

The Relationship between Language Comprehension and Age

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Abstract: The purpose of this study is to explore the relationship between language comprehension and age. Through in-depth analysis, we found that individuals' language comprehension shows a decreasing trend as they grow older. This finding is corroborated in several research fragments, showing the significant influence of the age factor on language ability. Although language comprehension occupies an important place in human social stability and interpersonal interactions, it cannot be avoided to be affected by the cognitive decline brought by aging. Therefore, we conclude that language comprehension is indeed affected by age changes and declines gradually with age. This finding has important implications for understanding human cognitive development and addressing the challenges of an aging society.

Keywords: Relationship; Language Comprehension; Age.

1. Introduction

Language comprehension is important for the stability of human society and normal interactions between people. Based on this, the study of the relationship between language comprehension ability and age has become an important field in the study of language cognition. Generally speaking, the cognitive language ability of adults will have a fluctuating change process of rising and then declining along with the growth of age. Young people's language comprehension ability tends to be in the period of rising to the peak from growth, and then along with ageing, the cognitive language ability begins to decline gradually, and older people always have difficulty in understanding the meaning of language, and the decline of language function is also regarded as a distinctive feature of aging.

In order to deeply investigate the relationship between language comprehension ability and age, we invited 45 subjects of all ages, namely 15 young subjects, 15 middle-aged and 15 elderly subjects, and designed and applied a scored questionnaire to investigate and study the ability of three groups of respondents in four parts of the ability, namely, central idea, headline summary, detail judgment and utterance comprehension, in order to assess the different ages of the subjects' language comprehension abilities.

The results of our study pointed out that the mean total scores of the younger group of subjects were higher than those of the middle-aged and older subjects. In terms of central idea, judgment of details and comprehension of utterances, the younger subjects had higher mean scores than the middle-aged and older subjects, and in terms of headline summarization, the middle-aged and older group had the highest mean scores, while the younger subjects were only the second highest. These results reflect that language comprehension does tend to decline with age.

2. Research Questions

- (1) How is language comprehension related to age?
- (2) How do the components of language comprehension relate to age?

3. Literature Review

As an important research topic in the field of language cognition research, researchers have tried to study the phenomenon of decline in language cognitive ability along with age through various methods. (Burke & Shafto 2004) examined the phenomenon of decline in respondents' oral expressive ability along with age. (Grady et al. 2005) utilized a clinical approach to investigate the differences in the activity of various areas of the brain during language comprehension between young and old people, and provided some medical explanations for the decline in language comprehension with age. (Monetta et al., 2007) investigated the phenomenon of decreasing comprehension of implicit and metaphorical meanings in language with age. (Conner et al. 2011) (Hung & Nippold 2014) (이미숙 & 김보선 2018) have successively explored the phenomenon of a rise and then a decline in the ability to utilize idioms and proverbs in adulthood in conjunction with ageing, and they have indicated that this phenomenon is due to the fact that the ability to utilize and understand idioms and proverbs relies on the accumulation of knowledge rather than on simple language comprehension. (Liliana 2012), on the other hand, focused their research on the elderly population to explore the phenomenon of language acquisition and language loss in the elderly and the reasons behind it.

Notably, (Timothy 2012) collates past research on age and cognitive ability and argues that although cognitive decline has been confirmed in numerous experiments to be related to ageing, these cognitive declines are not well reflected in everyday life, with middle-aged and older adults often being more capable of working or living than younger people. Cognitive ability, especially language comprehension, is likely to be the result of a combination of social factors, such as income, status and occupation.

All these studies point to the fact that language-related abilities gradually decline with age, and provide inspiration and ideas for our subsequent studies. At the same time, these studies also require us to try to control the social status and similarity of social identities of the respondents in our studies,

so as to avoid interfering with the final results due to the influence of a variety of other factors.

4. Methodology

In this experiment, 45 respondents of different age groups were invited, and the questionnaire survey was chosen to collect the data, compare the results of the data from different age groups, and use the language of R 4.2.1 to analyze the results of the data with One-way ANOVA to verify whether the differences are significant or not.

