

Do Females Learn Better Than Males? Gender Differences in Learning Values, Abilities, Emotions, and Behaviors for Chinese Undergraduates

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The purpose of this study is to test the gender differences in learning values, abilities, emotions, and behaviors for Chinese undergraduates. A total of 3,827 Chinese undergraduates were recruited from nine universities in China. Eight measures were used to assess students' learning values, abilities, emotions, and behaviors. Results showed that Chinese female undergraduates performed better than male undergraduates in these four aspects of learning psychology. Specifically, (1) Females paid more attention to learning value; (2) Females showed greater self-perceptions of abilities in learning self-regulation, learning strategy, and the use of learning conditions; (3) Females showed more creative learning emotion; and (4) Females were more engaged in learning and demonstrated less learning procrastination than did males. It is suggested that the superiority of learning mentalities for Chinese female undergraduates may be a state rather than a trait, and it may result from the gender differences in social development.

Keywords: learning mentalities, gender differences, learning values, learning abilities, learning emotions, learning behaviors, Chinese undergraduates

Introduction

The change of gender ratio in Chinese universities has attracted attention from researchers. In the 4th World Women University Presidents Forum (China, 2009), experts reported that the gender ratio in Chinese universities has changed with substantial growth in the percentage of females, and they stated that female undergraduates had attained greater academic achievements than males. The academic crisis of boys has been more obvious than that of girls, and even males performed poorer than females in academic achievements from primary school to university. It became obvious that over the past 10 years, in Chinese universities, females did better in learning than males (Li & Wei, 2009; Liu & Guo, 2016; Su & Ge, 2007; Yao & Tao, 2004; Zhang, 2016; Zhou & Sang, 2007). Does this fact reflect gender difference in internal learning values, abilities, emotions, and behaviors? Compared with students in primary and middle schools, these four aspects of learning mentalities of undergraduates are more mature and stable, and the gender differences are more obvious thereby having a more pronounced effect on their future vocation and life. Thus, exploring gender differences in the

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learning mentalities of Chinese undergraduates has become an important issue for the development of college teaching and for the social and economic development in China.

Learning mentalities refers to comprehensive psychological progresses involving cognition, emotion, and behavior in learning activities (Liu, 2012) and is a significant factor for students' academic achievements. Learning mentalities includes (1) learning values, (2) ability, (3) emotion, and (4) behavior. These four aspects were examined to explore the gender difference in undergraduates' learning mentalities. Previous studies explored the gender differences of only one or two of the learning psychological factors. For instance, Wang, Zhang, and Fu (2010) found that Chinese male undergraduates show a higher level of learning burnout than do females. A study by Qin (2008) showed that female undergraduates pay more attention to the teacher's attitudes, and positively respond to a teacher's questions. Wang's study (2005) found that Chinese female undergraduates performed better than males in learning adaption including more positive attitude towards learning, better adaption of new learning context, better adaption of new learning circumstances, and better adaption of new teaching methods. A review of previous studies on gender difference in Chinese undergraduates' academic achievements over the past 30 years revealed that in 1980s Chinese male undergraduates reported better academic achievements, while in the 1990s these differences and the gap between male and female academic achievement gradually began to close (Lan, 2016; Yao & Tao, 2004; Zeng, Yang, Rao, & Wu, 2009). However, starting in the 2000s, females obtained higher academic achievements and this has continued to increase in recent years (Lan, 2016; Yao & Tao, 2004; Zeng et al., 2009). This underscores the need to explore the reasons for the change of gender difference in the academic achievements of undergraduates and how a change of learning psychology is reflected in this variance.

For our study, we tested the gender difference in terms of learning values, ability, emotion, and behavior using a substantial test sample of 3,827 Chinese undergraduates. Undergraduates' learning motivation was measured by the Undergraduates' Learning Value Questionnaire (ULVQ), in that learning values is an important learning motivation for Chinese undergraduates. Undergraduates' learning ability was measured in three aspects: (1) learning regulation ability, (2) learning strategy, and (3) the use of learning conditions. We tested undergraduates' learning emotion in both creative learning emotion and learning burnout, and also the learning behavior in both learning engagement and learning procrastination.

