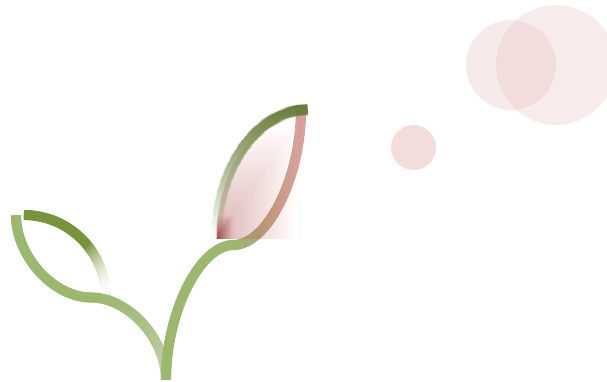


Comparison of Attitudes toward Science by Child-Rearing Attitude of Parents Perceived and Sex-Role Identity by Female Students

Developed at 2010 EASE Summer School
National Taiwan Normal University
Taipei, Taiwan
July 18~23, 2010

Yang-Hee Choi, Ewha Womans University



■ ■ ■ ■ ■ ■ ■ ■

Comparison of Attitudes Toward Science by Child-rearing Attitude of Parents Perceived by Female Students and Sex-role Identity

Choi, Yang-Hee & Kim, Sung-Won

Ewha Womans University

Korea



이화여자대학교
EWHHA WOMANS UNIVERSITY

Introduction (1)

- In results of TIMSS and PISA, our nation is one of the nations to taking biggest gender gap of science achievement(M. K. Lee et al., 2004).
- Students in later grades had a lager gender gap in science achievement than those in earlier grades, the cause of gender gap is social factors rather than biological factors.
- Gender gap in science was made worse due to the parents' different expectation about fixing gender role for their sons and daughters(K. H. Choi, 2003).



Introduction (2)

Child-rearing Attitude

- attitude of parents' parenting and teaching & tendency and reaction toward behavior
- attitude and behavior with affecting to intellectual and affective characteristics by caregivers' intention

Sex-role Identity

- to determine the gender characteristic behavior of individual through internalizing with standards of gender-role stereotypes
- deeming appropriate characteristic and attitude to sex in society

Attitude Toward Science

- attitude toward object related science that is science, scientist and scientific occupation



Introduction (3)

4-Types of Sex-Role Identity(Bem, 1984)

Androgyny type

Having both a high level of state of masculinity and femininity

Masculinity type

Having a high level of state of masculinity and a low level of state of femininity

Femininity type

Having both a high level of state of femininity and a low level of state of masculinity

Undifferentiated type

Having both a low level of state of masculinity and femininity



Method (1) - participants

Participants

- 374 female students of middle school and high school in Seoul and Gyeonggi-do

grade	7th	8th	10th	11th
number	64	71	89	150



Method (2) - measures 1

Measures

Child-rearing Attitude: M. Y. Hur(2000)'s scale

<Parenting Behavior Inventory Perceived by Adolescent>

- 4-point likert
- factor: monitoring, reasoning, inconsistency, over-expectation, intrusiveness, physical abuse, neglect, affection

Sex-role Identity: J. K. Jung(1999)' s scale

<Korean Sex Role Inventory: KSRI>

- 5-point likert
- type: androgyny, masculinity, femininity, undifferentiated



Method (3) - measures 2

Measures

Attitude toward science:

S. Y. Choi, S. Y. Kim and S. W. Kim(2007)'s scale

<Instruments to Assess Attitudes Toward Science of Students>

- 4-point likert
- factor

Cognition about value of science	Affection toward science & science learning	Cognitive participation in science learning
-academic/vocational value -social value -individual value	-general affection toward science -self-concept toward science learning - anxiety toward science learning -enjoyment toward science learning -self-efficacy toward science learning	-participation in scientific activities

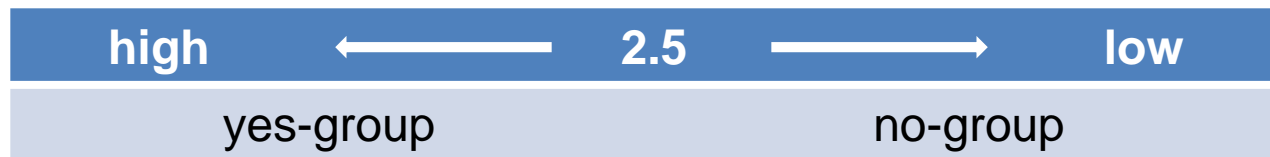


Method (4) - data analysis 1

Data Analysis

❖ t-test of attitude toward science by parents' child-rearing attitude

- 8-factors(monitoring, reasoning, inconsistency, over-expectation, intrusiveness, physical abuse, neglect, affection) of father's & mother's child-rearing attitudes were separated 2-groups.
- Median of 4-point likert is 2.5 point



