. Given that both are Middle Eastern cultures, attempting to find a theoretical explanation to this difference is not preferable, especially since the difference is small. Correlations among the different subscales of the SDQ–I were consistently substantial, as was also found in [37]. Enhancement of self-concept should be a key education objective, and this can be accomplished by setting realistic goals, encouraging parental engagement in students' learning, and providing consistent and positive feedback towards their performance [57].

The results were generally in agreement with previous research findings, but this study still contributes to the literature because it provides knowledge about Palestinian students and the Self-description Questionnaire–I has rarely been used with Palestinian samples. Also, Palestinian life has unique and complex characteristics that warrant investigating self-concept among Palestinians. The role cognitive ability and prior learning plays is important, but self-concept can help students to comprehend their academic achievement behavior. The current study was limited to Palestinian students in four public schools in only one governorate, this being Salfit Governorate. Therefore, the scope and generalizability of the results are limited to students who were enrolled in 8th, 9th, and 10th grade of these four schools at the time these data were collected. To enhance the findings' generalizability, future research on self-concept should use samples drawn from various grades and socioeconomic backgrounds. This research attempted to fill a gap in research on self-concept by investigating the self-concept construct in a different culture, this being Palestinians. Replication of this study and using various indicators for academic achievement, such as standardized tests, to assess the relationship between self-concept and academic achievement is recommended. Longitudinal studies also could be conducted in future research to determine the implications of these results. Intercultural studies that compare different countries are needed [22,23,58,59]. Moreover, to complete this study's questionnaire, participants were asked to select responses that were already provided, meaning they were confined to the questionnaire's structure. Therefore, some additional and more systematic research [60,61] is needed to better understand self-concept of Palestinian students. Overall, a need exists for self-concept studies, especially in the Palestine Territories, as little to no self-concept research has been conducted on Palestinian students. Also, more research is needed to investigate the variables influencing self-concept. Self-concept may be connected to motivation for academic achievement.

Conflict of Interest

The authors declare to have no conflict of interest.

Funding

This research received no external funding.

Acknowledgments

The researchers would like to acknowledge the contributions of participating schools in their data collection and volunteering students for kindly taking part in this study.

References

[1] Shavelson, R.J., Hubner, J.J., Stanton, G.C., 1976. Self-concept: Validation of construct interpretations. Review of Educational Research. 46(3), 407-441. DOI: https://doi.org/10.2307/1170010

[2] Calhoun, G., Morse, W.C., 1977. Self-concept and self-esteem: Another perspective. Psychology in the Schools. 14(3), 318-322. DOI: https://doi.org/10.1002/1520-6807(197707)14:33.0.CO;2-V

[3] Abu-Hilal, M.M., 2010. A structural model of attitudes towards school subjects, academic aspiration and achievement. Educational Psychology. 20(1), 75-84. DOI: https://doi.org/10.1080/014434100110399

[4] Herrera, L., Al-Lal, M., Mohamed, L., 2020. Academic achievement, self-concept, personality and emotional intelligence in primary education: Analysis by gender and cultural group. Frontiers in Psychology. 10, Article 3075.
DOI: https://doi.org/10.3389/fpsyg.2019.03075

[5] Jaiswal, S.K., Choudhuri, R., 2017. Academic self-concept and academic achievement of secondary school students. American Journal of Educational Research. 5(10), 1108-1113.
DOI: https://doi.org/10.12691/education-5-10-13

[6] Kobal, D., Musek, J., 2001. Self-concept and academic achievement: Slovenia and France. Personality and Individual Differences. 30(5), 887-899.
DOI: https://doi.org/10.1016/S0191-8869(00)00081-7

[7] Sewasew, D., Schroeders, U., 2019. The developmental interplay of academic self-concept and achievement within and across domains among primary school students. Contemporary Educational Psychology. 58, 204-212.
DOI: https://doi.org/10.1016/j.cedpsych.2019.03.009

[8] Stocker, J., Abu-Hilal, M., Hermena, E., et al., 2021. Internal/external frame of reference model and dimensional comparison theory: A novel exploration of their applicability among Arab high school students. Educational Psychology. 41(4), 483-501.
DOI: https://doi.org/ 10.1080/01443410.2021.1887455

[9] Susperreguy, M.I., Davis-Kean, P.E., Duckworth, K., et al., 2018. Self-concept predicts academic achievement across levels of the achievement distribution: Domain specificity for math and reading. Child Development. 89(6), 2196-2214.
DOI: https://doi.org/10.1111/cdev.12924