Method

Participants

The survey was performed via an anonymous method in a whole class survey environment. A total of 3,827 Chinese undergraduates were recruited from 9 different types of universities in China including a comprehensive university, science and emerging university, university of medicine, and an agriculture and forestry university. Responses from a total of 3,563 participants were collected, which accounted for 93.1% of the total. Of the 3,563 participants, they presented with a mean age of 19.7 years ($SD = 2.1$, ranging from 18 to 22 years). There were 1,581 males (44.4%), and 1,982 females (55.6%). Written informed consent was obtained from each participant and his/her teacher. All procedures of this study were approved by the Academic Ethic Committee of Fujian Normal University.

Measures

Learning cognition. The Chinese undergraduates' learning cognition was measured with a self-developed

Undergraduates' Learning Value Questionnaire (ULVQ). The ULVQ includes 17 items, involving 3 factors: (1) personal development, (2) utilitarian, and (3) responsibility. All items were rated on a 5-point Likert scale ranging between 1 = "Full disagreement" and 5 = "Full agreement". In the study, internal consistency was 0.89, and its split-half reliability was 0.86.

Learning abilities. The Chinese undergraduates' learning abilities were revealed using three aspects that included: (1) learning regulation ability, (2) learning strategy, and (3) the use of learning conditions. The learning regulation ability was measured with a self-developed Undergraduates' Learning Regulation Abilities Questionnaire (ULRAQ). The ULRAQ consists of 34 items, including three factors: (1) knowledge acquiring and applying ability, (2) self-regulation ability in learning, and (3) regulation and application ability of learning resources. All the items were rated on a 5-point Likert scale ranged from 1 = "Full disagreement" to 5 = "Full agreement" with the higher scores indicating better learning abilities. In this study, internal consistency was 0.94, and its split-half reliability was 0.88.

The learning strategy was measured with the self-developed Undergraduates' Learning Strategy Questionnaire (ULSQ). This questionnaire consists of 18 items, with the two factors being: (1) meta-cognitive strategy, and (2) cognitive strategy. All items were rated on a 5-point Likert scale ranging between 1 = "Full disagreement" and 5 = "Full agreement", and higher scores indicate better learning strategy. In this study, internal consistency was 0.95, and its split-half reliability was 0.86.

The use of learning conditions for Chinese undergraduates was measured with a self-developed Undergraduates' Use of Learning Conditions Questionnaire (UULCQ). This questionnaire consists of 9 items, with the two factors being: (1) external learning conditions, and (2) internal learning resources. All items were rated using a 5-point Likert scale ranging between 1 = "Full disagreement" and 5 = "Full agreement" where higher scores indicate the better use of learning conditions. In this study, internal consistency was 0.87, and its split-half reliability was 0.80.

Learning emotions. The Chinese undergraduates' learning emotions were revealed from both emotions relating to creative learning and academic burnout. The emotions relating to creative learning were measured with a self-developed Undergraduates' Creative Learning Emotion Questionnaire (UCREQ). The UCREQ consists of 21 items that tested 4 factors which include: (1) positive high-arousal, (2) positive low-arousal, (3) negative high-arousal, and (3) negative low-arousal. All items were rated on a 5-point Likert scale ranging between 1 = "Full disagreement" and 5 = "Full agreement". In this study, internal consistency was 0.85, and its split-half reliability was 0.82.

The Chinese Undergraduates' academic burnout was measured with a self-developed Undergraduates' Academic Burnout Questionnaire (UABQ) which consists of 20 items, involving 3 factors: (1) emotional turn down, (2) behavioral unsuitableness, and (3) low personal accomplishment. All items were rated on a 5-point Likert scale ranging between 1 = "Full disagreement" and 5 = "Full agreement" wherein higher scores indicate a higher level of academic burnout. In this study, internal consistency was 0.87, and its split-half reliability was 0.78.

