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PUBLIC VALUE: Impacts of Government R&D Funding on R&D Performance

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Abstract

***Purpose**: Government R&D investment maintains the expansion of R&D investment in key promotion fields such as finding future growth engines, economic innovation, and future biotech strategy. It is necessary to improve the efficiency of R&D investment in response to the worsening financial condition of the government, as manifested by slowing economic growth and increasing welfare demand. This study aims to analyze the factors affecting R&D performance, focusing on government funding. We investigate the impact of research papers, patents, and commercialization performance by controlling characteristics of researchers who have received government projects. We expect to present policy ideas that can enhance R&D performance.*

***Method**: This study applies multiple regression to the analysis. The data used in this survey are data on the implementation status and performance of national R&D projects by the Ministry of Science, Technology, and Information and the Korea Science and Technology Evaluation. This survey provides basic data for promoting evidence-based efficient national R&D projects and presenting policy direction. The study will use the most recently published data for 2016.*

***Results**: Government R&D funding has a positive effect on enhancing scientific and technological performance, SCI, and Patents. But there is no effect on commercialization of the Government R&D funding. Second, it is shown that SCI, Patents, and commercialization are higher in project status than a new project. Third, in the case of SCI, patents, the performance of government-affiliated and universities, is generally higher than the National Institute. Fourth,fundingon new technologies ofIT sector showed higher performance than SCI and Patents. Finally, rural variables have higher commercialization performance in other regions than Seoul, Incheon, and Gyeonggi.*

***Conclusion**: This suggests that Government R&D should continue to be supported. Also, the government R&D support on Government-affiliated and universities plays a positive role. Our findings suggest that Government R&D funding should be concentrated on technology characteristics. As well as, Government R&D funding should take regional characteristics into account when considering commercialization performance.*

[Keywords] ***R&D Performance, Government R&D Funding, Efficiency, Policy Ideas, New Growth Theory***

1. Introduction

For the vitality of the national economy, it is important for policy makers to facilitate the stabilization of employment and the commercialization of new technologies through National R&D. Due to the importance of the role of R&D in the industrial sector and social wellbeing, the government is striving to support creative technological innovation capabilities.

The major industrialized countries such as the United States, Germany, and Japan are emphasizing science and technology as key policy instruments for economic and social development, and Korea has actively expanded its investment in government R&D to support this

as well. However, since the global economic crisis in 2008, the rate of investment in public research and development in Korea has stagnated given the context. As a result, the government has made efforts to improve investment efficiency through scientific and technological innovation[1]. Government role has been increased for policy outcomes[2] related to economic growth.

R&D is becoming the main driving force in economic growth, as the industrial economy changes into one more centered on information and knowledge. In the New Growth theory, R&D investment is a powerful factor affecting production as well as labor and capital[3][4]. In addition, interest in the economic performance of R&D investment is increasing. However, according to recent National Assembly and media reports, government R&D investment has increased significantly compared to a decade ago. There is a tendency to expect that when the government makes investments, the beneficiaries do not feel satisfied. According to economic reports from various countries, the recent decline in economic growth is weakening the dynamics of the economy and growth trend.

Government R&D investment maintains the expansion of R&D investment in key promotion fields such as finding future growth engines, economic innovation, and future biotech strategy. However, the growth rate of government R&D investment is decreasing year by year. It is necessary to improve the efficiency of R&D investment in response to the worsening financial condition of the government, as manifested by slowing economic growth and increasing welfare demand. Governmental R&D investment needs to be strengthened. R&D investment should be focused on ways to contribute to economic development, industrial innovation, and improved quality of life.

Previous studies have examined the effectiveness of R&D investment on performance measured by only research-oriented rather than broader indicators. Thus, the studies did not comprehensively show the effects of R&D funding on diverse R&D performance, even though the funding is more effective on specific areas than on broad ones. Thus, we include R&D type and R&D performance using OECD R&D type classification to specify the effects of the R&D funding on certain areas in R&D. In addition, prior studies have not considered diverse factors influencing R&D performance. We include the status of R&D, organization, regions, and new technology, which are important factors for R&D performance.

Our study also has a several distinguishing characteristics compared to previous studies. First, the data used in this study are unique in that they include basic data for efficient national R&D project promotion and policy direction through an analysis of the status and performance of national R&D projects provided by the Ministry of Science and ICT and Korea Science and Technology Evaluation. Second, our data are relatively new, making it is meaningful to analyze them. Third, considering regional factors is important and novel because IT-related studies do not often consider regional factors, even though R&D performance and D investment might differ depending on the regions(urban and rural).

Thus, this study aims to analyze the factors affecting R&D performance, focusing on government funding. We investigate the impact of research papers, patents, and commercialization performance by controlling characteristics of researchers who have received government projects. We expect to present policy ideas that can enhance R&D performance.

2. Literature Review

2.1. Government R&D funding

Many previous studies have been conducted on the investment efficiency of national R&D projects. There are prior studies that analyze the effectiveness of R&D investment by measuring research achievements, analyzing performance and comparative research with other projects, and use it for budget allocation and adjustment by presenting evidence of the excellent performance of such projects. Detailed studies include the following. First, research

and development achievements were analyzed and reported in terms of numbers of scientific and technological papers and patents[5]. Second, the relationship between R&D investment and the performance of the corporate unit was analyzed as the meaningfuloutcome[6]. Third, the study showed the relationship between R&D investment and its ripple effect as long-term impacts such as the contribution to the national economy[7].

Prior studies examined the relationship between government R&D expenditure and research performance. According to the regression analysis, the higher the proportion of government subsidies, the higher the performance[8]. In the case of cooperative tasks, the higher the private matching research cost, the higher the R&D performance. The study by[9] also analyzed the research cost by subject, such as government, private sector, or university, and found that the effect of government support for research funding was greater than that of private and university research funding. Therefore, we want to analyze government funding of research budgets as an independent variable.

2.2. Government R&D funding and scientific·technological performance

In Article 6(1) and (3)of the Act on Performance Evaluation and Performance Management of National R&D Projects, it is required to establish performance targets and performance indicators for each R&D project. Accordingly, the government has established performance targets and performance indicators for each R&D project. Many projects use the number of papers, the number of patents, and commercialization as performance indicators. The research by[10] analyzed the relationship between R&D type and R&D performance using OECD R&D type classification. Basic research aimed at discovering new natural laws and facts mainly produces academic thesis. In addition, application research that pursues methods that can actually apply the found laws or facts is mainly patented. Finally, development research is intended to be utilized economically, and it has led to know-how and commercialization.

2.2.1. SCIs

A previous research measured the efficiency of the government's pure R&D project on the scientific and technological achievements of the SCIs, patents, etc. by the DEA method, and presented the characteristics of investment allocation affecting efficiency[11]. As a result of this research, the results of the research were found to be basic research, and in the case of university, the amount of thesis and patent was generated. The study[12] analyzed the performance of Korean government R&D investment in diverse. The results of the SCI thesis were higher than those of the non-cooperative research.

H1: Government R&D funding have a high SCI performance.

2.2.2. Patent

As can be seen from the previous research on R&D achievement, it is suggested that the index for measuring the achievement is to foster papers, patents, technology transfer manpower, new product launches, and sales increases. Among them, papers and patents are performance indicators commonly used for quantitative research on R&D performance. In particular, patents are relatively close to the industrial viewpoint and are widely used to analyze the R&D performance of companies. Patents are a good source of explanation of innovative activities and are characterized by long-term accumulation[13]. It is advantageous that the objectivity is relatively high as a surrogate indicator of R&D achievement, in that it undergoes a rigorous examination process by the Patent Office. Much existing research treats patents as important variables in R&D performance and R&D effect analysis[14][15][16][17][18].

H2. Government R&D funding has high domestic patent performance.

H3. Government R&D funding has high overseas patent performance.

2.2.3. Commercialization

Approximately 20 years have passed since the implementation of the technology commercialization policy of the government R&D project. However, the basis of technical commercialization of government R&D projects is still weak, and only 10% of the research results are recognized with high technology value. Although the importance of R&D performance is high, there are many technological problems, such as performance implementation and reliability verification, through which commercialization of foundation and application development research results are not solved. As a result, the level of performance is low due to government support, and the issue of whether the government supports the commercialization of the private sector is unresolved. Based on these circumstances, this study presents commercialization as a dependent variable.

H4. Government R&D funding has high commercialization performance.

3. Data and Methodology

The data used in this survey are data on the implementation status and performance of national R&D projects by the Ministry of Science, Technology, and Information and the Korea Science and Technology Evaluation. This survey provides basic data for promoting evidence-based efficient national R&D projects and presenting policy direction. It has been in full swing since 1999 and is considered completed by the end of the 2017 survey. The study will use the most recently published data for 2016.

The target of the survey and analysis in 2016 will be 562 detailed projects(19,392.7 billion won) and 54,827 detailed projects executed by 35 central agencies among 19,050,180 billion won organized by the government's R&D budget. This includes research expenses, area, technology classification, research personnel, etc. of two research projects(business purpose, business contents) and project information of research and development projects, and six performance information indicators(papers, patents, technical fees, etc.).This study analyzes 45,592 tasks, excluding the missing data in the government R&D funding, research subject, R&D stage, and performance information for each project.

3.1. Dependent variables

In this study, we analyze four scientific and technical performances pertaining to government R&D funding. Scientific and technical performance includes SCI papers, patents, and commercialization. The first dependent variable is the number of SCI papers. The second dependent variable is the number of patents. The research analyzes patents by dividing them into domestic and overseas patents. The third dependent variable is commercialization.

3.2. Independent variables

The key independent variable in this study is government R&D funding of individuals based upon their projects supported by the government in 2016. In this study, one unit of government R&D funding is 10 million won.

3.3. Control variables

In this study, we set five statistical variables. All of the control variables are dummy variables. The first control variable is project status, which consists of new projects and continued projects. The reference variable of project status is new project. The second control var-

iable is R&D stage, which consists of basic research, application, development, and other. The reference variable of the R&D stage is basic research. The third variable is organization, which consists of national institute, government affiliate, universities, large corporations, midsize-SMEs, and other. The reference variable of organization is national institute. The third variable is organization, which consists of national institute, government affiliate, universities, large corporations, midsize-SMEs, and other. The reference variable of organization is national institute. The fourth variable is new technology, which consists of IT(information technology), BT(biotechnology), NT(nanotechnology), ST(aerospace technology), ET(environmental technology), CT(cultural technology), and other. The reference variable of new technology is IT. The fifth variable is region, which consists of Seoul, Incheon, Gyeonggi, Daejeon, Sejong, Chungnam, Busan, Ulsan, South Gyeongsang, Daegu, North Gyeongsang, Gwangju, Jeonbuk, Jeonnam, Jeju, and other(including abroad). The reference variable of region is region. The characteristics of local government needs to be controlled.

3.4. Model specification

The study employs a panel data analysis to examine the impacts of government R&D funding on various types of R&D performance, such as SCI paper, patents, and commercialization. Our model adopts the ordinary least squares(OLS) regression with quantitative dependent variables.

4. Results

We got the multiple regression outcomes. <Model 1> is the SCI paper performance for Government R&D funding. <Model 2> is the domestic Patents performance for Government R&D funding. <Model 3> is the overseas Patents performance for Government R&D funding, and <Model 4> is the commercialization performance for Government R&D funding. We got the multiple regression results <Model 1> represents the sci paper performance for government R&D funding. <Model 2> is the domestic patents performance for government R&D funding. <Model 3> is the overseas patent performance for government R&D funding. Finally, <Model 4> is the commercialization performance for government R&D funding.

<Model 1> is the SCI performance for government R&D funding. The key independent variable, government R&D funding, had a statistically significant effect on domestic patents. A 10 million won increase in government R&D funding increased the number of SCI papers by about 2(1.74), holding the other variables fixed. The project status variable had a positive effect on the SCI performance. Increasing government R&D funding for continued projects was associated with an increased number of SCI papers than new projects. Next, the development R&D stage of the projects variables negatively affect the SCI paper performance. The development projects supported by government R&D produce less SCI compared to basic stage projects. On the other hand, as government R&D funding increases, basic projects generate more sci papers on average compared to development projects. The organization variable, specifically government-affiliated universities, large corporations, midsize-SMEs, and others, positively affected the SCI performance. As government R&D funding increased, government-affiliated institutions, midsize-SMEs, and universities showed better SCI performance than the national institute. Next, we found that as government R&D funding increases, IT performs better in SCIs than BT, but NT has a better SCI performance compared to IT.

<Model 2> illustrates the domestic patents performance for government R&D fund. The key independent variable, the government R&D fund, had a statistically significant effect on domestic patents. A 10 million won increase in government R&D fund increased the number of domestic patents by about 9(9.29), holding the other variables fixed. The project status variable had a positive effect on the domestic patent performance. Increasing government

R&D funding for continued projects was associated with an increased number of domestic patents in comparison to new projects. Next, the application and development of the R&D stage of the projects variables positively affect the domestic patents performance compared to basic stage projects. Considering the organization variable, government-affiliated universities, large corporations, midsize-SMEs, and others positively affect the domestic patents performance. As government R&D funding increases, government-affiliated universities, large corporations, midsize-SMEs, and institutes other than national research institutes improved domestic patent performance. Next, we found that as government R&D funding increases, IT has higher performance in a domestic patent compared to BT, NT, ST, ET, CT, and others.

<Model 3> represents the overseas patent performance for government R&D funding. The key independent variable, government R&D funding, had a statistically significant effect on the overseas patent. A 10 million won increase in government R&D funding increased the number of overseas patients by about 1(0.8), holding the other variables fixed. The project status variable had a positive effect on the overseas patent. Increasing government R&D funding for continued projects was associated with increased overseas patients rather than new projects on average. Next, government-affiliated universities and large corporations supported by government R&D produced more overseas patents compared to the National Institute.

<Model 4> is the commercialization performance for government R&D funding. The key independent variable, government R&D funding, had a negative effect on the commercialization performance but it is not statistically significant. The project status variable had a positive effect on the commercialization performance. Increasing government R&D funding for continued projects was associated with a improved commercialization performance compared to the new project. The development stage of R&D projects had a positive relationship with the commercialization performance for government R&D funding. That means the development stage projects supported by government R&D had better commercialization performance compared to basic stage projects. Next, midsize-SMEs organizations positively affected the commercialization performance, unlike the National Institute. BT of new technology was positively associated with the commercialization performance for government R&D funding, suggesting that as government R&D funding increases, BTs' commercialization performance improves, contrary to IT. Interestingly, all variables related to the region were statistically significant.

Table 1. Result.

		<Model 1> SCI paper	<Model 2> Domestic patent	<Model 3> Oversea patent	<Model 4> Commerciali -zation
		b(s.e.)	b(s.e.)	b(s.e.)	b(s.e.)
Government R&D funding		1.74**(.584)	9.288***(.410)	.795***(.188)	-.119(.907)
Project status (ref. new)	Continued	.771***(.028)	.481***(.020)	.115***(.009)	.422***(.044)
R&D stage (ref. basic)	Application	.236***(.047)	.397***(.033)	.118***(.015)	.084(.073)
	Development	-.248***(.041)	.188***(.028)	.032**(.013)	.354***(.063)

		<Model 1> SCI paper	<Model 2> Domestic patent	<Model 3> Oversea patent	<Model 4> Commerciali -zation
		b(s.e.)	b(s.e.)	b(s.e.)	b(s.e.)
	Others	-.279***(.056)	-.012(.039)	.031(.018)	.198*(.087)
Organization (ref. national institute)	Government affiliated	.768***(.066)	.689***(.046)	.142***(.021)	-.204*(.102)
	Universities	.655***(.053)	.206***(.037)	.074***(.017)	-.074(.083)
	Large corporations	.207(.165)	1.08***(.116)	.386***(.053)	-.065(.257)
	Midsize-SMEs	.182**(.062)	.091*(.044)	.031(.020)	.257**(.097)
	Others	.052(.118)	.849***(.083)	.225***(.038)	-.016(.183)
New technology (ref. IT)	BT(bio technology)	-.180***(.041)	-.538***(.029)	-.117***(.013)	.177**(.064)
	NT(nano technology)	.472***(.061)	-.194***(.043)	-.053**(.019)	.146(.095)
	ST(aerospace technology)	.046(.124)	-.319***(.087)	-.092*(.040)	-.045(.193)
	ET(environ technology)	.030(.050)	-.312***(.035)	-.083***(.016)	.032(.079)
	CT(culture technology)	-.129(.109)	-.169*(.076)	-.058(.035)	.180(.169)
	Others	-.042(.046)	-.477***(.032)	-.134***(.01)	.131(.071)
Region (ref. Seoul, Incheon, Gyeonggi)	Daejeon, Sejong, Chungnam, Chungbuk, Cheungwon	-.094(.046)	-.018***(.032)	-.031*(.015)	.248**(.072)
	Busan, Ulsan, South Gyeongsang	-.095**(.036)	.084**(.025)	.006(.011)	.244***(.056)
	Daegu, North Gyeongsang	.142**(.052)	.023(.037)	-.000(.017)	.278**(.082)
	Gwangju, Jeonbuk, Jeonnam, Jeju	-.058(.045)	-.009(.031)	-.032*(.014)	318***(.070)

		<Model 1> SCI paper	<Model 2> Domestic patent	<Model 3> Oversea patent	<Model 4> Commerciali -zation
		b(s.e.)	b(s.e.)	b(s.e.)	b(s.e.)
	Others(including abroad)	-.171(.120)	-.118(.084)	-.054(.038)	.079**(.187)
Constant		-71.7*** (23.947)	-380.648*** (16.825)	-32.598(7.713)	4.480 (37.189)
N		45,592	45,592	45,592	45,592
F		92.74***	113.31***	25.76***	11.53***
R^2		0.0410	0.049	0.011	0.005
ad R^2		0.0405	0.049	0.011	0.004

Note: *p<0.1, **p<0.05, ***p<0.001.

5. Conclusion and Discussion

The above results have several implications. First, Government R&D funding has a positive effect on enhancing scientific and technological performance, SCI, and Patents. This fining is consistent with previous studies[19][20]. In particular, when the regression coefficients are compared, the domestic paper results are highest. But there is no effect on commercialization of the Government R&D funding. Second, it is shown that SCI, Patents, and commercialization are higher in project status than a new project. This suggests that Government R&D should continue to be supported. Third, in the case of SCI, patents, the performance of government-affiliated and universities, is generally higher than the National Institute.We find that the government R&D support on Government-affiliated and universities plays a positive role. Fourth, new technology of IT sector showed higher performance than SCI and Patents. This suggests that the targeted performance of Government R&D funding should be strategically considered and invested based on technology characteristics[21][22]. Finally, rural variables have higher commercialization performance in other regions than Seoul, Incheon, and Gyeonggi. This suggests that Government R&D funding should take regional characteristics[23][24] into account when considering commercialization performance.

The data used in the analysis showed that the performers were more college than corporations, and that the R&D phase was 45% for basic research and 36% for development research. It is the limit of research that it is difficult to present indicators like previous studies[25] that can accurately predict how high the performance will be when one unit of Government R&D funding fluctuates. For future research, the interaction effects between variables used in the analysis, such as analyzing the amount of R&D funding x Actors, the amount of R&D funding x 6 Technology types, and the amount of R&D funding x Actors, show that it would be better to compare the influences of variables. Then the comparison of impacts on the effect of Government R&D support will have a more powerful explanation.

This study makes several policy contributions. First, the study theoretically supports new growth theory, showing that government R&D funding leads to higher performance of R&D.The research also highlights the importance of national R&D projects in the era of the Fourth Industrial Revolution. Second, our results contribute to the theoretical expansion of existing studies on impacts of government R&D funding on R&D performance through empirical analysis. Third, our study provides comprehensive factors that can be used for future research of government R&D-related topics. In addition, this study provides practical implications. First, government R&D support needs to be increased at government-affiliated universities for positive roles on R&D performance. Second, government R&D investment is more effective on technology characteristics among R&D sectors. Finally, our study implies that government R&D funding needs to consider regional characteristics to generate better performances.

6. Reference

6.1. Journal articles

[1] Park B.Enterprise Security Management for IoT Services Based on Event Correlation in Republic of Korea. *International Journal of Crisis & Safety*, 3(1), 17-24 (2018). [Article]

[2] Kim D. Government Roles in Policy Networks against Covid-19: Comparing Two Cases in S. Korea. *Protection Convergence*, 5(2), 14-26 (2020). [Article]

[4] Park C & Ku B. An Analysis of Distributed Lag Effects of Expenditure by Type of R&D on Scientific Production: Focusing on the National Research Development Program. *Journal of Korea Technology Innovation Society*, 19(4), 687-710 (2016).

[5] Song J & Kim H. The Effectiveness of Fiscal Policies for R&D Investment. *Journal of Technology Innovation*, 17(1), 1-48 (2005).

[6] Kwak T & Wang H. The Effect on R&D Expenditure to Value Relevance with respect to Firm Characteristics. *Korea International Accounting Review*, 50, 159-182 (2013).

[7] Oh S & Lim S & Son S. The Causal Relationship between R&D Investment and GDP(Gross Domestic Product) in Korea. *Journal of Technology Innovation*, 10(1), 62-89 (2002).

[8] Jang K. R&D Investment and Project Performance: Research on Industrial R&D Programs of Government. *Knowledge, Technology & Policy*, 18(1), 75-98 (2010).

[11] Park S & Kim K & Jeong S. The Study on the Analysis of Efficiency of Governmental R&D Programs Regarding to the S&T Outcomes. *Journal of Korea Technology Innovation Society*, 14(2), 205-222 (2011).

[12] Shim W & Kim E. Diversified Analysis of the Correlation between Investment and Performance of Korean R&D Programs. *Journal of Korea Technology Innovation Society*, 13(1), 1-27 (2006).

[13] Griliches Z. Patent Statistics as Economic Indicators: A Survey. *Journal of Economic Literature*, 28(4), 287-343 (1990).

[14] Arundel A & Kabla I. What Percentage of Innovations are Patented? Empirical Estimates for European Firms. *Research Policy*, 27(2), 127-141 (1998).

[16] Romijn H & Albaladejo M. Determinants of Innovation Capability in Small Electronics and Software Firms in Southeast England. *Research Policy*, 31(77), 1053-1067 (2002).

[18] Yoon Y & Oh S. The Types of R&D Projects and the Size of Corporations Affecting Patent Citations: Focusing on the Government-funded R&D Projects Carried Out by Corporations. *The Journal of Intellectual Property*, 12(1), 183-212 (2017).

[19] Lee B & Yim J & Lee W & Won D. Evaluation of SCI for Basic Research Programs in Science and Technology Measured at the Quality Level of Individual Articles. *Journal of the Korea Contents Association*, 19(9), 11-25 (2019).

[20] Lee J & Sim J & Lim C & Jung W. Impact of Government R&D Support on the Performance of Middle Market Enterprises: Focusing on the Comparison among Large, Middle-market, and SMEs. *Journal of Korea Technology Innovation Society*, 24(2), 139-160 (2021).

[21] Park C & Seo H. The Efficiency and Productivity Change in the National R&D Projects of 6T Sectors. *Journal of Industrial Economics and Business*, 31(1), 293-325 (2018).
[22] Oh D & Kim Y & Kim Y. Measuring the Quality of Research Papers Across Countries Using Relatively Rank-normalized Impact Factor(R2nIF). *Journal of Technology Innovation*, 21(1), 85-108 (2013).
[23] Shin W. The Importance of Education and Training of Local Government's Disaster Management Public Servants. *International Journal of Human & Disaster*, 2(2), 1-3 (2017). [Article]
[24] Sa Y. Human Capital Management Crisis for Indefinite-term Contract Workers in Local Governments: Focusing on Education & Training and Performance. *International Journal of Crisis & Safety*, 5(1), 1-12 (2020). [Article]
[25] Luo Y & Seo E. Directions for the Korean Social Integration Policy Index Development. *Public Value*, 6(1), 62-71 (2021). [Article]

6.2. Books

[3] Griliches Z. The Search for R&D Spillovers. The Scandinavian Journal of Economics, 29-47 (1992).
[9] Jang D & Kang G & Han D. An Empirical Study on the Impacts of Public Funding on the Academic Patent. Korea Institute of Intellectual Property(KIIP) (2013).
[10] Jang J. Development of Methodology for the Analysis of Productivity on Investment of Public R&D. Policy Research 2001-24 Science & Technology Policy Institute (2001).
[15] Archibugi D & Michie J. Trade, Growth and Technical Change. Cambridge University (1998).
[17] Griliches Z. R&D, Patents and Productivity. University of Chicago (2007).

