

The relationship between visual perception and social skills in late adolescence

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Abstract

It is necessary to investigate how age or gender affects visual perception and social skills in late adolescence. A study on the relevance of visual perception in late adolescence, a period that requires social adaptation through the development of social functions, is necessary. The purpose of this study is to investigate the relationship between visual perception and social skills in adolescence. Visual perception and social skill were evaluated for 18-24-year-olds, who are in late adolescence, and were analyzed for gender differences and correlations with chronological age. This study found that there was a difference in visual perceptual function according to gender in late adolescence, and it was significantly higher in men. There was no significant difference in social skills according to gender. However, there was a significantly positive correlation between chronological age and visual perception, but there was no correlation with social skills. These findings provide novel information regarding the developmental course of visual perception and social skill in late adolescence.

Keywords: *adolescence; social skills; visual perception*

1. Introduction

Vision is an important sensory organ that helps us communicate with the surrounding people and environment, and visual perception is the ability to organize and interpret what the eyes see as a comprehensive process of receiving visual stimuli and processing cognitive elements [1,2]. Visual perception is a function of recognizing the external environment through the visual organs [3]. Visual perception is a decision-making process that involves converting and integrating information obtained from the environment through the eyes into a cognitive concept, enabling accurate judgment of size, shape, and spatial relationships between objects [4]. It is the ability to integrate previous experiences into higher-order cognitive functions [5], and plays an important role in human survival and adaptation [6]. Cognition refers to a series of complex thought processes that are learned from past experiences, and generate new ideas by applying what we know to the surrounding environment [7,8]. According to classification of characteristics into complementary cognitive and noncognitive categories, cognitive skills involve achievement-oriented tasks, such as problem solving and academic abilities, which are measured by achievement tests; the noncognitive category covers everything else, such as behavioral characteristics, emotion regulation,

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attention, self-regulation, and social skills [9]. Noncognitive skills interact with cognitive skills to enable success in social skills in spaces such as school and the workplace [10,11]. A recent study found that noncognitive ability in the form of self-control in childhood was predictive of adult outcomes ranging from physical health to crime and substance abuse [12].

Social abilities are basic abilities for human beings as a member of society to establish relationships with others and to adapt in the society [13]. Social skills of having the ability to work with others help one improve and manage relationships that are valued in both personal and occupational spaces [14-16]. Having social skills can lead to successful social participation as it is often associated with increased engagement and motivation and academic and workplace [17-19]. In the long term, social skills promote emotional well-being and mental health [20-22]. The success of social participation requires cognitive skills as well as social-emotional skills because attention, self-control, and social interaction are affected [23,24]. The ability to navigate through situations and solve problems in which social skills and perceptual and cognitive functions are in harmony, are required to live in the complex interaction within environment [25].

Visual perception relates to almost every action we take, as well as our ability to make accurate judgments about these spatial relationships between objects [26]. In adolescence, perceptual skills are reinforced by established cognitive skill relationships, which enable one to imagine, create, and construct complex visual shapes to solve increased complex problems and mentally manipulate visual information to form and decide plans [26]. As such, visual perception is closely related to various cognitive functions and social skills. Therefore, insufficient visual perception ability in adulthood can negatively affect cognitive function and social skills to understand, judge, and solve problems through diverse thinking.

Late adolescence experiences a transition from secondary school to college or work. Late adolescence is a brief period, but it must adapt and go through the many changes required. They face more diverse and heterogeneous social situations [27,28,29]. From this perspective, late adolescence exhibit relative changes in their social identity, adapting to the significant changes in the social context they experience at their age.

Despite the importance of visual perception and social skills as useful variables affecting overall human growth and development, there have been few basic studies on the relationship between visual perception and social skills so far. Previous studies on visual perception were primarily focused on children or people with specific diseases, and studies on late adolescence, the period of transition into adults, are lacking. Therefore, it is necessary to investigate how each chronological age or gender affects visual perception and social skills in late adolescence. As a method to effectively cope with social abilities in late adolescence, a period when social adaptation through the development of social skills is required, a study on the relationship between visual perception, chronological age, and gender is necessary. The purpose of this study is to investigate the relationship between visual perception and social skills in late adolescence.

2. Methods

2.1 Participants

In this study, participants in late adolescence were selected from among the age classifications suggested in the development through life of Newman & Newman [30]. The criteria for selection included individuals in their late adolescence (18-24 years), those attending university, those who had no restrictions in their daily activities, those who had no difficulties in communication, and those who agreed to participate in the study.

