STEPHY Publishers

Journal of Psychological Science and Research

Research Article

ISSN: 2770-6990

Academic Self -Concept (ASC) and Well-Being of Students in Hongkong: An Exploratory Study

Verma R*

University of Hongkong, Hongkong

Abstract

Goal: There is considerable significance of academic self-concepts in the educational context and in personal growth and while much research has been devoted to the factors affecting their development, and gender is posited as an important factor. The purpose of this study was to examine the academic self-concepts of Hongkong adolescent high school students. The objectives and research questions were to explore Maths and English Academic self-concepts and happiness, regarding

1. Is gender associated with student's English and Math's academic self-concept?
2. Do adolescent boys and girls have different Math and English ASC?
3. Is there any association between academic self-concept and well-being?

Method: The study adopted a cross-sectional study design with convenient sampling using phone calls and emails. For data collection, the two scales used were – 1. The Academic Self-Description Questionnaire II (ASDQ-II) to index Maths and English academic self-concept by Marsh in 1990. 2. The subjective happiness Scale by designed by Lyubomirsky and Lepper in 1990.

Result: A total of 47 student participants, a mix of girls and boys were surveyed. The sample reported an average age of 13 (SD=.351); and most of the respondents are female (61.7%). The study involved one independent variable which is gender (n=47, mean=1.62, std. deviation=.491). The three dependent variables were as follows- English ASC (n=47, mean=33.6, std. deviation=.491), Maths ASC (n=47, mean=33.57, std. deviation=7.1 and happiness self-concept (n=46, mean=19.6, std. deviation=4.62. There were two significant findings -1. Gender is negatively correlated with Maths ASC. 2. Happiness is significantly correlated with English.

Conclusion: The findings of this study were revealing that the boys are more likely to report a higher level of Maths academic self-concept, while English academic self-concept is not related to gender. Also, happiness among students is positively correlated with high English Self-Concept. The results supported the notion that gender is correlated with academic self-concept. The study also supported the notions that academic self-concept influences happiness, as English academic self-concept was found to be positively correlated with happiness. The results have been strongly argued to confidently pave way for conclusive direction for future research.

Keywords: Self-concept, Gender, Happiness, Academic achievement

Introduction

Historically, the goals of education have moved from emphasis on cognitive outcomes to concerns on social and affective processes.[1-4] While traditionally schools prepared students for academic achievements and career placements, now a days the stress is equally upon the overall wellbeing of students via psychological, interpersonal, and social development. It is seen that this trend has

Quick Response Code:

***Corresponding author:** Ritu Verma, Department of behaviour Health, University of Hongkong, Hongkong

Received: 14 March, 2022 **Published:** 31 March, 2022

Citation: Verma R. Academic Self -Concept (ASC) and Well-Being of Students in Hongkong: An Exploratory Study. *J Psych Sci Res.* 2022;2(1):1–8. DOI: 10.53902/JPSSR.2022.02.000527

coincided with the advent of positive psychology which presses a need for positive self- concept in education.[5] Also, in recent times there is noted to be a sharp increase in the number of studies around self-concept in education which also reflects the ongoing emphasis upon non-cognitive and affective outcomes of education.[6]

Notably, this importance to self-concept in education is based upon the premise that high and positive self-concept leads to positive feelings of self-acceptance and happy students.[7,8] Additionally, the benefits of well-rounded self-concept for students are also acknowledged in various disciplines of psychology and social sciences like developmental, sports exercise, health, social, and personality psychology.[9-13] Therefore, there is growing research into how to help students develop positive and high academic self-concept in all subject areas by focussing on- "what affects development of academic self-concept, and if ASC and happiness are correlated."

Past and recent evidential research has categorized self-concept into two categories i.e., general self-concept and academic self-concept. Although the general self-concept is valuable for overall well-being however there are noted suggestions that it is the students' academic self- concept that holds important implications for their academic growth, career enhancement and well-being.[7,13,14] It is implied in this study that to develop a well-rounded and high academic self-concept it is important to seek the factors that affect its development and among many other factors, gender is posited as one important factor which is the focus of exploration in this study.