- independent variables: parents' child-rearing attitude(2-groups)
dependent variables: attitude toward science
⇒ **t-test**



Method (5)- data analysis 2

Data Analysis

❖ one-way ANOVA of attitude toward science by sex-role identity

- 374 participants were separated 4-groups by sex-role identity score.
- Acquiring masculinity score's median was 62 point and femininity score's median was 64.
- independent variables: 4-groups of sex-role identity
dependent variables: attitude toward science

⇒ **one-way ANOVA**

	masculinity score	
	high ← 62 → low	
femininity score ↑ 64 ↓	androgyny type	femininity type
	masculinity type	undifferentiated type



Result (1) - attitude toward science by parents' child-rearing attitude

• Result of t-test of attitude toward science by father's child-rearing attitude

		monitoring		reasoning		inconsistency		over-expectation		intrusiveness		physical abuse		neglect		affection	
		yes	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes	no
S I	M (SD)	2.84 (.56)	2.53 (.56)	2.83 (.56)	2.76 (.56)	2.78 (.56)	2.82 (.56)	2.87 (.57)	2.76 (.55)	2.82 (.57)	2.81 (.56)	2.66 (.54)	2.81 (.56)	2.71 (.60)	2.82 (.55)	2.82 (.57)	2.73 (.51)
	t	1.639		1.205		-.714		1.802		.278		-1.186		1.156		1.209	
	p	.102		.229		.475		.072		.781		.236		.248		.228	
S II	M (SD)	2.32 (.61)	2.19 (.56)	2.32 (.59)	2.21 (.60)	2.31 (.62)	2.27 (.59)	2.35 (.58)	2.22 (.60)	2.25 (.59)	2.29 (.60)	2.03 (.60)	2.29 (.59)	2.26 (.52)	2.28 (.60)	2.30 (.60)	2.20 (.59)
	t	1.882		1.573		-1.237		2.079		-.542		-1.452		-.203		1.067	
	p	.061		.088		.217		.038*		.588		.147		.839		.287	
S III	M (SD)	2.09 (.71)	1.91 (.70)	2.06 (.69)	2.00 (.75)	2.12 (.71)	2.00 (.71)	2.16 (.67)	1.94 (.72)	2.01 (.73)	2.05 (.70)	1.89 (.80)	2.05 (.70)	2.12 (.69)	2.03 (.71)	2.04 (.71)	2.02 (.72)
	t	2.158		.953		1.407		3.096		-.473		-.914		.744		.220	
	p	.032*		.341		.160		.002**		.637		.361		.458		.826	
ST	M (SD)	2.47 (.54)	2.34 (.51)	2.46 (.53)	2.37 (.54)	2.44 (.52)	2.43 (.54)	2.50 (.52)	2.37 (.53)	2.41 (.54)	2.44 (.53)	2.25 (.52)	2.44 (.53)	2.40 (.48)	2.43 (.54)	2.44 (.54)	2.46 (.51)
	t	2.063		1.624		.297		2.381		-.309		-1.452		-.421		1.118	
	p	.040*		.105		.766		.018*		.758		.147		.674		.264	

*p<.05, **P<.01, ***p<.001



S I : Cognition about value of science. S II : Affection toward science & science learning. S III : Cognitive participation in scientific activities. ST: Total on attitude toward science.