2.2 Operational definitions

The operational definition of visual perception in this study is as follows. Visual perception is a process in which the central nervous system integrates visual information to make decisions in order to convert basic

data obtained from the retina into a cognitive concept for humans to adapt to the environment. Through visual perception, it is possible to accurately judge the size, shape, object, and spatial relationship. These functions cooperate with each other [31].

The concept of social skills is referenced with a number of related terms that include: interpersonal skill, interpersonal competence, social competence, and communication competence. Many authors use these terms interchangeably. Some have tried to differentiate social skills, from, for example, social ability. However, such attempted distinctions have never been widely recognized in the literature [32].

Chronological age is defined as the age of a person as measured from birth to a given date. Participants' birth dates were noted, consistent with definitions from Merriam-Webster; chronological age was calculated of an individual's age based on the calendar date on which he or she was born [33].

2.3 Assessments

Motor-Free Visual Perception Test, third edition (MPVT-3), was used for visual perception evaluation. MVPT-3 evaluates visual perception ability without using motor functions by dividing it into eight areas. This test comprises 65 items. Up to the age of 10, only items 1-40 are performed, while for those 11 years and above items 14-65 are used. Reliability up to age 10 is 0.80, and for those above 11 years is 0.89 [34]. In this study, raw score, standard score, and percentile rank calculated as a result of MVPT-3 were compared.

The Korean Social Maturity Scale (K-SMS) is a tool to evaluate adaptive behaviors for social abilities, developed by Kim and Kim [35] according to the culture and context of Korea, based on the Vineland Social Maturity Scale [36] of the United States. The evaluation targets 0 to 30-year-olds, and the evaluation items include self-help, locomotion, occupation, communication, self-direction, and socialization. Cronbach's α of this tool is 0.84. In this study, the total score and social age calculated as a result of K-SMS were compared.

2.4 Data-analysis

Statistical analysis was performed using SPSS 26.0 program for Windows. Frequency analysis and descriptive statistics were performed to analyze the demographic characteristics of the participants, and an independent sample t-test was used to analyze the difference in visual perception and social skills according to gender. For correlation analysis, Pearson's correlation analysis was performed to analyze its relevance with chronological age. The statistical significance level was set at 0.05.

3. Results

3.1 General characteristics of participants

Table 1 shows the general characteristics of the study participants. The total number of study participants was 132; 40 (30.3%) men and 92 (69.7%) women. The participants of the study were all late adolescence (18-24 years old), 26 (18.2%) 19 years old, 60 (45.5%) 20 years old, 20 (15.2%) 21 years old, 14 (10.6%) 22 years old. There were 11 (8.3%) 23-year-olds and 3 (2.3%) 24-year-olds. The mean age was 20.52 ± 1.26 years; the mean age of men was 21.90 ± 1.12 years, and of women was 19.92 ± 0.75 .

Table 1. Demographic data (N=132)

Demographic information		n (%)	M ± SD ¹
Gender	Men	40 (30.3)	
	Women	92 (69.7)	
Chronological age classification	19 years	26 (18.2)	
	20 years	60 (45.5)	
	21 years	20 (15.2)	
	22 years	14 (10.6)	
	23 years	11 (8.3)	
	24 years	3 (2.3)	
Average chronological age	Total		20.52 ± 1.26
	Men		21.90 ± 1.12
	Women		19.92 ± 0.75

¹ Mean ± Standard deviation

3.2 Visual perception and social skills by gender

Table 2 shows the differences in visual perception ability and social skills according to gender in late adolescence. The average raw score of MVPT-3 among men in this study was 57.63 ± 5.55 , and for women it was 56.15 ± 5.71 ; there was no statistical difference according to gender. The mean standard score of MVPT-3 was 109.80 ± 21.69 for men and 100.82 ± 21.70 for women, and there were significant differences according to gender. The average percentile rank of MVPT-3 was 63.28 ± 34.67 for men and 53.12 ± 33.60 for women, and there was no statistical difference according to gender. The mean total score of K-SMS was 110.03 ± 2.71 for men and 109.40 ± 2.18 for women, and the mean social age was 25.92 ± 2.19 for men and 25.46 ± 1.93 for women, and there was no statistical difference by gender.