Furthermore, this exploration is also deemed important to understand the alarming trend of misrepresentation of women in STEM. The self-concept theorists, educational researchers and policy makers have pointed that woman continue to be under-represented in STEM (science, technology, English, and maths) related career choices and seem underconfident when choosing college course choices in mathematical fields.[6,15,16] Though there is no or very marginal difference between cognitive abilities of boys and girls whether its verbal abilities and/or numerical abilities.[17,18] Furthermore, if all the other factors like academic opportunities, family conditions and school climate remain the same then the focus shifts to academic self -concept.[19-21] This focus shift is supported by conclusive suggestions that academic self -concept and future selection of subject choices/career are strongly co-related.[6,21,22] Therefore, its valid to suggest here that the phenomenon of STEM can be due to differences in English and Maths academic self-concepts among girls. Moreover, it seems deemed to add here that the gender-based differences among boys and girls can be due to many reasons like gender schemas, parental influences, biological -hormonal -neuroscience factors, gender stereotypes etc.[6,16,23-29]

Against the backdrop of the above discussions, this study explored if there exist differences in Maths and English ASC among Hongkong students and if these differences reflect existence of known gender stereotypes in STEM. The study went further to explore if these differences in Maths and English academic self-concepts affect the wellbeing of students. Keeping all the above in mind, this study created a framework to discuss the following many constructs/study variables - self-concept, academic self-concept (ASC), ASC and wellbeing, gender and ASC, gender-based stereotypes in education, wellbeing, and happiness.

There were few accepted notions, first that self-concept is a valuable construct. Its importance is accepted and understood for personal and interpersonal growth in all areas of life.[30-33] Second, academic self-concept is important for students as it affects academic achievement, college subject selection, and happiness.[7,14,34,35] Third, academic self-concept is highly gendered and is affected by gender.[3,15,28,36,37]

Academic self-concept and student wellbeing

The main school goals can be summarized into two categories, one to achieve high academic results and the second to maintain good wellbeing by inculcating well -developed sense of self, others, and society. Simultaneously there is increasing stress upon development of global citizenship among children and adolescents to build character and civic virtues for societal wellbeing. To achieve this, wellbeing has been put forward as a major interest and goal across many different academic disciplines.

As per WHO's definition wellbeing is not just absence of a disease but its overall social, physical, and psychological wellbeing. This definition applies to the wellbeing of students too. It is posited here that wellbeing and happiness are strongly intercorrelated and can be understood interchangeably.[38,39] Studies exploring the happiness among students have noted that happiness is connected to five distinct areas of family, friends, schools, self and living environment. Further the focus is brought upon the academic stress among students which is one of the few many psychosocial factors that is associated with feelings of happiness and is negatively associated.[40] Academic stress is intellectual and emotional pressure that occurs due to demand of school life and academic engagements.

Mostly all students' experiences stress sometime in his/her schooling period. There are significant studies to show that increasing degree of stress reduces the feelings of happiness significantly.[41,42] Stress among youngsters is recognized as the major issues of concern, for children and adolescents and their families. There are adverse effects and consequences of stress among adolescents, both short term and long term and growing evidential support that stress causes adverse health outcomes like depression and serious physical ailments like headaches, nausea etc.[43]

Additionally, studies have noted that academic stress can be because of low motivation, personality, self-concept, lack of time, academic workload, social pressure, unclear assignment, self-con-

cept, relation with teacher, family environment, socio-economic states etc. Here we focus upon self-concept and more specifically academic self-concept as a factor influencing academic stress and happiness.

As noted in previous sections, academic self -concept is positively correlated with high self-efficacy, high self-esteem, and high academic achievement and subsequent boost in happiness. Researchers have noted that academic self -concept is related negatively to stress. Students experience more stress when academic self-concept is low, and this leads to negative feelings of wellbeing.