Learning behaviors. The Chinese undergraduates' learning behaviors were revealed from both learning engagement and learning procrastination. Learning engagement was measured with a self-developed Undergraduates' Learning Engagement Questionnaire (ULEQ) which consists of 17 items, involving 3 factors: (1) behavioral engagement, (2) cognitive engagement, and (3) emotional engagement. All items were rated on a 5-point Likert scale ranging between 1 = "Full disagreement" and 5 = "Full agreement" with the higher scores

indicating a higher learning engagement. In this study, internal consistency was 0.82, and its split-half reliability was 0.76.

Learning procrastination was measured with a self-developed Undergraduates' Learning Procrastination Questionnaire (ULPQ) which consists of 16 items, involving 4 factors: (1) level of learning procrastination, (2) troubles relating to procrastination, (3) hope for eliminating procrastination, and (4) emotions relating to procrastination. In this study, internal consistency was 0.89, and its split-half reliability was 0.83.

Statistics Analysis

Statistical analysis was conducted using SPSS 17.0. The conditions of Chinese undergraduates' learning psychologies were recounted as means and standard deviations. The differences in conditions of learning psychologies between males and females were analyzed using the independent-sample *t*-test.

Results

Gender Difference in Learning Values

There were significant differences between Chinese male and female undergraduates in terms of the total score of ULVQ, personal development, utilitarian, and responsibility. The female undergraduates scored significantly higher than did males in the totals of ULVQ, personal development, utilitarian, and responsibility (see Table 1).

Table 1

The Difference Between Chinese Male Undergraduates and Females in Learning Values (M ± SD)

	Males (n = 1581)	Females (n = 1982)	<i>t</i>	<i>d</i>
The total score of ULVQ	3.14 ± 0.24	3.29 ± 0.42	-12.64***	-0.26
Personal development	3.02 ± 0.24	3.86 ± 0.23	-106.23***	-1.74
Utilitarian	3.33 ± 0.28	3.60 ± 0.53	-18.32***	-0.42
Responsibility	2.83 ± 0.98	2.73 ± 0.48	3.98***	0.12

Note. *** $p < 0.001$.

Gender Difference in Learning Abilities

Table 2

The Difference Between Chinese Male Undergraduates and Females in Learning Abilities (M ± SD)

	Males (n = 1581)	Females (n = 1982)	<i>t</i>	<i>d</i>
The total score of ULRAQ	3.24 ± 0.43	3.30 ± 0.43	4.14***	-0.09
Knowledge Acquiring and Applying Ability	3.22 ± 0.51	3.18 ± 0.49	2.38**	0.06
Self-Regulation Ability in learning	3.23 ± 0.45	3.31 ± 0.47	-5.14***	-0.12
Regulation and Application Ability of Learning Resources	3.25 ± 0.51	3.35 ± 0.48	-6.01***	-0.14
The total score of ULSQ	3.22 ± 0.48	3.95 ± 0.64	-37.68***	-0.97
Meta-Cognitive Strategy	3.21 ± 0.64	3.92 ± 0.65	-32.61***	-0.88
Cognitive Strategy	3.16 ± 0.52	3.99 ± 0.75	-37.41***	-1.03
The total score of UULCQ	2.83 ± 0.55	3.45 ± 0.62	-31.17***	-0.81
External Learning Conditions	3.37 ± 0.43	3.91 ± 0.34	-41.86***	-0.88
Internal Learning Resources	2.67 ± 0.22	3.27 ± 0.74	-31.16***	-0.84

Notes. ** $p < 0.01$, *** $p < 0.001$.

The Chinese female undergraduates' total score for ULRQA, ULSQ, and UULCQ, and their sub-factors were significantly higher than males (see Table 2).

Gender Difference in Learning Emotions

The Chinese female undergraduates scored significantly higher than males in the Positive High-Arousal and Negative Low-Arousal (see Table 3).