Table 2. Comparison of visual perception and social skills by gender

Variables	M ± SD ¹		t	p	
	Men	Women			
MVPT-3	Raw score	57.63 ± 5.55	56.15 ± 5.71	1.372	.172
	Standard score	109.80 ± 21.69	100.82 ± 21.70	2.186	.031
	Percentile rank	63.28 ± 34.67	53.12 ± 33.60	1.580	.116
K-SMS	Total score	110.03 ± 2.71	109.40 ± 2.18	1.395	.165
	Social age	25.92 ± 2.19	25.46 ± 1.93	1.209	.229

¹ Mean ± Standard deviation

3.3 Relation of visual perception between social skills

Table 3 shows the correlation between chronological age and visual perception and social maturity. For all participants, there was a statistically significant positive correlation between chronological age and visual perception ($p < .05$); however, there was no significant correlation between chronological age and social maturity ($p > .05$). In men, there was no significant correlation between chronological age, visual perception function, and social maturity ($p > .05$). In women, chronological age and visual perception function were significantly positively correlated ($p < .05$), and chronological age and social maturity had a statistically significant correlation in the total score ($p < .05$). There was no significant correlation with social age ($p > .05$).

Table 3. Relation of visual perception between social skills (n=132)

Chronological age	MVPT-3			K-SMS	
	Raw score	Standard score	Percentile rank	Total score	Social age
Total	.190*	.246**	215*	.162	.115
Men	.014	.055	.086	-.066	-.067
Women	.241*	.235*	.229*	.247*	.147

*p<0.05, **p<0.01

4. Discussion

This study aimed to investigate the relationship between visual perception, social skills, chronological age, and gender in late adolescence. Visual perception and sociality were evaluated for 18-24-year-olds, to analyze gender differences and correlations with age. The results indicated a difference in visual perception function according to gender in late adolescence, and it was significantly higher in men. There was no significant difference by gender in social maturity, which evaluates social skills. There was a significant positive correlation between age and visual perception, but no correlation with social maturity. The correlations by gender revealed no significant correlation between men and the chronological age, visual perception, and social skills. Among women, there was a significant positive correlation between chronological age and visual perception function, and chronological age and the raw score of social maturity.

In terms of gender, men showed a higher visual perception than women, in late adolescence. There were no gender differences in social skills. Visual perception also improved with increasing ecological age in late adolescence. The visual perception function and social skills increased in women as their ecological age increased. This finding is similar to that of previous studies which reported that men typically tend to outperform women in memory tasks measuring visuospatial ability [37], and found similar gender differences in visual working memory [38,39]. Voyer and colleagues [40] found overall gender differences in spatiotemporal abilities, indicating that men performed at significantly higher levels than women on most spatiotemporal tasks. It has been reported that similar gender differences were found with respect to age from infancy to puberty [41-43]. In addition, opposite gender-related effects and age-related phenomena were found on visual episodic memory and working memory to men's advantage over women in adolescent and elderly populations. It must be noted that men tend to benefit in visual working memory, only as adolescents and older adults [44].

Visual perception is a decision-making process that converts and integrates information obtained from the environment through the eyes into a cognitive concept, allowing accurate judgment of size, shape, and spatial relationships of objects [4]. The ability of visual perception affects cognitive processing such as information processing ability, attention concentration, cognitive efficiency, higher-order concept formation, and complex reasoning ability [45]. The interrelationship between visual perception and cognitive function is related to behaviors for maintaining most of our daily lives [46]. Social skills are basic abilities for human beings as a member of society to establish relationships with others and to adapt to society [13]. Despite the importance of visual perception and social skills in late adolescence as variables that influence the transition from adolescence to adulthood, basic studies on factors affecting visual perception and social skills have not yet been conducted. Therefore, it is meaningful to present the basic data of this study. However, one of the limitations of this study is that it is difficult to generalize the study results due to a small sample size. Also, the study did not verify the influence of social and economic factors and environmental information other than gender and chronological age. Therefore, in future research, it is necessary to recruit a larger sample and analyze various factors that can affect visual perception and social skills.

5. Conclusion

The purpose of this study investigated the relationship between visual perception, social skills, chronological age, and gender in late adolescence. According to the results of this study, there was no significant difference in social skills according to gender. However, there was a significantly positive correlation between chronological age and visual perception, but there was no correlation with social skills. The findings of the present study provide novel information regarding the developmental course of visual perception and social skill in late adolescence. Therefore, it is meaningful to present the basic data of this study. These results are of great clinical value as they can help find other possible causes and consequences for the phenomena that may occur during the transition to adulthood over time. Future studies should provide more detailed measures of cognitive functioning and health status to help determine whether men and women actually differ in terms of their visual perceptions and social skills.