The case of hongkong

Hongkong school education framework has evolved from Chinese and British education systems. It preserves the virtues of traditional Chinese education while learning from advanced concepts of west.[44] In Hongkong, schooling opportunities for females have been virtually equal over the post war period. However, its seen recently that enrolment figures for different university faculties (for example female to male ratio in medicine is 0:32 and 0:10 in engineering and arts faculty of university of Hongkong being 4:30) have been skewed which suggests that there exist subtle forms of gender stereotyping.[44]

Moreover, in 1997, a longitudinal study conducted in Hongkong on 45000 secondary school students it was concluded that schooling did influence gender differences. The study concluded that girls performed good in science and arts whereas boys did not do well in arts after controlling the initial ability level.[21] It is a concerning to educationists and policy makers. Hongkong is an evolving and striving equal opportunity society and hence any sign of gender difference in academic and/or career choices should be noted and researched further to control its spread and long-term effects.

With evidential knowledge of interplay between academic self-concept and stress, this association is further investigated in this study with stress on that there should be further exploration of these variables for upkeeping student's overall wellbeing and holistic wellbeing.

The shortcomings of previous research/research gaps

In last decade, there has been alarming reports of increasing stress and unhappiness among students in Hongkong. Increasing stress has been attributed to academic stress but no attention has been paid to academic self-concept. The casual relationship between the two hasn't been explored at all. Moreover, past studies conducted with students have not always included international English-speaking students, they have included local English-speaking students. These need to be researched to provide missing information about how to effectively serve all students in Hongkong so they can have high academic self -concepts and be happy.

Research objective

The present study was conducted for adolescence with more focus on early adolescence. Two major features characterize the academic self-concept self-descriptions at this age. First, by adolescence usually children are more sophisticated to describe themselves by using abstract concepts such as like in reference to self. Secondly, at early adolescence, the self-concepts are formed but they are lucid and therefore, a study done at this stage is more conducive to seek interventions if needed. The objectives and research questions were to explore Maths and English Academic self-concepts and happiness, regarding:

1. Is gender associated with student's English and Math's academic self-concept?
2. Do adolescent boys and girls have different Math and English ASC?
3. Is there any association between academic self-concept and well-being?

Methodology

This purpose of this section is to describe the study design, participants, instrumentations, methods of data collection, and data analysis used in this study.

Study design

The study adopted a cross-sectional study design with convenient sampling using phone calls and emails. All data was collected by means of a self-administered questionnaire through an online survey system setup by the researcher using the Qualtrics® online platform.

Participants

A total of 47 students, aged between 13-15 year participated in this research. All respondents have been living in Hongkong and attending the same school since last three years. The demographic characteristics like age, grade and gender are cited in the Table 1 below.

Eligibility: Exclusion/Inclusion criterion

The participants included were students from co-educational English speaking, local/nonlocal and international schools. The data collection was conducted same time as schools' academic assessments to ensure high awareness of academic self-concepts among all participants. Also, all participants belonged to the schools that do not discriminate its students on basis of gender/race/nationality and provide equal educational opportunities to all in academic subjects especially Maths and English.

Additionally, it was seen that these schools also placed additional stress and anxiety preventive measures for all their students

during "COVID-19". The excluded participants were the ones who: (1). Suffered from any behavioural and psychological issues; (2). Lacked parent and/or self-consent; (3) Were at high risk for anxiety due to self-exploration due to the study content.

Table 1: Demographics.

Variables	No. (%)
Gender	
Male	18 (38.3%)
Female	29 (68.7%)
Education level	
7th	6.4
8th	31.9
9th	46.8
10th	13.9
Type of school	
Co-ed	47

Study instruments

The measures adopted for this study are validated English version of the original scales. The following section outlines the details of the scales and their internal reliabilities in this study.

