

THE INFLUENCE OF EXTRAVERSION ON EMOTIONAL EXPRESSION: A MODERATED MEDIATION MODEL

YANXIA WU, JIAMEI LU, NIANQU CHEN, AND BIHUA XIANG
Shanghai Normal University

We developed a moderated mediation model to investigate both the mediating role of self-esteem in the relationship between extraversion and emotional expression, and the moderating effect of emotional intelligence on this mediating role, in a moderated mediation model. We used personality and emotional expression questionnaires, and self-esteem and emotional intelligence scales to survey 2,644 Chinese college students. Results showed that there was a significant positive correlation between extraversion and emotional expression and a partial mediating role of self-esteem between extraversion and emotional expression, and that the mediating role of self-esteem was moderated by emotional intelligence. Indirect effects were more significant in participants with high versus low emotional intelligence. Thus, the influence of extraversion on emotional expression was a moderated mediation effect. Theoretical guidance and practical implications for the cultivation of emotional expression in college students are discussed.

Keywords: extraversion, emotional expression, self-esteem, emotional intelligence, Chinese college students.

Emotional expression is defined as individuals' ability to communicate emotional states through nonverbal movements and gestures, including through the face (H. Riggio, 2017; R. Riggio, 1986). It also refers to observable verbal and nonverbal behaviors that convey emotional experience (Kennedy-Moore & Watson, 1999). Emotional expression is transmitted through social comparison (Friedman & Riggio, 1981), is essential for communication, social life, and survival (Kret, Jaasma, Bionda, & Wijnen, 2016), and is therefore regarded

Yanxia Wu, Jiamei Lu, Nianqu Chen, and Bihua Xiang, Counseling and Student Development Center, Education Science College, Shanghai Normal University.

Correspondence concerning this article should be addressed to Jiamei Lu or Nianqu Chen, Education Science College, Shanghai Normal University, 100 Gui Lin Road, Shanghai 200234, People's Republic of China. Email: lujiamei@vip.163.com or 110596445@qq.com

as a socially adaptive trait. Previous researchers have explored the effects of emotional expression on perceivers' judgments (Hassin, Aviezer, & Bentin, 2013), on processing fluency, attractiveness, and trustworthiness (Winkielman, Olszanowski, & Gola, 2015), and on relationships (Butler et al., 2003). However, as little is known about the factors that drive emotional expression, we examined individual factors that drive emotional expression (including verbal and nonverbal), namely, extraversion, self-esteem, and emotional intelligence.

Literature Review and Hypothesis Development

Prior researchers have found that personality plays an important role in promoting individual emotional expression. For example, Friedman (1979) suggested that there is a connection between emotional expression and personality traits such as extraversion, dominance, affiliation, and charisma (Friedman, Prince, Riggio, & DiMatteo, 1980). There is further evidence to suggest that extraversion predicts emotional expression (Gross & John, 1995), and that there is a significant overall positive relationship between extraversion and emotional expressiveness, regardless of the type of expressiveness measure (Riggio & Riggio, 2002). However, key questions, such as how and under what conditions extraversion plays a role in emotional expression, have not been answered in these studies.

Previous researchers have also found that self-esteem is significantly positively correlated with emotional expression (Gray & Heatherington, 2003; Zeng & Zhang, 2012). Repression of emotional expression is associated with negative self-esteem (King & Emmons, 1990), and the tendency to express positive emotions is associated with higher self-esteem, lower depression and anxiety, and greater emotional stability (Lin, Soi-Kawase, Narita-Ohtaki, Itoh, & Kim, 2016). *Extraverted* people are active and cheerful, and they like socializing and partying. They are likely to like themselves and have a high self-evaluation and confidence. Moreover, Dou, Wang, Bin, & Liu (2016) found that self-evaluation, including self-esteem, played a mediating role between self-efficacy and the expression of positive emotions. Therefore, we proposed the following hypothesis:

Hypothesis 1: Extraversion will directly affect emotional expression, and may indirectly influence emotional expression through self-esteem.

