

The effect of depression and fandom activity on life satisfaction in adolescents: Moderated mediation effect of grit

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Abstract

Background: Korean adolescents have relatively high levels of depression and low life satisfaction compared to other countries. Academic interest is needed to devise measures to alleviate the effects of depression on life satisfaction in adolescents.

Objectives: The study aimed to suggest a way to alleviate the negative effects of depression on life satisfaction by verifying whether grit moderates the influence of depression on life satisfaction through fandom activities in adolescents.

Methods: The research subjects were selected from the 3rd grade of middle school among the subjects of the 3rd year (2020), the most recent data of the 『Korea Children and Youth Panel 2018 (KCYPS 2018)』. The data were analyzed using SPSS PC+ Win. 25.0 and SPSS PROCESS macro 4.1. Applied statistical techniques were descriptive statistics, reliability analysis, correlation analysis, and moderated mediating effect analysis.

Results: As a result of the study, first, depression in adolescents showed a significant positive correlation with fandom activity and a significant negative correlation with grit and life satisfaction. Fandom activity showed a significant negative correlation with grit and life satisfaction. And grit showed a significant positive correlation with life satisfaction. Second, grit moderated the effects of depression on life satisfaction through fandom activities. Grit served as a buffer to mitigate the negative effects of depression on life satisfaction through fandom activities.

Conclusions: This study confirmed that grit will alleviate the negative effect of depression and fandom activities on adolescents' life satisfaction.

Keywords: depression, life satisfaction, fandom activity, grit, moderated mediating effect, adolescent

1. Introduction

According to the statistics of the Korean adolescent health behavior online survey, 19.7% of male adolescents and 27.8% of female adolescents experienced depression, indicating that not a few adolescents experienced depression [1]. Depression experienced during adolescence is more worrisome that it negatively affects the development of adolescents [2], anti-social behaviors such as delinquency [3], and irreversible consequences such as suicidal thoughts and suicide attempts [4]. In addition, depression in adolescence directly affects social competence and interpersonal relationship formation ability, resulting in maladaptation to schoolwork and friendship, and negatively affects physical and mental growth [5]. In addition, it is known that the risk of depression in adolescence

becoming chronic and continuing into adulthood is 2 to 4 times higher, so early detection and professional intervention are very important [6].

On the other hand, Korean adolescents feel the academic burden of school education focused on entrance exams, and perceive that their lives are not satisfactory due to a competitive social atmosphere [7]. According to the National Statistical Office social survey, life satisfaction (perceived satisfaction) of adolescents aged 13 to 19 increased 0.2% from 47.8% in 2012 to 48.0% in 2013 (e-country indicator), but overall adolescents do not experience satisfaction with life. Also, looking at the change in the subjective happiness level of adolescents, it was 73.4% in 2011, 79.6% in 2013, and 78.7% in 2014, which is the lowest score among OECD countries (OECD national average = 100) [8]. Therefore, research to resolve depression and life dissatisfaction among Korean adolescents is urgently needed.

In a number of previous studies, life satisfaction in adolescence was reported as a predictor of development and adaptation [9]. Adolescents with high life satisfaction adjust well to school, form good interpersonal relationships with peers, and have high problem-solving skills [10], whereas adolescents with low life satisfaction have psychological problems such as depression [11] and externalized problems such as aggression, delinquency, and suicide [12,13]. In particular, depression was negatively correlated with life satisfaction in all age groups [14], and in a study on the elderly, depression had a negative effect on life satisfaction [15], depression also had a negative effect on life satisfaction in a study of middle-aged men [16]. Therefore, there is an important correlation between depression and life satisfaction, and it is necessary to find a way to alleviate the negative effects of depression on life satisfaction.