The academic self-description questionnaire II

Maths and English academic self-concept is indexed by The Academic Self-Description Questionnaire II (ASDQ-II).[46] The scale was developed by Marsh to measure multiple subject matter dimensions of academic self -concept as well as single dimension of general school concept among early adolescents. It has evolved from the construct validity research related to the Marsh/Shavelson Model.[47] Marsh (1990, 1992) determined a set of school subjects taken by all students and constructed self-concept subscales corresponding to match each content area. The subject matters tapped by ASDQ-II are English language, English literature, foreign languages, history, geography, commerce, computer studies, science, mathematics, physical education, health, music, art, industrial art, and religion.[45,47]

Administration and scoring

Each item on the scale is structured on a 6-point Likert type scale format. Students are directed to respond to simple declarative statements by placing a checkmark under one of the six alternatives that best describes them. Given a six-point scale format, the score for each completed item represents a value from 1(False) to 6 (True). Subscale scores are obtained through a simple summation of scores relative to all items constituting the scales in question. Higher score implies high ASC in relation to the specific subject. For example, a sample item from ASDQ-11 English sub-scale can be seen as: - "I am hopeless when it comes to English classes" and responses can range as false, mostly false, more false than true, more true than false, mostly true, and true.

The subjective happiness scale

This is an English language scale designed by Lyubomirsky and Lepper in 1990. It is a subjective approach to the assessment of the happiness by means of statements with which participants self-rate themselves or compare self to others. The scale constitutes 4-items. It is derived from an original pool of 13 self-report items. The responses were recorded in 7-point Likert scale format. A single composite score for global subjective happiness is computed by averaging responses to the four items. Thus, the possible range of scores on the subjective happiness scale can be from 1.0 to 7.0, with higher scores reflecting greater and low score reflecting lower happiness.[48] Five measures of happiness and well-being were used to validate the subjective happiness scale and there were found substantial correlations ranging from 0.52 to 0.72.[48] An internal consistency with reliability coefficient of 0.55- 0.85 was obtained. Also test-retest reliability is found to be extremely high, 0.55 to 0.90 (mean=0.72). The statistical parameters have been tested in China and Hongkong and have found high internal validity and reliability.[49] In the study the internal reliability coefficient was computed and found to be good to high. The Cronbach's alphas for the happiness scale were found to be .747 and .816 respectively.

A sample item in this scale can be seen as: - "In general, I consider myself not a very happy person," and the responses can be marked on scale ranging from 1 to 6. The total value was computed by adding all the responses.

Administration and scoring

An invitation email with the web-based consent forms as well as the questionnaires were sent out via email and telephone. All forms were electronic forms, and all data was were stored electronically using the Qualtrics® system.

All data were downloaded and imported into IBM SPSS® Statistics 26 for data analysis. To explore the relationship between academic self-concept and happiness, correlation analysis was conducted using the Pearson's r (r); while gender differences on academic self-concept and happiness were explored using independent sample t-test. Type I errors in the findings were indexed by the p-value (p), and we considered the convention cut-off of p-value smaller or equal to .05 ($p \leq .05$) for the test of statistical significance.

Results, Data Analysis and Discussions

Results

The objective of this study was to explore correlation between gender, Maths and English academic self-concept and happiness. A total of 47 student participants, a mix of girls and boys were surveyed. The sample reported an average age of 13 (SD=.351); and most of the respondents are female (61.7%). The study involved one independent variable which is gender (n=47, mean=1.62, std. deviation=.491). The three dependent variables were as follows-

English ASC (n=47, mean=33.6, std. deviation=.491), Maths ASC (n=47, mean=33.57, std. deviation=7.1 and happiness self-concept (n=46, mean=19.6, std. deviation=4.62). The three dependent variables of the study showed high internal reliability. As noted, the Cronbach's Alphas for the English ASC, Maths ASC, and Happiness scales are .747, .816, and .780, respectively. Thus, the measurements adopted in this study reported acceptable to good internal reliability. There were two significant findings: 1. Gender is negatively correlated with Maths ASC. 2. Happiness is significantly correlated with English ASC. The following table lays out all the correlations Table 2:

Table 2: Correlations.