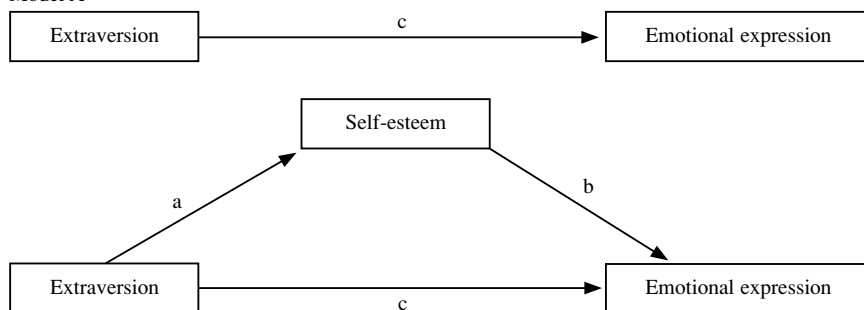
Although self-esteem may provide a mechanism by which extraversion influences emotional expression, it is unclear as to the context in which extraversion would have such a strong effect. Previous researchers have found that both emotional intelligence and personality variables affect the decoding of natural expressions of emotion (Edgar, McRorie, & Sneddon, 2012). Subsequent researchers have suggested that emotional intelligence has a strong positive

effect on self-esteem (Cheung, Cheung, & Hue, 2015) and that extraversion is positively correlated with many facets of emotional intelligence (Séguin & Hipson, 2016). Therefore, we proposed the following hypothesis:

Hypothesis 2: Emotional intelligence will moderate the indirect effect of extraversion on emotional expression through self-esteem.

In sum, we developed a moderated mediation model to examine the mediating role of self-esteem in the relationship between extraversion and emotional expression, and the moderation of this mediating role by emotional intelligence. The hypothetical model is shown as Model B in Figure 1.

Model A



Model B

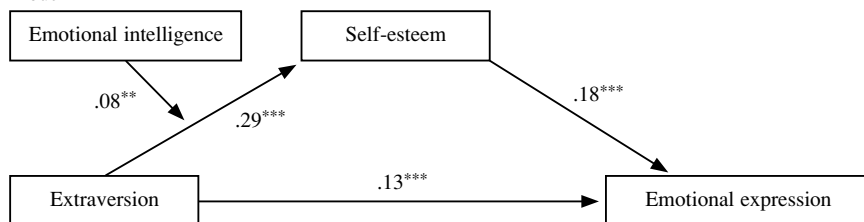


Figure 1. Mediation model (Model A) and moderated mediation model (Model B).

** $p < .01$, *** $p < .001$.

Method

Participants and Procedure

We used stratified random sampling to select students from 20 universities in 15 cities and provinces in China, with a range of socioeconomic statuses, to participate in this study. We obtained informed consent from the university

counselors and the students. The study and the consent procedure were approved by the Research Ethics Committee of Shanghai Normal University. We collected 2,644 valid questionnaires, which was 99.5% of the distributed questionnaires. Of the participants, 885 were men and 1,679 were women; 886 were freshmen, 1,026 were sophomores, 453 were seniors, and 267 were senior plus students. Of the participants, 1,199 were majoring in science and history, and 1,417 were majoring in science and technology. The mean age of the participants was 20.76 years ($SD = 1.62$).

Measures

Extraversion. We used the 85-item Eysenck Personality Questionnaire designed by Eysenck and Eysenck (1975) and adapted by Chen (1983) to measure extraversion. Of the four subscales, namely, extraversion, neuroticism, psychoticism, and lie, we used the 21-item extraversion subscale, which has yes/no answer options. A sample item is “Do you have a wide range of hobbies?” Cronbach’s α in this study was .83.