7. Appendix

7.1. Authors contribution

	Initial name	Contribution
Lead Author	SL	-Set of concepts☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑
Corresponding Author*	SP	-Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Co-Author	JK	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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A Study on How to Use CHILDREN'S PARKS according to the Change in Population Composition

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Abstract

Purpose: *Although children's parks are easily accessible from anywhere in the vicinity, there are many children's parks that children are ignoring. This study aims to provide a variety of activities to residents by utilizing these parks. In particular, these parks can be used as an alternative to creating a place for active play and effective exercise for the elderly who spend free time in an aging society. This study suggested using the existing children's play space as a complex play and exercise space with the elderly.*

Method: *This paper selected 63 children's parks in Suseong-gu, Daegu Metropolitan City, and analyzed them by dividing them into three residential types. Population change trends were investigated from 2005 to 2020, when children's parks were subdivided. This paper conducted a one-way ANOVA analysis to find out the difference by park facilities in children's parks. Post-hoc analysis was performed by the Scheffe test. To conduct the above statistical analysis, this paper used the Spss Statistics 21 statistics program.*

Results: *As a result of analyzing the change in the total population composition of Suseong-gu, where the children's park is located, the population of infants and children decreased, and the population of the elderly increased. The designation of children's parks has declined since the 1990s. It was found that the number of children by housing type decreased little by little every year. This paper analyzed that the park area by residential type was the largest for children's parks located in mixed housing areas. In addition, it was found that many children's play facilities were installed in mixed residential areas.*

Conclusion: *This study propose that if we increase the utilization rate of children's parks that lack user consideration and utilize children's parks within the living area, we can solve outdoor activities for the elderly according to the rapidly progressing aging age. In particular, if the children's park is made into a multi-purpose culture, sports, and amusement park that not only the elderly but also children and young people can use, it will be of great help to the utilization of the park.*

[Keywords] ***Park, Children's Park, Aging, Playing Facilities, Playing Environment***

1. Introduction

Children's park is a park that can be easily found and accessed from anywhere in the vicinity. However, it is not easy to find children playing in the current children's park[1]. The first reason is that the population of children has decreased due to low birth, and the second reason is that the children's play culture is changing.

*This Paper Summarizes Seokjin Jung's Daegu Haany University Master's Thesis.

The development of science has also changed children's play culture. These days, children spend more time at school or the academy than at the playground. Children are more used to smartphones or game consoles when they enjoy playing or relaxing[2].

Most of the facilities installed in the children's park include slides, swings, and seesaws, and each park has no characteristics. The newly created park faces the practical problem of budget, and the space composition is not diverse, so it does not induce the interest of children, and there are many parks that children are ignoring[3]. Children's parks that do not consider the rapidly changing children's play culture are not functioning because they are far from children's interest[4].

Parks created in the past are being redeveloped over time. Still, the parks are being built with a large budget without reflecting the surrounding social environment and population change trend by surrounding housing type[5][6]. Although the number of parks is increasing like this, it is questionable whether the budget invested is making an effect due to the uniform installation of facilities and inefficient space planning of the living area parks. In particular, it is true that the utilization rate of children's parks, which can be easily accessed from the surroundings, is falling significantly[7]. However, regardless of whether the park is large or small, it is also a place where residents can do various activities. Until now, various attempts have been made to increase the utilization of children's parks. Most of today's children's parks are planned and created only with the thoughts of adults within the boundaries of the law, so we can say that they are not diverse and are planned and created only as a uniform space[8][9].

The current children's park needs to be made not just for children, but for adults to use together. Suppose the children's park is made into a complex play and rest area considering the surrounding environment and various conditions. In that case, although it is a small space, residents will be able to use it in various ways[10][11].

In the future, although the number of children is gradually decreasing while the number of older adults increases rapidly, most parks in modern society are being built without adequately considering the changing demographic structure[12]. It is difficult to find children in children's parks built without reflecting the declining children's population and the changing population. The vacant seats are sought by the elderly, but facilities that can be used by the elderly are pretty lacking[13].

This study aims to provide various activity environments to residents by utilizing a children's park that can be easily accessed from anywhere in the vicinity. In particular, we tried to create a place for active exercise and play for the elderly who spend free time in an aging society. As an alternative, the purpose of this study is to create a children's park as a complex play and exercise space that can be used with the elderly and lead to a place of harmony among residents.

2. Methods

2.1. Gathering data

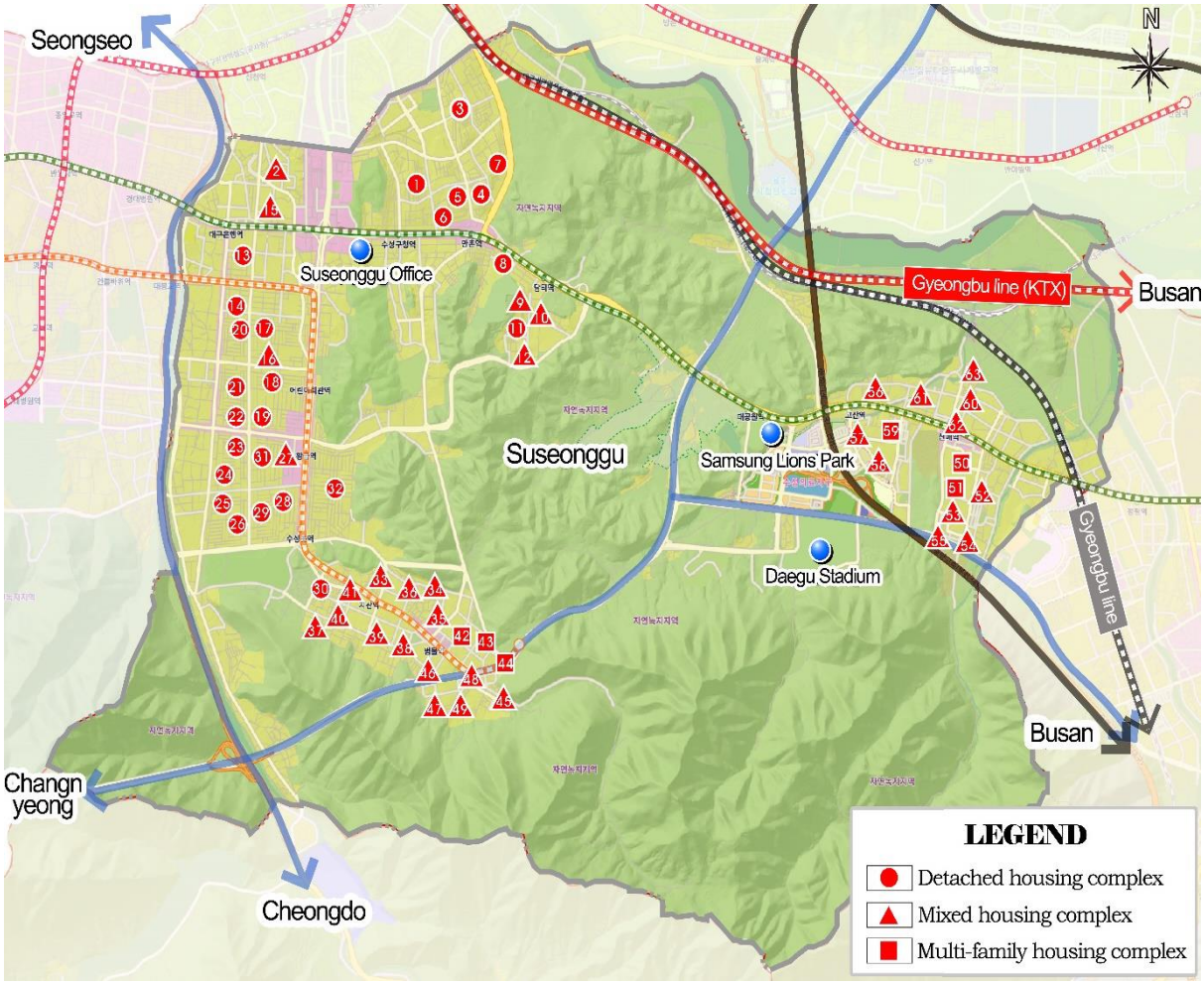
This study used data on children's parks by administrative dong among urban parks in Suseong-gu, Daegu metropolitan city[14]. The spatial scope of this study was selected as 63 children's parks in Suseong-gu, Daegu. The study was conducted by dividing 63 children's parks by dong into three types of housing: multi-family housing complex(6 places), mixed housing complex(32 places), and detached housing complex(25 places) <Table 1>, <Figure 1>.

As for the children's parks by administrative dong in Suseong-gu, Gosan-dong was the largest with 14 places(22.2%). Manchon-dong and Jisan-dong were each 10 places(15.9%), Beommul-dong was 8 places(12.7%), Dusan-dong was 5 places(7.9%), Sang-dong and Hwanggeum-dong eachwere 4 places(6.3%), Suseong-dong and Jung-dong each were 3 places(4.8%), and Beomeo-dong was 2 places(3.2%).

Table 1. The scope of research subject.

Target index / Dong name	Number	Ratio
Beomeo-dong	2	3.2
Manchon-dong	10	15.9
Suseong-dong	3	4.8
Hwanggeun- dong	4	6.3
Jung- dong	3	4.8
Sang- dong	4	6.3
Dusan- dong	5	7.9
Jisan- dong	10	15.9
Beommul- dong	8	12.7
Gosan- dong	14	22.2
Total	63	100

Figure 1. Research target area.



2.2. Data analysis

This study proposes a plan to utilize the children's park as a complex play and relaxation space that all residents can use based on population change in the Suseong-gu area. Therefore, a field survey was conducted based on the administrative data of the Suseong-gu Office. The population change trend in Suseong-gu was set as the research range from 2005 to 2020 when the children's park was subdivided. This paper analyzed 63 children's parks in Suseong-gu by classifying them into three types of housing: multi-family housing complex(such as apartment complexes), mixed housing complex(such as apartment complex, detached housing, urban residential housing), and detached housing areas(such as urban residential housing).

This study analyzed the population composition change in Suseong-gu, the status of designation of children's parks by period, the current status of children's parks by dong, the proportion of children's population composition, and the number and area of children's parks. We conducted a one-way analysis of variance(One-way ANOVA) to determine the difference by park facilities in the children's park. This paper conducted a post-hoc analysis through the Scheffe test method. In addition, this paper used the Spss Statistics 21 statistics program to conduct statistical analysis.

3. Results & Discussion

3.1. Suseong-gu population composition change

The results of analyzing the change in the total population composition of Suseong-gu are shown in <Table 2>. The number of infants and children continued to decrease from 69,267(19.7%) in 2005 to 39,940(12.0%) in 2020. The number of young and middle-aged people were from 254,180(72.5%) in 2005 to 241,336(72.3%) in 2020. The number of elderly people continued to increase from 27,333(7.8%) in 2005 to 52,529(15.7%) in 2020.

Table 2. Changes in the population composition in suseong-gu.

Sortation		2005 year	2006 year	2007 year	2008 year	2009 year	2010 year	2011 year	2012 year
Infants· Children	Number	69,267	66,584	64,926	64,041	62,657	61,059	58,515	56,218
	%	19.7	19.2	18.6	18.1	17.5	16.8	16.1	15.5
Young· Middle-aged	Number	254,180	251,015	253,950	258,114	261,605	267,778	268,831	269,274
	%	72.5	72.6	72.7	72.8	73.1	73.6	74.0	74.1
Older adults	Number	27,333	28,351	30,271	32,167	33,601	34,961	36,012	37,825
	%	7.8	8.2	8.7	9.1	9.4	9.6	9.9	10.4
Sortation		2013 year	2014 year	2015 year	2016 year	2017 year	2018 year	2019 year	2020 year
Infants· Children	Number	54,418	51,996	49,341	46,901	44,805	42,066	40,879	39,940
	%	15.0	14.5	13.9	13.3	13.0	12.5	12.2	12.0
Young · Middle-aged	Number	269,251	266,618	263,872	260,583	254,445	247,864	244,132	241,336
	%	74.1	74.1	74.2	74.1	73.7	73.4	72.9	72.3
Older adults	Number	39,579	41,093	42,497	44,046	46,092	47,919	50,033	52,529
	%	10.9	11.4	11.9	12.5	13.3	14.2	14.9	15.7

3.2. Change in children's park

The first children's park in Suseong-gu of Daegu Metropolitan City was designated as Hodori Children's Park in 1972. Since then, 4 places have been designated in the 1970s, 9 places in the 1980s, 47 places in the 1990s, 1 place in the 2000s, and 2 places in the 2010s. Changes in children's parks showed an increasing trend until the 1990s but decreased to one in the 2000s and two in the 2010s <Table 3>.

Table 3. Park designation status for children by period.

Sortation		1970s	1980s	1990s	2000s	2010s	Total
Children's park	Places	4	9	47	1	2	63
	%	6.3	14.3	74.6	1.6	3.2	100

3.3. Analysis of the proportion of children's population composition by residential type

As a result of analyzing the change of children's population by residential type, in 2005, it was 21.5%(6 places) for the multi-family housing complex, 20.6%(32 places) for the mixed housing complex, and 17.2%(25 places) for the detached housing complex. In 2020, it was 11.4%, 11.4%, and 10.9%, respectively, which decreased slightly every year <Table 4>.

Table 4. Percentage of children's population composition by housing type.

Sortation	2005 year	2006 year	2007 year	2008 year	2009 year	2010 year	2011 year	2012 year
Multi-family housing complex	21.5	20.8	19.8	19.1	18.3	17.5	16.6	15.7
Mixed housing complex	20.6	19.9	19.2	18.6	17.9	17.0	16.3	15.5
Detached housing complex	17.2	16.6	16.3	15.8	15.2	14.6	14.2	13.8
Total	19.3	18.7	18.1	17.5	16.8	16.1	15.5	14.8
F	16.694	15.263	13.150	11.787	9.749	8.064	6.382	4.398
Probability of significance	.000	.000	.000	.000	.000	.001	.003	.017
Sortation	2013 year	2014 year	2015 year	2016 year	2017 year	2018 year	2019 year	2020 year
Multi-family housing complex	15.0	14.5	13.9	13.2	12.8	12.2	11.8	11.4
Mixed housing complex	14.9	14.3	13.7	13.1	12.7	12.1	11.8	11.4
Detached housing complex	13.5	12.9	12.4	11.9	11.6	11.2	10.9	10.9
Total	14.3	13.8	13.2	12.7	12.3	11.7	11.4	11.2
F	3.273	2.954	2.834	2.340	1.768	1.593	1.148	0.405
Probability of significance	.045	.060	.067	.105	.179	.212	.324	.669

3.4. Analysis of children's park area by residential type

By classifying children's parks in Suseong-gu by dong, we compared and analyzed the park area by residential type. Six children's parks are located in the multi-family housing complex, with a total area of 10,981.4 m^2 and an average area of 1,830.2 m^2.

There are 32 children's parks in the mixed housing complex, with a total area of 72,283.5 m^2 and an average area of 2,258.8 m^2.

There are 25 children's parks in the detached housing complex, with a total area of 44,560.4 m^2 and an average area of 1,782.4m^2 <Table 5>.

In terms of park area by residential type, the area of children's parks in mixed housing complex was the widest, and park areas of multi-family and detached housing complex were similarly investigated.

Table 5. Children's park area by residential type.

Sortation	Places	Area	Average
Multi-family housing complex	6	10,981.4	1,830.2
Mixed housing complex	32	72,283.5	2,258.8
Detached housing complex	25	44,560.4	1,782.4
F 1.637, Probability of significance .203			

3.5. Analysis of the number of amusement facilities in the children's park by residential type

The analysis results of amusement facilities in children's parks were 19 cases(average 3.17 cases) in the multi-family housing complex, 172 cases(average 5.38 cases) in the mixed housing complex, and 100 cases(average 4.00 cases) in the detached housing complex. More children's play facilities were installed in the mixed housing complex <Table 6>.

Table 6. The number of amusement facilities in children's parks by residential type.

Sortation	Park	Amusement facilities	Average	Standard deviation
Multi-family housing complex	6	19	3.17	2.563
Mixed housing complex	32	172	5.38	2.803
Detached housing complex	25	100	4.00	2.062
Total	63	291	4.62	2.599
F=3.213, df1=2, df2=60, p=0.047				

4. Conclusion

In this study, we tried to solve leisure activities for the elderly by using a children's park that can be easily found and accessed around the area. We investigated and analyzed changes in the population composition around the existing children's parks and suggested ways to use parks by age group. In addition, we tried to increase the utilization rate of the park by dividing the children's park into three residential types such as multi-family housing complex, mixed housing complex, and detached housing complex. In particular, this study aims to suggest a way for the elderly to actively utilize the park by inducing a customized park tailored to the surrounding conditions in which the park is located.

First, as a result of analyzing the change in the total population composition of Suseong-gu, where the children's park is located, the number of infants and children continued to decrease from 69,267(19.7%) in 2005 to 39,940(12.0%) in 2020. The number of young and middle-aged people were from 254,180(72.5%) in 2005 to 241,336(72.3%) in 2020. The number of elderly people continued to increase from 27,333(7.8%) in 2005 to 52,529(15.7%) in 2020. Second, Hodori Park was first designated as a children's park in Suseong-gu in 1972. There were 4 in the 1970s, 9 in the 1980s, 47 in the 1990s, 1 in the 2000s, and 2 in the 2010s as children's parks. It showed an increase until the 1990s but decreased to 1 in the 2000s and 2 in the 2010s. Third, as a result of analyzing the change of children's population by residential type, in 2005, it was 21.5% for the multi-family housing complex, 20.6% for the mixed housing complex, and 17.2% for the detached housing complex. In 2020, it was 11.4%, 11.4%, and 10.9%, respectively, which decreased slightly every year.

Fourth, as a result of analyzing the area of children's parks by residential type, the average area of children's parks located in the multi-family housing complex was 1,830.2 m^2, the average area of children's parks located in the mixed housing complex was 2,258.8 m^2. The average area of children's parks located in the detached housing complex was 1,782.4 m^2. In terms of park area by residential type, the area of children's parks in mixed housing complex was the widest, and park areas of multi-family and detached housing complex were similarly investigated. Fifth, as a result of analyzing the amusement facilities in the children's park, there was an average of 3.17 in the multi-family housing complex, an average of 5.38 in the mixed housing complex, and an average of 4.00 in the detached housing complex. More children's play facilities were installed in the mixed housing complex.

This study aims to present a plan to utilize the park based on population change trends and the park's location by residential type.

First, it is necessary to increase the utilization rate of the elderly in the neighborhood by making good use of children's parks with low utilization rates. For example, parks located in places with many older adults should boldly introduce customized sports and play facilities for the elderly. Existing children's parks around the neighborhood need to be built into complex cultural, sports, and amusement park facilities that can be used by all residents[15][16].

Second, when creating a children's park as a complex park, it is not divided into facilities for children and facilities for the elderly.

It is necessary to mix appropriately to suit the user environment of the park. In other words, parks with a high use rate of the elderly have more recreation and sports facilities than amusement facilities, and parks with high use of children can have more amusement facilities. In this way, if the park facilities are supplemented according to the proportion of the population around the park, the utilization rate of the park can be increased[17].

Third, it is important to planning a park with a characteristic and theme in connection with various facilities.

From now on, generalized facilities alone cannot provide interest to children and the elderly.

Facilities preferred by children and the elderly need to be introduced by investigating users' preferences and developing park facilities with particular themes.

In particular, if facilities for the elderly are developed and applied, the park can become more diverse and abundant[18][19].

Fourth, it is necessary to prepare legal and institutional mechanisms for introducing play and sports facilities for the elderly in the park.

In other words, exercise and play equipment for the elderly should be customized facilities that the elderly can use with interest, not just strength training[20][21].

In conclusion, it is possible to increase the utilization rate of the park by investigating and analyzing the current state of the children's park, which lacks facilities that various users can use.

We can solve outdoor activities for the elderly, occurring with the rapidly progressing aging era, by utilizing a children's park in a nearby neighborhood. In addition, if it is made into a

complex multi-purpose culture, sports, and amusement park within the scope of not damaging the characteristics of the children's park, the elderly and residents can also use it. Legal and institutional changes must be made together to support these developments. Then, the current children's park will be reborn as a park where the elderly and residents can enjoy relaxation and exercise together.

5. References

5.1. Journal articles

[1] Lee WG & Shim JY & Kim DS & Lee SY. A Study on the Revitalization of Children's Parks by the Transition of the Surrounding Environment in Seogu, Daejeon. *The Korean Journal of Community Living Science*, 23(1), 17-30 (2012).

[2] Yoon JY & Ahn HS. A Study on a Sporting Equipment Developing to Induce Old People`s Interest. *Journal of the Korean Institute of Landscape Architecture*, 18(1), 221-234 (2012).

[3] Kim DC & Kim CH. Design Characteristics of Children`s Parks though an Analysis of Structuring Themes: Focused on a Case of the Imagine Children`s Park. *Journal of the Korean Society Design Culture*, 17(4), 23-37 (2011).

[4] Jeon MJ & Park JS & Lim WH. An Investigation on Developing the Shelter and Safety Facilities of Forest Kindergartens. *International Journal of Protection, Security & Investigation*, 5(1), 42-53 (2020). [Article]

[5] Lee JK. Study on Activating of Regional Community by Children's Park Remodeling -Focused on the Gwangju Hanam Children's Park 1. *Journal of the Korea Institute of Youth Facility and Environment*, 10(2), 119-127 (2012).

[6] Hong J & Lee H & Cheon W & Lim W. An Investigation on the Differences of Management in Landscape Construction Projects. *Public Value*, 5(2), 32-38 (2020). [Article]

[7] Kwun KC. A Study on Proper Distribution of Urban Parks in Living Area. *Journal of Korean Institute of Traditional Landscape Architecture*, 17(4), 129-137 (1999).

[8] Lee DH & Kang BK & Park HS. A Study on the Planning of the Barrier Free Park with Analyze of Urban Park in Domestic. *Journal of the Korean Society Design Culture*, 31(2), 169-170 (2011).

[9] Kwon GS & Cheon WK & Lim WH. A Study on the Actual Condition and Improvement Plan of Hierarchical Safety Management in Natural Parks. *International Journal of Crisis & Safety*, 5(1), 21-34 (2020). [Article]

[10] Kim DK. A Case Study of Wawoo Children's Park -A Study on the Modernization of Children's Parks in Seoul. *Journal of Korean Institute of Traditional Landscape Architecture*, 14(1), 67-77 (1996).

[12] Lee SY & Moon YH. Landscape Renovation Design for Children's Park by the Transition of Its Surrounding Environment. *Journal of Natural Science Pai Chai University Korea*, 23(1), 83-99 (2012).

[13] Jung GY. Analyzing Imagination, the Country of the Giant, a Barrier-free Playground in the Seoul Forest, from the Viewpoint of Inclusive Playground. *The Journal of Cultural Policy*, 17, 225-243 (2005).

[15] Ryu YS & Ra JH & Do HJ. Proper Arrangement of City Park though Analysis of Disposition Distance. *Journal of the Korean Institute of Landscape Architecture*, 20, 33-38 (2002).

[16] Lee CE & Kim SW. Analyzing Imagination, the Country of the Giant, a Barrier-free Playground in the Seoul Forest, from the Viewpoint of Inclusive Playground. *Journal of the Korean Society Design Culture*, 23(3), 605-618 (2017).

[17] Kim SB & Kim YS. The Role of Green Space in Metropolitan -Region with Practical Reference to Taegu City, Korea. *Journal of Korean Institute of Landscape Architecture*, 19(4), 1-11 (1992).