5. Data Collection

A set of questionnaires was created to study language comprehension skills. The questionnaires collected information about the age of the respondents, and the main body consisted of 20 questions in groups of 5, which were used to investigate four parts of the ability: "central idea", "headline summarization", "Judgment of Details" and "Comprehension of Statements". The reliability and validity analyses of the questionnaires in this study have been completed in the pre-test, which proved that the questionnaires in this study are reliable and the results are credible.

This experimental questionnaire will be distributed to 45 subjects of all age groups which are 15 young subjects, 15 middle aged subjects and 15 old subjects. The age distribution of the young subjects will be from 20 to 40 years old, the middle-aged and old subjects will be from 41 to 60 years old, and the old subjects will be 60 years old and above.

6. Data Analysis

In this study, we chose a simple quantitative analysis method to obtain the results we needed. We organized the test paper responses of the subjects of different age groups and used the data of the four sections of ability as four dimensions. Subsequently, R 4.2.1 was used to perform One-way ANOVA analysis on the experimentally collected data to verify the significance of the differences between the three age groups and to explore the scores of the subjects in the three age groups as a whole and in each dimension respectively and to compare the differences and trend among them. Box plots for data visualization were chosen to complete the plotting in Excel.

7. Results and Findings

7.1. For the Overall Score:

The total data sample $N = 45 < 50$, thus the Shapiro-Wilk normality test was performed on the collected data and the test result was $P\text{-Value} = 0.0547$, $P > 0.05$, the data results were in line with normal distribution. Subsequently, Bartlett Test was conducted and the test result was $P\text{-Value} = 0.1392$, $P > 0.05$, which verified that the data collected in this experiment had good variance alignment. One-Way ANOVA analysis was then performed, which resulted in $Pr = 1.03e-09$, which is highly significant, indicating that the scores differed significantly between different age groups.

7.2. For Some of the Scores:

"Central Idea", "Headline Summary", "Detailed Judgment", and "Statement Comprehension", the data of four parts The results were all normally distributed, and the Bartlett Test confirmed that the data were well aligned. The One-Way

ANOVA analyses were all significant, indicating that the differences in scores between age groups were equally significant for each group.

8. Discussion

In this study, it is evident in Fig 1 that there is a tendency for the overall scores used to assess language comprehension to decrease with age stage. The overall scores of the younger group of respondents are concentrated around 17, the overall scores of the middle-aged and older group of respondents are concentrated around 14, while the overall scores of the older group of respondents are concentrated around 8. This indicates that language comprehension decreases with age.

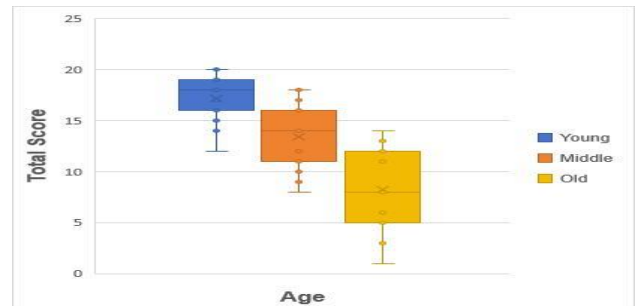


Figure 1. Box plots of overall scores by age group

In Fig. 2, 4 and 5, the trends of the scores of "central idea", "judgment of details" and "comprehension of statements" in different age groups are the same as those of the overall scores of "central idea", "judgment of details" and "comprehension of statements". All of them show the same trend of decreasing scores with increasing age. Only in Fig. 3, the scores on the section of "title selection" showed a trend of increasing and then decreasing with age.