Emotional expression. We used the Questionnaire for College Students’ Emotional Expression designed by Wu (2017) to measure emotional expression. This 6-point, 15-item scale, for which good reliability and validity have been demonstrated, consists of three dimensions: adaptive, inhibitory, and excessive emotional expression. Confirmatory factor analysis results showed that each item loading was significant with the normalized load between .907 and .958, and that the three-factor model fitted well. A sample item of adaptive emotional expression is “If I feel unhappy because of my roommate using my things without my permission, I will calmly tell her/him not to do so.” Cronbach’s α in this study was .89.

Self-esteem. We used Rosenberg’s (1965) Self-Esteem Scale, translated and adapted by Ji and Yu (1993) to measure self-esteem. This is a 4-point, 10-item scale. A sample item is “I have a positive attitude towards myself.” Cronbach’s α in this study was .83.

Emotional intelligence. We used the Chinese version (Wang & Het, 2002) of Schutte et al.’s (1998) Emotional Intelligence Scale to measure emotional intelligence. This 5-point, 33-item scale consists of four dimensions: emotional awareness, emotional understanding, emotional regulation, and use of emotion. A sample item is “Other people find it easy to confide in me.” Cronbach’s α in this study was .88.

Control variables. Because previous researchers have shown that gender has a significant effect on emotional expression (Aslam, 2013; Panjwani, Chaplin, Sinha, & Mayes, 2016), we included gender as a control variable in the model.

Data Analysis

Each variable was standardized. We conducted all operations using SPSS PROCESS (version 2.1; Hayes, 2012) and analyzed all data using SPSS version 20.0.

Results

Common Method Variance

In this study, all measures of the variables were self-reported, which can lead to common method variance. Thus, we used the Harman single-factor test (Podsakoff, MacKenzie, Podsakoff, & Lee, 2003) to analyze all variables without rotating the exploratory factor. The results showed that there were 24 variables with a characteristic root greater than 1. The percentage of variance explained by the first factor was 11.29%, which was much lower than the threshold of 40%. The results showed that there was no obvious common method variance in this study.

Descriptive Statistics

Descriptive statistics ($M \pm SD$), and correlations among the variables are shown in Table 1. The correlation analysis showed correlations between the variables, and the magnitude and direction of the correlation coefficients were in line with our expectations.

Table 1. *Descriptive Statistics and Correlations Among Study Variables*

	Men ($M \pm SD$)	Women ($M \pm SD$)	1	2	3	4
1. E	0.58 ± 0.23	0.55 ± 0.22	1.00			
2. EI	3.68 ± 0.47	3.77 ± 0.36	.25**	1.00		
3. S-E	2.86 ± 0.48	2.92 ± 0.43	.29**	.40**	1.00	
4. EE	3.80 ± 0.81	4.10 ± 0.68	.13**	.34**	.20**	1.00

Note. $N = 2644$. E = extraversion, EI = emotional intelligence, S-E = self-esteem, EE = emotional expression. ** $p < .01$.

Mediating Effect of Self-Esteem

We conducted mediation analysis using PROCESS software (Hayes, 2012; Preacher & Hayes, 2004) to test whether or not self-esteem mediated the relationship between extraversion and emotional expression (see Model A in Figure 1). Gender was the covariant. All variables were standardized. Bootstrap estimates were based on 5,000 bootstrap samples. Statistical mediation results are reported in Table 2. The results indicated that self-esteem partially mediated the relationship between extraversion and emotional expression. Approximately 38% of the total effect was accounted for by the indirect effect.