Result (2) - attitude toward science by parents' child-rearing attitude

- Result of t-test of attitude toward science by mother's child-rearing attitude

		monitoring		reasoning		inconsistency		over-expectation		intrusiveness		physical abuse		neglect		affection	
		yes	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes	no
S I	M (SD)	2.83 (.56)	2.62 (.57)	2.83 (.55)	2.77 (.59)	2.79 (.58)	2.82 (.55)	2.83 (.56)	2.79 (.56)	2.82 (.55)	2.80 (.57)	2.81 (.48)	2.81 (.57)	2.78 (.76)	2.81 (.54)	2.83 (.56)	2.68 (.55)
	t	2.229		.906		-.377		.724		.361		.046		-.212		1.639	
	p	.026*		.366		.706		.469		.719		.963		.834		.102	
S II	M (SD)	2.29 (.60)	2.16 (.59)	2.28 (.60)	2.28 (.59)	2.31 (.58)	2.26 (.61)	2.33 (.56)	2.23 (.63)	2.28 (.59)	2.28 (.60)	2.03 (.60)	2.29 (.59)	2.42 (.41)	2.27 (.61)	2.28 (.60)	2.26 (.60)
	t	1.272		.100		.760		1.578		-.116		-.036		1.673		.315	
	p	.204		.920		.448		.115		.908		.971		.105		.753	
S III	M (SD)	2.06 (.70)	1.80 (.67)	2.04 (.70)	2.04 (.73)	2.13 (.73)	1.99 (.69)	2.16 (.69)	1.91 (.70)	2.09 (.73)	2.00 (.69)	2.06 (.66)	2.04 (.71)	2.22 (.64)	2.03 (.71)	2.04 (.70)	2.02 (.76)
	t	2.172		-.106		1.752		3.512		1.237		.151		1.299		.168	
	p	.031*		.916		.081		.000***		.217		.880		.195		.866	
ST	M (SD)	2.45 (.53)	2.28 (.51)	2.44 (.53)	2.41 (.53)	2.45 (.54)	2.42 (.53)	2.45 (.51)	2.38 (.55)	2.44 (.53)	2.43 (.54)	2.43 (.48)	2.43 (.54)	2.52 (.48)	2.42 (.54)	2.44 (.54)	2.37 (.50)
	t	1.890		.363		.597		1.746		.236		.061		.829		.792	
	p	.060		.717		.551		.082		.814		.987		.407		.429	

*p<.05, **P<.01, ***p<.001



S I : Cognition about value of science. S II : Affection toward science & science learning. S III : Cognitive participation in scientific activities. ST: Total on attitude toward science.

Result (3) - attitude toward science by sex-role identity

- Result of one-way ANOVA of attitude toward science by sex-role identity

	Androgyny M(SD)	Masculinity M(SD)	Femininity M(SD)	Undifferentiated M(SD)	F	Scheffe
1	2.75(.74)	2.61(.74)	2.71(.87)	2.55(.74)	1.513	
2	3.30(.62)	3.27(.59)	3.21(.54)	3.16(.60)	1.200	
3	2.62(.72)	2.56(.73)	2.53(.80)	2.42(.74)	1.488	
4	2.26(.85)	2.20(.79)	2.20(.82)	2.00(.82)	2.941*	A>U *
5	2.16(.68)	2.10(.73)	2.02(.79)	1.86(.75)	3.386**	A>U *
6	2.67(.69)	2.55(.69)	2.43(.69)	2.40(.63)	3.887**	A>U *
7	2.52(.77)	2.36(.79)	2.38(.87)	2.18(.78)	3.432**	A>U *
8	2.49(.70)	2.38(.73)	2.12(.65)	2.16(.66)	6.646***	A>F *, A>U *
9	2.20(.74)	2.04(.72)	2.00(.66)	1.86(.65)	4.829**	A>U **
T	2.55(.52)	2.45(.53)	2.40(.58)	2.28(.49)	5.258**	A>U **

*p<.05, **P<.01, ***p<.001

1.academic/vocational value, 2.social value, 3.individual value, 4.general affection toward science, 5.self-concept toward science learning, 6.anxiety toward science learning, 7.enjoyment toward science learning, 8.self-efficacy toward science learning, 9. participation in scientific activities, T.total

Conclusion (1)

- Over-expectation factor was a negative influence on many research, but it was a positive influence on this research
 - ⇒ this reason may be that parents provided experiences and opportunities for their daughter
 - ⇒ Pygmalion effect
- In general, father's child-rearing attitudes are more influenced to attitudes toward science of female student, when compared to mother's child-rearing



Conclusion (2)

- There is no statistically significant difference to 4-type of sex-role identity in values of science as academic/vocational value, social value, and individual value ⇒ it has reflected that many people universally recognized value of science study
- There are statistically significant differences to 4-type of sex-role identity in the other factors of attitudes toward science, especially androgyny type female students had taken high score of attitudes toward science rather than undifferentiated type ⇒ Androgyny type is more influenced to attitudes toward science of female student