[18] Lee WK. Study on a Plan for the Vitalization of Children's Parks in a Metropolitan City: A Case of the Children's Parks in Suseong-ku, Taegu. *Journal of the Korea Tourism Management Association*, 16(1), 63-81 (2001).
[19] Kim C & Lee H & Lim W. Improvement Plan Through Nonagreement Consultation Analysis of Small Scale Environmental Impact Assessment. *Public Value*, 6(1), 1-13 (2021). [Article]
[20] Lee KB & Hong KP & Lee HJ. Evaluation of Citizens' Perception on the Utilization of Children's Parks for the Elderly. *The Journal of the Convergence on Culture Technology*, 6(4), 507-515 (2020).
[21] Lee J & Kwon G & Cheon W & Lim W. A Study on the Revitalization of Forest Management by Improving the Implementation Rate of Forest Projects. *International Journal of Human & Disaster*, 5(2), 1-9 (2020). [Article]

5.2. Thesis degree

[11] Jung JH. Study on Distributive Equity of Urban Park -Focusing on Urban Park in Daegu Metropolitan City-. Daegu Haany University, Doctoral Thesis (2017).

5.3. Additional references

[14] https://www.suseong.kr/ (2020).

6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Lead Author	SJ	-Set of concepts☑ -Design ☑ -Getting results ☑ -Analysis ☑
Corresponding Author*	CK	-Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Co-Author	HL WL	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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POLICE STRESS by Gender and Age

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Abstract

Purpose: *The purpose of this study is to verify the difference according to gender and age among general characteristics as stress factors in the Korean security police in terms of public value. Through the verification of the difference between these two factors, a discussion was conducted about which gender and age group perceived more occupational stress and how to effectively control it.*

Method: *In this study, among police officers in the security department as of 2020 who had experience in work related to North Korean defectors, 100 trainees in the Police Human Resources Development Institute were surveyed via self-administration method. Among the collected survey questionnaires, 91 were selected as valid samples, excluding those whose answers were incomplete or missing.*

Results: *As a result of the study, there was a significant difference in Q-5 as a difference in stress according to sex. Specifically, men were higher than women at the 1% significance level. Significant differences were found in Q-6, Q-7, and Q-8 in stress according to age. In all three questions, those in their fifties and above showed the highest at the 5% significance level, and those in their twenties showed the lowest stress.*

Conclusion: *According to the results of the study, there were significant differences in stress according to gender and age, and as a measure to reduce stress, organization should actively clarify the work environment, job system, and promotions, the direction and goals of the security police organization within a comprehensive security concept, and maintain efforts to reduce the burden of work in a male-centered organizational culture.*

[Keywords] ***Public Value, Police, Stress, Gender, Age***

1. Introduction

An appropriate amount of stress can be a factor of objectives and growth for organizations and individuals, but if stress is excessive or not effectively managed, it acts as an impediment to work efficiency and performance from an organizational perspective. From a personal perspective, we can also experience mental, emotional, and negative symptoms such as depression, suicide, burnout, and disease[1][2], which area important problems in the complex social environment of modern society[3].

Police officers in the front line are one of the occupational groups with high job stress due to various factors such as their duty to protect the lives and property of people, and the occurrence of various crimes, as well as internal factors such as police organization, interclass communication, work environment, promotion, work goals, and also personal factors such as human relations[4].

Accordingly, prior studies to find out methods and factors for relieving the police's job stress are continuously being conducted[5][6].

In particular, with the rapid changes in the social environment due to external factors, criminal methods and means are progressing and diversifying, and illegal acts that destroy the social order are constantly occurring, so the police are bound to experience constant job stress[7][8][9][10].

This has a negative impact on the police's job of maintaining public well-being and order. Furthermore, as a police officer, it is a factor that lowers the trust of the people by participating in deviant behaviors such as bribery and corruption that engage in illegal activities[11][12][13].

Unlike the general international security environment, Korea has the peculiarity that traditional, transnational, and inter-Korean security threats exist in various ways, and the characteristics of these threats coexist in a complex manner. In particular, the security police, in order to protects national legal interests and maintains social order, carries out information collection and espionage, as well as investigation activities to prevent crime and illegal activities, in order to become more complex and effective in responding to security issues that have a multi-layered nature of security even within the police organization, thus they face a wide range of job stress[14][15][16].

As such, a number of studies have been conducted on the factors and negative effects of job stress in general police organizations, but research on a special subject called the security police is somewhat insufficient. Therefore, in this study, a t-test for stress and a one-way Anova difference test were conducted, focusing on gender and age, which are the general characteristics of the Korean security police.

2. Research Method

2.1. Research subjects and sampling method

In this study, among police officers in the security department as of 2020 who had experience in work related to North Korean defectors, 100 trainees in the Police Human Resources Development Institute were surveyed via self-administration method. Among the collected survey questionnaires, 91 were selected as valid samples, excluding those whose answers were incomplete or missing.

Table 1. The general characteristic of the research subjects.

	Description	N(%)	Total
Gender	Male	61(67.0%)	91
	Female	30(33.0%)	
Age	20s	7(7.7%)	91
	30s	28(30.8%)	
	40s	30(33.0%)	
	50s or older	26(28.6%)	
Education	High school	14(15.4%)	91
	Junior college	30(33.0%)	
	College	43(47.3%)	
	Graduate school	4(4.4%)	
Rank	Policemen/women	1(1.1%)	91
	Senior policemen/women	19(20.9%)	
	Assistant inspector	18(19.8%)	
	Inspector	29(31.9%)	
	Senior inspector	14(15.4%)	
	Superintendent	10(11.0%)	
Employment path	General recruitment	75(82.4%)	91
	Special recruitment	5(5.5%)	
	Police academy	2(2.2%)	
	Police cadet	9(9.9%)	

	Other	0(0.0%)	
The total length of service as a police officer	5 years and less	13(14.3%)	91
	6-10 years	32(35.2%)	
	11-15 years	13(14.3%)	
	16-20 years	13(14.3%)	
	Longer than 20 years	20(22.0%)	
The length of service at the security department	2 years and less	16(17.6%)	91
	3-5 years	56(61.5%)	
	6-10 years	17(18.7%)	
	Longer than 10 years	2(2.2%)	
The number of police officers in the organization	10 or less	18(19.8%)	91
	November 15	42(46.2%)	
	16-20	24(26.4%)	
	More than 21	7(7.7%)	
Service location	Tier 1 areas(big cities)	80(87.9%)	91
	Tier 2 areas(small/medium-sized cities)	11(12.1%)	
	Tier 3 areas(rural areas)	0(0.0%)	

2.2. Measuring instrument

The appropriate method for each verification method was chosen to increase the content validity and verify the construct validity of the questionnaire. Content validity was validated through consultation with relevant experts to adopt survey questions suitable for the purpose of the study, and the reliability of the survey questions was shown to be Cronbach's α coefficient .834.

Table 2. The questions.

	Questions
Q-1	I often face a situation where the demands are conflicting.
Q-2	I get conflicting demands from two or three people.
Q-3	I am in charge of what needs to be done differently depending on the situation.
Q-4	I have a clearly established mission and goals for my job.
Q-5	I clearly know my role.
Q-6	I understand my responsibility for my role.
Q-7	I clearly feel the scope of responsibility for my role.
Q-8	The degree of responsibility for my work is clearly defined.
Q-9	I feel the need to reduce some of my roles.
Q-10	I feel that I have too many roles.
Q-11	I take on too much responsibility.
Q-12	My workload is too much.
Q-13	My heavy workload can negatively affect the quality of my work.

2.3. Data processing and analysis method

The data processing of this study was performed by using the SPSS 23.0, a statistical package program, to perform statistical verification for the purpose of data analysis as follows:

First, frequency analysis was conducted to identify general characteristics using the SPSS/PC+23.0 program.

Second, Cronbach's α coefficient was calculated for the reliability verification of the questionnaire.

Third, a t-test was conducted to find out the difference in stress according to gender.

Fourth, a One Way ANOVA was conducted to find out the difference in stress according to age.

3. Study Results

3.1. Differences in stress according to gender

<Table 3> shows the difference in stress according to gender. Specifically, in Q-5 men were higher than women at the 1% significance level.

As a result of the difference in stress according to gender, men were higher than women in Q-1, Q-2, Q-4, Q-6, Q-7, Q-8, Q-9, Q-10, and Q-11, while women were higher than men in Q-3, Q-12, and Q-13.

Table 3. Differences in stress according to gender.

	Gender	N	M	SD	t-value	sig
Q-1	Male	61.	3.1967.	.74877	.375	.969
	Female	30.	3.1333.	.77608		
Q-2	Male	61.	3.1148.	.63504	.550	.612
	Female	30.	3.0333.	.71840		
Q-3	Male	61.	3.1639.	.75675	-.825	.784
	Female	30.	3.3000.	.70221		
Q-4	Male	61.	3.0492.	.64359	.334	.779
	Female	30.	3.0000.	.69481		
Q-5	Male	61.	3.2623.	.83470	.551	.019*
	Female	30.	3.1667.	.64772		
Q-6	Male	61.	3.2623.	.70478	1.225.	.752
	Female	30.	3.0667.	.73968		
Q-7	Male	61.	3.2459.	.74511	.078	.460
	Female	30.	3.2333.	.67891		
Q-8	Male	61.	2.9508.	.84511	1.201.	.859
	Female	30.	2.7333.	.73968		
Q-9	Male	61.	3.2131.	.75531	.079	.665
	Female	30.	3.2000.	.71438		
Q-10	Male	61.	3.3279.	.72391	.403	.106
	Female	30.	3.2667.	.58329		
Q-11	Male	61.	3.1967.	.77071	.991	.109
	Female	30.	3.0333.	.66868		
Q-12	Male	61.	3.0656.	.67992	-.714	.297
	Female	30.	3.1667.	.53067		

Q-13	Male	61.	2.9836.	.64529	-1.489.	.265
	Female	30.	3.2000.	.66436		

3.2. Differences in stress according to age

<Table 4> shows the difference in stress according to age. In Q-6, Q-7, and Q-8, those in their fifties and above showed the highest at the 5% significance level.

Specifically, in Q-6, those in their fifties and above had higher levels than those in their twenties and thirties. In Q-7, those in their fifties and over were had higher levels than those in their thirties. In Q-8, those in their fifties and above had higher levels than those in their twenties and thirties.

Table 4. Differences in stress according to age.

		N	M	SD	F	sig	post hot
Q-1	20's	7.	3.4286.	.78680	.509	.677	
	30's	28.	3.1786.	.81892			
	40's	30.	3.0667.	.78492			
	Over 50	26.	3.2308.	.65163			
Q-2	20's	7.	3.4286.	.78680	1.188.	.319	
	30's	28.	3.1786.	.72283			
	40's	30.	2.9667.	.61495			
	Over 50	26.	3.0385.	.59872			
Q-3	20's	7.	3.4286.	.53452	.435	.728	
	30's	28.	3.1071.	.73733			
	40's	30.	3.2000.	.76112			
	Over 50	26.	3.2692.	.77757			
Q-4	20's	7.	2.7143.	.75593	2.025.	.116	
	30's	28.	2.8571.	.52453			
	40's	30.	3.1333.	.68145			
	Over 50	26.	3.1923.	.69393			
Q-5	20's	7.	2.8571.	.69007	2.424.	.071	
	30's	28.	3.0714.	.71640			
	40's	30.	3.2000.	.71438			
	Over 50	26.	3.5385.	.85934			
Q-6	20's	7.	2.7143.	.75593	6.791.	.000***	D>A D>B
	30's	28.	2.8929.	.68526			
	40's	30.	3.2333.	.67891			
	Over 50	26.	3.6154.	.57110			
Q-7	20's	7.	2.8571.	.89974	3.893.	.012*	D>B
	30's	28.	3.1071.	.73733			
	40's	30.	3.1333.	.57135			
	Over 50	26.	3.6154.	.69725			
Q-8	20's	7.	2.1429.	.37796	5.018.	.003**	D>A, D>B
	30's	28.	2.6429.	.67847			
	40's	30.	2.9667.	.71840			
	Over 50	26.	3.2308.	.95111			
Q-9	20's	7.	3.0000.	.57735	1.521.	.215	
	30's	28.	3.1429.	.70523			
	40's	30.	3.1000.	.71197			
	Over 50	26.	3.4615.	.81146			

Q-10	20's	7.	3.2857.	.75593	.704	.552	
	30's	28.	3.2857.	.59982			
	40's	30.	3.2000.	.61026			
	Over 50	26.	3.4615.	.81146			
Q-11	20's	7.	3.0000.	.57735	1.332.	.269	
	30's	28.	3.0357.	.69293			
	40's	30.	3.0667.	.73968			
	Over 50	26.	3.3846.	.80384			
Q-12	20's	7.	3.0000.	.57735	.235	.872	
	30's	28.	3.1786.	.72283			
	40's	30.	3.0667.	.52083			
	Over 50	26.	3.0769.	.68836			
Q-13	20's	7.	3.5714.	.78680	2.572.	.059	
	30's	28.	3.1429.	.75593			
	40's	30.	2.8667.	.50742			
	Over 50	26.	3.0385.	.59872			

A: 20's, B: 30's, C: 40's, D: Over 50

4. Conclusion and Discussion

In this study, a t-test for stress and a one-way Anova difference test were conducted, focusing on gender and age, which are the general characteristics of the Korean security police.

As a result of the study, there was a significant difference in Q-5 as a difference in stress according to sex. Specifically, men were higher than women at the 1% significance level.

In all three questions, those in their fifties and above showed the highest at the 5% significance level, and those in their twenties showed the lowest stress. Due to the characteristics of the security police, it can be said that this is a result of higher workloads and more complex tasks.

Based on the above research results, men are more stressed than women, which supports the claim of previous studies that men develop high job stress[17][18]. On the other hand, there were also results that women had high job stress[19], but there was no significant difference in stress. This happens not only in the security police, but in a variety of departments, In particular, the results seem to be due to the fact that the judicial police such as the Life Safety Division and the investigation police amount to more than 70%. However, even taking into account the overall ratio, the proportion of female police officers is very low, so it is necessary to supplement the results through additional research according to ratio and department in the future.

Based on research findings that men and older officers have higher stress, the security police have to improve their job and environmental burdens and anxiety factors such as work environment, job system, and promotion that affect older age groups and seek changes so that young and female police officers work evenly in the organization as a way to reduce stress. In addition, the direction and goal of the security police organization should be clarified within the comprehensive security concept, and efforts should be made to reduce the workload in a male-centered organizational culture[20][21].

It is hoped that the results of this study on the gender and age of police officers will provide policy suggestions that can contribute to the police officer's work environment and policies.

5. References

5.1. Journal articles

[1] Hwang IH & Lee YH. Influences of Police Officer's Job Stress and Traumatic Stress on Burnout. *Korean Journal of Forensic Psychology*, 31(4), 1115-1138 (2012).
[2] Shim HI. Comparative Study on the Job Stress and Job Satisfaction of the Police Officer and the Public Official. *The Korean Association of Police Science Review*, 18(4), 35-66 (2016).
[3] Lim YJ & Bang WS & Park GY. Factors of the Job Stress of Non Commissioned Women Officers. *International Journal of Military Affairs*, 4(1), 12-19 (2019). [Article]
[4] Yun GH & Joo HM & Lee JH. A Study on the Utilization of the Acceptance and Commitment Program to Relieve Job Stress and Treatment of the Police Officer. *Korean Police Studies Review*, 11(3), 185-216 (2012).
[5] Yun WS & Kim JH. What Makes People Satisfy the Police?. *International Journal of Police and Policing*, 5(2), 11-23 (2020). [Article]
[6] Nam J & Youn H & Jo S. Security Agency: Differences in Leaders' Followership in the Korean Security Police Organization according to the Educational Background and Employment Paths. *International Journal of Terrorism & National Security*, 5(2), 12-26 (2020). [Article]
[7] Lim CH. The Measures to Activate Trusted Community Policing. *Korean Journal of Public Safety and Criminal Justice*, 28(4), 376-408 (2019).
[8] Kim YG. A Study on the Job Satisfaction of Police Officials according to Job Stress Factors. *The Police Science Journal,* 10(1), 29-54 (2015).
[9] Hyun CD & Lee HD. Office Environment for Criminal Investigation and Its Impact on the Investigators. *The Police Science Journal*, 11(2), 115-147 (2016).
[10] Youn H & Nam J & Jo S. National Security: Differences in Leaders' Followership in the Korean Security Police Organization according to the Number of Police Officers and Work Location. *International Journal of Terrorism & National Security*, 5(2), 27-39 (2020). [Article]
[11] Lee KJ & Ji YH. A Study on the Utilization of Laughter Therapy Program for the Relief and Treatment of the Job Stress(PTSD) of Police Officers. *The Police Science Journal*, 6(1), 69-93 (2011).
[12] Lee HJ & Yoo YJ. The Effect of Job-stress on the Attitude of Police Deviance. *The Korean Association of Police Science Review*, 22(4), 179-206 (2020).
[13] Son YJ & Song YA & Choi YE. The Relationship between Occupational Stress and Exhaustion in the Police. *Stress*, 16(3), 225-231 (2008).
[14] Chang NS & Nam JS. A New Security Paradigm for the Korean National Police and the Role of Security Police. *Korean Police Studies Review*, 8(2), 123-152 (2009).
[15] Cho DW. A Study on the Plan of Early Settlement North Korean Defectors. *Korean Police Studies Review*, 14(2), 427-450 (2015).
[16] Lee JC & Lee JW. Performance Management of Security Police: An Analysis of Performance Measurement(2007-2019). *The Korean Association of Police Science Review*, 22(3), 177-210 (2020).
[17] Park JS & Choi ER. A Study on Relationships between Sleep Disorder, Fatigue and Job Stress in Police Shift-workers. *The Police Science Journal*, 5(1), 25-53 (2010).
[18] Woo JT. Positive Analysis of the Correlates between the Work-stress and Job-satisfaction of the First-line Police. *Korean Journal of Public Safety and Criminal Justice*, 16(2), 143-169 (2007).
[19] Moon YS. The Level and Influencing Factors of Police Officers' Job Stress. *The Korean Journal of Local Government Studies*, 14(4), 41-60 (2011).
[20] Youn H & Nam J & Jo S. Differences in Leaders' Followership in the Korean Security Police Organization according to Gender and Age. *International Journal of Police and Policing*, 5(2), 24-34 (2020). [Article]
[21] Park SY & Park SY. Influence of Job Stress Factors on Job Satisfaction among Local Officials: Mediating Effect of Depression. *The Korean Journal of Local Government Studies*, 21(4), 123-142 (2018).

6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Lead Author	SB	-Set of concepts☑ -Design ☑ -Getting results ☑ -Analysis ☑
Corresponding Author*	SJ	-Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Co-Author	CL	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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Creation of PUBLIC SERVICE VALUE Based on the Mediating Effect of Customized Cosmetics Salesperson Customer Empathy in the Relation Between Middle-Aged Women's Cosmetic Consumption Needs and Customized Cosmetic Purchase Intentions

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Abstract

Purpose: *This study aimed to analyze the relation between the desire to consume customized cosmetics and the purchase intention in middle-aged women. In the relation between these variables, the mediating effect of customer empathy is confirmed. The purpose is to present the implications of the individual public value of beauty services for the expansion of middle-aged women consumption of customized cosmetics.*

Method: *This study used the SPSS 22.0 program as the empirical analysis method for the 515 copies of an online questionnaire for middle-aged women in 17 cities and provinces nationwide. In order to verify the desire to consume cosmetics and the mediating effect of customized cosmetics salesperson's customer empathy, a re-verification was performed through regression analysis and the Sobel-test according to the mediating effect verification procedure proposed by Baron & Kenny(1986).*

Results: *In Research Question 1, in regards to the desire to consume cosmetics, the desire for brand and self-expression, for relations and belonging, for nature-friendliness, and for pleasure have a significant positive(+) effect on the purchase intention of customized cosmetics. In Research Question 2, the desire for safety, for nature-friendliness, and for pleasure had a significant positive(+) effect. In addition, in Research Question 3, the desire for safety($p<.01$), for nature-friendliness($p<.05$), and for pleasure($p<.05$) mediate the salesperson's empathy towards the customer and their influence on purchase intention was partly significant.*

Conclusion: *This study results show the positive effect of emotional empathy on consumers purchase through the customized cosmetics salesperson cognitive empathy and the importance of their ability to empathize in order to induce the consumer's purchasing behavior. Therefore, in the future, customized cosmetics sellers need not only to equip them with specialized knowledge and qualifications to obtain the public value purchase of products and services through empathy, but also to provide training programs.*

[Keywords] ***Middle-Aged Women, Customized Cosmetics, Consumption Desire, Purchase Intention, Salesperson Customer Empathy***

1. Introduction

The cosmetic market in Korea is growing rapidly. According to the 2019 Beauty & Personal Care Market Survey, Korea was the 9th largest beauty product market after the United States, China, Japan, Brazil, Germany, United Kingdom, India, and France[1]. The beauty industry can have a positive effect on improving the quality of everyday life[2]. In modern societies in the era of the 4th industrial revolution, the purchase of beauty products is expected to expand into different business areas encompassing different lifestyles by the purchase of cosmetics tailored in terms of skin, constitution, and health, in addition to their function as beauty products[3]. In modern society, as consumption

trends that value personal satisfaction and value are spreading, personalized marketing strategies in which individuals can reveal their individuality or own customized products are becoming more active. The result of rebuilding consumertopia, which is one of the key keywords that better represents the consumption trends in 2017, reflects this trend[4]. The cosmetics market has also developed customized cosmetics to keep pace with the recent trends.

Customized cosmetics refer to cosmetics that combine the contents of manufactured or imported cosmetics by adding the contents of other cosmetics or raw materials determined by the Minister of Food and Drug Safety, or cosmetics obtained by subdividing the contents of manufactured or imported cosmetics[5]. According to the '2019 Cosmetic Industry Analysis Report' surveyed by the Korea Health Industry Development Institute, as the customized cosmetics sales business began in earnest, various types of customized cosmetics tailored to individual skin types and characteristics were expected to be produced and sold to meet the needs of consumers. These customized cosmetics are especially attracting the attention of middle-aged women that are noticing their skin aging[6]. Middle-aged women experience physical and environmental changes, such as the independence of their children and hormonal changes. In many cases, they have economical margins, and when food, clothing, and shelter are satisfied, they pursue the need for self-esteem and self-realization[7][8], which can be satisfied by purchasing customized cosmetics.

Before actually purchasing customized cosmetics, consumption desire and purchase intention arise. Consumption desire appears in the process of trying to solve a deficiency that consumers feel, and the desire to consume customized cosmetics consists of six factors, including the desire for brand/self-expression, the desire for aesthetics/youth, the desire for safety, the desire for relations/belonging, the desire for nature-friendliness, and the desire for pleasure[9]. The desire for brand/self-expression is explained as an effort to express an appropriate image because the brand chosen symbolizes authority or honor; the desire for aesthetics and youth is the desire to delay aging and pursue aesthetic beauty, the desire to consume products that are suitable for the physical characteristics of the person and whose clinical results are certified; the desire for relations and belonging is the desire to follow the trends of the people around us or of the public; the desire for nature is the desire for products that go through the nature-friendly manufacturing process; the desire for pleasure can be explained as a desire to satisfy the five senses or to feel pleasure through customized cosmetics. These desires have been proven to increase purchase intention for customized cosmetics[9][10], which is understood to occur when customized cosmetics are considered to satisfy the needs of consumers.

The salesperson’s empathy can also play an important role in the purchase intention of customized cosmetics. Empathic communication can elicit intrinsic motivation that invites others to act[11][12]. The salesperson’s emotional empathy revealed through the interaction with the customer can act as an important factor for the customer to evaluate the company's service quality and judge whether or not they are satisfied. A salesperson's understanding of the customer's mood and disposition can affect not only the immediate product purchase, but also the repurchase intention[13]. In particular, salespeople of customized cosmetics can easily obtain information about customers by empathizing with them, and this helps in the process of recommending or preparing suitable products, so empathy towards the customer is a factor that should be emphasized.