Table 2. Summary of Mediation Results

Effect of E on S-E		Effect of S-E on EE		Total effect		Direct effect		Indirect effect	
<i>B</i> (<i>SE</i>)	95% CI	<i>B</i> (<i>SE</i>)	95% CI	<i>B</i> (<i>SE</i>)	95% CI	<i>B</i> (<i>SE</i>)	95% CI	<i>B</i> (<i>SE</i>)	95% CI
0.29***	(0.02)	0.25	0.32	0.18***	(0.02)	0.14	0.22		
Effect of GD on S-E		Effect of GD on EE							
<i>B</i> (<i>SE</i>)	95% CI	<i>B</i> (<i>SE</i>)	95% CI						
0.15***	(0.04)	0.07	0.23	0.38***	(0.04)	0.30	0.46	0.13***	(0.02)
				0.09	0.17	0.08**	(0.02)	0.04	0.12
								0.05	(0.01)
									0.04
									0.07

Note. CI = confidence interval, E = extraversion, S-E = self-esteem, EE = emotional expression, GD = gender. Standard errors are shown in parentheses.
 ** $p < .01$ *** $p < .001$.

Table 3. Moderated Mediation Analysis Results with Self-Esteem as Mediator

Mediator variable model: DV = S-E					
Predictor	B	SE	t	p	95% CI
GD	0.06	0.04	1.50	.13	-0.02, 0.13
E	0.20	0.02	10.73	<.001	0.16, 0.23
EI	0.36	0.02	19.09	<.001	0.32, 0.40
E × EI	0.04	0.02	2.39	.02	0.01, 0.08
Dependent variable model: DV = EE					
Predictor	B	SE	t	p	95% CI
GD	0.39	0.04	9.70	<.001	0.31, 0.47
S-E	0.18	0.02	8.76	<.001	0.14, 0.22
E	0.08	0.02	4.07	<.01	0.04, 0.12
Conditional indirect effect at specific values of emotional intelligence: DV = S-E					
	B	SE	95% CI		
-1 SD (-0.98)	0.03	0.01	0.02, 0.04		
M (0.02)	0.03	0.01	0.02, 0.05		
+1 SD (1.00)	0.04	0.01	0.03, 0.06		

Note. CI = confidence interval, DV = dependent variable, S-E = self-esteem, GD = gender, E = extraversion, EI = emotional intelligence, EE = emotional expression.

Moderating Effect of Emotional Intelligence

We examined whether or not the strength of the mediated relationships was contingent on emotional intelligence. Specifically, we tested whether or not emotional intelligence moderated the effect of extraversion on self-esteem in the mediation models (see Model B in Figure 1). Our moderated mediation analysis followed Preacher and Hayes' (2004) guidelines. All variables were standardized and gender was the covariant. The analysis results are shown in Table 3.

To understand the moderating effect, we conducted simple effect analysis (Aiken & West, 1994). For extraversion and self-esteem, the mean emotional intelligence plus or minus one standard deviation were considered to draw a simple effect analysis (see Figure 2).

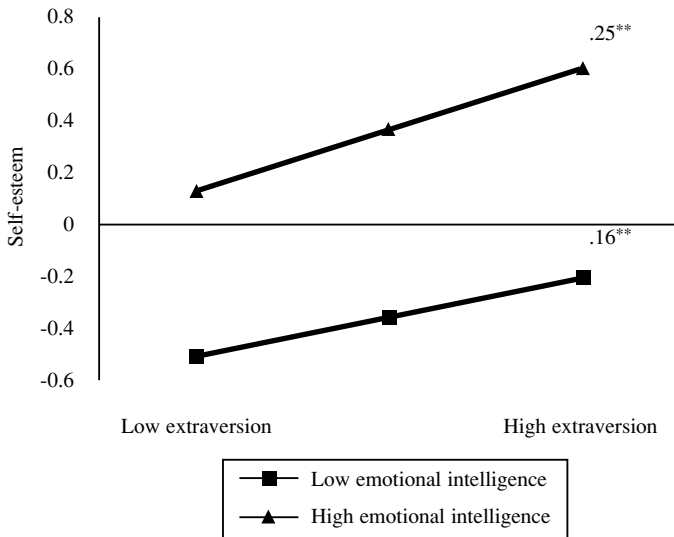


Figure 2. Moderating effect of emotional intelligence on the prediction of self-esteem.