On the other hand, one of the activities that teenagers enjoy is fandom activity, which is a combination of the words 'fanant', which means to follow enthusiastically, and 'dom', which means a collective syndrome. Fandom activity is a term that refers to the means and methods of idolizing a star, such as attending a fan meeting, joining a fan club or fan cafe, or visiting a broadcasting station or concert hall. These fandom activities were reported to be closely related to depression and life satisfaction. In other words, depression in adolescence causes low self-esteem and fear of rejection [17], and spends a lot of time alone, leading to frequent use of media such as the Internet and smartphones. The use of such media leads to a lot of contact with popular stars, and the exposure of popular stars through the media causes fandom activities to start. Therefore, fandom activities can be seen as a target that enables young people with high depression to relieve conflict and stress in a reality where they have no other options other than popular culture [18]. On the other hand, fandom activity is also related to life satisfaction. In a study of first-graders in elementary school, fandom activity and life satisfaction had a negative correlation [19], and had a negative effect on adolescents' school adjustment [20]. In addition, it was found that adolescents with lower life satisfaction were more likely to participate in fandom activities [21]. From these results, it is predicted that depression has a positive effect on fandom activity, and fandom activity also has a positive effect on life satisfaction, so fandom activity plays a mediating role in depression and life satisfaction. Therefore, this study was to examine whether fandom activity mediates the relationship between depression and life satisfaction targeting third graders of middle school.

Meanwhile, grit is defined as the tendency to pursue long-term goals with persistence and passion [22]. Grit also refers to maintaining effort and interest for many years even if failure, adversity, or temporary settling occurs during the course of a challenge [22]. Grit is not a concept that simply refers to hard work, but a concept that means setting a long-term goal and putting effort into it without giving in to obstacles, setbacks, and failures that may be encountered in the process of achieving that goal [23].

In previous studies, grit was reported to be a better predictor of success in various domains than IQ or talent [22]. Grit predicted high school graduation and GPA better than IQ [24] and was the best predictor of West Point freshman stay at the Military Academy [25]. In addition, high-grit individuals were more likely to complete the Army Special Operations Forces selection process, salespeople were more likely to remain employed, and high-grit high school students were more likely to graduate from school. And men with higher grit were more likely to stay married [26]. A study of college students also showed that college students with high grit had higher academic achievement [27].

Such grit has been verified to play a moderation and moderated mediating role in a number of previous studies. As a result of a longitudinal study of 209 college students, the interaction effect of gratitude and grit reduced suicidal ideation [28]. In a study on high school students, the buffering effect of grit on the relationship between career decision self-efficacy and depression was investigated [29]. In another study on high school students, grit served as a moderated mediating effect to increase the effect of mindfulness on happiness through gratitude [30]. In a study on college students, the moderated mediating effect of grit has been verified by acting as a buffer to relieve the negative effect of job stress on happiness through a growth mindset [31].

2. Objectives

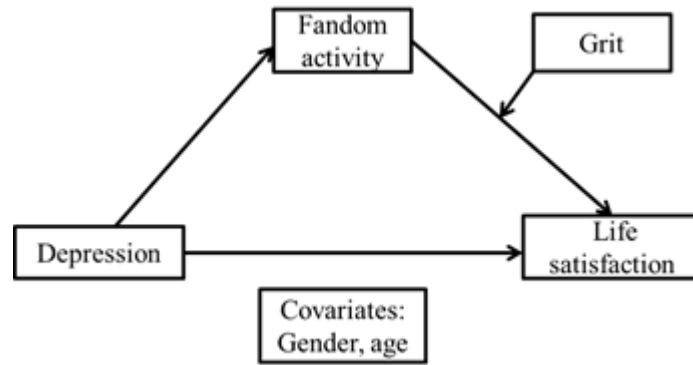
As a result of considering these preceding studies, grit was predicted to play a role in moderating and buffering the negative effects of depression on life satisfaction through fandom activities. Therefore, by examining this for middle school students, we tried to come up with a way to alleviate the negative effects of depression on life satisfaction.

The research questions for this are as follows. First, what is the correlation between depression, fandom activity, grit, and life satisfaction? Second, does grit moderate the effects of depression on life satisfaction through fandom activities?

3. Methods

1) Research model

As for the research model, as shown in [Figure 1], it was established to verify the moderated mediating effect (conditional indirect effect) that grit moderates the path of depression → fandom activity → life satisfaction. This model was analyzed according to the moderated mediating effect analysis procedure, which is Model No. 14 in PROCESS macro ver. 4.1.