According to the existing previous research, a study on the Effect of Cosmetic Consumption Desire on Purchase Intention of Customized Cosmetics : Purchasing Motivation as a Mediating Effect, purchasing motivation plays a mediating role in the relationship of purchasing intention that promotes consumption desire. Gwanjae Lee's study(2020), Effects of Cosmetic Salesperson’s Qualities on Repurchase Intention : focusing on the Mediating Effect of Customer Empathy, suggested that the degree of empathy between cosmetics salesmen and customers is the most important in relation to repurchasing intention. A study on Reliability and Purchase Behavior of Customized Cosmetic : Focus on 20 to 50 Aged Female Living in Gwangju found that female customers have high intent to purchase customized cosmetic.

Customized cosmetics, which are expected to emerge as a mainstream trend in the future, are expected to grow even more as they incorporate the customers’ individual personality and constitution.

However, there is not enough awareness of customized cosmetics, and studies on middle-aged women with consumption power are insufficient, and understanding the public value according to the value created by salespeople and individuals, exercising valuable thinking, maximizing procedural benefits to improve the quality of the different relations of customers, as well as creating value, and realizing that the value of services is important. Therefore, this study aims to examine the relationship between the desire to consume customized cosmetics and the purchase intention for middle-aged women in order to contribute to the expansion of the consumption of customized cosmetics. In the relation between these variables, particularly, the mediating effect of empathy towards the customer is confirmed among the capabilities of the customized cosmetics salesperson, whose importance at the sales site was introduced. The purpose of this study is to present the implications on the individual public value of beauty services for the expansion of the consumption of customized cosmetics.

1.1. Research problem

1. H1, The desire to consume cosmetics will have a significant positive(+) influence on the intention to purchase customized cosmetics.
2. H2, The desire to consume cosmetics will have a significant positive(+) effect on customized cosmetics salesperson's customer empathy.
3. H3, In regards to the desire to consume cosmetics that affects the purchase intention of customized cosmetics, there will be a mediating effect of the customized cosmetics salesperson's customer empathy.

2. Research Method

2.1. Research subject

This study was conducted from October 2nd to October 25th, 2020 in 17 cities and provinces nationwide to analyze the mediating effect of customized cosmetics salesperson's customer empathy in the relationship between the cosmetics consumption demands of middle-aged women and the purchase intention of customized cosmetics. Online questionnaires and consent forms were distributed and collected, among which 515 were selected and analyzed, and 15 were excluded for not being faithful. .

2.2. Survey method

This study used the online questionnaire method as a survey tool to empirically analyze the research problem. The questionnaire is made of questions based on the Likert 5-point scale divided as follows: 5 on general characteristics and 29 on consumption needs[14], 11 on the cosmetics salesperson's empathy towards the customer[13], 5 on intention to purchase customized cosmetics[15] for a total of 50 questions.

2.3.Data processing method

The following statistical analysis was performed using SPSS 22.0 program for the data of this study.

First, to analyze the validity of the measurement tool exploratory factor analysis was performed, and the reliability of the items constituting the factor was analyzed using Cronbach's alpha coefficient.

Second, to understand the general characteristics of the research subject frequency analysis was performed, and to understand the level of research variables descriptive statistics analysis was applied.

Third, to find out the correlation between the research variables Pearson's correlation was performed.

Fourth, in order to verify the mediating effect of customer empathy towards from customized cosmetics salespersons in the relationship between cosmetics consumption desire and customized cosmetics purchase intention, a regression analysis was performed according to the mediating effect verification procedure proposed by Baron & Kenny[16], and re-verified through Sobel-test. The statistical analysis was performed on the basis of the significance level of 5%.

3. Research Results

3.1. Reliability and validity verification

An exploratory factor analysis was conducted to verify the validity of the measurement tool used in this study. Among the factor analysis methods, a principal component analysis was used to minimize information loss while extracting factors that explain as much of the variance of the original variables as possible, and factors were analyzed using Varimax rotation until their structure was most pronounced while maintaining their independence. Factor classification was composed of one factor when the eigen value was 1 or more, and when the factor loading exceeded .40, it was classified as a corresponding factor.

3.1.1. Desire to consume cosmetics

As for the desire to consume cosmetics, the factor analysis was conducted with 27 items, as two items(relationship and belonging desire No. 1 and No. 2) that hindered the validity were excluded. As a result of factor analysis, the KMO measure was found to be .928, and the result of Bartlett's sphericity verification was also significant($p<.001$), while the factor analysis model was judged to be suitable. The desire to consume cosmetics was classified into six factors, and the six factors showed 69.4% of factor explanatory power. The first factor is the 'desire for brand/self-expression' with 7 items, the second factor is the 'desire for aesthetic/youth' with 6 items, the third factor is the 'desire for safety' with 5 items, the fourth factor is the 'desire for relation/belonging' with 4 items, the fifth factor was 'the desire for nature-friendliness' with three items, and the sixth factor was composed of 'the desire for pleasure' with two items, as shown in <Table 1>.

Table 1. Factor analysis of cosmetics consumption desire.

Items	Factor					
	1.	2.	3.	4.	5.	6.
Desire for brand/self-expression 1	0.753.	0.178.	0.088.	0.138.	0.108.	0.163.
Desire for brand/self-expression 2	0.757.	0.131.	0.080.	0.160.	0.184.	0.092.
Desire for brand/self-expression 3	0.823.	0.097.	-0.059.	0.231.	-0.060.	0.082.
Desire for brand/self-expression 4	0.766.	0.131.	0.021.	0.197.	0.095.	0.143.
Desire for brand/self-expression 5	0.752.	0.063.	-0.022.	0.111.	0.172.	0.093.
Desire for brand/self-expression 6	0.848.	0.059.	-0.003.	0.202.	0.015.	0.056.
Desire for brand/self-expression 7	0.828.	0.110.	-0.005.	0.208.	0.028.	0.013.

Desire for aesthetics and youth 1	0.180.	0.784.	0.268.	0.007.	0.142.	0.034.
Desire for aesthetics and youth 2	0.200.	0.799.	0.226.	0.062.	0.149.	0.023.
Desire for aesthetics and youth 3	0.157.	0.838.	0.145.	0.070.	0.172.	0.019.
Desire for aesthetics and youth 4	0.168.	0.760.	0.256.	0.120.	0.068.	0.106.
Desire for aesthetics and youth 5	0.044.	0.685.	0.431.	0.052.	0.026.	0.123.
Desire for aesthetics and youth 6	0.030.	0.712.	0.452.	-0.037.	0.072.	0.120.
Desire for safety 1	0.014.	0.341.	0.683.	-0.001.	0.134.	0.080.
Desire for safety 2	-0.051.	0.224.	0.698.	0.012.	0.305.	-0.047.
Desire for safety 3	0.066.	0.247.	0.723.	0.055.	0.226.	0.028.
Desire for safety 4	0.068.	0.232.	0.736.	0.091.	0.096.	0.042.
Desire for safety 5	-0.081.	0.336.	0.674.	0.023.	0.144.	0.184.
Desire for relation and belonging 3	0.201.	0.073.	-0.001.	0.813.	0.119.	-0.015.
Desire for relation and belonging 4	0.321.	-0.090.	0.012.	0.748.	0.068.	0.098.
Desire for relation and belonging 5	0.361.	0.047.	0.118.	0.686.	0.060.	0.268.
Desire for relation and belonging 6	0.281.	0.179.	0.069.	0.727.	0.107.	0.055.
Desire for nature friendliness 1	0.198.	0.104.	0.192.	0.138.	0.801.	0.018.
Desire for nature friendliness 2	0.125.	0.142.	0.309.	0.084.	0.770.	0.061.
Desire for nature friendliness 3	0.071.	0.233.	0.253.	0.109.	0.661.	0.155.
Desire for pleasure 1	0.392.	0.084.	0.179.	0.209.	0.302.	0.589.
Desire for pleasure 2	0.310.	0.205.	0.105.	0.159.	0.053.	0.793.
Eigen value	5.182.	4.182.	3.347.	2.600.	2.164.	1.250.
% of Variance	19.194.	15.491.	12.395.	9.629.	8.013.	4.630.
Cumulative %	19.194.	34.684.	47.079.	56.709.	64.722.	69.352.

KMO=.928, Bartlett χ^2=8462.061(p<.001)

3.1.2. Customized cosmetics salesperson's customer empathy

As for the customized cosmetics salesperson empathy for the customer, one item(cognitive empathy No. 6) that hinders the validity was excluded, and the factor analysis was finally conducted with 10 items. As a result of factor analysis, the KMO measure was found to be .914, and the result of Bartlett's sphericity verification was also significant(p<.001), while the factor analysis model was judged to be suitable. The customized cosmetics salesperson's customer empathy was classified into two factors, which showed 58.4% of factor explanatory power. The first factor was composed of

'cognitive empathy' with 5 items, and the second factor was composed of 'emotional empathy' with 5 items, as shown in <Table 2>.

Table 2. Analysis of factors of customized cosmetics salesmen's empathy for customers.

Items	Factor	
	1.	2.
Cognitive empathy 1	0.170.	0.769.
Cognitive empathy 2	0.155.	0.692.
Cognitive empathy 3	0.310.	0.714.
Cognitive empathy 4	0.461.	0.549.
Cognitive empathy 5	0.329.	0.697.
Emotional empathy 1	0.667.	0.312.
Emotional empathy 2	0.664.	0.383.
Emotional empathy 3	0.725.	0.254.
Emotional empathy 4	0.738.	0.267.
Emotional empathy 5	0.808.	0.107.
Eigen value	3.079.	2.759.
% of variance	30.792.	27.590.
Cumulative %	30.792.	58.383.
KMO=.914, Bartlett χ^2=1940.645(p<.001)		

3.1.3. Intention to purchase customized cosmetics

A factor analysis was conducted for the purchase intention of customized cosmetics in five items. As a result of factor analysis, the KMO measure was found to be .847, and the result of Bartlett's sphericity verification was also significant(p<.001), while the factor analysis model was judged to be suitable. The intention to purchase customized cosmetics was classified into 1 factor, and 1 factor showed 67.2% factor explanatory power, as shown in the following <Table 3>.

Table 3. Factor analysis of purchase intention of customized cosmetics.

Items	Factor
	1.
Purchase intention of customized cosmetics 1	0.829.
Purchase intention of customized cosmetics 2	0.759.
Purchase intention of customized cosmetics 3	0.864.
Purchase intention of customized cosmetics 4	0.845.

Purchase intention of customized cosmetics 5	0.796.
Eigen value	3.358.
% of variance	67.157.
Cumulative %	67.157.
KMO=.847, Bartlett χ^2=1297.539(p<.001)	

3.1.4. Reliability analysis

Reliability analysis was conducted to determine whether respondents responded consistently to the survey through the questionnaire of this study. Reliability means that the same result appears even when the object is measured multiple times, and that there is consistency among the items constituting a certain indicator. To verify this, Cronbach's alpha coefficient was used. In general, if the alpha coefficient is 0.6 or more, it is considered to be relatively reliable[17]. The alpha coefficients of all variables were judged to be more than 0.6, indicating that the reliability was high, as shown in <Table 4>.

Table 4. Reliability analysis.

Variables		No. of items	Cronbach`s α
Cosmetic consumption desire	Desire for brand/self-expression	7.	.923
	Desire for aesthetics and youth	6.	.918
	Desire for safety	5.	.841
	Desire for relation and belonging	4.	.830
	Desire for nature friendliness	3.	.782
	Desire for pleasure	2.	.651
Customized cosmetics salesmen's empathy for customers	Cognitive empathy	5.	.800
	Emotional empathy	5.	.831
	total	10.	.879
Purchase intention of customized cosmetics		5.	.876

3.2. General characteristics of the subject

For this study, a questionnaire survey was conducted on 515 middle-aged women, and the general characteristics of the study subjects are as follows. The age range was 127(24.7%) for those aged 40-44, 130(25.2%) for those aged 45-49, 129(25.0%) for those aged 50-54, and 129(25.0%) for those aged 55-590. As for the academic background, 155(30.1%) were high-school graduates, 64(12.4%) were community college graduates, 248(48.2%) were university graduates, and 48(9.3%) were post-graduate title holders. In terms of career, 53(10.3%) were professional/technical workers, 155 (30.1%) were clerical/managerial workers, 29(5.6%) were self-employed, 46(8.9%) were sales/service staff, 232(45.0%) were full-time housewives. Among them, the monthly average income was less than 1 million won for 105(20.4%), 1 million to 2 million won for 98(19.0%), 2 to 3.5 million won for

125(24.3%), and 3,5 million to 5 million won for 101 people(19.6%), 5 million won or more for 86(16.7%). Regarding their location, 168(32.6%) were located in Seoul, 42(8.2%) in Busan, 22(4.3%) in Daegu, 33(6.4%) in Incheon, 14(2.7%) in Gwangju, 14(2.7%) in Daejeon, 10(1.9%) in Ulsan, 128(24.9%) in Gyeonggi-do, 9(1.7%) in Gangwon-do Ga, 11(2.1%) in Chungcheongbuk-do, 12(2.3%) in Chungcheongnam-do, 10(1.9%) in Jeollabuk-do, 10(1.9%) in Jeollanam-do, 13(2.5%) in Gyeongsang-buk-do, 14(2.7%) in Gyeongsangnam-do, 3(0.6%) in Jeju, 2(0.4%) in Sejong, as shown in <Table 5>.

Table 5. Characteristics of research subjects.

Characteristics	Categories	N	%
Age group	40-44 years old	127.	24.7.
	45-49 years old	130.	25.2.
	50-54 years old	129.	25.0.
	55-59 years	129.	25.0.
Educational background	High school graduates	155.	30.1.
	Community college graduates	64.	12.4.
	University graduates	248.	48.2.
	Postgraduates	48.	9.3.
	Professional/technical	53.	10.3.
Career	Office/administrative position	155.	30.1.
	Self-employed	29.	5.6.
	Sales/service	46.	8.9.
	Housewives	232.	45.0.
Average monthly income	Less than 1 million won	105.	20.4.
	1 million to 2 million won	98.	19.0.
	2,5 to 3,5 million won	125.	24.3.
	3,5 to 5 million won	101.	19.6.
	More than 5 million won	86.	16.7.
Location	Seoul	168.	32.6.
	Busan	42.	8.2.
	Daegu	22.	4.3.
	Incheon	33.	6.4.

	Gwangju	14.	2.7.
	Daejeon	14.	2.7.
	Ulsan	10.	1.9.
	Gyeonggi-do	128.	24.9.
	Gangwon-do	9.	1.7.
	Chungcheongbuk-do	11.	2.1.
	Chungcheongnam-do	12.	2.3.
	Jeollabuk do	10.	1.9.
	Jeollanam-do	10.	1.9.
	Gyeongsangbuk-do	13.	2.5.
	Gyeongsangnam-do	14.	2.7.
	Jeju	3.	0.6.
	Sejong	2.	0.4.
Total		515.	100.0.

3.3. Technical statistics

The mean and standard deviation were calculated to determine the level of the research variables measured in this study. The average of the sub-factors of cosmetic consumption desires out of 5 total points was 2.87 for brand/self-expression, 4.21 for aesthetics and youth, 4.28 for safety, 2.97 for relationship and belonging, 3.76 for nature-friendliness, 3.40 for pleasure, 3.77 for customized cosmetics salesperson's empathy for customers, and 3.15 for average of purchase intentions for customized cosmetics In addition, Skewness and Kurtosis were calculated to determine whether the variables satisfy the normality assumption. If the skewness is less than the absolute value of 3 and the kurtosis is less than the absolute value of 10, it is judged to be approximated to the normal distribution[18]. All variables were found to satisfy the normality assumption, as shown in <Table 6>.

Table 6. Technical statistics.

Variables		Min.	Max.	Mean	S.D	Skewness	Kurtosis
Cosmetic consumption desire	Desire for brand/ self-expression	1.00.	5.00.	2.87.	0.85.	-0.25.	-0.41.
	Desire for aesthetics and youth	1.00.	5.00.	4.21.	0.68.	-1.27.	2.63.

	Desire for safety	1.20.	5.00.	4.28.	0.57.	-1.26.	3.12.
	Desire for relation and belonging	1.00.	5.00.	2.97.	0.81.	-0.08.	-0.27.
	Desire for nature friendliness	1.33.	5.00.	3.76.	0.70.	-0.59.	0.66.
	Desire for pleasure	1.00.	5.00.	3.40.	0.77.	-0.35.	0.00.
		1.40.	5.00.	3.77.	0.56.	-0.59.	1.14.
Customized cosmetics salesmen's empathy for customers							
Purchase intention of customized cosmetics		1.00.	5.00.	3.15.	0.73.	-0.20.	0.05.

3.4. Correlation analysis

Pearson's correlation analysis was performed to find out the correlation between the variables in this study. In regards to the intention to purchase customized cosmetics, the desire for brand/self-expression(r=.533, p<.001), the desire for aesthetics and youth(r=.301, p<.001), the desire for safety(r=. =.258, p<.001), the desire for relationship/belonging(r=.495, p<.001), the desire for nature-friendliness(r=.479, p<.001), the desire for pleasure(r=.494, p <.001) showed a significant positive(+) correlation. The purchase intention of customized cosmetics showed a statistically significant positive(+) correlation with customized cosmetics salesperson's customer empathy(r=.361, p<.001). In regards to the customized cosmetics salesperson's customer empathy, the desire for brand/self-expression(r=.247, p<.001), the desire for aesthetics and youth(r=.476, p<.001), the desire for safety(r=. =.580, p<.001), the desire for relationship/belonging(r=.212, p<.001), the desire for nature-friendliness(r=.454, p<.001), the desire for pleasure(r=.389, p <.001) showed a significant positive(+) correlation. Also, since the absolute value of the correlation coefficient between the measured variables was less than .80, the problem of multicollinearity did not appear, as shown in <Table 7>.

Table 7. Correlation analysis.

	Desire for brand/self-expression	Desire for aesthetic and youth	Desire for safety	Desire for relationship and belonging	Desire for nature friendliness	Desire for pleasure	Customized cosmetics salesmen's empathy for customers	Purchase Intention of Customized Cosmetics
Desire for brand/self-expression	1.							
Desire for aesthetics and youth	.305***	1.						

Desire for safety	.105*	.664***	1.					
Desire for relation and belonging	.569***	.209***	.155***	1.				
Desire for nature friendliness	.303***	.427***	.550***	.313***	1.			
Desire for pleasure	.560***	.380***	.332***	.474***	.414***	1.		
Customized cosmetics salesmen's empathy for customers	.247***	.476***	.580***	.212***	.454***	.389***	1.	
Purchase intention of customized cosmetics	.533***	.301***	.258***	.495***	.479***	.494***	.361***	1.

Note: *p<.05, **p<.01, ***p<.001.

3.5. Verification of the mediating effect

3.5.1. Customized cosmetics salesperson's customer empathy

In order to verify the mediating effect of the desire to purchase cosmetics on the intention of purchasing customized cosmetics, the mediating effect of customized cosmetics salesperson's customer empathy was analyzed through a regression analysis over three stages proposed by Baron and Kenny[16], as shown in <Table 8>. First, in step 1, the sub-factors of cosmetics consumption desire, which are independent variables, are the desire for safety(β=.408, p<.001), the desire for nature-friendliness(β=.119, p<.01), the desire for pleasure(β=.139, p<.01) and have a statistically significant positive(+) effect on the customized cosmetics salesperson's empathy for the customer, which is a parameter. In step 2, the sub-factors of the cosmetics consumption desire, which are independent variables, are the desire for brand/self-expression(β=. 255, p<.001), the desire for relationship/belonging(β=.194, p<.001), the desire for nature-friendliness(β=.282, p<.001), the desire for pleasure(β=.140, p<. 01) have a significant positive (+) effect on the purchase intention of customized cosmetics, which is a dependent variable. And in the last step 3, the desire for brand/self-expression(β=.246, p<< .001), the desire for relationship and belonging(β=.195, p<.001), the desire for nature-friendliness(β=.267, p<.001), the desire for pleasure(β=.124, p<.01) and the parameter of the parameter of the customized cosmetics salesperson's customer empathy(β=.121, p<.01) have a significant positive(+) effect on the purchase intention of customized cosmetics. The sub-factors of the cosmetics consumption desire, which are independent variables, are the desire for safety, nature-friendliness, and pleasure and had a significant positive(+) effect on customized cosmetics

salesperson's empathy towards the customer as a parameter in step 1; and customized cosmetics salesperson's empathy towards the customer as a parameter in step 3 had a significant positive(+) effect on the dependent variable of the intention to purchase customized cosmetics, so the indirect effect of the desire for safety, for nature-friendliness, and for pleasure on the purchase intention of customized cosmetics was found to be significant. The influence of step 3 on the purchase intention of customized cosmetics of the sub-factors of desire for cosmetics consumption(β=.282, β=.267) and desire for pleasure(β=.140, β=.124) was reduced from that of step 2. Customized cosmetics salesperson's customer empathy partially mediates the relationship between the desires for nature-friendliness and pleasure, which are sub-factors of the cosmetics consumption desire, and the purchase intention of customized cosmetics. In other words, it can be said that the customized cosmetic sales person's empathy towards the customer directly affects the intention to purchase the customized cosmetic product, and the customized cosmetic sales person's empathy towards the customer has an indirect effect on the purchase intention of the customized cosmetic product.

Table 8. Analysis of the mediating effect of customized cosmetics salesperson's customer empathy.

Model	DV	IV	B	SE	β	t	p	F(R^2)
1.	Customized cosmetics salesmen's empathy for customers	Desire for brand/ self-expression	0.047.	0.031.	.072	1.517.	.130	56.148^{***} (.399)
		Desire for aesthetics and youth	0.067.	0.040.	.082	1.682.	.093	
		Desire for safety	0.400.	0.051.	.408	7.834^{***}	<.001	
		Desire for relation and belonging	-0.009.	0.030.	-.013	-0.295.	.768	
2.	Purchase intention of customized cosmetics	Desire for nature friendliness	0.095.	0.035.	.119	2.715^{**}	.007	65.992^{***} (.438)
		Desire for pleasure	0.100.	0.033.	.139	3.056^{**}	.002	
		Desire for brand/ self-expression	0.218.	0.039.	.255	5.538^{***}	<.001	
		Desire for aesthetics and youth	0.019.	0.050.	.018	0.375.	.708	
		Desire for safety	-0.015.	0.064.	-.012	-0.235.	.815	
		Desire for relation and belonging	0.174.	0.038.	.194	4.619^{***}	<.001	

		Desire for nature friendliness	0.292.	0.044.	.282	6.627***	<.001	
		Desire for pleasure	0.132.	0.041.	.140	3.192**	.001	
		Desire for brand/ self-expression	0.211.	0.039.	.246	5.373***	<.001	
		Desire for aesthetics and youth	0.008.	0.050.	.008	0.165.	.869	
		Desire for safety	-0.078.	0.068.	-.061	-1.158.	.247	
3.	Purchase intention of customized cosmetics	Desire for relation and belonging	0.176.	0.037.	.195	4.688***	<.001	58.516*** (.447)
		Desire for nature friendliness	0.277.	0.044.	.267	6.285***	<.001	
		Desire for pleasure	0.116.	0.041.	.124	2.803**	.005	
		Customized cosmetics salesmen's empathy for customers	0.158.	0.056.	.121	2.849**	.005	

Note: **p<.01,***p<.001.

As a result of the validation of the mediating effect of Baron and Kenny previously conducted in addition to the re-verification of the significance of the mediating effect through the Sobel-test, in the sub-factors of cosmetics consumption desire of desire for safety(Z=2.677, p<.01), desire for nature-friendliness(Z=1.965, p<.05), and desire for pleasure(Z=2.084, p<.05) effect on intention of purchase, the customized cosmetics salesperson's customer empathy was found to be statistically significant, as shown in <Table 9> and <Figure 1>.