Discussion

We examined the relationships among extraversion, emotional expression, self-esteem, and emotional intelligence in Chinese college students. We found that extraversion influenced emotional expression, and was positively correlated with self-esteem and emotional intelligence, which is consistent with previous findings (Edgar et al., 2012; Zeng & Zhang, 2012). In contrast to previous researchers (Gross & John, 1995; Riggio & Riggio, 2002), we expanded on the influence of extraversion on emotional expression by examining a moderated mediation model.

We validated the mediating role of self-esteem between extraversion and emotional expression, which is consistent with previous findings (Dou et al., 2016). This is important because personality is a relatively stable trait, and is not easily changed in the short term (McCrae et al., 2000). In contrast, self-esteem is a dynamic process and much more open-ended (Mruk, 2013). It is not easy for introverted college students to change their personality traits in the short term. However, it is possible for them to enhance their emotional expression indirectly by improving their level of self-esteem, and thus possibly become more willing to express their emotions. This would be beneficial as emotional expression promotes interpersonal communication (Butler et al., 2003), social interaction (Pennebaker & Graybeal, 2001), and self-confidence (Lin et al., 2016).

In our hypothesized model, the moderating role of emotional intelligence showed that extraversion positively predicted self-esteem, and the greater the emotional intelligence, the higher the self-esteem, and vice versa. Emotional intelligence further facilitates extraverted individuals to express their emotions. Therefore, an improvement in the self-esteem and emotional intelligence of college students would indirectly improve their emotional expression. Further, the relationship can work in reverse: An improvement in emotional expression can increase extraversion and sociability levels. For example, people have found that writing about emotional topics has improved their physical health, promoted cognitive change, and led to healthier behavior and improved social interaction and relationships (Pennebaker & Graybeal, 2001).

Thus, educational practitioners should pay attention to cultivating extraversion, improving self-esteem, and increasing the emotional intelligence of college students. Emotional intelligence, for example, can be enhanced through group psychological counseling (Tang, Zhang, & Liu, 2013).

There are some limitations in this study. First, causality cannot be established in cross-sectional research. Future researchers should use longitudinal or experimental research designs to explore other models, such as the influencing mechanism of emotional expression on personality or a relationship. Second, as participants comprised adult college students only, whether or not the results are generalizable to children and adolescents remains to be investigated. Third, we investigated only the impact of college students' individual factors on emotional expression. Familial and situational factors should be investigated in future studies. Fourth, our data were self-reported. Future researchers may consider the use of symbols in modern and electronic communications, including emoticons (an image of a facial expression). Finally, as previous researchers have found cultural differences between Eastern and Western countries (Sims, et al., 2015; Zhou, 2013), future researchers may consider cross-cultural research based on this model.

Nevertheless, we have provided a solid basis for the moderated mediation relationship between extraversion and emotional expression among college students, and our findings are of practical significance.