	Gender	English ASC	Maths ASC	Happiness
Gender	1	0.193	-.305*	-0.225
English ASC	0.193	1	0.107	.366*
Maths ASC	-.305*	0.107	1	0.211
Happiness	-0.229	.366*	0.211	1

Data analysis

The data was analysed in line with the research questions/hypothesis. It is as follows:

1. Is gender associated with student's English and Math's academic self-concept?

Finding of this study suggested a negative correlation between gender and maths academic self-concept (r=-31, p≤.01); suggesting that males are more likely to report a higher level of Maths academic self-esteem. Although positive correlation (r=.19, p=.19) was found between gender and English academic self-esteem, the finding was statistically non-significant. Our finding seemed to suggest that the boys are more likely to report a higher level of Maths academic self-concept, while English academic self-concept is not related to gender.

2. Do adolescent boys and girls have different Math and English academic self-concept?

An independent samples T-test was conducted to compare the study's dependent variables Maths Academic Self-Concept and English Academic Self-Concept and independent variable gender. There was not a significant difference in the scores for Maths Academic Self-Concept among males (mean=36.33, standard deviation=6.01) and females (mean=31.86, standard deviation=7.41); t(45)=2.15, p=0.037. Also, there was not a significant difference in the scores for English Self-Concept among males (mean=32.44, standard deviation=-4.98) and females (mean=34.44, standard deviation=4.22); t(45)=-1.32, p=.193. These results suggest that gender really does doesn't influence academic self-concept. Specifically, the results suggest that boys and girls don't have academic self-concept differences between them.

3. Is there any association between academic self-concept and well-being?

Strong positive correlation was found between English academic self-concept and overall happiness (r=.37, p≤ .05); suggesting that those who reported a higher level of English academic self-concept are also those who are more likely to report a higher level of happiness in general. Nevertheless, the positive correlation between Maths academic self-concept and overall happiness was statistically non-significant (r=.21, p=.15). The finding suggested that happiness of students is associated with English academic self-concept, but its relationship with Maths academic self-concept has remained inconclusive.

Discussions

The objective of the present study was to explore relationships between gender, academic self-concept, and happiness of adolescent students in Hongkong. The findings of the research revealed that Math academic self-concept is significantly associated with gender. In this research result there was found significant negative relationship between gender and Maths academic self-concept.

Another significant finding was the revelation that happiness is positively correlated with English academic self-concept. This signified that when English self-concept increases then happiness increases. Further this research results showed that gender has played insignificant role with English academic self-concept of participants. Additionally, gender has also played insignificant role in case of happiness.

The above findings were further explored in literature. Much past and recent research has signified that academic self-concept especially Math self-concept is found to highly gendered.[25,28,33,50,51] Further relationship between Math self-concept and gender is explored and have been found to be line with the literature findings that the differences in Maths academic self-concept are known to be caused due to gender differences among boys and girls.[2,3,7,52]

Additionally, it is explored in literature that boys and girls feel same kind of academic stress and there is no significant differences between them.[53,54] Gender plays insignificant role in academic stress and hence to conclude that gender does not affect happiness. The reason behind the high English ASC and happiness maybe due to participants of the sample which only belonged to English speaking schools.[55,56]

Areas for further discussions and implications

This is a cross sectional study done with only one data collection instrument. Future studies can complement the self-report measure with school reports and other measurements along with the longitudinal study for more generalizability of the results. Moreover, previous research has shown that teaching styles, school

instruction ways, type of schools, parenting styles effect the formation of academic concepts. In addition, past research has also posited that gender differences are understood and explored not only with reference to gender stereotypes but also with reference to gender schemas, cognitive and biological differences, and social learning factors. In future research this knowledge utilized for deriving more understanding of the development of academic self-concepts.

The children under this study revealed their academic self-concepts and perceived happiness that had very important implications. They explored and revealed and became aware of an important part of their inner world. Their responses had implications on productive interaction between their gender and academic subject learning, and how their happiness is affected by this interaction.