Table 3

The Difference Between Chinese Male Undergraduates and Females in Learning Emotions (M ± SD)

	Males (n = 1,581)	Females (n = 1,982)	t	d
The total score of UCREQ	-	-		
Positive High-Arousal	3.48 ± 0.61	3.65 ± 0.61	-8.26***	-0.22
Positive Low-Arousal	3.36 ± 0.70	3.34 ± 0.64	0.89	0.02
Negative High-Arousal	2.98 ± 0.63	3.01 ± 0.59	-1.46	-0.04
Negative Low-Arousal	3.09 ± 0.67	3.03 ± 0.65	2.70***	0.07
The total score of UABQ	2.81 ± 0.78	2.79 ± 0.79	0.76	0.02
Emotional Turndown	2.75 ± 0.76	2.71 ± 0.65	1.69	0.05
Behavioral Unsuitableness	2.95 ± 0.73	2.93 ± 0.64	0.87	0.02
Low Personal Accomplishment	2.67 ± 0.68	2.69 ± 0.57	-0.95	-0.03

Note. *** $p < 0.001$.

Gender Difference in Learning Behaviors

There were significant differences between Chinese male and female undergraduates in the total score of ULEQ and ULPQ, as well as in their sub-factors. The females scored significantly higher than males in these factors (see Table 4).

Table 4

The Difference Between Chinese Male Undergraduates and Females in Learning Behaviors (M ± SD)

	Males (n = 1,581)	Females (n = 1,982)	t	d
The total score of ULEQ	2.70 ± 0.38	3.29 ± 0.86	-25.37***	-0.73
Behavioral Engagement	2.92 ± 0.22	3.39 ± 0.45	-38.06***	-0.80
Cognitive Engagement	3.10 ± 0.35	3.39 ± 0.45	-13.17***	-0.46
Emotional Engagement	2.58 ± 0.73	3.10 ± 0.33	-28.30***	-0.73
The total score of ULPQ	3.13 ± 0.18	3.73 ± 0.43	-51.97***	-1.06
Level of Learning Procrastination	2.21 ± 0.56	2.60 ± 0.83	-16.00***	-0.46
Troubles relating to Procrastination	2.87 ± 0.82	3.54 ± 0.54	-30.99***	-0.82
Hope for Eliminating Procrastination	3.20 ± 0.76	3.91 ± 0.64	-30.26***	-0.85
Emotions relating to Procrastination	3.23 ± 0.31	3.67 ± 0.56	-28.01***	-0.66

Note. *** $p < 0.001$.

Discussion

Did Chinese Female Undergraduates Show Better in All Aspects of Learning Mentalities?

We explored the gender differences in four aspects including learning values, abilities, emotions, and behaviors. Our results revealed that: (1) Chinese females scored a higher level of the learning values than males, specifically, females paid more attention to their personal development, utilitarian, and responsibility; (2)

Females presented with better learning abilities than males as females enjoyed better ability of learning self-regulation, learning strategies, and abilities of using learning conditions than did the males; (3) Females showed a more positive high-arousal and less negative low-arousal in creative learning emotion when compared with males; and (4) Females manifested more learning engagement but less learning procrastination than the males. These results showed that Chinese females manifested better in all the tested aspects of learning mentalities than did the males.

Was it a State or a Trait That Chinese Females Showed Better in Learning?

Previous studies have reported female superiority in verbal abilities and in manifesting more sensitivity in emotional reactions; whereas males generally do better in spatial intelligence and mathematical ability and tend to show more aggression than do females (Makel, Wai, Peairs, & Putallaz, 2016; Meneghetti, Labate, Grassano, Ronconi, & Pazzaglia, 2014; Skagerlund & Träff, 2016; Yeo et al., 2016). Androgyny theory proposes that both genders access both female and male traits, and that both genders share a commonality rather than differences (Lenney, 1991; Van Gundy, 2014). Observation of social development in recent decades has revealed that the gender differences tend to be unisex.

In other words, there can be a tendency toward masculinity of females and an inclination of femininity by males (Arrindell et al., 2003; Leszczynski, 2009; Navarro, Flores, Lee, & Gonzalez, 2014). Thus, it is proposed that the superior learning performance of Chinese female undergraduates may be a state condition rather than a female trait.