References

- Aiken, L. S., & West, S. G. (1994). Multiple regression: Testing and interpreting interactions. *Journal of the Operational Research Society*, *45*, 119–120.
- Aslam, N. (2013). Attachment styles as a predictor of emotional expression among depressed and non-depressed individuals. *Journal of Behavioural Sciences*, *23*, 102–117.
- Butler, E. A., Egloff, B., Wilhelm, F. H., Smith, N. C., Erickson, E. A., & Gross, J. J. (2003). The social consequences of expressive suppression. *Emotion*, *3*, 48–67. <https://doi.org/dgqmb6>
- Chen, Z. (1983). Item analysis of Eysenck Personality Questionnaire tested in a Beijing district. *Acta Psychologica Sinica*, *15*, 211–218.
- Cheung, C.-K., Cheung, H. Y., & Hue, M.-T. (2015). Emotional intelligence as a basis for self-esteem in young adults. *The Journal of Psychology*, *149*, 63–84. <https://doi.org/cgkv>
- Dou, K., Wang, Y.-J., Bin, J. L., & Liu, Y.-Z. (2016). Core self-evaluation, regulatory emotional self-efficacy, and depressive symptoms: Testing two mediation models. *Social Behavior and Personality: An international journal*, *44*, 391–400. <https://doi.org/f8hpcq>
- Edgar, C., McRorie, M., & Sneddon, I. (2012). Emotional intelligence, personality and the decoding of non-verbal expressions of emotion. *Personality and Individual Differences*, *52*, 295–300. <https://doi.org/bxm5f4>
- Eysenck, H., & Eysenck, S. (1975). Manual of the Eysenck Personality Questionnaire. *Journal of Cardiac Failure*, *20*, S67.
- Friedman, H. S. (1979). The concept of skill in nonverbal communication: Implications for understanding social interaction. In R. Rosenthal (Ed.), *Skill in nonverbal communication: Individual differences* (pp. 2–27). Cambridge, MA: Oelgeschlager, Gunn, & Hain.
- Friedman, H. S., Prince, L. M., Riggio, R. E., & DiMatteo, M. R. (1980). Understanding and assessing nonverbal expressiveness: The Affective Communication Test. *Journal of Personality and Social Psychology*, *39*, 333–351. <https://doi.org/b84cbd>
- Friedman, H. S., & Riggio, R. E. (1981). Effect of individual differences in nonverbal expressiveness on transmission of emotion. *Journal of Nonverbal Behavior*, *6*, 96–104.
- Gray, S. M., & Heatherington, L. (2003). The importance of social context in the facilitation of emotional expression in men. *Journal of Social and Clinical Psychology*, *22*, 294–314. <https://doi.org/b5fxfm>
- Gross, J. J., & John, O. P. (1995). Facets of emotional expressivity: Three self-report factors and their correlates. *Personality and Individual Differences*, *19*, 555–568. <https://doi.org/cks>
- Hassin, R. R., Aviezer, H., & Bentin, S. (2013). Inherently ambiguous: Facial expressions of emotions, in context. *Emotion Review*, *5*, 60–65. <https://doi.org/cgkz>
- Hayes, A. F. (2012). *PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling* [White paper]. Retrieved from <https://bit.ly/2B82gNB>
- Ji, Y. F., & Yu, X. (1993). Self-esteem scale. In X. D. Wang (Ed.), *Handbook of mental health rating scales* [In Chinese] (pp. 251–252). Beijing, China: Chinese Mental Health Journal.
- Kennedy-Moore, E., & Watson, J. C. (1999). *Expressing emotion: Myths, realities, and therapeutic strategies*. New York, NY: Guilford Press.