Hongkong comprises a very competitive school environment and development of high academic self-concepts in all subjects is stressed upon. Moreover, high academic results and excellent college placements is looked for. Also, it's to underscore that Hongkong school system pride itself upon virtues of equal education and opportunities for all irrespective of gender and race.

The study's first finding that boys like maths more is needs due attention. As there are no proven cognitive differences in Maths among boys and girls, this finding among Hongkong students raises a due alarm. It directs us to investigate factors that are contributing to development of this correlation. These factors can be school instructions, teaching styles and/or stereotypes. Moreover, though done at a local level and with a small sample, the significant result encourages future researchers to expand the study among the broad student population in Hongkong, China and other countries. To sum it inspires to do cross-cultural exploration.

The study has educational, developmental, and counselling implications along with guidance for policy makers. Notably academic self-concept is affected by age and hence its interlinked with social-physical development. Also, for the educators and school administrators its beneficial to know that Math academic self-concept is affected by gender. With this knowledge they can formulate and put into practice a curriculum, educational practices, and teaching instructions conducive to development of positive academic self-concepts among boys and girls.

Additionally, for counsellors responsible for student's happiness and wellbeing the knowledge of relationship between academic self-concept and wellbeing is useful to plan school well-being programs. Consistent patterns across societies suggest that in 21st century schools will require policy initiatives that ensures student's wellbeing programs as a core component of literacy. The knowledge that academic self-concept effects wellbeing can give growth and new direction to the preexisting research.

Whatever the merits and demerits of this research, it is a timely reminder that academic self-concept is an important construct in education and wellbeing. With this knowledge the students can explore the development of their academic self-concept gender-based stereotypes. It is a valuable knowledge for self -development as well as academic growth. Moreover, for researchers and educationists, with knowledge of existence of gender-based stereotype in academic self-concepts, it's a important direction to employ more study research and intervention measures to curtail further existence of gender based stereotypes.

Acknowledgments

None.

Funding

None.

Conflicts of Interest

Author declares that there is no conflict of interest.

References

1. Byrne BM, Shavelson RJ. On the Structure of Adolescent Self-Concept. *Journal of educational psychology.* 1986;78(6):474–481.
2. Skaalvik S, Skaalvik EM. Gender Differences in Math and Verbal Self-Concept, Performance Expectations, and Motivation. *Sex Roles.* 2004;50(3/4):241–252.
3. Eccles J, Wigfield A, Harold RD, et al. Age and Gender Differences in Children's Self- and Task Perceptions during Elementary School. *Child development.* 1993;64(3):830.
4. Epstein JL. A Case Study of the Partnership Schools Comprehensive School Reform (CSR) Model. *ELEM School J.* 2005;106(2):151–170.
5. Seligman ME, Csikszentmihalyi M. Positive psychology. An introduction. *Am Psychol.* 2000;55(1):5.
6. Eccles J. Gendered educational and occupational choices: Applying the Eccles et al. model of achievement-related choices. *International journal of behavioral development.* 2011;35(3):195–201.
7. Marsh HW, Craven R. Chapter 6 - Academic Self-Concept: Beyond The Dustbowl. Academic Press.1996;pp.131-198.
8. Seligman MEP. Positive Psychology: A Personal History. *Annu Rev Clin Psychol*. 2019;15(1):1–23.
9. Seligman MEP, Ernst RM, Gillham J, et al. Positive education: positive psychology and classroom interventions. *Oxford review of education*. 2009;35(3):293–311.
10. Marsh HW, Craven RG. Reciprocal Effects of Self-Concept and Performance from a Multidimensional Perspective. *Perspectives on psychological science.* 2006;1(2):133.
11. Marsh HW, Craven RG. Reciprocal Effects of Self-Concept and Performance From a Multidimensional Perspective: Beyond Seductive Pleasure and Unidimensional Perspectives. *Perspect Psychol Sci.* 2006;1(2):133–163.
12. Marsh HW, Pekrun R, Murayama K, et al. An Integrated Model of Academic Self-Concept Development: Academic Self-Concept, Grades, Test Scores, and Tracking Over 6 Years. *Dev Psychol.* 2018;54(2):263–280.