[10] Wolff, F., Nagy, N., Helm, F., et al., 2018. Testing the Internal/External Frame of Reference Model of academic achievement and academic self-concept with open self-concept reports. Learning Instruction. 55, 58-66.
DOI: https://doi.org/10.1016/j.learninstruc.2017.09.006

[11] Zahra, A.T., Arif, M.H., Yousuf, M.I., 2010. Relationship of academic, physical and social self-concepts of students with their academic achievement. Contemporary Issues in Education Research. 3(3), 73-78.
DOI: https://doi.org/10.19030/cier.v3i3.190

[12] Ghazvini, S.D., 2011. Relationships between academic self-concept and academic performance in high school students. Procedia Social and Behavioral Sciences. 15, 1034-1039.
DOI: https://doi.org/10.1016/j.sbspro.2011.03.235

[13] Lyon, M.A., 1993. Academic self-concept and its relationship to achievement in a sample of junior high school students. Educational and Psychological Measurement. 53(1), 201-210.
DOI: https://doi.org/10.1177/0013164493053001022

[14] Abu-Hilal, M.M., Al-Maamari, S., Al-Harthy, I.S., et al., 2019. Achievement and self-concept relation: An evidence of the adequacy of the I/E model with a short version of the self-description questionnaire-II among school students in Oman. Italian Journal of Sociology of Education. 11(3), 194-211.

[15] Abu-Hilal, M.M., Bahri, T.M., 2000. Self-concept: The generalizability of research on the SDQ, Marsh/Shavelson Model and I/E Frame of Reference Model to United Arab Emirates students. Social Behavior and Personality: An International Journal. 28(4), 309-322.
DOI: https://doi.org/10.2224/sbp.2000.28.4.309

[16] Eshteewe, T., 2016. The self-concept according to gender and academic year for students of department of Physical Education-Palestine Technical University. The Swedish Journal of Scientific Research. 3(4), 38-43.

[17] Salami, S.O., 2010. Emotional intelligence, self-efficacy, psychological well-being and students' attitudes: Implications for quality education. European Journal of Educational Studies. 2(3), 247-257.

[18] Chen, S.K., Yeh, Y.C., Hwang, F.M., et al., 2013. The relationship between academic self-concept and achievement: A multicohort-multioccasion study. Learning and Individual Differences. 23, 172-178.
DOI: https://doi.org/10.1016/j.lindif.2012.07.021

[19] Eccles, J., 2009. Who am I and what am I going to do with my life? Personal and collective identities as motivators of action. Educational Psychologist. 44(2), 78-89.
DOI: https://doi.org/10.1080/00461520902832368

[20] Harter, S., 2013. New directions in self-development: Resurrecting the I-self. D. M. McInerney, H. W. Marsh, R. G. Craven, et al. (Eds.), Theory driving research: New wave perspectives on self-processes and human development. Information Age Publishing: Charlotte, North Carolina. pp. 1-30.

[21] Nasir, R., Lin, L.S., 2013. The relationship between self-concept and career awareness amongst students. Asian Social Science. 9(1), 193-197.
DOI: https://doi.org/10.5539/ass.v9n1p193

[22] Marsh, H.W., Hau, K.T., 2003. Big-fish–little-pond effect on academic self-concept: A cross-cultural (26-country) test of the negative effects of academically selective schools. American Psychologist. 58(5), 364-376.
DOI: https://doi.org/10.1037/0003-066X.58.5.364

[23] Nagengast, B., Marsh, H.W., 2012. Big fish in little

ponds aspire more: Mediation and cross-cultural generalizability of school-average ability effects on self-concept and career aspirations in science. Journal of Educational Psychology. 104(4), 1033-1053.
DOI: https://doi.org/10.1037/a0027697

[24] Seaton, M., Marsh, H.W., Craven, R.G., 2010. Big-fish-little-pond effect: Generalizability and moderation-two sides of the same coin. American Educational Research Journal. 47(2), 390-433.
DOI: https://doi.org/10.3102/0002831209350493

[25] Marsh, H.W., Martin, A.J., 2011. Academic self-concept and academic achievement: relations and causal ordering. British Journal of Educational Psychology. 81(1), 59-77.
DOI: https://doi.org/10.1348/000709910X503501

[26] Guo, J., Nagengast, B., Marsh, H.W., et al., 2016. Probing the unique contributions of self-concept, task values, and their interactions using multiple value facets and multiple academic outcomes. AERA Open. 2(1), 1-20.
DOI: https://doi.org/10.1177/2332858415626884

[27] Mejia-Rodriguez, A.M., Luyten, H., Meelissen, M.R.M., 2020. Gender differences in mathematics self-concept across the world: An exploration of student and parent data of TIMSS 2015. International Journal of Science and Mathematics Education.
DOI: https://doi.org/10.1007/s10763-020-10100-x

[28] Laryea, J.E., Saani, A.J., Dawson-Brew, E., 2014. Influence of students self-concept on their academic performance in the Elmina Township. European Journal of Research and Reflection in Educational Sciences. 2(4), 1-10.