First, gender differences noting in traits should be root of early human development. However, the current gender differences in learning mentalities for Chinese undergraduates have only become apparent in the past ten years; therefore, it is not a constant, frequent or long-time existing trait. The gender differences mainly manifested in that females pay more attention to learning, display more positive emotional reactions to learning, and possess a greater learning aptitude than that of males. These differences only reflected that the females show more comprehension, carefulness, and endurance in learning (Li & Wei, 2009).

Second, androgyny theory proposes that both males and females enjoy the trait of learning well; however, neither gender manifests an obvious trait of superiority in learning (Yu & Xie, 2008). The greater academic achievement of males at the time did not prove that males possess a superior trait in learning; nor does the current phenomenon of females reporting greater academic achievement proffer proof of female superiority. Neither males nor females showed significant differences in the psychological trait related to learning. The current statement that Chinese female undergraduates learn better than males may be explained by the present-day non-different parenting expectation of females and males (Hu & Wang, 2009), which has resulted from an improvement in the socio-economic status of Chinese females, modern civilization, and the only-one child policy (Chen & Liu, 2012). The current non-different parenting expectation for both male and female children has lead Chinese females to develop with more motivation for pursuing greater academic achievements.

Furthermore, the trend of unisex development may indicate that human gender civilization has entered a new stage in which people are freer from self-physiological constraints and whereby females, in particular, reap greater benefits. Males may show less ability to adapt to the current social conditions due to diminished male-dominated effects. This trend may explain why Chinese female undergraduates show better than males in learning mentalities. Females not only mature physiologically earlier but they also achieve better psychological

development in response to the unisex and androgyny progresses, which lead females to show more positive psychological states than males. The female undergraduates' positive attitude towards the learning psychologies was consistent to the teaching models in Chinese universities, which focus more on comprehension, memory, assessments of students' academic achievements by pen and paper test, and teaching requirements of uniformity.

Did the State Result From Cognitive Development or Social Development?

Previous research on psychological development revealed that gender differences were obvious in social development but not obvious in cognitive development. Due to a difference in parenting attitudes and earlier maturity, the social development for Chinese females was better than males in childhood, and these differences became more obvious in adolescence. The gender difference in social development manifests specifically in that females are more sensible, more realistic when considering their future, and more likely to access additional resources for facilitating their development. Thus, the state of Chinese female undergraduates' better learning performance reflected more on social development rather than cognitive development.

This State Was Problem or Developmental?

The current situation, which Chinese female undergraduates manifesting better learning psychology as well as obtaining greater academic achievements, maybe developmental rather than problem. As androgyny theory proposes that males and females enjoy more commonality than differences, there should be no significant difference in the learning ability of either gender (Lenney, 1991). However, in the past, due to patriarchal ideology, social circumstances, and low productivity level, Chinese male undergraduates achieved more academically than did females. In recent years these social elements have changed and as a result females have made greater progress in learning (Li & Wei, 2009).

Whether the State Was Negligible or Should be Given More Attention?

Although the superiority of either males or females in learning should not become a social normality, in recent years the higher achievements in academic learning for Chinese female undergraduates has influenced the social circumstances and developments in China. The "Sheng Nu" (leftover Women) group has resulted from high education level and income level. More attention should be given to Chinese male undergraduates with social delay; these students need assistance from parents, universities, and society. Specifically, the parents of these students should attempt to cultivate a sense of masculinity in these boys as well as develop attributes such as boldness, an enterprising attitude, and a serious desire for continued learning. Universities should make efforts to contribute to and improve the social abilities of males; this could include teaching them to be more patient, careful, and peaceable when dealing with social issues as well as their personal problems, improving their speech ability and communication intelligence, and cultivating a cooperative, communicative, and realistic attitude toward learning. Moreover, society in general could help males form more positive attitudes towards the malepowercultureandfeministculture.

Conclusion

Chinese female undergraduates presented better in all four aspects of learning psychology: (1) Females paid more attention to learning values; (2) Females showed greater abilities in learning self-regulation, learning strategy, and the use of learning conditions; (3) Females demonstrated more creative learning emotion; and (4) Females were more engaged in learning as well as showed less learning procrastination than did the males. The

superiority of Chinese female undergraduates in learning psychology may be a state, and it may result from the gender difference in social development.

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