

The Relationship between Selective Attention Ability and Educational Level

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Abstract

Although the relationship between children's socioeconomic status and selective attention ability has been proved, there hasn't been any research to prove whether selective attention ability is related to educational level. The current study discovered the differences in selective attention ability between people with different levels of education. The current study recruited 56 participants from online social media platforms to test their selective attention ability. The result is that no relationship between selective attention ability and educational level was proved in this study.

Keywords

Selective attention, educational level, survey, video.

1. Introduction

In psychology, selective attention is the brain filtering out a lot of unnecessary sensory information so that people can better focus on a task. Human's limited attention span prevents us from focusing on multiple things at once. When people are concentrating on a task, they may not notice other events. For example, people who are studying hardly for a test might not be able to notice the noise made by others. Studies show that selective attention is an ability to help forming the working memory since it would filter the unnecessary information. (Working memory is one kind of short memory which can be stored temporarily) Everyone is receiving information all the time, and if all the information had to be noticed and become memories, the human brain would be overwhelmed, so selective attention automatically filters out for people what they don't need to notice.

This study is going to find out the relationship between selective attention and educational level. This could help in the studying of neurodevelopment within people at different levels of education and in people from diverse backgrounds.

1.1. Literature Review

A study about selective auditory attention has been done before. This study discovered the relationship between the development of selective attention and the socioeconomic status of preschool-age children.[1] This study evaluated development of neural systems for selective attention in children in early childhood.

Although before this study, people have already found out that there is a difference on selective attention between high socioeconomic status (SES) and low SES, people still didn't know the difference in early childhood, which is a time of rapid attention development. In this case, the researchers ask 33 children from low SES and 14 children from high SES to do a dichotic listening task to acquire the difference of their event-related potentials (ERPs: very small voltages generated in the brain structures in response to specific events or stimuli). Furthermore, the researchers followed the low SES group longitudinally for a year. For the result, the researchers found out that at age four, the higher SES group shows a longer ERPs response to attended compared to unattended condition, which was not observed in the lower SES group. At age five, the lower SES group exhibited a significant attention effect comparable

in overall magnitude to that observed in the 4-year-old higher SES group, but with poorer distractor suppression (larger response to the unattended condition). The study suggests that young children from lower compared to higher SES backgrounds have both a maturational delay and divergent developmental pattern in neural mechanisms for selective attention.

Another previous study talked about the differences in audiovisual integration between divided attention and selective attention in adolescents. [2] The study based on the racial model showed that there was no great difference between adolescents and adults under the condition of segmented attention and under the condition of visual selective attention, indicating that adolescents have reached the adult level of multisensory integration.

A study discussed Individual differences in selective attention and scanning dynamics influence children's learning from relevant non-targets in a visual search task.[3] The result of this study shows that children's incidental learning from relevant non-targets is an active process that depends on how children use selective attention to engage in effective information gathering.

1.2. Hypothesis

There will be a positive correlation between educational level and selective attention ability.

2. Methods

This study is a survey, which is mainly a questionnaire and a video. 56 participants have been recruited through Chinese social media platform, such as Wechat and QQ, to do this survey. There is no special requirement for recruited the participants as long as they are willing to take some time to finish this survey. This survey was created through Wenjuanxing, which is a questionnaire design website in China. The first four questions ask about the demographic information of participants.

Table 1. The demographic information of this survey

Gender	Male		Female	Do not wish to answer
	26		27	3
Age	15-20	21-30	41-50	More than 70
	49	2	3	2

After these four questions, they were instructed to view a video from YouTube, which tests their selective attention abilities(<https://www.youtube.com/watch?v=iiEzf3J4iFk>). In the video, participants are asked to count how many times the girls in green have jumped rope. But while the girls were skipping, there were other things happened in the scene. For example, a person in a chicken suit comes out and dance, the people swinging the rope changes to other people, and the color of the background changes. Participants will watch the video without pausing, and they can't go back after they've watched it. When they finished watching the video, they need to answer seven more questions. If participants answered "No" to question six, they would just finish the whole questionnaire without seeing the rest of the questions. This is to avoid uncontrollable variables, such as people who don't see the people in the chicken suit in the back, but after they see the question asking whether they have noticed a chicken, they might pick "Yes". To further rule out variables that can't be controlled, the survey also have a few lure questions, such as question seven and question ten. The truth is there is no monkey in this video, and the rope jumpers, which are those girls in green, didn't change. Lure questions are to figure out who chose "Yes" even though they didn't see it.

When the data of this survey came out, only 20 participants' data is useful since question six eliminated a lot of participants. Plus, all of these useful data came from high school students

and middle school students. As the data are rare, Fisher's Exact Test can analyze the data. Fisher's Exact Test is often used to find out whether there is a relationship between two variables. Responses were analyzed in Microsoft Excel.

3. Result

For the three main questions of the questionnaire, the results are in the form of charts.

Did you notice a monkey walking through the scene?		
Education	Yes	No
Middle school students	1	3
High school students	5	11
Note. P value=1.000, ns		

Do you think the background color changed?		
Education	Yes	No
Middle school students	3	1
High school students	9	7
Note. P value=0.619, ns		

Did you notice a change in the rope turners?		
Education	Yes	No
Middle school students	2	2
High school students	7	9
Note. P value=1.000, ns		

4. Conclusion

All of the p values are greater than 0.05, which means that there is no relationship between selective attention ability and educational level in this study.

There are two possible reasons why the survey failed to draw the conclusions it had hoped for. The first reason is that the useful data all come from middle school students and high school students. Middle school and high school students, due to the age gap is not large, their nervous system development and consciousness growth are similar. As a result, this questionnaire can't prove the hypothesis. If the participants are elementary school students and high school students, the hypothesis might have a chance to be proven. The second reason is that there are some differences between this study and previous study that discovered the relationship between children's socioeconomic status and the development of selective attention ability. These differences prevent this study from proving the hypothesis as previous studies. One of these differences is that this study is a survey, but the previous study is an experiment. Survey has its own advantages, which are quick and cheap. However, the result of survey is not very valid and reliable since there are a lot of confound variables that can't be controlled. Experiment is time-consuming and more expensive, but the result comes from the experiment is much more valid and reliable. Since this study is a survey, the result might not be that accurate.

There are also some limitations of this study. First, the population of this study is very limited, because this survey is mainly answered by the middle school students and high school students. If a certain amount of data on college students and elementary school students was included in the study, the result would be more representative. The second problem is that one of the

questions in the questionnaire was not well designed, and it eliminated 36 subjects with this bad question. This question is question six, "Did you notice anything strange or changing in the video?" What is bad about this question is that the word "strange" is a very subjective word. The thing one person thinks strange might not seem strange to others. Moreover, this question was designed to be a knockout question. In other words, if the participants choose "No" when answering this question, they would directly end the questionnaire without answering the latter questions. The initial thought is to weed out participants who might have chosen some options even if they didn't notice those things in the video. However, as a result, a total of 56 participants in the questionnaire, but only the data of 20 participants could be used as a reference. The right way to do that would be to add more lure questions later so that those participants could be weed out by this way, and still, they provide useful data.

References

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