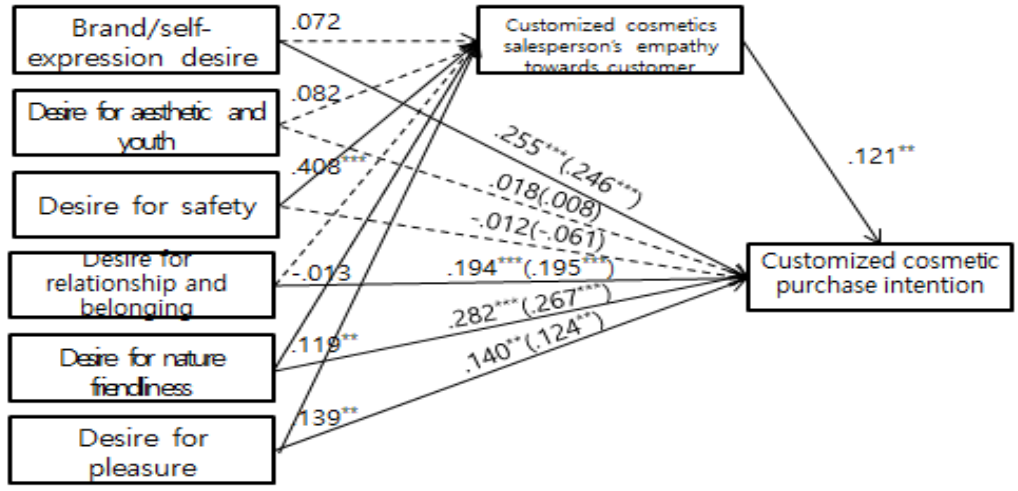
Table 9. Sobel-test results.

Path	Z	p
Brand/self-expression desire→customized cosmetics salesperson's empathy towards customer →customized cosmetics purchase intention	1.339.	.181
Desire for aesthetic and youth→customized cosmetics salesperson's empathy towards customer→customized cosmetics purchase intention	1.448.	.148
Desire for safety →customized cosmetics salesperson's empathy towards customer →intention to purchase customized cosmetics	2.677**	.007

Desire for relationship and belonging→customized cosmetics salesperson's empathy towards customer→customized cosmetics purchase intention	-0.294.	1.231.
Desire for nature friendliness →customized cosmetics salesperson's empathy towards customer →intention to purchase customized cosmetics	1.965*	.049
Desire for pleasure→customized cosmetics salesperson's empathy towards customer→customized cosmetics purchase intention	2.084*	.037

Note: * p<.05,** p<.01.

Figure 1. A Mediating effect model of customized cosmetics salesperson customer empathy in the relation between cosmetic consumption needs and customized cosmetic purchase intentions.



4. Conclusion

This study was conducted with the aim of verifying the factors affecting the intention to purchase customized cosmetics of middle-aged women, who are considered to be the main consumers, in order to revitalize the purchase of customized cosmetics. In order to achieve the research purpose, a self-written questionnaire survey was conducted on 515 middle-aged women nationwide, and the analysis results are as follows.

Hypothesis 1, which was partially supported, was that the desire to consume cosmetics would have a significant positive(+) effect on the purchase intention of customized cosmetics. In other words, it can be said that the desire to reveal one's power or dignity by using customized cosmetics, the desire to feel the same as those around you, the desire to use nature-friendly products, and the desire to satisfy the five senses or feel pleasure through the use of customized cosmetics lead to the consumption of customized cosmetics. The results of Jin Lee and Eunjoo Choi's[9] research support this and it can be confirmed that the consumption desire that reflects the characteristics of modern society contributes to the formation and value of consumption culture. Modern middle-aged women want to be differentiated from others, and they want to enhance themselves through the products they use. In particular, the result that showed the greatest influence of the desire for nature-friendliness could be interpreted as the fact that middle-aged women want cosmetics with natural ingredients and manufacturing methods. There is a perception that nature-friendly products are harmless to the human body[19]. However, it seems that they have a high influence among middle-aged women because they also convey the image of promoting health. Therefore, in order to in-

crease the purchase intention of customized cosmetics, it is considered effective to emphasize the characteristics of nature-friendly products.

Next, hypothesis 2, which was supported, was that the desire to consume cosmetics will have a significant positive(+) effect on the purchase intention of customized cosmetics and that the desire for safety, for nature-friendliness, and for pleasure have a significant positive(+) effect. In particular, the influence of the desire for safety was high, and it was interpreted that the more middle-aged women who purchase cosmetics valued safety, the better they sympathized with the salesperson. Consumers of customized cosmetics understand the perspectives and reasons of purchase from their point of view as customers, and expect from the salesperson's expertise and explanations on whether the ingredients and manufacturing processes are safe products for them. This makes middle-aged women seem to become more emotionally empathetic.

Finally, hypothesis 3 was that there would be a mediating effect of customized cosmetics salesperson's customer empathy in regards to the fact that the desire to consume cosmetics influences the purchase intention of customized cosmetics and it was partially supported according to Baron and Kenny's hierarchical regression analysis and the Sobel test, in which the desire for safety, for nature-friendliness, and for pleasure mediate the salesperson's empathy towards the customer and influences the purchase intention. This result supports previous research that if empathic communication is achieved, it can lead to behavior by naturally inducing the other person's internal motivation[11]. The empathy of the salesperson has a positive effect on feelings[20], in addition, the empathy ability of salespeople is a very important factor to induce consumers' purchasing behavior and can contribute to the public value of services in the future. Therefore, in the future, it will be necessary to provide customized cosmetics sellers with specialized knowledge and qualifications, as well as training programs that can improve empathy with customers.Customer empathy from customized cosmetics salespeople is very important to purchasing intention, and communication with customers plays an important role as a mediating variable in forming sympathy with customers. As the market conditions change, the cosmetics industry needs prompt policies and countermeasures to meet the diverse needs of customers. Accordingly, it is necessary to contribute to the vitalization of the cosmetics market by establishing a customized cosmetics marketing process based on the consumer's desire to consume cosmetics.

Customized cosmetics are new cosmetics that have not been around for a long time, but demand is expected to increase significantly as consumers' awareness of them expands in the future. However, until now, they are not well known due to the lack of related publicity, and accordingly, there is insufficient research. In this study, while designating the target of middle-aged women, the age range was set from 40 to 59 years old. Since the values and desires pursued may differ according to age, an analysis of the influence relationship according to age will be necessary. In addition, it is necessary to establish an effective marketing process according to the characteristics of the target and to seek strategies according to consumption trends, so research on this should also be conducted.

5. References

5.1. Journal articles

[1] Park JS. Changes in Beauty Service Industry in Era of the Fourth Industrial Revolution and Aging: Focused on Expandability of the Smart Beauty Care Market. *The Journal of Humanities and Social science*, 11(1), 205-220 (2020).

[2] We HJ & Lee JB & Kim EJ. Exploring the Experience of Job Convergence Change in the Beauty and Health Industry Using Grounded Theory. *Protection Convergence,* 5(2), 84-93 (2020). [Article]

[3] Kim TS & Lee JB. Analysis of Perception of Naturopathy Convergence and Utilization Satisfaction Perceived by Skin Beauty Industry Workers. *Protection Convergence,* 5(2), 94-102 (2020). [Article]

[4] Kong SM & Kim MS. Usage of Customized Cosmetics and Preferred Customized Cosmetic Types by Age in Female Consumers. *Journal of Investigative Cosmetology*,14(3), 331-342 (2018).

[6] Cha YH. Effects of the Integrative Play Therapeutic Counseling Program on the Depression for the Elderly. *Protection Convergence,* 5(2), 103-111 (2020). [Article]
[7] Lee JB & Liang D. Suggestions for Using AI in Preparation for a Super-aging Society. *Robotics & AI Ethics,* 5(2), 57-64 (2020). [Article]
[8] Maslow AH. A Theory of Human Motivation. *Psychological Review,* 50, 370-396 (1943).
[9] Lee J & Choi EJ. A Study on the Effect of Cosmetic Consumption Desire on Purchase Intention of Customized Cosmetics -Purchasing Motivation as a Mediating Effect-. *Journal of the Korean Society for Wellness,* 15(4), 43-58 (2020).
[10] Lee MS & Song TI. A Study on Reliability and Purchase Behavior of Customized Cosmetic -Focus on 20 to 50 Aged Female Living in Gwangju. *Journal of the Korean Society of Design Culture,* 26(3), 283-293 (2020).
[11] Lim YJ. Implications of Emotional Coaching and Integrated Art Therapy Teaching Method on Leadership Education in the AI Era. *Robotics & AI Ethics,* 5(2), 42-49 (2020). [Article]
[12] Lee JS & Son JM. The Effect of Emotional Empathy Ability of Face-to-face Channel Salesperson on CRM Performance and Sales Performance: Effect of Customer Orientation. *Journal of Marketing Management Research,* 23(4), 95-115 (2018).
[16] Baron RM & Kenny DA. The Moderator-mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182 (1986).
[19] Park SY & Kim JD. A Study on Recognition, Current Use and Satisfaction with Natural Cosmetic Products. *Journal of the Korean Society of Cosmetics and Cosmetology*, 10(2), 157-172 (2020).
[20] Seo MJ & Jun DG. A Study of Consumers' Responses to the Attributes of Salespeople in Fashion Retail Stores. *Fashion & Textile Research Journal*, 20(5), 509-519 (2018).

5.2. Thesis degree

[13] Lee GJ. Paper Title Effects of Cosmetic Salesperson's Qualities on Repurchase Intention - Focusing on the Mediating Effect of Customer Empathy. Kongju National University, Master's Thesis (2020).
[14] Lee J. Paper Title a Study on the Effect of Cosmetic Consumption Desire on Purchase Intention of Customized Cosmetics. Westminster Graduate School of Theology, Doctoral Thesis (2020).
[15] Cho M. Paper title the Effects on Customized Cosmetics Selection Attributes and Safety Perception on Purchase Behavior Intention. Konkuk University, Master's Thesis (2020).

5.3. Books

[17] Hair JF & Black WC & Babin BJ & Anderson RE & Tatham RL. Multivariate Data Analysis. Prentice hall (1998).
[18] Kline RB. Principles and Practice of Structural Equation Modeling. Guilford Publications (2005).

5.4. Additional references

[5] https://www.law.go.kr/ (2020).

6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Lead Author	HY	-Set of concepts☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Corresponding Author*	EK	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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A Study on the Design of Art Mask Based on Traditional Korean Patterns and Obang Color in MODERN SOCIETY

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Abstract

Purpose: *Traditional Korean patterns, which have continued throughout our life history, have developed into decorative patterns that apply dots, lines, and colors today through changes in the times. It is an important inspiration for the creation of various sculptures against the backdrop of a sense of beauty in modern society, and this is no exception in the field of beauty design. This study aims to expand the range of expressions on masks by applying makeup design to art masks by applying traditional Korean patterns and obang colors.*

Method: *First, we consider the theoretical background of Korean traditional patterns, obang colors, and art masks. Second, we analyze the characteristics of traditional Korean patterns and obang colors. Third, we analyze the concept and expression techniques of art masks. Fourth, based on the above research, art mask works are produced based on traditional Korean patterns and obang colors. As a research method, we will focus on domestic dissertations and professional books and present a wide range of art mask designs by applying traditional Korean patterns and obang colors.*

Results: *The first work was based on the motif of ghost painting, which recognized ghosts as good beings, not evil beings, and expressed the main pattern of ghost painting in a three-dimensional manner. The second work is based on lotus patterns, and it expresses a beautiful, colorful, but sad lotus flower by contrasting the lotus patterns with two colors. The third work is based on dragon patterns, and since ancient times, dragons and phoenixes have expressed the best as imaginary animals in myths and legends.*

Conclusion: *Traditional patterns and obang colors have been studied in various fields in modern times, and traditional patterns and obang colors have been used in various fields in the beauty design field recently. Based on the results of this study, various scope of art mask design research using Korean traditional patterns and obang colors were presented within art makeup design.*

[Keywords] ***Art Mask, Obang Color, Korean, Patterns, Traditional***

1. Introduction

Our society has made remarkable progress in politics, economy, society and science[1]. With this trend, information is quickly transmitted to almost everyone, based on the development of computers and the Internet in the fourth industry beyond the third industry[2]. In modern society, information has been delivered quickly, and fashion has also changed a lot. Fashion cycles become shorter and trends are a way of expressing individuality, rather than simply mimicking it, and this trend can be seen quickly in the fields of beauty and fashion[3].

Korean patterns have been developed for thousands of years, from prehistoric times when petroglyphs began to be painted to the Joseon Dynasty, forming a space deep in our lives, ranging from architecture, sculpture, painting, metal, crafts, ceramics, lacquerware, and other decorations and

accessories[4]. The traditional Korean patterns that have continued throughout our life history have developed through changes in the times[5] into decorative patterns that apply dots, lines, and colors today[4]. Color rituals of the Korean people have long been divided into 'obangjeong color' and 'obanggan color' colors by the Yin and Yang five elements, and different colors have been used depending on their status.

Obang colors have been represented by hanbok, food, architecture, and jewelry, and have been developed into a variety of colors rather than just five colors through the use of colors today. It is an important inspiration for the creation of various sculptures against the backdrop of aesthetic awareness in modern society, and this is no exception in the field of beauty design, and makeup design, hair design, and nail art works from various s angles have been recognized for their artistic value[6]. Modern art in various cultural fields, including craft, art, thought, customs, and beauty, is being used in design development, and the world is paying attention to new values and influences[7]. Therefore, this study aims to expand the range of expressions available to masks by applying makeup design to art masks by applying traditional Korean patterns and obang colors shown in modern society.

2. Media Based Learning

2.1. Obang color

The obang colors are blue, red, yellow, white, and black as 'jeong color' or 'obangjeong color', and green, scarlet, wall, purple, and yellow as 'obanggan color'. It was also seen that colors are assigned according to their orientation, and that the correlation of mis-lines results in intermediate colors, resulting in infinite hues[8]. The obang colors were the symbolic language of the traditional period, which was sublimated into an artistic style by adapting and purifying real life. In addition, ethnic color philosophy was born by giving meaning to each other, not just by color[9]. Obang Color has been closely related to our lives since a long time ago, and 10 colors of Obangjeong Color and Obanggan Color are born. In terms of the obang colors found in everyday life, there are customs such as putting rouge on the married bride's face, putting balsam flowers in her nails, and red, etc. When she gave birth to a son who means evil, red peppers and charcoal were hung in front of her door[10]. Rather than coming from Confucian Yin and Yang five elements, the color of Korean culture can be attributed to the use of Chinese Yin and Yang five elements and Confucian status structures on top of the folk belief color view[11].

2.2. Korean traditional patterns

Traditional patterns are shapes that date back to ancient times and are generally a combination of the vocabulary words tradition and pattern[12]. Tradition is an idea passed down from a group or community. It refers to a cultural heritage that is meaningfully and rewarding in its present life as a custom, a style of behavior, or a spirit and historical vitality at its center[13]. Patterns generally refer to the appearance of various shapes on the outside of objects[14]. Patterns are the products of cultural activities throughout life and of creative civilization. Such patterns have become the source of all the sculptural arts, including paintings, sculptures, and crafts made by mankind, as well as their role as letters and language[6]. Traditional Korean patterns have symbolic meanings as well as beauty, and different patterns are expressed depending on their personality and purpose. The round one symbolizes the sky, the octagon symbolizes the universe, and the square one symbolizes the earth. The diagonal shape of the plane is a symbol of 'chaos' and 'migung', which is represented by the shape of the taegeuk or wheel[15]. If you look at the traditional Korean patterns, they vary widely from the original nature to the symbolically simplified geometry[16]. In other words, patterns can be divided into two main categories artificial and natural. Artificial ones include geometric or abstract ones, and natural ones are constructed by iteratively arranging or constructing simple schematics of natural objects[4].

2.3. Art mask

A mask is a generic term for objects that cover part or all of the face, including cotton, masks, and masks. In primitive society, it was said that painting the face for religious or shamanistic purposes was the beginning of the mask, and the communication between God's world and humans was used as a media for unique things of each nation. Masks can be referred to as 'masks' in Korean, but masks exist among almost all ethnic groups, regardless of whether they are Eastern or Western, civilized or uncivilized, and date their origins back to primitive ethnic societies[17]. Masks have recently been called art masks as they have been used as materials for new expression techniques and design research in the domestic makeup design field, a combination of art and makeup[6]. It can be said that it expresses artistic sensations on the face and body of a model as if it were painting[18]. Art is a general term for human creative activities, especially conscious activities to represent beauty, and this scope is the realm of art, and includes creation that works on vision, such as painting and sculpture[19]. The term "makeup" is translated into Korean for "makeup" in a very narrow sense, but makeup actually has a very wide meaning as it refers to the artificial formulation of the body surface by introducing elements of painting, designing, printing, carving and modeling[20].

3. Research Method

This study summarizes the characteristics of traditional Korean patterns, obang colors, and art masks. Art mask works were produced based on traditional Korean patterns and obang colors. Research methods focused on domestic dissertations, academic journals, and professional books. Three art mask designs were made by applying traditional Korean patterns and obang colors.

The contents and methods of this study are as follows.

First, we consider the theoretical background of Korean traditional patterns, obang colors, and art masks.

Second, it analyzes the characteristics of traditional Korean patterns, obang colors, and art masks.

Third, we analyze the concept and expression techniques of art masks.

Fourth, based on the above research, art mask works are produced based on traditional Korean patterns and obang colors.

As a research method, we will focus on domestic dissertations and professional books and present a wide range of art mask designs by applying traditional Korean patterns and obang colors.

4. Research Results

4.1. Inside a human being

It is a work that expresses the inner side of human beings by applying the Ghost pattern as its main pattern and utilizing the characteristics of obang colors. Ghosts have long been recognized as objects of fear, but there are evil beings such as demons, ghosts but there are good beings such as gods, spirits, and newcomers.

In the work, ghosts are recognized as good beings, not as demons, and ghosts depict the main patterns of ghosts in three dimensions by drawing earpieces on art masks.

The results of the work are shown in <Table 1>.

Table 1. Inside a human being.

Motif image	Artwork	Work result
A. Ghost patterns.		
Color suggestion		

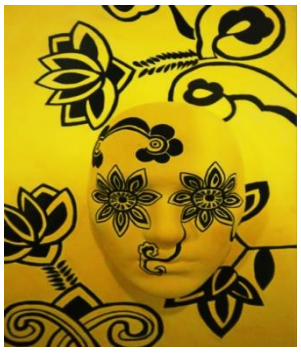
Note: A. https://www.culture.go.kr

4.2. flowery days

Lotus and lotus scroll patterns are applied as the main patterns, and flowery days are depicted by using the obang color characteristics flower days Lotus means the most beautiful and happiest moment of life. The flower word of a lotus flower is "You are beautiful" and it is the best flower to express the most beautiful moment in life, but unlike the flower word, the legend of a lotus flower is a sad story. The painting uses two colors to contrast the lotus patterns, showing beautiful, colorful, but sad lotus flowers on the outside.

The result of the work are shown in <Table 2>.

Table 2. Flowery days.

Motif image	Artwork	Work result
A. Lotus patterns.		
Color suggestion		

Note: A. https://www.culture.go.kr

4.3. The best

The main patterns of the dragon and phoenix patterns are applied, and the obang colors are used to express the best. Dragons and phoenixes have long been recognized as imaginary animals in myths and legends. It was considered an animal that symbolizes the divine power and order in space, and when it appears in the world, it symbolizes the highest Bible that says the world is very well-being. In

the work, dragons and phoenixes represent each characteristic and appear to be in harmony.

The result of the work are shown in <Table 3>.

Table 3. The best.

Motif image	Artwork	Work result
A. Dragon patterns.		
Color suggestion		

Note: A. https://www.culture.go.kr

5. Conclusion

To conclude this study, the discussions so far are summarized as follows.

The introduction defined the background and importance of the study and referred to research methods and data collection. In the theoretical background, the definition and characteristics of Korean traditional patterns, obang colors, and art masks were studied, and in the conclusion, three works of art masks were produced based on research derived from theoretical backgrounds.

Based on the findings above, the researcher concludes that.

As modern society developed rapidly, traditional Korean patterns and obang colors developed rapidly. Korean traditional patterns are art in which the identity of Korean national culture is expressed by symbolic symbols and can be seen as a symbolic sculpture as a medium for expressing and conveying Korean emotions[21].

The ritual of color of the Korean people has long been influenced by the Yin and Yang five elements, and among them, it has been based on the five acts.

This aspect of traditional patterns and Obang colors has become a subject of research in various fields in the rapidly changing modern era, and traditional patterns and five-sided colors have been used in various fields of beauty design.

The conclusions obtained through production are as follows.

In traditional Korean patterns, dots and lines were transformed into design elements, and patterns were arranged symmetrically to provide a sense of balance. The obang colors gave symbolism to the patterns by contrasting the colors.

Suit the rapidly changing modern art based on makeup or more of the study design applications obangsaek which are art with Korean traditional patterns in the mask was able to provide a wide range of design study.

6. References

6.1. Journal articles

[1] Lee JY. Research on Smart Learning Model Based on 5 Steps Using Media-based Teaching and Learning Method. *Public Value*, 5(2), 1-12 (2020). [Article]
[2] Kang YD. A Design on Teaching and Learning Method for Creative Talent in the Fourth Industrial Revolution. *International Journal of Human & Disaster*, 5(1), 1-9 (2020). [Article]
[3] Kang YD. Design of Liberal Arts Curriculum Centered on Core Competencies. *International Journal of Protection, Security & Investigation,* 5(2), 49-57 (2020). [Article]
[5] Jo SG. Terrorism Crisis on Northeast Asia. *International Journal of Crisis & Safety*, 5(1), 35-42 (2020). [Article]
[6] Han GY & Kim SH. A Study on Design of Art-mask Using Korean Traditional Pattern. *Korean Society of Cosmetics and Cosmetology*, 6(2), 189-200 (2016).
[7] Heo MR & Cai XX & Choi EM. A Study on the Artistic Value of Dunhuang Patterns. *Public Value,* 6(1), 51-61 (2021). [Article]
[9] Han GS & Min HJ. A Study on Expression of Floral Sculpture of Taegeuk Images. *Korean Society of color Studies*, 2005(1), 33-35 (2005).
[11] Kim JY & Kim YI. The Characteristics of Five-elements Color of Traditional Costume of Korean Basic Culture. *Journal of the Korean Society of Costume*, 57(6), 62-70 (2007).
[18] Bang SJ. Study on Characteristics of Object Represented in Art Make up. *Korean Journal of Aesthetics and Cosmetics Society*, 8(1), 225-237 (2010).
[20] Lee JM. A Study on Correlation between Art Make-up and Expression of Persona. *Korean Society of Basic Design & Art*, 13(1), 359-372 (2012).

6.2. Thesis degree

[8] Jang MH. A Study of Formativeness Expressed in Korean Painting's Five Colors: Focused on My Own Paintings. Wonkwang University, Master's Thesis (2013).
[10] Go JG. A Study of the Colors Represented by Korean Traditional Paintings: Based on Five Basic Colors. Chonnam University, Master's Thesis (1999).
[12] Gang GH. A Study on Cultural Posters Using Korean Traditional Patterns. Sungkyunkwan University, Master's Thesis (2011).
[13] No YH. A Study on Learning Textile Design Using Korean Traditional Patterns. Daegu University, Master's Thesis (2007).
[15] Jang HS. Art Make-up Design in Utilization of Korean Traditional Colors and Patterns. Seokyeong University, Master's Thesis (2010).
[19] An NH. Emotional Images of Art Makeup with Design Principles Applied. Seokyeong University, Doctoral Thesis (2014).

6.3. Books

[4] Choi CS. Understanding Application of Korean Traditional Pattern. Changjisa (2006).
[14] Lim YJ. Traditional Korean Patterns. Hangukhakjaryowon (2020).
[16] Lim YJ. Korean Tranditioanl Patterns. Yewon (1998).
[21] Heo G. Korean Tranditioanl Patterns-colorful Books 165. Daewonsa (1995).

6.4. Additional references

[17] http://terms.naver.com/ (2019).