[29] Abu-Hilal, M.M., Al-Maamari, S., Al-Sulaimani, H., 2020. Factor structure of a short version of SDQ-II among Omani school students. International Journal of School & Educational Psychology. 8(sup1), 124-132.
DOI: https://doi.org/10.1080/21683603.2019.1572553

[30] Marsh, H.W., 1988. Self-description questionnaire: A theoretical and empirical basis for the measurement of multiple dimensions of preadolescent self-concept: A test manual and a research monograph. The Psychological Corporation: San Antonio, Texas.

[31] Marsh, H.W., Holmes, I.W.M., 1990. Multidimensional self-concepts: Construct validation of responses by children. American Educational Research Journal. 27(1), 89-117.
DOI: https://doi.org/10.3102/00028312027001089

[32] Strein, W., 1993. Advances in research on academic self-concept: Implications for school psychology. School Psychology Review. 22(2), 273-284.
DOI: https://doi.org/10.1080/02796015.1993.12085652

[33] Marsh, H.W., 1992. Content-specificity of relations between academic achievement and academic self-concept. Journal of Educational Psychology. 84(1), 35-42.
DOI: https://doi.org/10.1037/0022-0663.84.1.35

[34] Marsh, H.W., 1990. The structure of academic self-concept: The Marsh/Shavelson Model. Journal of Educational Psychology. 82(4), 623-636.
DOI: https://doi.org/10.1037/0022-0663.82.4.623

[35] El-Hassan, K., 2004. Structure and correlates of self-concept in Lebanon. International Journal of Testing. 4(1), 1-17.
DOI: https://doi.org/10.1207/s15327574ijt0401_1

[36] Kaminski, P.L., Shafer, M.E., Neumann, C.S., et al., 2005. Self-concept in Mexican American girls and boys: Validating the Self-description Questionnaire–I. Cultural Diversity and Ethnic Minority Psychology. 11(4), 321-338.
DOI: https://doi.org/10.1037/1099-9809.11.4.321

[37] Marsh, H.W., Craven, R.G., Debus, R., 1991. Self-concepts of young children 5 to 8 years of age: Measurement and multidimensional structure. Journal of Educational Psychology. 83(3), 377-392.
DOI: https://doi.org/10.1037//0022-0663.83.3.377

[38] Marsh, H.W., Relich, J.D., Smith, I.D., 1983. Self-concept: The construct validity of interpretations based upon the SDQ. Journal of Personality and Social Psychology. 45(1), 173-187.
DOI: https://doi.org/10.1037/0022-3514.45.1.173

[39] Sardouk, R., 1995. The relationship between academic self-concept, academic causal attributions and teacher's evaluative feedback in a sample of upper elementary private school students [Unpublished master's thesis]. American University of Beirut: Beirut.

[40] Shihab, L., 1996. Relationships between the adapted self-description questionnaire (SDQ–I) and academic achievement [Unpublished master's thesis]. American University of Beirut: Beirut.

[41] Hollingshead, A.B., Redlich, F.C., 2007. Social class and mental illness: A community study. American Journal of Public Health. 97(10), 1756-1757.
DOI: https://doi.org/10.2105/ajph.97.10.1756

[42] United Nations Educational, Scientific and Cultural Organization (UNESCO), 2011. World Data on Education, UNESCO-IBL-Palestine. Retrieved from http://www.ibe.unesco.org/. (Accessed 10 August 2021).

[43] Ministry of Education and Higher Education, 2021. Publications and Studies. Retrieved from http://www.moehe.gov.ps/general-education/general-education/Brochures-and-Studies. (Accessed 15 August 2021).

[44] The New York Times, 2021. The Palestinian Authority. New York: The New York Times. Retrieved from https://www.nytimes.com/topic/organization/the-palestinian-authority. (Accessed 10 August 2021).