13. Salchegger S. Selective School Systems and Academic Self-Concept: How Explicit and Implicit School-Level Tracking Relate to the Big-Fish-Little-Pond Effect Across Cultures. *Journal of educational psychology*. 2016;108(3):405–423.
14. Marsh HW. The Structure of Academic Self-Concept: The Marsh/Shavelson Model. *Journal of educational psychology.* 1990;82(4):623–636.
15. Eccles JS. Where Are All the Women? Gender Differences in Participation in Physical Science and Engineering. In: Ceci SJ, Williams WM, editors. Why aren't more women in science?: Top researchers debate the evidence. American Psychological Association, American Psychological Association, Washington, DC. 2007. p.199–210.
16. Gurian M. Boys and girls learn differently a guide for teachers and parents. 1st Edn. San Francisco: Jossey-Bass. 2011.
17. Halpern DF, Benbow CP, Geary DC, et al. The Science of Sex Differences in Science and Mathematics. *Psychol Sci Public Interest.* 2007;8(1):1–51.
18. Wai J, Cacchio M, Putallaz M, et al. Sex differences in the right tail of cognitive abilities: A 30 year examination. *Intelligence (Norwood). 2010;*38(4):412–423.
19. Eccles J. Who Am I and What Am I Going to Do With My Life? Personal and Collective Identities as Motivators of Action. *Educational psychologist.* 2009;44(2):78–89.
20. Halpern DF, Straight CA. Beliefs About Cognitive Gender Differences: Accurate for Direction, Underestimated for Size. *Sex Roles*. 2011;64(5):336–347.
21. Kam Cheung W, Lam YR, Lai Ming H. The Effects of Schooling on Gender Differences. *British educational research journal.* 2002;28(6):827–843.
22. Marsh HW, Martin AJ. Academic self-concept and academic achievement: Relations and causal ordering. *Br J Educ Psychol.* 2011;81(1):59–77.
23. Hirnstein M, Coloma Andrews L, Hausmann M. Gender-Stereotyping and Cognitive Sex Differences in Mixed- and Same-Sex Groups. *Arch Sex Behav.* 2014;43(8):1663–1673.
24. Hyde JS. The Gender Similarities Hypothesis. *Am Psychol.* 2005;60(6):581–592.
25. Hyde JS, Linn MC. The Psychology of gender: advances through meta-analysis. Baltimore : Johns Hopkins University Press. 1986.
26. Johnson MM. The Psychology of Sex Differences. Eleanor E Maccoby, Carol N Jacklin, editors. Chicago: Chicago: University of Chicago Press. 1993, p. 625–629.
27. Lakin JM. Sex differences in reasoning abilities: Surprising evidence that male–female ratios in the tails of the quantitative reasoning distribution have increased. *Intelligence (Norwood).* 2013;41(4):263–274.
28. Marsh HW. Age and Sex Effects in Multiple Dimensions of Self-Concept: Preadolescence to Early Adulthood. *Journal of educational psychology.* 1989;81(3):417–430.
29. Wong WI, Shi SY, Chen Z. Students from single-sex schools are more gender-salient and more anxious in mixed-gender situations: Results from high school and college samples. *PLoS One*. 2018;13(12):e0208707–e0208707.
30. Herbert WM. The Multidimensional Structure of Academic Self-Concept: Invariance over Gender and Age. *American educational research journal.* 1993;30(4):841–860.
31. Rosenberg M. Conceiving the self (Reprint ed. ed.). R E Krieger. 1986.
32. Shavelson RJ, Bolus R. Self concept: The interplay of theory and methods. *Journal of educational psychology.* 1982;74(1):3–17.
33. Wylie RC, Wylie RC. The self-concept (Rev. ed). Lincoln: University of Nebraska Press. 1979.
34. Herbert WM, Alexander Seeshing Y. Coursework Selection: Relations to Academic Self-Concept and Achievement. *American educational research journal*. 1997;34(4):691–720.