[Figure 1]. research model

2) Research subjects and data collection methods

The subjects of this study were 2,590 3rd grade middle school students selected from among the 3rd year (2020) data, the most recent data from the Korea Children and Youth Panel 2018 (KCYPS 2018).

Among the total survey subjects, 49.3% (1,278 people) of male students, 42.7% (1,106 people) of female students, and 8% (206 people) did not respond. Excluding non-response, 90.5% (2,345 people) had the highest number of births in 2005, and their living areas were ranked as Gyeonggi Province at 22.9% (594 people), Seoul at 15.1% (39 people), and Incheon at 7.5% (194 people).

3) Research tools

(1) Depression

Depression scales from the 3rd year (2020) data of the Korea Children and Youth Panel 2018 (KCYPS 2018) were used. The depression scale consisted of a total of 10 items excluding 3 items out of 13 items on the simplified mental test by Kim et al. [32]. The items included “I feel unhappy or sad and depressed,” “I worry a lot,” “I feel like I want to die”, and “I have no interest in everything”, and each question was measured on a 4-point Likert scale ranging from 1 point (not at all) to 4 points (strongly agree). A higher score means a higher degree of depression. In this study, the reliability of the depression scale was .915 for Cronbach α .

(2) Fandom activities

The fandom activity scale of the 3rd year (2020) data of the Korea Children and Youth Panel 2018 (KCYPS 2018) was used, and there are a total of 9 questions. It was measured by the frequency of buying books or related books, uploading videos on internet sites, attending fan meetings, joining fan clubs or fan cafes, visiting broadcasting stations, concert halls, and stadiums, visiting related websites, writing e-mails or fan letters, sending gifts, and commenting on portal sites or articles. Each item is on a 6-point Likert scale, ranging from 1 point for ‘never’ to 6 points for ‘many times a week’. The reliability of this scale was Cronbach's α of .774.

(3) Grit

The grit scale of the 3rd year (2020) data of the Korea Children and Youth Panel 2018 (KCYPS 2018) was used. The Korean version of the children's grit scale validated by Kim et al. [33] was used, and it consists of a total of 8 items. The scale consists of 4 items of the 'maintaining interest' factor and 4 items of the 'continuation of effort' factor and is a 4-point Likert scale. The higher the score, the higher the grit, and the credibility of the grit in this study was Cronbach's α .701.

(4) Life satisfaction

The life satisfaction scale of the 3rd year (2020) data of the Korea Children and Youth Panel 2018 (KCYPS 2018) was used. The life satisfaction scale was developed by Diener et al. [34] and consists of a total of 5 items. It consists of items measuring life satisfaction such as 'Overall, my life is close to the ideal' and 'My life situations are very good', and it is a 4-point Likert scale. The higher the score, the higher the level of life satisfaction. In this study, the Cronbach's α was .823.

(5) Control variables

Among the general characteristics variables [32, 35] affecting life satisfaction, gender and age were analyzed after controlling.

4) Data Analysis

In this study, SPSS PC+ Win. ver. 25.0 and SPSS PROCESS macro 4.0 were used for analysis. For basic analysis, descriptive statistics was performed, and Cronbach's α value, which is an internal consistency coefficient, was calculated to determine reliability. Pearson correlation analysis was performed to determine the correlation between major variables. In order to verify the moderated mediating effect, it was analyzed according to procedure No. 14 of the SPSS PROCESS macro model. Bootstrap was used to verify the moderated mediating effect, the confidence level was 95%, the number of samples was set to 5,000, and the conditional effect was analyzed based on three conditions ($M \pm SD$, M). In the analysis of moderated mediating effects, the independent variable (x) and the moderating variable (w) were average-centered.