[45] Palestinian Central Bureau of Statistics (PCBS), 2018. Preliminary Results of the Population, Housing and Establishments Census 2017. Ramallah: PCBS. Retrieved from http://www.pcbs.gov.ps/Downloads/book2364-1.pdf. (Accessed 15 August 2021).

[46] The Jerusalem Legal Aid and Human Rights Center (JLAC), 2020. Salfit Governorate: Palestinians Vs Israeli Settlers. Ramallah: JLAC. Retrieved from https://www.jlac.ps/userfiles/Salfit-%20JLAC_pub.pdf. (Accessed 10 August 2021).

[47] The Applied Research Institute – Jerusalem (ARIJ), 2014. Locality Profiles and Needs Assessment in Salfit Governorate. Bethlehem: ARIJ. Retrieved from https://www.arij.org/files/arijadmin/IDRC/publications/Salfit_English3-7-2015.pdf. (Accessed 10 August 2021).

[48] Marsh, H.W., 1990. A multidimensional, hierarchical model of self-concept: Theoretical and empirical justification. Educational Psychology Review. 2(2), 77-172.
DOI: https://doi.org/ 10.1007/BF01322177

[49] Alkhateeb, H.M., 2010. Self-concept in Lebanese and Arab-American pre-adolescents. Psychological Reports. 106(2), 435-447.
DOI: https://doi.org/10.2466/PR0.106.2.435-447

[50] Henson, R.K., 2001. Understanding internal consistency reliability estimates: A conceptual primer on coefficient alpha. Measurement and Evaluation in Counseling and Development. 34(3), 177-189.
DOI: https://doi.org/10.1080/07481756.2002.12069034

[51] Streiner, D.L., 2003. Starting at the beginning: an introduction to coefficient alpha and internal consistency. Journal of Personality Assessment. 80(1), 99-103.
DOI: https://doi.org/ 10.1207/S15327752JPA8001_18

[52] Hair, J.F.Jr., Black, W.C., Babin, B.J., et al., 2009. Multivariate data analysis. Prentice Hall: Upper Saddle River, New Jersey.

[53] Streiner, D.L., Norman, G.R., 2008. Health measurement scales: A practical guide to their development and use. Oxford University Press: Oxford.

[54] McGuire, B., Tinsley, H.E.A., 1981. A contribution to the construct validity of the Tennessee Self-Concept Scale: A confirmatory factor analysis. Applied Psychological Measurement. 5(4), 449-457.
DOI: https://doi.org/10.1177/014662168100500402

[55] Koocher, G.P., Norcross, J.C., Greene, B.A., 2013. Ethical principles of psychologists and code of conduct. G. P. Koocher, J. C. Norcross, B. A. Greene (Eds.), Psychologists' desk reference. Oxford University Press: Oxford. pp. 529-550.
DOI: https://doi.org/10.1093/med:psych/9780199845491.003.0103

[56] Cohen, L.J., 2016. The Handy Psychology Answer Book. Visible Ink Press: Canton, Michigan.

[57] Yong, F.L., 1994. Self-concepts, locus of control, and machiavellianism of ethnically diverse middle school students who are gifted. Roeper Review: A Journal on Gifted Education. 16(3), 192-194.
DOI: https://doi.org/10.1080/02783199409553571

[58] Bleidorn, W., Arslan, R.C., Denissen, J.J.A., et al., 2016. Age and gender differences in self-esteem – A cross-cultural window. Journal of Personality and Social Psychology. 111(3), 396-410.
DOI: https://doi.org/10.31219/osf.io/b65sa

[59] Min, M.C., Islam, M.N., Wang, L., et al., 2018. Cross-cultural comparison of university students' emotional competence in Asia. Current Psychology. 40, 200-212.
DOI: https://doi.org/10.1007/s12144-018-9918-3

[60] Mayer, J.D., Salovey, P., Caruso, D.R., 2012. The validity of the MSCEIT: Additional analyses and evidence. Emotion Review. 4(4), 403-408.
DOI: https://doi.org/10.1177/1754073912445815

[61] Petrides, K.V., Vernon, P.A., Schermer, J.A., et al., 2010. Relationships between trait emotional intelligence and the big five in the Netherlands. Personality and Individual Differences. 48(8), 906-910.
DOI: https://doi.org/10.1016/j.paid.2010.02.019

BILINGUAL
PUBLISHING CO.
Pioneer of Global Academics Since 1984

Tel.:+65 65881289
E-mail: contact@bilpublishing.com
Website:ojs.bilpublishing.com

2630-5143
02
9 772630 514226