7. Appendix

7.1. Authors contribution

	Initial name	Contribution
Lead Author	SB	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Corresponding Author*	JC	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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A Study on PUBLIC Lifelong Education Model for Second Life Planning and Support for Middle-Aged Adults

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Abstract

Purpose: *The purpose of this study is to propose a Public lifelong education model for the second life plan of middle-aged and elderly people in order to cope with the rapid progress of today's aging society. Public support is needed so that middle-aged adults can design their second life and live successfully according to their own plans. In this study, the purpose is to propose a lifelong education model for the second life design and support for middle-aged adults.*

Method: *The research method of this study used various methods such as literature research, Delphi research, and expert advisory meeting. First, literature research and previous studies related to life redesign and second life of middle-aged adults were analyzed. And, using the components of the middle-aged adult lifelong education model of the expert group extracted from the Delphi survey results. Finally, a lifelong education model was developed to support the second life plan for middle-aged and elderly people by collecting and reflecting the opinions of the expert group.*

Results: *As a result of the study, the second life support lifelong education model for middle-aged and elderly people focuses on middle-aged learners, and analyzes the second life plan of middle-aged and elderly through counseling on life course and learning according to the learner's personal career and orientation. It is necessary to develop lifelong education programs that can support this and guide them to participate in such lifelong education.*

Conclusion: *Supporting the second life plan for middle-aged and elderly people is not something that any individual or institution can do. Therefore, it is necessary to approach the lifelong education model that supports the second life plan of the middle-aged and elderly with a strategy that connects and utilizes existing systems and functions to the maximum extent.*

[Keywords] ***Lifelong-Education, Lifelong-Learning, Aging-Society, Second-Life-Design, Lifelong-Education-Model***

1. Introduction

1.1. Research purpose

Today, Korean society is rapidly entering an aging society. There may be various reasons for the rapid progression of the aging society, but the main causes are the prolonged life expectancy of humans and the rapid decline in the fertility rate. In addition, it is a reality in Korea today that the area of demographic structure is rapidly growing in aging group due to the retirement of the baby boomer generation and rapid incorporation into the elderly population.

The rapid increase of middle-aged and elderly population causes various social problems. Specifically, the economic productivity of society decreases, and economic contraction appears. Due to the decrease in the economically active population, overall economy and productivity decrease. In

addition, the burden of support expenses for the elderly will increase socially. In addition, despite the increasing political comments and demands of the elderly, and the burden of welfare expenses for them, the decrease in the number of young and aged people who pay taxes to finance such expenditures is increasing the burden on the national finances[1].

In Korea, as the retirement period of the baby boomers overlaps with the rapid progression of aging, the pace of aging is intensifying. Social members are in better health than before after retirement, and it is wasteful and undesirable to spend old age vaguely without doing anything due to an increase in life expectancy, both in terms of personal life and society[2]. Therefore, it is one of the urgent tasks of the present time that the government provides public support so that middle-aged adults can actively plan and implement their second life[3].

The middle and old Koreans are not well prepared for retirement. The level of retirement preparation is also greatly influenced by the situation in which an individual is faced. In the case of women, having a job, the higher their income, the better they are prepared for social retirement[4]. Also, preparing for retirement before becoming the elderly helps to live actively in old age by mediating social and psychological support factors[5].

Therefore, this study aims to develop a lifelong education supporting model for middle-aged and elderly adults as one of the ways to help them with their second life design and to successfully live their second life. Among the various policies that support a second life for the middle-aged and elderly, it is intended to present a plan to support lifelong education for the middle-aged and elderly[2].

The lifelong education model that supports the second life of middle-aged adults is a lifelong education model aimed at helping middle-aged adults to realize their individual plans for their second life in detail. In other words, it is necessary for those whose second life demands are employment and entrepreneurship education, to guide to institutions that provide education necessary for employment and start-up, provide information on employment after completion of education, link with employment institutions, provide internship programs, and follow-up management after employment, etc. I would like to suggest a plan to provide services of the company.

The second life plan for middle-aged adults is to provide the education necessary for leisure activities even for those who have hobbies and leisure life, and a plan is needed to link organizations, groups, and clubs where leisure and hobbies are possible after completion of education. On the other hand, those who wish to spend their second life in social service activities are encouraged to participate in the literacy education necessary for social service activities, and after completing the literacy education, information on the volunteer organization or organization they desire will be provided[3].

It is necessary to support them in doing volunteer work. In addition, for those whose second life plan is to lead a healthy life through health management, institutions and information that are useful for health management, participation in health-related lifelong education programs, and institutions that are helpful for living a healthy life are guided.

1.2. Previous studies

Research on the characteristics of middle and elderly people was conducted mainly by developmental scholars. According to Erikson's theory of psychosocial development, the middle age corresponds to the period after 40 years of age, and the middle age is the period of experiencing a self-depression in the productivity level, and the middle age is productively. You need to help with what you can do. According to him, since old age is a time of experiencing a sense of unity versus despair, it is necessary to support the formation of a sense of unity that enables satisfaction with life before in old age. Levinson's middle age is from 40 to less than 60, and the late adulthood is over 60. He argued that the transition period from the previous life period to the later life period would go through in the middle ages[6].

Today, the problem of middle-aged people in Korea is emerging as a serious social problem. The problem of middle-aged people in Korea is that the retirement and aging of the baby boomer generation is rapidly progressing, and in the year of 2020, the population between the ages of 46 and 65 more than 30% of the total population[7].

On the other hand, it was found that age, education level, economic activity, work life, and home

ownership had a positive effect on financial retirement preparation for middle-aged and elderly people[8]. However, the public retirement management system in Korea is not sufficiently institutionalized and systemized even in case for firefighters engaged in public affairs[9]. Difficulties in aging are emerging as specific phenomena in recent years. Crimes of the elderly are increasing, the type of crime is the 5th violent crime, and the cause of the crime is for living[10]. Therefore, according to the increase in crimes of the middle-aged and elderly, it is necessary to promptly respond to this problems[11].

Today, along with the development of an aging society, it is important to respond defensively to social problems arising from this, but the silver industry such as groceries is to actively respond to such problems so that the elderly can live a happier retirement safely and satisfactorily[12]. It is necessary to seek out and to actively prepare policies for health management, health, exercise, leisure, and social participation[13]. On the one hand, the use of artificial intelligence technology developed today will be able to provide positive support for various aspects of the elderly's lives[14].

As the society enters an aging society, negative phenomena such as an increase in elderly support costs, deterioration of economic indicators, and a decline in investment are intensifying[15]. Therefore, it is necessary to promote an active aging policy for middle-aged and old people. Active aging emphasizes the quality of life of the elderly, which means living a healthy and happy life physically and mentally[16].

Today, the government is promoting the elderly job policy and the elderly society participation project to support elderly economic activities and social participation of the elderly from a policy level[17]. Meanwhile, in the face of an aging society, the government has been promoting various lifelong education policies and lifelong learning opportunities for middle-aged and elderly citizens[18], and is trying to operate life-long education programs that are practically helpful for middle-aged and elderly people[19].

In order to actually support the second life plan of the middle-aged and old, first of all, it is necessary to analyze the life and learning of the middle-aged and old. As a result of the study on the life and learning of middle-aged adults, middle-aged adults showed different learning patterns and life patterns according to their demographic and sociological background variables[20].

In order to support the second life of middle and old people, it is necessary to provide a variety of support to meet their middle and old life plans and needs. The government and local governments should provide such support systematically in an integrated manner. Although there are currently many institutions that support the second life plan of middle and middle-aged people in Korea and provide various supports and services for their second life, support for middle-aged and elderly people is not being systematically integrated. Because. Currently, support to middle-aged and elderly Koreans at the national level is providing lifelong learning opportunities and sporadically providing re-employment support centered on vocational education provided by companies for retirees and re-employment applicants[21].

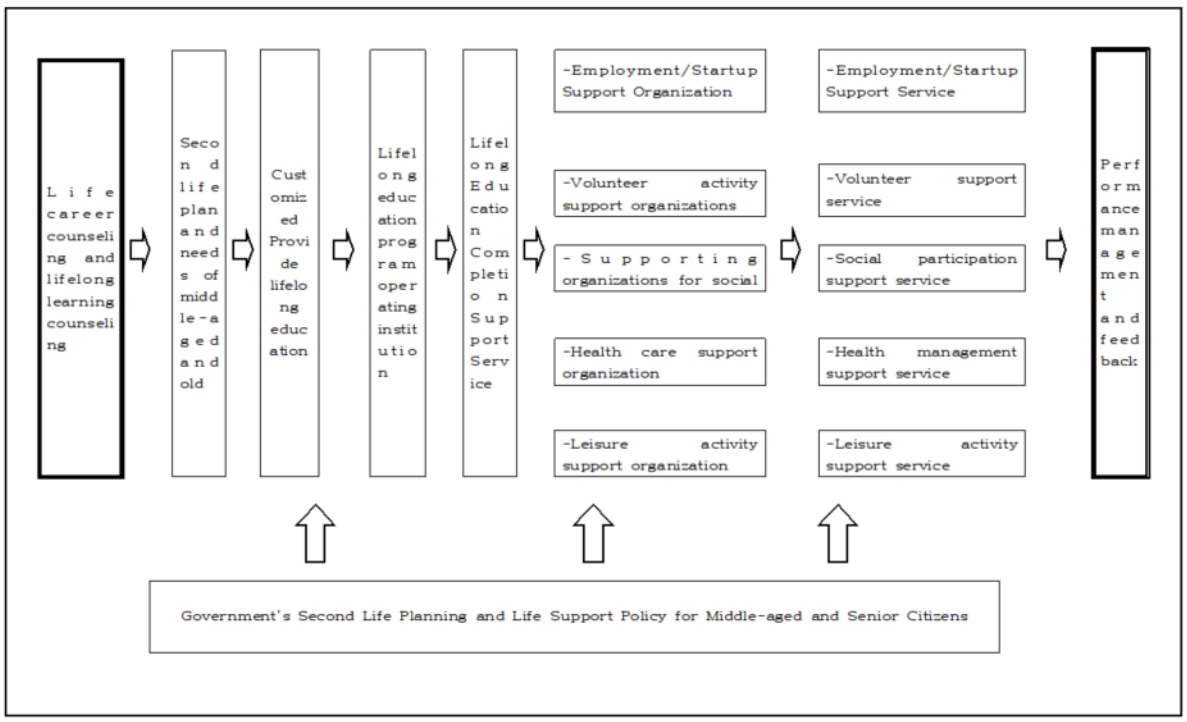
Currently, Korea's support policies for middle-aged and retired persons or job seekers focus only on supporting economic activities such as reemployment or start-ups, which is not desirable. Because they have diverse needs such as leisure and hobbies, health care, social activities, and volunteer activities for which a comprehensive lifelong education support plan should be prepared to meet their diverse needs.

2. Second Life Support Lifelong Education Model for Middle and Senior Elderly

2.1. Components of lifelong education model supporting second life design for middle-aged and senior elderly citizens

In this section, I will construct and present a theoretical conceptual model of lifelong education that supports the second life plan of middle and old adults in Korea. The second life support lifelong education model for middle and elderly adults consists of the following components. The components like this one are shown in <Figure 1> below.

Figure 1. Second life design and support for middle-aged and senior citizens constituents of lifelong education model.



The researcher conducted a Delphi investigation based on these components. In this study, the components of the lifelong education model finally collected through the Delphi survey were used. In the next section, questions with high opinions of such component experts were used. In addition, the researcher collected 10 expert's advisory opinions through e-mail. Researcher suggested a lifelong education model for the second life plan and support of middle-aged adults by reflecting the results of the expert group's survey results.

2.2. Contents of the components of the second life support lifelong education model

<Table 1> analyzes the response results of the 3rd survey from the Delphi survey results, and presents the items with a CVR of 0.7 or higher and a CV of 0.5 or higher as the content of the second life design and support lifelong education model components for middle-aged and elderly people.

Table 1. Contents of the elements of the lifelong education model for designing and supporting the second life of middle-aged and senior citizens derived from the delphi survey.

Order	Component	Contents
1	2nd life plan	- Employment and entrepreneurship, health care, leisure, hobbies and travel, volunteer activities
2	National and local government support plans for middle-aged and elderly people	- Life planning support, re-employment job provision, re-employment education provision, re-employment information provision, re-employment counseling provision, re-employment education expense support, social participation support, health management support
3	Institutions that provide lifelong education and vocational education for the elderly	- Lifelong learning center, city - County office - University lifelong education center - Corporate lifelong education center - Agency under the ministry of employment and labor - Retiree support center

		- Human resources development center - Korea women's human resources development institute
4	Lifelong education program for middle and senior citizens	- Vocational competency development education - Employment education - Entrepreneurship education - Life planning education - Well-aging education
5	Employment support plan for middle-aged and elderly people	- Employment support education - Entrepreneurship education - Employment internships - Job placement - Educational expenses support
6	Role of employment support institutions for middle and old people	- Employment consultation - Employment information provision - Vocational competency development education - Job placement - Re-employment counseling for retirees - Operation of a talent bank
7	Employment counseling for middle-aged and senior citizens, employment support organizations and professional personnel	- Employment welfare center - Job center - Vocational counselor - Startup consultant - Employment counselor - Lifelong educator
8	Organizations and services supporting volunteer activities for the elderly	- Volunteer portal - Volunteer center - Social Welfare center - Linking with volunteer sites - Provision of volunteer information - Volunteer literacy education - Linking volunteers and fields
9	Policy direction for supporting the second life of the middle and old	- Linking lifelong education and jobs - Providing corporate support for hiring middle-aged and senior citizens - Providing comprehensive information such as employment, creating high-quality jobs, creating jobs - Improving middle-aged employment awareness - Linking employment after retirement - Training for employment development - Employment counseling services

3. Expert Advisory Opinion

In order to support the second life design and life of the middle-aged and elderly, the researcher collected advisory opinions from 10 experts. The expert group consisted of professors majoring in lifelong education, leisure, welfare, economy, and lifelong education managers. The opinions suggested by the expert group are shown in <Table 2> to <Table 9> below.

First, the contents of support from the state, public institutions, and private organizations for the second life design and support for middle and elderly people are shown in <Table 2>.

Table 2. National and public institutions and private organizations' support plan for designing and supporting the second life of middle and old.

Order	Division	Response contents
1	Contents of support that the state, public and private organizations and organizations can provide for the second life plan and support for middle-aged and elderly people	- Establish various lifelong education policies - Build a community among middle and elderly people - Form a community where middle and old people can share experiences - Revitalize learning clubs where middle-aged and elderly people participate - Support systematically long-term planning so that educational results are linked to activities - Develop measures and indicators for measuring educational outcomes - Operate an education program for life planning - Provide life planning, career counseling, and employment training - Utilize various facilities in the local community as support facilities for middle and elderly people

<Table 3> shows the lifelong learning support plan for the second life design and support for middle-aged and elderly people.

Table 3. Lifelong learning support plan for designing and supporting second life for middle-aged and senior citizens.

Order	Division	Response contents
2	Plans to support lifelong learning for middle-aged and elderly people in the state, public and private organizations and organizations	- Expand lifelong learning facilities, operate various lifelong education programs, support learning clubs and support club budgets, and establish an online learning platform - Provide support for learning expenses for middle-aged and senior citizens, linking financial resources such as employment insurance with support for learning expenses, enhancing access to learning spaces, and providing psychological support for learning - Provide learning information - Expand and install lifelong learning facilities - Support lifelong learning by using distance education media

<Table 4> shows the government, public institutions, and private organizations' employment and entrepreneurship support plans for middle-aged and elderly people.

Table 4. Measures to support employment and entrepreneurship by private organizations in the state and public institutions for middle-aged and elderly people.

Order	Division	Response contents
3	National, public and private organizations and organizations to support employment and entrepreneurship for middle-aged and senior citizens	- Employment education is operated by a professional employment education institution - Provide opportunities for exchange of experiences among middle-aged and elderly people - Prepare for re-employment support for middle-aged and elderly people from an early stage in the long term - Develop and operate employment and entrepreneurship education programs - Provide employment information, provide job counseling and introduce, and reeinternship courses - Establish an information system between the middle-aged and elderly manpower bank and manpower demanders - Create jobs using the experiences of middle-aged and

		elderly people

<Table 5> shows the government, public institutions, and private organizations to support middle-aged people's social participation.

Table 5. Support plan for the government and public organizations and private organizations to participate in society.

Order	Division	Response contents
4	Measures to support middle and old people's social participation in the state, public and private organizations and organizations	- Support space for local residents to gather and solve problems in local communities - Build a professional platform to support social participation - Operate lifelong education programs for residents - Promote social participation activities - Discover social participation activities for middle-aged and elderly people - Operate education on social participation activities

<Table 6> shows the government, public institutions, and private organizations for middle-aged people to support leisure activities for middle-aged and old people.

Table 6. Measures to support leisure activities by the state and public organizations and private organizations for middle-aged and senior citizens.

Order	Division	Response contents
5	Measures to support leisure activities for middle-aged and elderly people in the state, public and private organizations and organizations	- Host a lifelong learning cultural festival as a community leisure - Promote community leisure activities and prepare conditions - Operate hobby and leisure education for middle and old - Guide to hobbies and leisure activities groups or clubs for middle and old people - Use the local government's homepage to guide leisure activities

<Table 7> shows the second life plan for middle-aged and old people and how to install equipment for support.

Table 7. Second life plan for middle-aged and elderly people and plans to install equipment to support life.

Order	Division	Response contents
6	Second life design for middle-aged and elderly people and plans to install equipment to support life	- Provide high-quality lifelong education programs to middle-aged and elderly people - Strengthen the second life support function for middle-aged and elderly people in existing lifelong education institutions - Active connection with existing counseling, employment, and social economy projects is necessary - Establish dedicated institutions such as the second life project support center

<Table 8> shows how to assign experts to the state, public institutions, and private organizations for the second life plan and support for middle-aged and elderly people.

Table 8. National and public Institutions and private organizations for middle-aged and senior cultivation of experts and deployment plan.

Order	Division	Response contents

7	National, public institutions, private organizations and organizations to foster and deploy experts for the second life support for middle-aged and elderly people	- Using lifelong education companies, lifelong education in charge of supporting middle-aged and elderly citizens - Needs support from a long-term perspective - Role of experts: life career counseling in the second half, linking career and learning, linking learning with activities, strengthening training for career counseling of existing personnel - Cultivate and arrange specialists such as career planners - Operate a qualification training course for social workers and lifelong educators in charge of services for the elderly - Train senior counselors and senior psychotherapists

Other opinions of experts for the second life design and support for middle-aged and elderly are shown in <Table 9>.

Table 9. Other opinions order.

Order	Division	Response contents
8	Other opinions for middle-aged and elderly people's second life plan and support	- Support for middle-aged and elderly people should be provided by utilizing the existing lifelong education promotion system - Establish a linkage between the second life plan for the middle-aged and elderly and the support system - Systematically promote the second life plan and support for middle-aged and elderly people from a long-term perspective - Provide systematic life preparation education

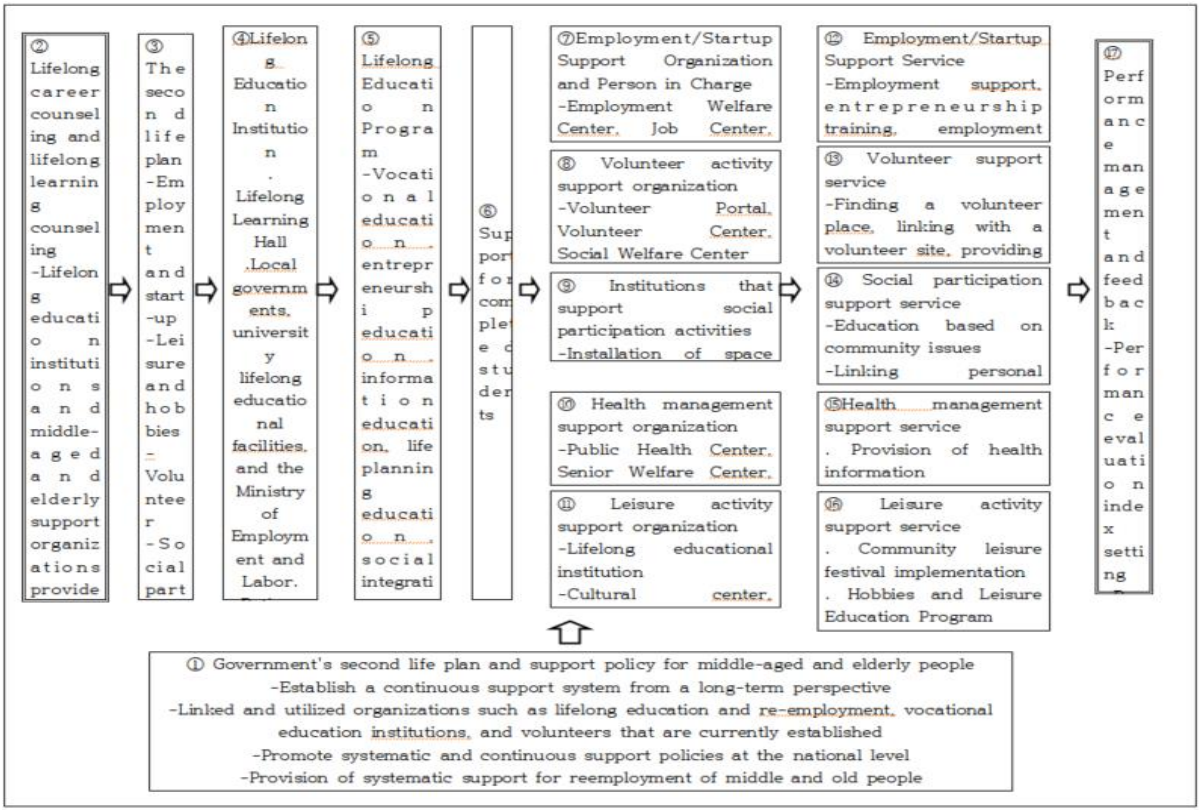
4. Second Life Planning Support Lifelong Education Model for Middle-Aged and Elderly Adults

Based on the components of the second life design and support lifelong education model for middle-aged adults analyzed above, the elements of the lifelong education model extracted from the Delphi 3rd survey result and the contents of the advisory opinions of related expert groups were developed. <Figure 2> shows the life-long education model for life design and support.

As shown in this figure, the lifelong education model for the second life design and support for middle-aged and elderly people is composed of 17 elements in all. Each element is described below.

The first element is the government's support policy for middle-aged and elderly people, the second element is life-planning career counseling, the third element is the orientation for the second life of the middle-aged and elderly, and the fourth element is an institution that provides lifelong education programs. to be. The fifth element is a variety of lifelong education programs provided to middle-aged and elderly people. The sixth element is the harvest support service for the graduates. The seventh element is an institution that provides employment and entrepreneurship support, and the twelfth element is the service provided for employment and entrepreneurship support.

Figure 2. Second life design and support lifelong education model for middle-aged and senior citizens.



The eighth element is an organization that supports volunteer activities, and the thirteenth element is the service provided by the volunteer support organization. The ninth element is an institution that supports social participation activities and a space for residents' activities, and the fourteenth element is a service that supports adult learners' social participation. The tenth element is the health care support organization, and the fifteenth element is the health care support service. The eleventh element is a leisure activity support organization for middle-aged and elderly people, and the sixteenth element is the services provided to support leisure activities. The seventeenth element is an element that measures the performance by developing an index that measures the performance of each content of the second life support project for the middle-aged and elderly, as described above, and then feedback it again.

5. Conclusion

This study supports lifelong education to respond to various problems such as reemployment, social participation, volunteer work, hobby and leisure, health welfare, income generation, etc. for middle-aged and old people, which are emerging as social issues in response to the rapid progress of aging in Korea today. This is a study for the purpose of developing a model.

Through this study, the speaker conceived a lifelong education model to support the second life design and life of middle-aged learners, and tried to present a model that reflected realistic demands. For the realization of the theoretical model, among the opinions on the elements of the lifelong education model collected in the 3rd survey of the Delphi expert survey, the question elements with high opinion gathering were used. In addition, advisory opinions from 10 experts in various fields related to the second life design and support for the middle-aged and elderly were collected. Related experts are experts in lifelong education, social welfare, economics, leisure studies, and lifelong education practitioners. With reference to the above opinions, the researcher proposed a lifelong education

model that supports the second life plan and life of the middle-aged and elderly as shown in <Figure 2>.