4. Results

1) Correlation between variables and descriptive statistics

<Table 1> shows the results of Pearson's correlation analysis to understand the correlation between depression, fandom activity, grit, and life satisfaction, the major variables of this study. Depression had a significant positive correlation with fandom activity ($r=.122, p<.01$), had a significant negative correlation with grit ($r=-.409, p<.01$), and life satisfaction ($r=-.402, p<.01$). Fandom activity showed a significant negative correlation with grit ($r=-.141, p<.01$) and life satisfaction ($r=-.058, p<.01$). And grit showed a positive correlation with life satisfaction ($r=.394, p<.01$).

<Table 1> Correlation analysis and descriptive statistics of major variables

	Depression	Fandom activity	Grit	Life satisfaction
Depression	1			
Fandom activity	.122**	1		
Grit	-.409**	-.141**	1	
Life satisfaction	-.402**	-.058*	.394**	1
M	1.7911	1.7243	2.5712	2.6275
SD	0.60438	0.75272	0.41846	0.54868

* p<.05, ** p<.01

2) The moderated mediating effect of grit

For the analysis of moderated mediating effects, model 14 of SPSS PROCESS macro 4.1 proposed by Hayes (2017) was used for analysis. The analysis results are presented in [Figure 2], <Table 2> and <Table 3>.

In the mediating variable model, depression had a significant positive effect on fandom activity (.1202, p<.001). Looking at the dependent variable model, depression had a negative and significant effect on life satisfaction (-.3174, p<.001), and the moderating variable grit had a positive and significant effect on life satisfaction (.3187, p<.001). and the interaction term between fandom activity and grit had a positive and significant effect on life satisfaction (.1048, p<.05), so grit moderated the relationship between fandom activity and life satisfaction.

Looking at the conditional effect of the interaction term according to the value of grit, the conditional effect was significant in M+SD when the grit was high (.0698, .0071 ~ .1325), and when the grit was high, it played a moderating role in increasing the effect of the interaction term on life satisfaction.

The Johnson-Neyman method was applied to identify the significant area of the conditional effect of interaction term according to the grit value. The moderating effect was significant in the area where the grit value was lower than -1.3588, and 8.65% of the survey subjects fell into this area. Also, the moderating effect was significant in the area where the grit was higher than .2707, and 27.94% of the subjects fell in this area.

<Table 2> Moderating effect of grit in the moderated mediation model

Items	Mediating variable model (DV:fandom activity)			Dependent variable model (DV:life satisfaction)		
	Coeffect	SE	t value	Coeffect	SE	t value

Constant		-778.3485	302.7196	-2.5712*	-542.8141	218.3102	-2.4864
Independent variable	Depression	.1202	.0349	3.4488**	-.3174	.0273	-11.6243***
Mediating variable	Fandom activity				.0247	.0217	1.1344
Moderating variable	Grit				.3187	.0379	8.4060***
Interaction term	Fandom activity × grit				.1048	.0447	2.3446*
Highest order test	R ² change				.0037		
	F				5.4972*		
Covariate	Gender	.4868	.0418	11.6527***	-0.282	.0317	-.8899
	Age	.3877	.1510	2.5679*	.2723	.1089	2.5012*
Model summary	R ²	.1265			.2339		
	F	55.6139***			58.4797***		

Conditional effect of fandom activity according to grit

Grit	Effect(B)	se	t value	LLCI	ULCI
-.4307(M-SD)	-.0205	.0258	-.7938	-.0711	.0301
.0000(M)	.0247	.0217	1.1344	-.0180	.0673
.4307M+SD)	.0698	.0319	2.1847*	.0071	.1325