- King, L. A., & Emmons, R. A. (1990). Conflict over emotional expression: Psychological and physical correlates. *Journal of Personality and Social Psychology*, 58, 864–877. <https://doi.org/b3tnmr>
- Kret, M. E., Jaasma, L., Bionda, T., & Wijnen, J. G. (2016). Bonobos (*Pan paniscus*) show an attentional bias toward conspecifics' emotions. *Proceedings of the National Academy of Sciences of the United States of America*, 113, 3761–3766. <https://doi.org/cgk2>
- Lin, M., Soi-Kawase, S., Narita-Ohtaki, R., Itoh, M., & Kim, Y. (2016). Reliability and validity of a self-report emotional expressivity measure: The Japanese version of the Berkeley Expressivity Questionnaire. *Japan Journal of Nursing Science*, 13, 196–201. <https://doi.org/f8nt7k>
- McCrae, R. R., Costa, P. T., Jr., Ostendorf, F., Angleitner, A., Hřebíčková, M., Avia, M. D., ... Smith, P. B. (2000). Nature over nurture: Temperament, personality, and life span development. *Journal of Personality and Social Psychology*, 78, 173–186. <https://doi.org/cpkgq2>
- Mruk, C. J. (2013). Defining self-esteem as a relationship between competence and worthiness: How a two-factor approach integrates the cognitive and affective dimensions of self-esteem. *Polish Psychological Bulletin*, 44, 157–164. <https://doi.org/cgk3>
- Panjwani, N., Chaplin, T. M., Sinha, R., & Mayes, L. C. (2016). Gender differences in emotion expression in low-income adolescents under stress. *Journal of Nonverbal Behavior*, 40, 117–132. <https://doi.org/cgk4>
- Pennebaker, J. W., & Graybeal, A. (2001). Patterns of natural language use: Disclosure, personality, and social integration. *Current Directions in Psychological Science*, 10, 90–93. <https://doi.org/c7tkgt>
- Podsakoff, P. M., MacKenzie, S. B., Podsakoff, N. P., & Lee, J. Y. (2003). The mismeasure of man(agement) and its implications for leadership research. *The Leadership Quarterly*, 14, 615–656. <https://doi.org/cpwfjt>
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, and Computers*, 36, 717–731. <https://doi.org/gd3>
- Riggio, H. R. (2017). Emotional expressiveness. In V. Zeigler-Hill & T. K. Shackelford (Eds.), *Encyclopedia of personality and individual differences* (pp. 1–8). New York, NY: Springer International Publishing.
- Riggio, H. R., & Riggio, R. E. (2002). Emotional expressiveness, extraversion, and neuroticism: A meta-analysis. *Journal of Nonverbal Behavior*, 26, 195–218. <https://doi.org/c9bxwh>
- Riggio, R. E. (1986). Assessment of basic social skills. *Journal of Personality and Social Psychology*, 51, 649–660. <https://doi.org/fxcfrc>
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Schutte, N. S., Malouff, J. M., Hall, L. E., Haggerty, D. J., Cooper, J. T., Golden, C. J., & Dornheim, L. (1998). Development and validation of a measure of emotional intelligence. *Personality and Individual Differences*, 25, 167–177. <https://doi.org/fmng7j>
- Séguin, D. G., & Hipson, W. (2016). Unravelling the complex associations between emotional intelligence and personality in later childhood and early adolescence. *Early Child Development and Care*, 186, 1212–1226. <https://doi.org/cgk5>
- Sims, T., Tsai, J. L., Jiang, D., Wang, Y., Fung, H. H., & Zhang, X. (2015). Wanting to maximize the positive and minimize the negative: Implications for mixed affective experience in American and Chinese contexts. *Journal of Personality and Social Psychology*, 109, 292–315. <https://doi.org/f7p4kj>
- Tang, H. B., Zhang, S. J., & Liu, C. (2013). The effect of group psychological counseling on university students' emotional intelligence [In Chinese]. *China Journal of Health Psychology*, 21, 716–718.

- Wang, C. K., & He, Z. (2002). The relationship of parental rearing styles with general self-efficacy and emotional intelligence in middle school students [In Chinese]. *Chinese Mental Health Journal, 16*, 781–782, 785.
- Winkielman, P., Olszanowski, M., & Gola, M. (2015). Faces in-between: Evaluations reflect the interplay of facial features and task-dependent fluency. *Emotion, 15*, 232–242. <https://doi.org/f67cbb>
- Wu, Y. X. (2017). *A study on the current situation, influencing factors and intervention of college students' emotional expression* (Unpublished doctoral dissertation). Shanghai Normal University, Shanghai, China.
- Zeng, Y., & Zhang, L. C. (2012). Relationship among parenting styles, personality and self-esteem [In Chinese]. *China Journal of Health Psychology, 20*, 1556–1558.
- Zhou, W. J. (2013). Study on individual differences of emotional expression in senior high school students [In Chinese]. *Medical Journal of Chinese People's Health, 25*, 67–69.