References

- [1] Lieberman, L.M. "Visual perception versus visual function," *Journal of Learning Disabilities*, vol. 17, no. 3, pp. 182-185, 1984.
- [2] Solomon, J.W.; O'Brien, J.C. *Pediatric skills for occupational therapy assistants*; Mosby, 1984.
- [3] Martin, N.A.; Gardner, M.F. *Test of visual perceptual skills*. Academic Therapy Publication, 2006.
- [4] Warren, M. Evaluation and treatment of visual deficits. In *Occupational therapy practice skill for physical dysfunction*, 5th ed.: Pedretti, L.W., Early, M.B., Eds.; Mosby, 2001.
- [5] Kramer, P. *Frames of Reference for Pediatric Occupational Therapy (2Eds)*. Lippincott Williams & Wilkins, 1999.
- [6] Eo, E.K.; Kim, G.S. "The Effects of the Scribble Technique on the Visual Perception of Elementary School Children," *Journal of Arts Psychotherapy*, vol. 8, no. 2, 1-26, 2012.
- [7] Carol, J.W. Evaluation and Treatment of Cognitive Dysfunction. In *Occupational therapy practice skill for physical dysfunction*, 5th ed.: Pedretti, L.W., Early, M.B., Eds.; Mosby, 2001.
- [8] Wheatley, C.J. Evaluation and treatment of cognitive dysfunction. In *Occupational therapy practice skill for physical dysfunction*, 4th ed.: Pedretti, L.W., Early, M.B., Eds.; Mosby, 1995.
- [9] Farrington, C.A.; Roderick, M.; Allensworth, E.; Nagaoka, J.; Keyes, T. S.; Johnson, D. W.; Beechum, N. O. Teaching Adolescents to Become Learners: *The Role of Noncognitive Factors in Shaping School Performance-A Critical Literature Review*. Consortium on Chicago School Research, 2012.
- [10] Duckworth, K.; Schoon, I. "Progress and attainment during primary school: the roles of literacy, numeracy and self-regulation," *Longitudinal and Life Course Studies*, vol. 1, no. 3, pp. 223-240, 2010.
- [11] Kautz, T.; Heckman, J.J.; Diris, R.; Ter Weel, B.; Borghans, L. *Fostering and Measuring Skills: Improving Cognitive and Non-cognitive Skills to Promote Lifetime Success*. Organization for Economic Cooperation and Development, 2014.
- [12] Moffitt, T.E.; Arseneault, L.; Belsky, D.; Dickson, N.; Hancox, R.J.; Harrington, H.; Houts, R.; Poulton, R.; Roberts, B.W.; Ross, S.; Sears, M.R.; Murray Thomson, W.; Caspi, A. "A gradient of childhood self-control predicts health, wealth, and public safety," *Proceedings of the National Academy of Sciences of the United States of America*, vol. 108, no. 7, 2693-2698, 2011.
- [13] Woo, J.K. *Effects of Animal-Assisted Therapy with Companion Dogs on the Social Skills of Adults with Intellectual Disabilities*. Master' Thesis, Wonkwang University, Iksan, 2013.
- [14] Barthel, A.L.; Hay, A.; Doan, S.N.; Hofmann, S.G. "Interpersonal emotion regulation: A review of social and developmental components," *Behavior Change*, vol. 35, no. 4, 203-216, 2018.
- [15] Gallup, Inc. *21st century skills and the workplace: A 2013 Microsoft Partners in Learning and Pearson Foundation study*. Gallup. Inc, 2013.
- [16] Pinheiro Mota, C.; Matos, P.M. "Peer attachment, coping, and self-esteem in institutionalized adolescents: The mediating role of social skills," *European Journal of Psychology of Education*, vol. 28, no. 1, pp. 87-100, 2013.
- [17] Chernyshenko, O.S.; Kankaraš, M.; Drasgow, F. (2018). *Social and emotional skills for student success and well-being: Conceptual framework for the OECD study on social and emotional skills*, OECD Education Working Papers, 2018.
- [18] Chiteji, N. "Time preference, noncognitive skills and well being across the life course: do noncognitive skills encourage healthy behavior?," *American Economic Review*, vol. 100, no. 2, pp. 200-204, 2010.
- [19] Duncan, G.J.; Dunifon, R. *Introduction to Soft-Skills and Long-Run Labor Market Success. In 35th Anniversary Retrospective*, Emerald Group Publishing Limited, 2012.