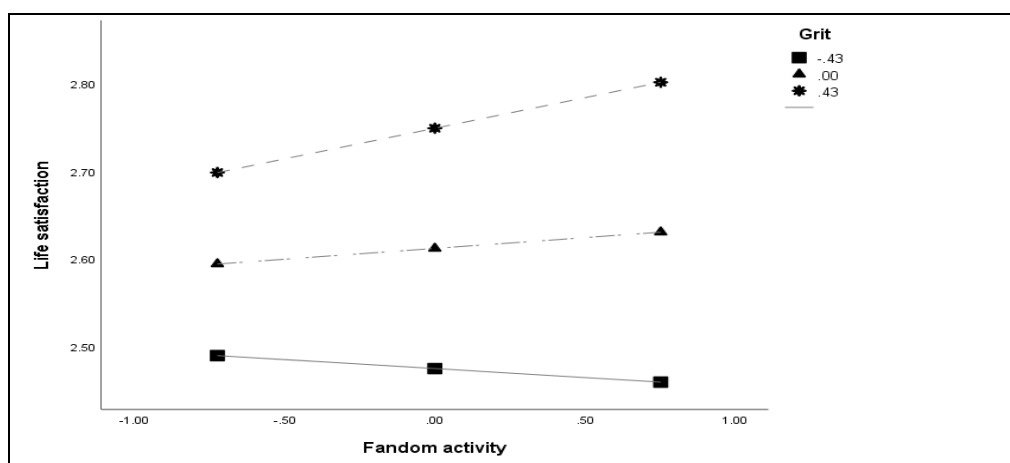
Johnson-Neyman's Conditional Effect Significance Area

Grit	Below(%)	Above(%)
-1.3588	.0865	99.9135

.2707		72.0588		27.9412	
Grit	Effect(B)	se	t value	LLCI	ULCI
-1.5651	-.1394	.0687	-2.0282*	-.2742	-.0045
-1.4072	-.1228	.0620	-1.9797*	-.2445	-.0011
-1.3588	-.1177	.0600	-1.9620	-.2355	.0000
-1.2493	-.1063	.0555	-1.9161	-.2151	.0025
⋮					
.1717	.0427	.0245	1.7383	-.0055	.0989
.2707	.0530	.0270	1.9620	.0000	.1060
.3296	.0592	.0287	2.0607*	.0028	.1156
⋮					
1.4349	.1750	.0720	2.4326*	.0339	.3162

* p<.05, *** p<.001

Among the three conditions of grit (M, M±1SD), life satisfaction increased as fandom activity increased in M and M+1SD. In particular, in grit M+1SD, the slope increased relatively steeply as fandom activity increased. However, life satisfaction decreased gently in M-1SD. That is, even if the fandom activity increased equally, the life satisfaction of the group with high grit increased, but the life satisfaction of the group with low grit decreased.



[Figure 2]. The simple gradient of grit's moderating effect

The direct effect and conditional indirect effect of depression on life satisfaction were analyzed. The direct effect between depression and life satisfaction was $-.3174$ ($-.3710 \sim -.2638$), which was significant because 0 was not included between the bootstrap lower limit (BootLLCI) and the upper limit (BootULCI) within the 95% confidence interval.

The conditional indirect effect is significant because 0 is not included between the bootstrap lower limit (BootLLCI) and the upper limit (BootULCI) within the 95% confidence interval at $M+1SD$ ($.0084, .0002$ to $.0213$) when the grit is high. Therefore, the moderated mediating effect was verified. On the other hand, the conditional indirect effect was not significant when the grit was medium (M) and low ($M-1SD$), so the moderated mediating effect was not verified. Also, the moderated mediating index was $.0126$ ($.0011 \sim .0301$), which was significant. Judging from these results, the moderated mediating effect of grit on the path from depression to life satisfaction through fandom activity was verified.

<Table 3> Direct and conditional indirect effects of depression on life satisfaction

Direct effect (Depression → life satisfaction)				
Effect(B)	se	t value	LLCI	ULCI
-.3174	.0273	-11.6243***	-.3710	-.2638
Conditional indirect effect (Depression → fandom activity → life satisfaction)				
Grit	Effect(B)	BootSE	BootLLCI	BootULCI
-.4307	-.0025	.0035	-.0100	.0044
.0000	.0030	.0034	-.0023	.0111
.4307	.0084	.0055	.0002	.0213
Moderated mediating index				
	Index	BootSE	BootLLCI	BootULCI
Grit	.0126	.0074	.0010	.0301

*** $p < .001$

5. Discussion

The purpose of this study was to suggest a way to alleviate the negative effects of depression and fandom activity on life satisfaction by examining whether grit moderates the effects of depression on life satisfaction through fandom activity for adolescents.