35. Marsh HW, Trautwein U, Lüdtke O, et al. Integration of multidimensional self-concept and core personality constructs: Construct validation and relations to well-being and achievement. *J Pers*. 2006;74(2):403–456.
36. Hyde JS, Linn MC. Gender Differences in Verbal Ability: A Meta-Analysis. *Psychological bulletin.* 1998;104(1):53–69.
37. Makarova E, Aeschlimann B, Herzog W. The Gender Gap in STEM Fields: The Impact of the Gender Stereotype of Math and Science on Secondary Students' Career Aspirations [Original Research]. *Frontiers in Education.* 2019;4(60).
38. Gibson RL. Counseling in the elementary school: a comprehensive approach. Boston: Allyn and Bacon. 1993.
39. Natvig GK, Albrektsen G, Qvarnstrøm U. Associations between psychosocial factors and happiness among school adolescents. *Int J Nurs Pract.* 2003;9(3):166–175.
40. Lalita S, Meeta J, Deepak P. Self-concept and academic stress among boys and girls students. *Indian journal of health and wellbeing.* 2016;7(5):540.
41. Hirvonen R, Yli Kivistö L, Putwain DW, et al. School-related stress among sixth-grade students – Associations with academic buoyancy and temperament. *Learning and individual differences.* 2019;70:100–108.
42. Ma Y, Bennett D. The relationship between higher education students' perceived employability, academic engagement and stress among students in China. *Education & training (London).* 2012;63(5):744–762.
43. Garton AF, Pratt C. Stress and self-concept in 10- to 15-year-old school students. *Journal of adolescence (London, England.).* 1995;18(6):625–640.
44. Sweeting A. Education in Hong Kong: 1941 to 2001. Visions and revisions. Hong Kong: Hong Kong Univ Press. 2004.
45. Marsh HW. The Structure of Academic Self-Concept: The Marsh/Shavelson Model. *J Educ Psychol*. 1990b;82(4):623–636.
46. Marsh HW, Shavelson R. Self-Concept: Its Multifacted, Hierarchical Structure. *Educational psychologist.* 1985;20(3):107.
47. Marsh HW. Content Specificity of Relations Between Academic Achievement and Academic Self-Concept. *Journal of educational psychology.* 1992;84(1):35–42.
48. Sonja L, Heidi SL. A Measure of Subjective Happiness: Preliminary Reliability and Construct Validation. *Social Indicators Research*. 1999;46(2):137–155.
49. Chien CL, Chen PL, Chu PJ, Wu HY, Chen YC, et al. The Chinese Version of the Subjective Happiness Scale: Validation and Convergence With Multidimensional Measures. *Journal of psychoeducational assessment. 2019;*38(2):222–235.
50. Marsh HW. Verbal and Math Self-Concepts: An Internal/External Frame of Reference Model. *American educational research journal.* 1986;23(1):129–149.
51. Meece JL, Parsons JE, Kaczala CM, et al. Sex differences in math achievement: Toward a model of academic choice. *Psychological bulletin.* 1982;91(2):324–348.
52. Jacquelynne E, Allan W, Rena DH, et al. Age and Gender Differences in Children's Self- and Task Perceptions during Elementary School. *Child Dev.* 1993;64(3):830–847.
53. Damaliamiri M, Afshar M, Zeraati M. Environmental Stresses, Gen-

der Stresses and Academic Stress in Schools. *European psychiatry.* 2015;30:1169–1169.

54. Liu Y, Lu Z. Chinese High School Students' Academic Stress and Depressive Symptoms: Gender and School Climate as Moderators: Academic Stress. *Stress and health*. 2012;28(4):340–346.

55. Miller DI, Halpern DF. The new science of cognitive sex differences. *Trends Cogn Sci.* 2014;18(1):37–45.

56. Lee MY, Chan CLW, Ng SM, et al. Integrative Body-Mind-Spirit Social Work: An Empirically Based Approach to Assessment and Treatment. Oxford: Oxford University Press. 2018.