- [20] Holopainen, L.; Lappalainen, K.; Junntila, N.; Savolainen, H. "The role of social competence in the psychological well-being of adolescents in secondary education," *Scandinavian Journal of Educational Research*. vol. 56, no. 2, pp. 199-212, 2012
- [21] Taylor, R.D.; Oberle, E.; Durlak, J.A.; Weissberg, R.P. "Promoting positive youth development through school-based social and emotional learning interventions: A meta-analysis of follow-up effects," *Child development*, vol. 88, no. 4, pp. 1156-1171, 2017.
- [22] Rose, K.; Hawes, D.J.; Hunt, C.J. "Randomized controlled trial of a friendship skills intervention on adolescent depressive symptoms," *Journal of Consulting and Clinical Psychology*, vol. 82, no. 3, pp. 510-520, 2014.
- [23] Duncan, G.J.; Murnane, R.R. *Whither Opportunity*. Russell Sage Foundation, 2011.
- [24] Conti, G.; Heckman, J. "The developmental approach to child and adult health," *Pediatrics*. vol. 131, no. suppl 2, pp. S133-S141, 2013.
- [25] Park, S.W.; Bak, I.H.; You, S.J. "The Effects of Korean Computer-based Cognitive Rehabilitation Program (CoTras) for the Cognition and Visual Perception and ADL in Brain Injury," *Journal of Occupational Therapy for the Aged and Dementia*, vol. 7, no. 2, pp. 47-57, 2013
- [26] Schneck, C. M. Visual perception. In *Occupational therapy for children*, 4th ed.: Case-Smith, J., Allen, A. S., Pratt, P. N. Eds.; Mosby, 2001.
- [27] Tanti, C.; Stukas, A.A.; Halloran, M.J.; "Foddy, M. Social identity change: Shifts in social identity during adolescence," *Journal of Adolescence*. vol. 34, no. 3. pp. 555-567, 2011.
- [28] Bennett, M.; Sani, F. *The development of the social self*. Psychology Press, 2004.
- [29] Newman, B.M.; Newman, P.R. *Development through life: A psychosocial approach*. Cengage Learning, 2017.
- [30] Pedretti, L.W.; Early, M.B. *Occupational therapy practice skill for physical dysfunction*, 5th ed.; Mosby, 2001.
- [31] Segrin, C. "Social skills deficits associated with depression," *Clinical Psychology Review*. vol. 20, no. 3, pp. 379-403, 2000.
- [32] Malina, R.M.; Bouchard, C.; Bar-Or, O. *Growth, Maturation, and Physical Activity*. Human Kinetics, 2004.
- [33] Colarusso, R.P.; Hammill, D.D. *Motor-free perception test (MVPT-3)*. Academic Therapy Publication, 2003.
- [34] Kim, S.; Y. Kim. *Korean Version of the Vineland Social Maturity Scale*. JungAngJukSung, 1985.
- [35] Doll, E.A. *Vineland Social Maturity Scale: manual of directions*. American Guidance Service, 1965.
- [36] De Frias, C.M.; Nilsson, L.G.; Herlitz, A. "Sex differences in cognition are stable over a 10-year period in adulthood and old age," *Aging, Neuropsychology, and Cognition*, vol. 13, no. 3-4, pp. 574-587, 2006.
- [37] Duff, S.J.; Hampson, E.A. "Sex difference on a novel spatial working memory task in humans," *Brain and Cognition*, vol. 47, no. 3, pp. 470-493, 2001.
- [38] Geiger, J.F.; Litwiller, R.M. "Spatial working memory and gender differences in science," *Journal of Instructional Psychology*, vol. 32, no. 1, pp. 49-57, 2005.
- [39] Voyer, D.; Voyer, S.; Bryden, M.P. "Magnitude of sex differences in spatial abilities: a meta-analysis and consideration of critical variables," *Psychological Bulletin Journal*. vol. 117, no. 2, pp. 250-270, 1995.
- [40] Davison, K.K.; Susman, E.J. "Are hormone levels and cognitive ability related during early adolescence?," *International Journal of Behavioral Development*, vol. 25, no. 5, pp. 416-428, 2001.
- [41] Moore, D.S.; Johnson, S.P. "Mental rotation in human infants: A sex difference," *Psychological Science*, vol. 19, no. 11, pp. 1063-1066, 2008.
- [42] Quinn, P.C.; Liben, L.S. "A sex difference in mental rotation in young infant," *Psychological Science*, vol. 19, no. 11, 1067-1070.
- [43] Pauls, F.; Petermann, F.; Lepach, A.C. "Gender differences in episodic memory and visual working memory including the effects of age," *Memory*, vol. 21, no. 7, pp. 857-874, 2013.
- [44] Wee, J.S.; Han, J.Y.; Lee, S.G.; Noh, S.M. "Brief Cognitive and Visuospatial Assessment for Patient with Stroke and Correlation of Cognitive Function and Functional Outcome," *Annals of Rehabilitation Medicine*, vol. 26, no. 3, pp. 237-242, 2002.
- [45] Kim, S.U.; Jung, J.H. "Study on the Necessity of Development Principle of Computerized Korean-style Visual Perception Examination Tools for the Employment of Disabled People," *Disability & Employment*, vol. 25, no. 2, pp. 79-104, 2006.