First, as a result of correlation analysis, depression of adolescents showed a significant positive correlation with fandom activity and a significant negative correlation with grit and life satisfaction. These results are in line with the research findings [35] that the higher the depression and the lower the life satisfaction, the higher the adolescent fandom activity. When depression increases, it can be interpreted that adolescents try to reduce depression and increase a sense of belonging by relieving loneliness through media such as mass stars. On the other hand, fandom activity showed a negative correlation with grit and life satisfaction, which is partially in line with a result of the study that excessive fandom activity of adolescents had a negative effect on their life satisfaction as well as their adjustment to school life [21]. In addition, the research result that depression has a negative correlation with grit and life satisfaction was consistent with the results that grit and life satisfaction have a positive correlation [30], and grit and school dropout have a negative correlation [36].

Second, it was analyzed whether grit moderates the relationship between fandom activity and life satisfaction. The interaction term between fandom activity and grit had a positive and significant effect on life satisfaction, and therefore, grit moderated the relationship between fandom activity and life satisfaction. Although fandom activity did not have a significant effect on life satisfaction, the interaction term had a positive effect on life satisfaction, so the moderating variable grit played a moderating role to alleviate the relationship between fandom activity and life satisfaction.

In addition, as a result of analyzing the conditional effect, which is the effect of the fandom activity according to the three conditions ($M \pm SD$ and M) on life satisfaction, the conditional effect of fandom activity was not significant when grit is $M - SD$ and M , but it was significant in the value of $M + SD$ when grit was high. Also, as a result of analyzing the significant area of the conditional effect by applying the Johnson-Neyman method, the grit was not significant between the area of -1.3588 and $.2707$. Therefore, when the grit is somewhat high, the interaction term increases life satisfaction, but when the grit is low, it does not affect life satisfaction.

As a result of analyzing the slope of the conditioning effect, life satisfaction increased as fandom activity increased in the middle (M) and high ($M + 1SD$) of the three conditions (M , $M \pm 1SD$) of grit. In particular, in grit $M + 1SD$, the slope increased relatively steeply as fandom activity increased. However, life satisfaction decreased gently in $M - 1SD$ of grit. Even if the fandom activity increased equally, the life satisfaction of the low-grit group decreased, but the life satisfaction of the high-grit group increased.

Furthermore, to determine whether grit moderates the pathway of depression \rightarrow fandom activity \rightarrow life satisfaction, the conditional indirect effect of depression on life satisfaction was analyzed. As a result of the analysis, the conditional indirect effect was significant because there was no 0 between the bootstrap lower limit (BootLLCI) and the upper limit (BootULCI) within the 95% confidence interval at $M + 1SD$ of grit (.0084, .0002 ~ .0213). Therefore, the moderated mediating effect of grit was verified. On the other hand, the conditional indirect effect was not significant when the grit was medium (M) and low ($M - 1SD$), so the moderated mediating effect was not verified.

These results suggest that when depression has a negative effect on the life satisfaction of adolescents, an intervention plan is needed to alleviate this negative effect, which is possible by enhancing the adolescent's grit. In particular, when the grit was medium or low, the moderating effect and the mediated mediating effect of grit were not significant, so it is necessary to increase the

grit to a high level to enhance life satisfaction by using the interaction effect of fandom activity and grit. For this, it is necessary to maintain life satisfaction by applying the grit program to students with high depression at school.

The limitations of this study and suggestions for further studies are as follows. First, fandom activity was found to have a significant negative correlation with life satisfaction, but it was reported that appropriate fandom activity had a positive effect on life satisfaction [37]. Although this paper only analyzed the correlation and causality of the two variables, a further study needs to analyze the propensity of life satisfaction according to the degree of fandom activity. Second, this study analyzed data from the third year of the Korea Children and Youth Panel 2018 (KCYPS 2018), which is the most recent data. Therefore, although the subject of the study was limited to middle school 3, a further study targeting various school levels and grades is proposed.

Despite these limitations, this study will find great significance in that it is presented as an intervention using grit that can alleviate the negative effects of depression on life satisfaction, which are prevalent among adolescents.

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