This model consists of a total of 17 elements. In other words, each service is provided according to the government policy, life-career learning counseling for middle-aged and elderly people, second life plan for middle-aged and elderly, lifelong education program operating institutions, lifelong education programs, support for those who have completed lifelong education, and life plans for those who have completed lifelong education. It consists of the service content provided by the agency and each agency, and the performance measurement and feedback elements of the entire middle-aged and elderly business.

The lifelong education model for the second life plan and life support for middle-aged and elderly people presented in this study is significant in that it systematically presented lifelong education and life support services currently provided to middle-aged and elderly adults in Korea. However, the model presented at present does not provide detailed information on the administrative linkage plan of various organizations related to the second life and life support for the middle and old in Korea. Therefore, there is a need for a study to present a plan for linking the administrative system to mutually link related services including lifelong education that supports life and a second life plan for middle-aged and elderly people.

Nevertheless, the implications from this study are that the establishment of a lifelong education model that designs and supports their second life for middle-aged and elderly people should be made from a long-term perspective at the national level. In addition, it can be expected that various existing institutions, organizations, related experts, and services provided should be systematized. In addition, it can be required that the policy to support middle and old should be promoted in the direction of utilizing existing institutions, organizations, and professional manpower as much as possible, and actively nurturing and installing necessary institutions, organizations, and manpower in the future.

6. References

6.1. Journal articles

[1] Choi MJ. An Exploration on Middle Aged Women's Social Capital and Economic Capital: A Comparison of Four Different Age Groups. *Health and Social Welfare Review*, 32(2), 124-163 (2015).

[2] Doo SH & Chang JY & R JI. The Effects of Work Centrality on Active Aging among the Older Adults: Mediating Role of Generativity. *Korean Journal and Organizational Psychology,* 27(3), 565-584 (2014).

[3] Kim JH. Productive Activities of Older People and Their Influence on Life Satisfaction. *Development and Society*, 36(1), 45-69 (2007).

[4] Byun JS & Kwon CH. The Analysis of Decision Factors for Middle-aged Women's Social Later-life Preparation: Focusing on the Regulation Effect of 386·X Generations. *Korean Policy Sciences Review*, 20(4), 173-199 (2016).

[5] Shin SM & Kim DB. The Effects of Preparation for Old Age of the Past on Activity of the Elderly: The Mediating Effect of Psycho-social Resources. *Korea Journal of Social Welfare Studies*, 44(3), 57-83 (2013).

[7] Chung JA & Kim YJ. Self-parenting of Middle and Old Aged Men in Korean. *Asia-pacific Journal of Multimedia Services Convergent with Art, and Sociology*, 7(10), 577-587 (2017).

[8] Park CJ. Financial Preparation Trend for Aging of the Middle-aged over Time and Their Determinants in Korea. *Korean Journal of Gerontological Social Welfare*, 73(4), 217-248 (2018).

[9] Ryu SI. Retirement Management of Firefighters in Korea. *International Journal of Human & Dister*, 2(2), 19-22 (2017). [Article]

[10] Lee MH & Kang KS. A Study on Causes of Elderly Crimes on Korea and Countermeasures. *International Journal of Criminal Study*, 2(1), 11-15 (2017). [Article]

[11] Chang IS. Security Policy of Police according to Increase of Elder Crimes. *International Journal of Police & Policing*, 2(2), 1-6 (2017). [Article]

[12] Yang JS & Kim HN & Choi BH. The Purchase Behavior of HMR for Safety Food Culture for the Elderly People. *International Journal of Crisis & Safety*, 5(2), 1-8 (2020). [Article]
[13] Lee ES. The Effects of Preparation for Aging Health Trajectory of People over 50 Years Old with Disabilities. *Korean Journal of Local Government & Administration Studies*, 34(4), 295-312 (2020).
[14] LEE JB & Liang D. Suggestions for Using AI in Preparation for a Super-aging Society. *Robotics & Ai Ethics*, 5(2), 57-64 (2020). [Article]
[15] Choi WH. A Study on the Factors Affecting Job Separation by Middle and Old Aged Self-employed Using KLoSA Panel. *The Journal of Vocational Education Research*, 37(1), 119-138 (2018).
[16] Han TY & Shin SK & Rie JI. The Mediation Effects of Post-retirement Preparation on Active Ageing and Productive Aging: Based on Theory of Planned Behavior. *Korean Journal of Culture and Social Issues*, 22(2), 137-163 (2016).
[17] Cho HJ & Gwak MJ. Social Interaction and Financial Stability of Middle and Old Aged Households. *Consumer Policy and Education Review*, 16(2), 27-55 (2020).
[18] An KS & Hwang JY. Reorganization of the Baby-boom Generation and the University Lifelong Education System. *Journal of Digital Convergence*, 17(11), 509-515 (2019).
[19] Yang HK & Nam MR. The Study on the Life Patterns and Learning Patterns of an Middle and Old Age Korean. *Global Creative Leader: Education & Learning*, 9(5), 223-244 (2019).
[20] Ko JK. Review of Connection between the Employment Policy and Pension Policy. *Labor Law*, 18, 259-289 (2004).
[21] Kim MJ. A Study of the Factors Affecting Successful Aging and Their Roles in Lifelong Learning: Baby Boomers in Korea. *Journal of Lifelong Learning Society*, 9(2), 23-50 (2013).

6.2. Books

[6] Kwon DS & Jo AM. Adult Learning and Counseling to Realize a Lifelong Learning Society. Kyoyookbook (2016).

7. Appendix

7.1. Authors contribution

	Initial name	Contribution
Lead & Corresponding Author*	HY	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Co-Author	MN	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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Emerging Trends and New Improvements in Stadiums and URBAN DEVELOPMENT Using Cite Space Visualization

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Abstract

Purpose: *The stadiums play an important role in the development of a city. It is not only the place to hold sport events, but also an important regulating factor for the development of a city. Under the theme of sustainable development, how to develop stadiums to play the biggest role in urban development is the topic. This paper aims to make stadium become the driving force of regional environmental change, and provide necessary conditions for urban regeneration and renewal, so as to drive the realization of sustainable development of the city through urban renewal and upgrading.*

Method: *In this paper, CiteSpace 5.7.R5 was used as the research tool, the core database of Web of Science was selected as the literature source, the stadiums or venues and urban development and Olympic legacy were taken as the search terms, and the literature type was set as literature. A total of 1912 literature from 2010 to 2021 were selected for visualized analysis to draw the knowledge map of stadiums and urban development, and the number of published papers, institutions and research hotspots of related research on stadiums and urban development were studied.*

Results: *Firstly, according to the published number of related research on the stadiums and urban development from 2010 to 2021, this period presented three different stages. The number of literature published on topics related to stadiums and urban development from 2010 to 2015 was relatively stable. From 2016 to 2018, the research on stadiums and urban development showed a sharp decrease, and the research enthusiasm began to decline. Between 2018 and 2021, the number of studies gradually increased and reached the highest number. Then, universities at home and abroad were the main research institutions on stadiums and urban development, and kept a continuous focus on this topic. Finally, the research focus in this field focused on the construction and development of stadiums, mega sport events and stadiums and the relationship between stadiums and urban development from architecture and city and link of stadiums, city and mega sport event.*

Conclusion: *From 2010 to 2021, domestic and foreign scholars maintained a certain amount of enthusiasm in the research on stadiums and urban development, with a large number of research results. With the holding of the Olympic Games, the number of literature also increases, which provides reference resources for the follow-up research on the stadium and urban development. Second, universities at home and aboard have conducted more research on stadiums and urban development than other types of institutions. Finally, the research hotspots on stadium and urban development focuses on the analysis of the construction and development of stadium from different perspectives, mega sport events, and the relationship between stadiums and urban development from architecture and city and link of stadiums, city and mega sport event.*

[Keywords] ***Sport Stadiums, Urban Development, Visualized Analysis, Research Hotspots, Cite Space***

1. Introduction

Stadiums have always been an important component of a city. Their exaggerated shape, huge scale and function of holding sport events made them become a landmark. Their structures were more spectacular than other structures, especially when holding large sporting events such as the Olympics and the World Cup. The stadiums attracted the public's attention with extravagant architectural structures, creating a new urban landscape. It also promoted the urban upgrading of the surrounding environment[1].

The stadiums made major improvements to the natural landscape and the structure of the building with the help of mega sport events and projects that were conducive to urban development, achieving a lasting impact on the city[2]. The construction of the Olympic Stadiums had a great connection with the city. The economic development, technological level and social and cultural environment of the city affected the development of the Olympic Stadium to some extent. But on the other hand, the organic integration of the Olympic Stadiums and city provided a new environment and opportunities for the development of the city[3]. Urban development was the product of a city's economy, social culture and environment. The development of stadiums was also affected by these factors[4]. In the process of urban development, stadiums occupied a large number of urban resources, such as public transportation and land resources, etc. Therefore, stadiums have also become an important motivation for urban development[5]. At the same time, urban development also affected stadiums development, such as the location, finance and some others. Some research suggested that urban form had an impact on the project of stadiums. The construction of stadiums was limited by urban form and should take urban form as the prior condition[6].

Another research analyzed the relationship between Olympic park, as Olympic Legacy, and urban design and evaluated the challenges of transforming Olympic Parks using evidence from four past hosts, Munich(1972), Sydney(2000), London(2012) and Rio de Janeiro(2016)[7]. The failure of 1976 Montreal Olympics also showed the relationship between stadium and urban development in opposite. The original intention of Montreal Olympic Stadium was to be used as a means to regenerate the entire neighborhood after the Games. However, it became a burden for the whole city for many years. It slowed down the urban development of Montreal[8]. White elephant is used to described this phenomenon. But it truly tells the relationship between stadium and urban development. On culture input level, culture is one of the most significant aspects in urban development. Stadiums were always built with characteristics of sport and urban culture, which made a stadium as a landmark. A scholar studied how the visual iconography of the stadiums were deployed to define urban, national, and sporting identity[9]. In particular, some mega stadiums, such as the Olympic Stadiums, played the role of the Olympic legacy, played a positive impact on the city's traffic resources, land resources and ecological resources, and promoted the city's renewal and upgrading[10].

Above all, the relationship between stadiums and urban development is always the topic in sport field. The development of them relies on each other. Since sustainable development has become the theme of the times, urban upgrading and renewal has become an important aspect of sustainable development. ‘Transforming our World: The 2030 Agenda for Sustainable Development’ issued by the United Nations clearly pointed out this goal. As a special building, stadium and urban development promote and influence each other. In urban development, stadium construction can play a certain regulatory role, become the driving force of regional environmental change, provide necessary conditions for urban regeneration, and promote the sustainable development of the city through urban renewal and upgrading. In addition, urban development is the important index which needs to be considered in construction of stadiums. Therefore, it is necessary to explore the relationship between stadiums and urban development.

2. Method

In this study, CiteSpace 5.7.R5 was used for visualized analysis. It is the literature analysis software designed and developed by Professor Chen Chaomei based on Java program. Through the recombination of literature authors, key words, research institutions, citation frequency and other characteristic information, new information is formed. It could create new knowledge units, and realize the image output of input information, accurately track and analyze the frontier hot spots and dynamic evolution process in this field[11].

The Web of Science core collection was took as the database. WOS(Web of Science) Citation Database was a product of the Institute for Scientific Information of the United States. Web of Science was a comprehensive academic resource with the largest coverage and the most extensive academic nature in the world, which could effectively obtain the most cutting-edge literature in specific research fields[12]. For the comprehensiveness, the different concepts of stadiums were contained to set as search terms. Therefore, search terms were chosen with "urban development" AND "stadiums" or "venues" AND "Olympic legacy". This study was limited in English language and literature type was set as Article and data parameters from the start of January 1st, 2010 to May 8th, 2021. A total of 1912 literature records were retrieved.

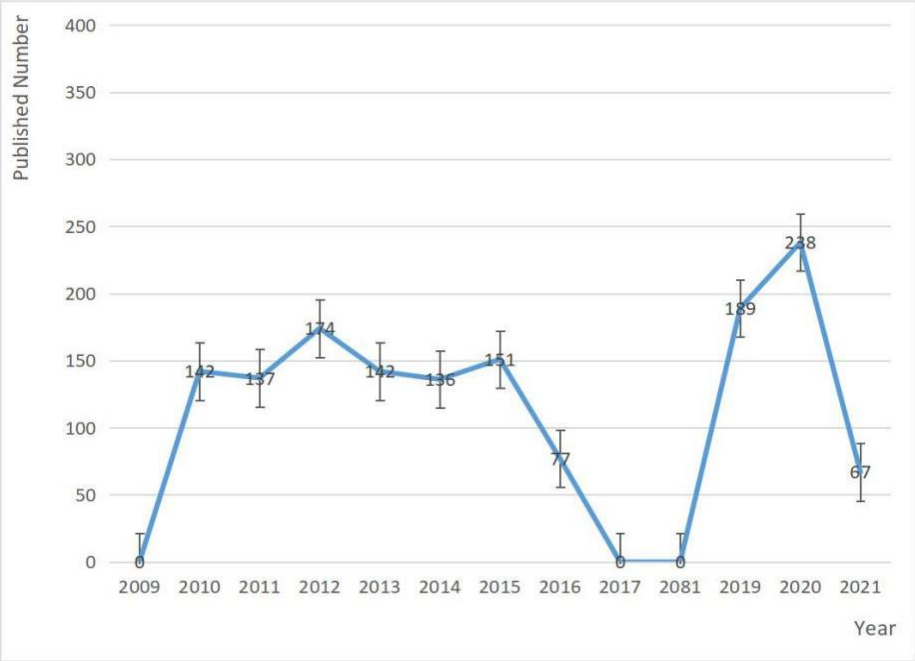
After the visualization map was obtained, the number of published paper, research Institution, key words co-occurring the map were read and summarized to obtain the research hotspots in this field.

3. Results

3.1. Publication numbers on yearly basis

The statistics of the number of published articles can be the most intuitive reflection of the importance of a topic in the field. In 2010-2021, the relevant research on urban development and stadiums presented three different stages. See <Figure 1> for details.

Figure 1. The number of published paper on stadiums and urban development.



The first stage was from 2010 to 2015. The published number of 2012 reached the peak of 174 articles in this stage. And the published number of each year in this stage were more than

130 article. The published number of researches on urban development and stadiums was relatively stable, while the Beijing, London Olympic Games were involved in this period, and it was closed to Rio Olympic Games. The researches in this period was continuous.

The second stage was from 2016 to 2018. The number of the researches on stadiums on urban development showed a sharp decrease, indicating that the researches about stadiums and urban development gradually no longer received too much attention, and the research interest began to decline.

The third stage was from 2018 to 2021.The number of papers published on the topic began to increase gradually from 2018, with the number peaking in the year of the Tokyo 2020 Olympic Games with 228 articles, indicating that stadiums were getting more and more attention from researchers. By 2021, the number has declined. The more literature related to the studies of stadiums and urban development, the more in-depth the research in this field will be.

3.2. Research institutions

Through the analysis of the co-occurring map of institutions on stadiums and urban development, the betweenness centrality between institutions was 0, indicating that there was less cooperation in this field. The institution with the largest number of publishing was University of Florida with 16 papers. Other institutions that more than 10 papers included Schlaich Bergermann & Partner which ranked the second place with 12 articles, Arizona State University, Chinese Academy of Science, Harbin Institution of Technology published 10 articles. Based on the above analysis, for the coverage and expertise of subjects in universities, also the scientific research advantages of resources, universities have conducted more researches on stadiums and urban development than other types of institutions. However, it was also showed that universities in the world do not take their own scientific research advantages to cooperated with others to conduct International research. See <Figure 2> for details.

Figure 2. Basic information on research institutions.

3.3. Research hotspots

The node represented the keywords, marked as circle. The higher the frequency of occurrence, the larger the node was. The thickness of the line between nodes was the intensity of co-occurring relationship, and the color corresponds to the time of the first co-occurring[13]. According to the keyword co-occurring map and <Table 1>, the top 10 keywords in the related research on stadiums and urban development were: Stadium, sport, football, professional sport, demand, soccer, dynamics, city, design and fan. Nodes whose betweenness centrality exceeds 0.1 were called key nodes. The top 10 keywords with betweenness centrality ≥ 0.1 were football, professional sport, dynamics and design. See <Figure 3> and <Table 1> for details.

Figure 3. The keywords co-occurring map of researches relevant to stadiums and urban development.

As can be seen from <Table 1>, Stadium is the first high-frequency keyword in the research fields related to Stadium and urban development in recent ten years, which indicated that Stadium had attracted great attention from many scholars in this field. It is found that there was a certain interactive relationship between the development of stadiums and urban development, and the two are important influencing factors for each other's development[14]. There is study on the influence that stadium construction could bring to the local area from the perspective of local politics and economy[15]. There is study on the new interpretation of stadiums from the perspective of economy and finance, so as to focus on broader urban governance[16]. There is also study on the relationship between naming rights of European football stadiums and urban development[17]. The research on stadium construction from different perspectives is still the hot spot and trend of future research, but the ways and methods to promote urban development need to be further explored and explored.

Sport, soccer, football and professional sport are the hot keywords with occurrence frequency ranking the 2nd, 3rd, 4th and 6th place respectively, and betweenness centrality ranking the 6th, 1st, 3rd and 9th place respectively. The above four keywords are the upper and lower concepts of sport events. they represents the specific way in which the stadium, based on specific projects, establishes a relationship with the city in the form of sport events, or influences the development of the city. The relationship between sport events and stadiums was the most

important factor to prove the interactive relationship between the stadium and the urban development. Research suggests mega sport events, as the promoter of the development of cities, got the attention of the global[18]. The newly build and renovated stadiums were the focus of media attention during 2010 football World Cup in South Africa and bring more international attention for nine host cities[19]. As a kind of city marketing tools, mega sport events improved infrastructure upgrading and created conditions for urban development[20]. Therefore, the development of sport events has become an important means for stadiums to promote urban development, and all kinds of related sport events are also the research focus in this field.

Table 1. High frequency key words of researches relevant to stadiums and urban development.

Number	Frequency	Betweenness centrality	Key words
1	147	0.01(9)	Stadium
2	87	0.07(6)	Sport
3	52	0.23(1)	Football
4	46	0.17(3)	Professional sport
5	46	0.02(8)	Demand
6	33	0.01(9)	Soccer
7	28	0.23(1)	Dynamics
8	28	0.09(4)	City
9	7	0.12(5)	Design
10	3	0.03(7)	Fan

Demand, dynamics, city and design rank the 5th, 7th, 8th and 9th respectively in terms of occurrence frequency. The above keywords refer to the specific ways of integration stadiums and urban development, which reflect more macroscopic concepts. The betweenness centrality of these words are ranked as follows: dynamics has the highest intermediary centrality, followed by city and design, and finally demand. Some research Combining a microclimate model and a CFD model studied the flow field behavior formed around the stadium, so as to explore the relationship between the stadium and the urban environment[21]. The construction of some large stadiums would directly affect the urban development to a certain extent. The announcement and cancellation of development projects would have a significant impact on the housing price near the base, but there are great differences in intensity and direction in space[22]. All the key words stressed the way to connect stadiums and urban development from architecture and residences. It is also an interaction relationship around people, city and stadiums. The relationship relies on what these three factors need from others. Therefore, the harmonization of various operating mechanisms between stadiums and urban development has always attracted attention in this field, and how to connect them organically has become a research hotspot in this field.

Fan is keywords with occurrence frequency ranking 10th, and it is the key to connect stadiums, mega sport events and an interaction relationship around people, city and stadiums. Development of stadiums and stadiums serves for people. Fans is a group people to connect stadiums and mega sport events, while fans from other countries for international mega sport events can connect stadiums, city and mega sport events. They are the directive part to tell whether stadiums play a proper role to improve urban development via mega sport events and urban development has a positive impact on stadiums during mega sport events. Therefore, fans is the key to make an interaction relationship around people, city and stadiums.

4. Conclusion

Sport stadium is the place where sport events and activities are held. It is also a typical kind of sport architecture and also a part of urban public buildings[23]. Sport events is the way to attract people attention and present the city[24]. Stadiums is the platform to connect all them together and push the urban development based on sport events.

On the research related to sport stadiums and urban development, scholars for the study about the stadiums and urban development maintain interest in this topic with lots of research results. This period presented three different stages from 2010 to 2021. The number of literature published on topics related to stadiums and urban development from 2010 to 2015 was relatively stable. From 2016 to 2018, the research on stadiums and urban development showed a sharp decrease, and the research enthusiasm began to decline. Between 2018 and 2021, the number of studies gradually increased and reached the highest number. With the holding of the Olympic Games, the number of literature also increases, which provides reference resources for the follow-up research on the stadium and urban development.

Second, through the research of co-occurring map of institutions, universities have conducted more researches on stadiums and urban development than other types of institutions. Univ Florida published the largest number of papers, with 16 papers. Other institutions that published more tan 10papers included Schlaich Bergermann & Partner, which published 12 articles, Arizona State University, Chinese Academy of Science, Harbin Institution of Technology published 10 articles during 10 years. But there is less cooperation among these universities with good scientific research advantages. The further cooperation could be a way to conduct this topic in the future.

Finally, through the analysis of co-occurring map of key words, the researches focus on these four aspects are relatively concentrated. They are construction and development of the stadium from different perspectives, mega sport events, the relationship between stadiums and urban development from perspective of architecture and city and the link of all these three aspects. The construction of stadiums is the catalyst of urban development[25]. How to drive urban development through the development of stadiums is an important research content of this topic. As the development of stadiums and cities are influenced by each other, their operating mechanisms can promote each other, and the eventual win-win situation is also the focus of scholars in this period. As the best platform to show urban development, mega sports events need the support of stadiums. Hosting mega-sport events can benefit various areas, including the economy, society, culture, and environment. In detail, a sport event not only promotes the sale of sporting goods and the operation of sports facilities, but also affects various corporate activities such as promotion, advertisement, and product promotion of sports as an opportunity and means for sports to develop into an industry itself. In addition, the promotion effect of not only the host city, but also the companies and tourism resources that are located there can promote the competitiveness of local industries and vitalize the local economy and exert various influence on the community and residents, including enhancing the image of the host city and raising the brand value[26]. Therefore, mega sport events are also an important connection between stadiums and urban development, which has always been the focus of research. In addition people are considered as the most important aspect to tell whether all of stadiums, mega sport events and city integrate wonderfully. The integration between stadium and urban development relies on how people feel in the city and feel sport.

Above all, urban development can be affected by stadiums as a driving force, while the development of stadiums should base on how a city design and its regeneration goals. under the sustainable development theme, the relationship between them is the key to realize the sustainable development. Only sustainable development can presents the value of stadiums beyond sport architecture and truly make urban development meaningful.

5. References

5.1. Journal articles

[2] Gospodini A. European Cities in Competition and the New 'Uses' of Urban Design. *Journal of Urban Design*, 7(1), 59-73 (2002).

[3] Kiuri M & Teller J. Olympic Stadiums in Their Urban Environment: A Question of Design and Cultural Significance. *Journal of Cultural Heritage Management and Sustainable Development*, 2(2), 115-129 (2012).

[4] Yüce A & Katırcı H & Yüce SG. Examination of Sustainable Features of Stadiums as an Integral Part of Sustainable Urban Development: The Case of Turkey. *International Journal of Sports Marketing and Sponsorship*, 22(1), 142-163 (2020).

[6] Buckman S & Mack AE. The Impact of Urban Form on Downtown Stadium Redevelopment Projects: A Comparative Analysis of Phoenix and Denver. *Journal of Urbanism*, 5(1), 1-22 (2012).

[7] Sanchez RLO & Essex S. The Challenge of Urban Design in Securing Post-event Legacies of Olympic Parks. *Journal of Urban Design*, 23(2), 278-297 (2018).

[8] Roult R & Lefebvre S. Planning and Reconversion of Olympic Heritages: The Montreal Olympic Stadium. *The International Journal of the History of Sport*, 27(16-18), 2731-2747 (2010).

[9] Flowers B. Stadiums: Architecture and the Iconography of the Beautiful Game. *The International Journal of the History of Sport*, 28(8-9), 1174-1185 (2011).