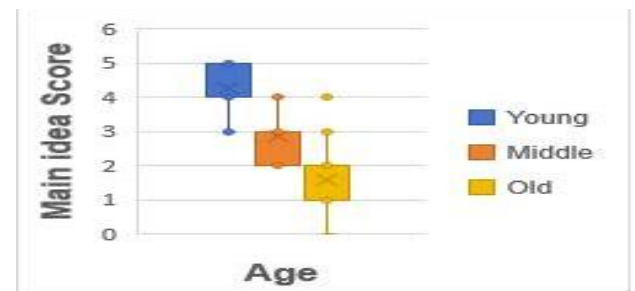


Figure 2. Box plots of "central idea" scores by age group

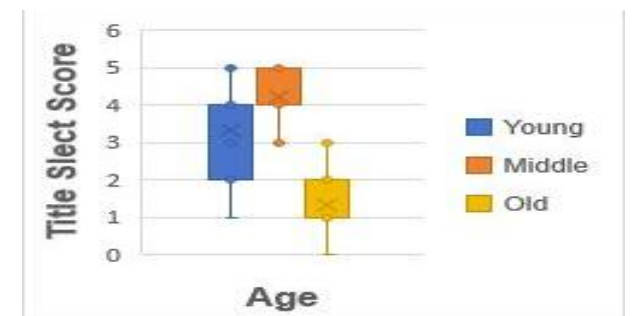


Figure 3. Box plot of "Title Choice" scores by age group

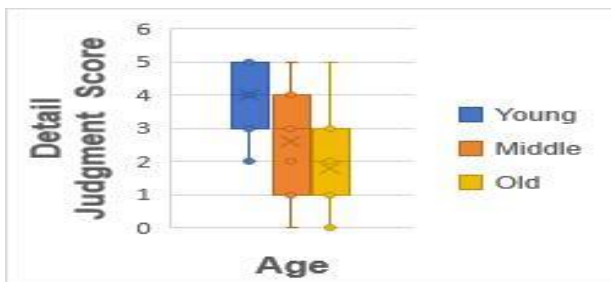


Figure 4. Box plot of "judgment of detail" scores by age group

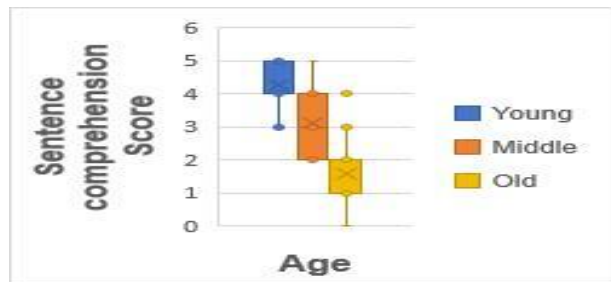


Figure 5. Box plot of "statement comprehension" scores by age group

We believe that the ability to "choose titles" tested in Fig 3 is likely to be similar to the ability to "understand proverbs and sayings" in previous studies, which means that this ability is likely to be the result of a combination of "language comprehension" and "experience". In other words, this ability is likely to be the result of a combination of "language comprehension" and "experience". As we grow older, our "experience" increases, but our "language comprehension" does not decrease as rapidly as our "experience" accumulates, which ultimately leads to a decrease in our "title choice" ability. In the end, the test scores of the "title selection" part show a special situation of first increasing and then decreasing. Nevertheless, this peculiarity does not affect our overall judgment that language comprehension declines with age.

9. Conclusion

Our study basically answered the initial question that language comprehension ability is affected by age change and decreases with age. Among the components of language comprehension, only the ability of "title selection" tends to increase and then decrease with age, while the other abilities change in the same way as the overall language

comprehension.

There are still many shortcomings in this study, and we cannot guarantee that the questions we designed can cover all aspects of "language comprehension". We chose the survey method of questionnaire survey and neglected other parts of "language comprehension ability" except "reading", and it is necessary to conduct further research on "listening" ability in the subsequent study. It is necessary to conduct further research on "listening" ability in subsequent studies. In addition, our questionnaire did not limit and count the time taken by the respondents to complete it, which may result in our data not reflecting the true and accurate picture of "language comprehension skills" among different age groups.

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