[10] Zhao XM & Bai XF & Shin HB. The Impacts of Olympic Legacy on Urban Regeneration: A Systematic Review. *Public Value*, 5(2), 39-48 (2020). [Article]

[11] Yan JF & Sun H & Zhang J & Dai ST & liu ZD. Research on Ecological Environment in China: Context Evolution, Frontier and Hot Topics and Development Trends. *Journal of Wuhan Institute of Physical Education*, 55(2), 13-20 (2021).

[12] Li Bi & Jin YZ & Zhu XT. Analysis on Knowledge Mapping of World Sports Stadiums and Gyms Based on CiteSpace and Its Enlightenment. *Journal of Shenyang Sport University*, 37(6), 57-64 (2018).

[13] Shi Y & Huo XY. The Mapping Knowledge Analysis of Sport Risk Domain Research. *China Sport Science*, 37(2), 76-86 (2017).

[14] Preuss H & Plambeck A. Utilization of Olympic Stadiums: A Conceptual Stadium Legacy Framework. *International Journal of Sports Marketing & Sponsorship*, 22(1), 10-31 (2020).

[15] Leland S. Urban Development and the Growth with Equity Framework: The National Football League Stadium in Downtown Los Angeles. *Urban Affairs Review*, 55(5), 1370-1401 (2019).

[16] Friedman MT & Beissel AS. Beyond "Who Pays?": Stadium Development and Urban Governance. *International Jouranl of Sports Marketing & Sponsorship*, 22(1), 107-125 (2020).

[17] Vuolteenaho J & Wolny M & Puzey G. "This Venue is Brought to you by…": The Diffusion of Sports and Entertainment Facility Name Sponsorship in Urban Europe. *Urban Geography*, 40(6), 762-783 (2018).

[18] Gogishvili D & Brandts S. Coinciding Practices of Exception in Urban Development: Mega-events and Special Economic Zones in Tbilisi. *Georgia, European Planning Studies*, 28(10), 1999-2019 (2020) .

[19] Haferburg C. South Africa under FIFA's Reign: The World Cup's Contribution to Urban Development. *Development Southern Africa*, 28(3), 333-348 (2011).

[20] Steinbrink M & Haferburg C & Ley A. Festivalisation and Urban Renewal in the Global South: Socio-spatial Consequences of the 2010 FIFA World Cup, South African. *Geographical Journal*, 93(1), 15-28 (2011).

[21] Kim HU & Jong SI. Development of a System for Evaluating the Flow Field around a Massive Stadium: Combining a Microclimate Model and a CFD Model. *Building and Environment*, 172, n106736 (2020).

[22] Hyun D & Milcheva S. Spatio-temporal Effects of an Urban Development Announcement and Its Cancellation on House Prices: A Quasi-natural Experiment. *Journal of Housing Economics*, 43, 23-26 (2018).

[23] Zhao XM & Bai XF & Shin HB. Exploring the Nature of Genius Loci in Sport Stadiums Based on Collective Memory in China. *Kinesiology*, 5(1), 48-57 (2020). [Article]
[24] Bai XF & Shin H & Lee S. The Impacts of the Winter Olympic Games on Sport Tourism: A Systematic Review. *Kinesiology*, 6(1), 39-47 (2021). [Article]
[25] Nam SH & Lee JB & Oh JM. Analysis of the Perception of Leaders and Participants for the Value Creation of Sports for All in Urban Society. *International Journal of Human & Disaster*, 5(2), 41-48 (2020). [Article]
[26] Shin HB. Developing Sport Legacy through Post Use of Mega-sport Event Facilities: The Case of Winter Sport. *Public Value*, 5(1), 17-28 (2020). [Article]

5.2. Books

[5] Balletto G & Borruso G & Tajani F. Gentrification and Sport: Football Stadiums and Changes in the Urban Rent. Springer International Publishing AG (2018).

5.3. Conference proceedings

[1] Ertenl S & Özfiliz S. Stadium Construction and Sustainability: The Review of Mega-event Stadiums(1990-2012). 1st International CIB Endorsed METU Postgraduate Conference Built Environment & Information Technologies, Ankara (2006).

6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Lead Author	XZ	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑
Corresponding Author*	HS	-Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Co-Author	XB	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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Reforming Tool to Measure MEDICAL ETHICS CONSCIOUSNESS of Korean Young Students

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Abstract

Purpose: *This study complements some of the limitations of the past developed tool for measuring medical ethics consciousness of Korean young students.*

Method: *This study was based on the past tool which was developed according to G. Lind of Germany. The validity process followed the verification procedure of Moral Competence Test (MCT) proposed by G. Lind. To get much higher validation, this study got advices from 3 specialist in the sphere of moral education.*

Results: *This study adopted the result of the past medical ethics consciousness measurement tool. Its whole validation did cover three major processes, preference hierarchy by moral development, affective-cognitive parallelism test, quasi-simplex structure of inter-correlations between the six moral orientations test by L. Kohlberg. This past tool showed weakness in the point of preference hierarchy test. Especially the tool got some strange situation at 1st stage and 4th stage. To back up this weakness, we made a decision to receive specialists' advices. So we interviewed 3 people who is professor or research fellow in the sphere of moral education. We could arrived at more advanced level for medical ethics consciousness.*

Conclusion: *This study showed the more advanced medical ethics consciousness tool. Next time it is necessary to generalized through deep research using much broader topics in the medical ethics.*

[Keywords] ***Medical Consciousness Measurement Tool, Moral Competence Test, Preference Hierarchy by Moral Development, Affective-Cognitive Parallelism Test, Quasi-Simplex Structure of Inter Correlations between the Six Moral Orientations Test***

1. Introduction

Medical ethics is a part of public value which covers all kinds of publicities including sports, arts, culture etc[1][2][3][4][5]. Medical ethics is a branch of ethics. In the category of ethics, it is a sort of normative, more specifically applied normative ethics. To understand well, we need to inquiry the definition and meaning of ethics. Ethics, or moral philosophy, is a branch of Philosophy concerned with norms and values, rights and wrongs and what ought or what not ought to be done. In other words coming after reflection, argument and analysis, to a sense of what one ought to do under given sets of circumstances. The relationship between physician and patient has been of interest since ancient times, principally concerning the moral obligations of physicians in preventing disease and treating the sick and injured[6].

In terms of deontological perspective, Beauchamp and Childress defined four key principles of medical ethics: respect for autonomy, non-maleficence, beneficence and justice. These four principles are of equal importance and coherent with common morality as well as professional medical norms and traditions[7][8].

As a branch of normative ethics or practical ethics, medical ethics aimed to support fair and

well-reasoned decisions in the tension-filled areas between technical possibilities, data-based statistical evidence, economic factors and various dimensions of health and disease[9].

From the perspective of an actor, medical ethics can not be said to be an ethical principle that medical personnel such as doctors and nurses must adhere to. Medical ethics includes both patients, their families, and medical environment. It encompasses the ethical thinking, feeling, and judgment of the people involved in the medical community. Therefore, based on the basic research results already presented in previous study[10], we intend to secure a higher validity through experts' advices.

2. Overview on the Past Tool to Measure Medical Ethics Consciousness

2.1. Subject of survey

The survey for this study was conducted among 120 middle, high, and college students in Gyeongnam province of South Korea, from May to June 2019. Specific data could be seen as follows <Table 1>.

Table 1. Characteristics of survey targets(N=120).

Variable		Frequency	Ratio(%)
Sex	Girl	63	52.5
	Boy	57	47.5
Grade	Middle school	40	33.3
	High school	43	35.8
	College	37	30.8
Religious sect	Buddism	10	26.3
	Roman catholic	10	26.3
	Protestant	18	47.4

2.2. Tool

The past survey tool followed the algorithm of Moral Judgment Competence Test(MCT) developed by Professor G. Lind. Originally, MCT exploited two moral dilemmas[11][12][13][14][15][16][17]. The past tool did not use the dilemma. But it used the MCT algorithm of 'value hierarchy' and 'weighting'.

2.3. Data processing

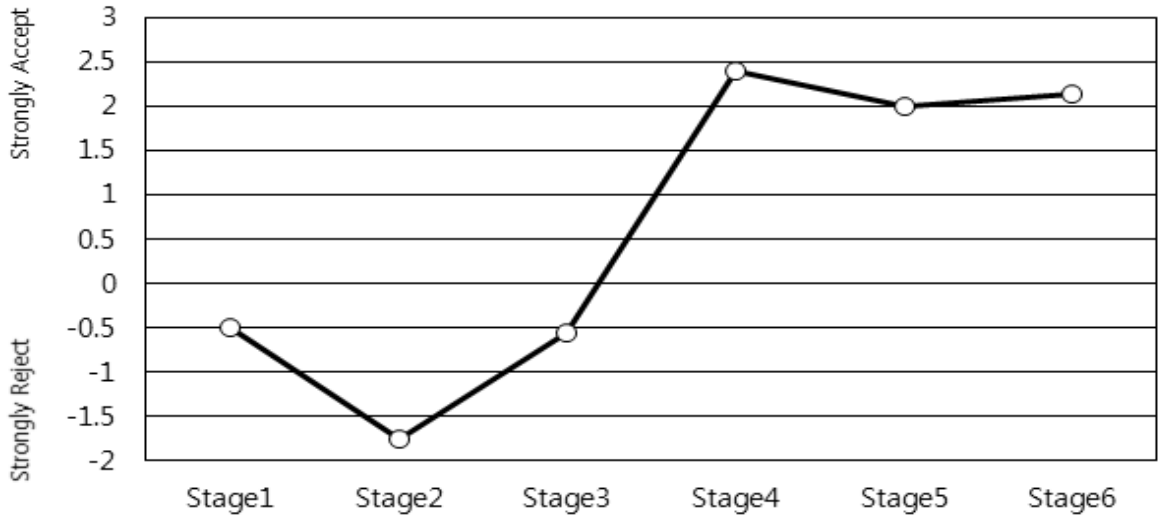
Data processing followed the C-score calculation method in MCT[17].The processing was conducted according to the validity verification procedure created by G. Lind. For statistical analysis, this paper used the frequency comparison, mean comparison, and variance comparison. And the results of interviewing with moral education expert were quoted after transcription.

2.4. Validation process

In previous studies, the validation of the tool followed the suggestions by G. Lind. Those were three validation as follows: 1)Moral development preferences' Sequence Validation, 2)Quasi-Simplex Structure of inter-correlations between the six moral orientations, 3)affective-cognitive parallelism validation.

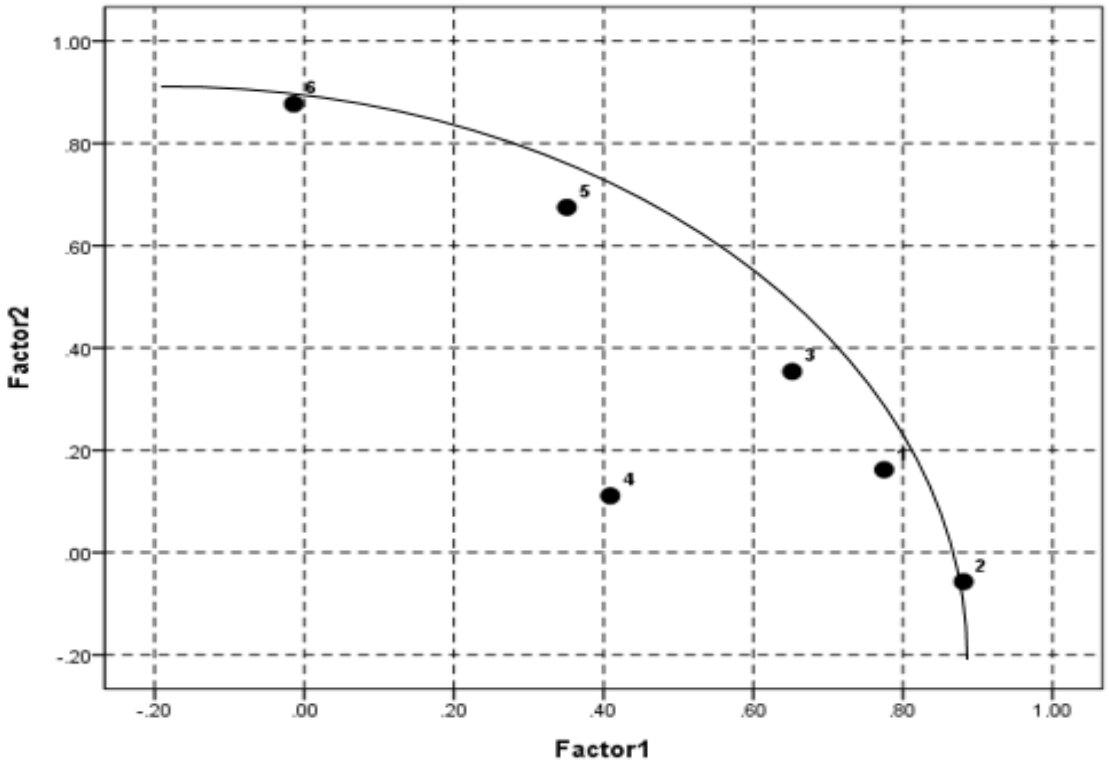
First, as a result of the verification of the order of preference, each stages range stage 1 -.49, stage 2 -1.75, stage 3 -.56, stage 4 2.39, stage 5 1.99, stage 6 2.13 <Figure 1>. Shown in figure 1, especially at stage 1 and stage 4, the validity of the order of preference is not satisfied.

Figure 1. Moral development preferences' sequence validation.



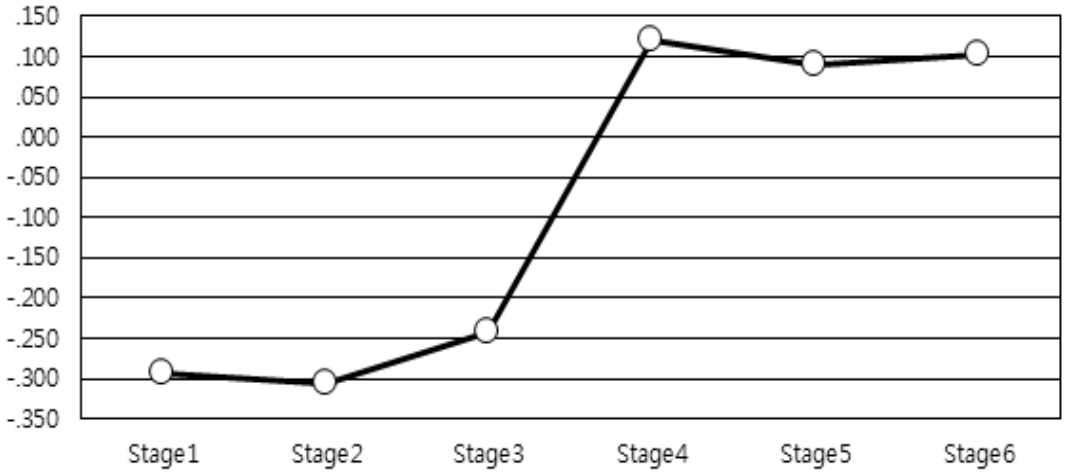
Second, as a result of examining the relationship between Kohlberg's six stages through quasi-simplex structure verification, stage 1 to 3 were grouped into one factor, but the result of stage 4 is exceptional <Figure 2>. This is a quite unusual and out of normal validation in terms of quasi-simplex structure.

Figure 2. Quasi-simplex structure of inter-correlations between the six moral orientations validation.



Third, as a result of the cognitive-emotional parallel test, it has secured somewhat normal validity. But stage 4 is not a good example to explain the validation of cognitive-emotional consistency <Figure 3>.

Figure 3. Affective-cognitive parallelism validation.



3. Improvement for the Past Medical Ethics Consciousness Measurement Tool

This study aimed to develop an improved tool to measure medical ethics consciousness of adolescents. The validity of the original tool was not fully verified. In particular, it seems that the statements advocating stage 1 and 4 did not clearly represent the characteristics of each stages. Therefore, this study tried to receive the opinions of domestic experts in the field of moral education. More details of experts are as follows <Table 2>.

Table 2. Three experts' summarized biographies.

	Institute	Major area	Career year
Bongje Kim	Seoul national university of education	Morality measurement	24
Hyunsoo Kim	Pusan national university	Moral education methodology	24
Intae Lee	Korea institute curriculum and evaluation	Moral psychology	18

Note: Source: Individual Communication, March, 2021.

First of all, the researchers interviewed with professor Bong-Je Kim at Seoul National University of Education. He has devoted his efforts in measuring morality and he is interested in Artificial Intelligence ethics. He commented as follows: "As medical ethics is a special area in the field of ethics, so measuring its consciousness is not easy. It is important to set up demographic variables appropriately because it is not easy to find something common in a specific topic of medical ethics. Stage 1 and 4 of the previously developed measurement tool showed a relatively higher tendency than those above. This situation can be seen in other previous studies. Therefore, there seems to be no big problem with the existing measurement tools. And I hope that these tools will produce a self-diagnosis kit in conjunction with artificial intelligence."

Next, we interviewed with a professor Hyunsoo Kim who is a professor at Pusan National University and a specialist in moral education methodology. He maintained a critical view as follows: "Since the previously developed medical ethics consciousness measurement tool targets adolescents, it is effective to choose the simple type that does not mobilize a moral dilemma. However, if the dilemma with holding a story is omitted, the interests of young students

to a measurement tool will be down. It is necessary to reconsider using a moral dilemma in future supplementation."

Lastly, we interviewed with In-Tae Lee who is a research fellow at the Korea Institute for Curriculum and Evaluation who explored the academic background of moral psychology. He gave us significant advice as follows: "Although medical ethics is a very important topic, it has not been discussed in the curriculum and textbooks for moral education in Korea. If the medical ethics awareness measurement tool is settled down, it is believed that it can be provided as a source technology for self-diagnosis to Korean youth who do not have much time. If such data are accumulated, we can discuss the necessity containing the medical ethics in the revised curriculum for moral education in the future."

This study aimed to improve the previously developed by the researchers. Through the deep interview, this study could overcome the weakness in the past tool. Based on the interview, this study showed the revised tool such as <Table 3>, <Table 4>.

Table 3. Reform the sentences at the 4th stage.

Pro or contra/ stage		Before or after	Statements
Pro	1st stage	Before	When I got the request for abortion, if there is no punishment, I accept it.
		After	If there is no punishment for euthanasia or abortion, I accept it.
	4th stage	Before	When I got the request for euthanasia, if that is no illegal, I accept it.
		After	If euthanasia or abortion is not illegal, I accept it.
Contra	1st stage	Before	If there is no fear to punishment to abortion, I do not accept it.
		After	If there is not the fear of punishment for euthanasia or abortion, I do not accept it.
	4th stage	Before	Without careful consideration, euthanasia or abortion may cause a major social problem, I do not accept it.
		After	Without careful consideration of euthanasia or abortion, social order will not maintain well, so I do not accept it.

Table 4. Reformed medical ethics consciousness measurement tool.

Statement		Disagree								Agree
Pro	1. If there is no punishment for euthanasia or abortion, I accept it.(1)*	-4	-3	-2	-1	0	1	2	3	4
	2. In case of euthanasia or abortion, if there is no harm to me, I can it.(2)	-4	-3	-2	-1	0	1	2	3	4
	3. If other persons around me accept euthanasia or abortion mostly, I accept it.(3)	-4	-3	-2	-1	0	1	2	3	4
	4. If euthanasia or abortion is not illegal, I accept it.(4)	-4	-3	-2	-1	0	1	2	3	4
	5. If euthanasia or abortion is helpful for the benefit of society as a whole, I accept it.(5)	-4	-3	-2	-1	0	1	2	3	4
	6. If the patient's request for euthanasia or abortion is so severe that his or her suffering is too extremely severe to endure, I accept it.(6)	-4	-3	-2	-1	0	1	2	3	4

Contra	7. If there is not the fear of punishment for euthanasia or abortion, I do not accept it.(1)	-4	-3	-2	-1	0	1	2	3	4
	8. If euthanasia or abortion does not give me interests, I do not accept it.(2)	-4	-3	-2	-1	0	1	2	3	4
	9. If other persons do not accept the euthanasia or abortion, pursue my interests, I do not accept it.(3)	-4	-3	-2	-1	0	1	2	3	4
	10. Wiithout careful consideration of euthanasia or abortion, social order will not maintain well, so I do not accept it.(4)	-4	-3	-2	-1	0	1	2	3	4
	11. If euthanasia or abortion causes loss of the interests of the community as a whole. I do not accept it.(5)	-4	-3	-2	-1	0	1	2	3	4
	12. Even if there is some discomfort because of euthanasia or abortion, as the same human being, I do not accept it.(6)	-4	-3	-2	-1	0	1	2	3	4

Note: Mark '*' means L. Kohlberg's Moral Developmental Stage. During the survey it does not show the figures to the interviewees.

4. Conclusion

This study attempted to improve some of the previously developed tools to make a general medical ethics consciousness measurement tool. Existing tools showed a tendency to be unstable in the 1st and 4th stages of L. Kohlberg, but through the advice of experts, this part could be supplemented to some extent. In the future, this research tool can measure the degree of ethical consciousness of ordinary citizens in relation to medical ethics. Furthermore, the results of this study can be used for basic investigations to measure the medical ethics consciousness of various medical professionals, namely medical doctor, dentist, Korean medical doctor, nurse, dental hygienist, nursing assistant, and various medical technicians. In particular, it is necessary to devise a plan to utilize the moral dilemma adopted by the original tool of MCT in order to educate the prospective of medical personnel.

5. References

5.1. Journal articles

[1] Lee J. Application and Satisfaction Study of Medua-based Teaching & Learning Method in Beauty Education: Focusing on Flipped Learning Using Google Classroom. *Public Value*, 6(1), 92-105 (2021). [Article]

[2] Heo M & Cai XX & Choi E. A Study on the Artistic Value of Dunhuang Patterns. *Public Value*, 6(1), 51-61 (2021). [Article]

[3] Lee S. A Study on the Professionalism of Cabin Crew Applying the Professionalism Perspective. *Public Value*, 6(1), 72-82 (2021). [Article]

[4] Zhao X & Bai X & Shin H. The Aspects of Ecological Environment in Host City of the Winter Olympic Games. *Public Value*, 6(1), 83-91 (2021). [Article]

[5] Luo Y & Seo E. Directions for the Korean Social Integration Policy Index Development. *Public Value*, 6(1), 62-71 (2021). [Article]

[6] Andrew DL. What is Medical Ethics?. *Trends in Anaesthesia and Critical Care*, 1, 3-6 (2011).

[8] Borysowski J & Ehni HJ & Górski A. Ethics Codes and Medical Decision Making. *Patient Education and Counseling*, 104, 1312-1316 (2021).

[9] Frischhut M & Werner-Felmayer G. A European Perspective on Medical Ethics. *Healthcare Ethics and Communication*, 48(10), 634-636 (2020).

[10] Park GY. Tool to Measure the Medical Ethics Consciousness. *Journal of Learner-centered Curriculum and Instruction*, 19(22), 701-722 (2019).

5.2. Books

[7] Beauchamp TL & Childress JF. Principles of Biomedical Ethics. 8th Edition. Oxford University (2019).
[11] Lind G. How Does One Measure Moral Judgment? Problems and Alternative Ways of Measuring a Complex Construct[German: Wie Mißt Man Moralisches Urteil? Probleme und Alternative Möglichkeiten der Messung Eines Komplexen Konstrukts. Beltz (1978).
[12] Lind G. Experimental Questionnaires: A New Approach to Personality Research. North-Holland (1982).
[13] Lind G. Growth and Regression in Moral-cognitive Development. Precedent (1985).
[14] Lind G. The Theory of Moral-cognitive Judgment: A Socio-psychological Assessment. Precedents (1985).
[15] Lind G. Ist Moral Lehrbar? Ergebnisse der Modernen Moralpsychologischen Forschung Logos-Verlag (2002).
[16] Lind G. Moral ist Lehrbar: Handbuch zur Theorie und Praxis Moralischer und Demokratischer Bildung Oldenbourg-verlag (2003).
[17] Lind G. How to Teach Morality. Logos (2016).

6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Lead Author	WL	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Corresponding Author*	GP	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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