

Basic research on the Utilization of Picture Books in Life Science Education

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Abstract: In Japan, science class starts from the third grade of elementary school. On the contrary, the importance of continuous science study from early years is now recognized internationally. In English-speaking countries, the significance of using picture books for science education in early years and primary education is shown, and many concrete programs are proposed (Lynn et. al., 2009). Shoin University (2018) showed the proportion of the early years' educators who are reading in leisure time and those who do not read much is about fifty-fifty. It might be difficult for the latter ones to propose picture books that are linked with scientific experiences of children by themselves. Following these backgrounds, in this presentation, in order to support early years' learning about life science in Japan, (1) the analysis of the view of "life" in the early years' education, (2) the consideration on the view of the selecting picture books which connect to the life science learning of children, were reported.

(1) Method and Results: the view of "life" in the early years' education

Using KH Coder (Higuchi, 2017), it was analyzed that how the term "life" was used in the new national guidelines for care and education at nursery in Japan, which targeting children from 0 years old to pre-primary school. As the result, the term was used as the descriptions of "the life of children" and "the life of familiar animals and plants" (Fig. 1). As for the life of children, the term was used in the context of being kept by childcare, and as for the life of familiar animals and plants, the term was used in the context of cherishing them. The latter matches the context of the course of study for kindergarten. The understandings about the life of their own, familiar animals and plants will construct basic ideas of "living environment studies" in the first and second grade of elementary school.

(2) Method and Results: the view of the selecting picture books for early year's science

For early years science education, RIKADOKU (理科読) programs has been practiced in several educational and/or nursery institutions in Japan. In these programs, to integrate children's understandings, not only scientific experiences but also reading and introducing picture books are conducted. In this research, the book lists which had been created by the librarian in the program-making team was analyzed.

The classification code (C-code) was used for analysis. C-code is known as a kind of book classification code in Japan. It's a 4-digit number set decided by the publishers. The first digit represents the sale target, the second one represents the form of the book, and the third and the fourth ones represent the genre of the book. According to the rules of C-code, the picture books for children are shown as 87** (8: for children, 7: picture books, **: contents number; table 1). To learn about children's body, it was seemed the picture books in C8747 (picture books for children, medicine/dentistry/pharmacology) were appropriate, and to learn about the familiar animals and plants, the books in C8745 (picture books for children, biology) were appropriate.

The result of the analysis about the genre of the picture books using in the RIKADOKU programs for learning about their body ("teeth", "injury" and "motion") is shown in fig.2. It was found that the genre of the books were mainly in No. 8740-47(natural science), secondly in No. 8791-98(literature). It was also became clear that the lists contain the books in No. 8770-79 (art/daily life) and No. 8730-39(social science). The results showed the book lists include not only the books in C8747 or C8745, but also those which weren't classified in natural science categories. The result of the analysis about the genre of the picture books using in the RIKADOKU programs for learning about air is shown in fig.3. The results showed the similar trend.

From the interview for the librarian, her thought was revealed that even if the books are not categorized as the scientific picture books, they may become the learning materials for fostering the scientific thought and enrich sensibility of children. Hence, it was suggested that making science education program with the support of the librarians makes the program more effective for children's learning.

Table 1. the 3rd digits of C-code: the genre of the book

code	classification	code	classification	code	classification
0*	general(not 1-9)	4*	natural science	7*	art · daily life
1*	philosophy · religion · psychology	5*	engineering · technology	8*	linguistics
2*	history · geography	6*	industry	9*	literature
3*	social science				

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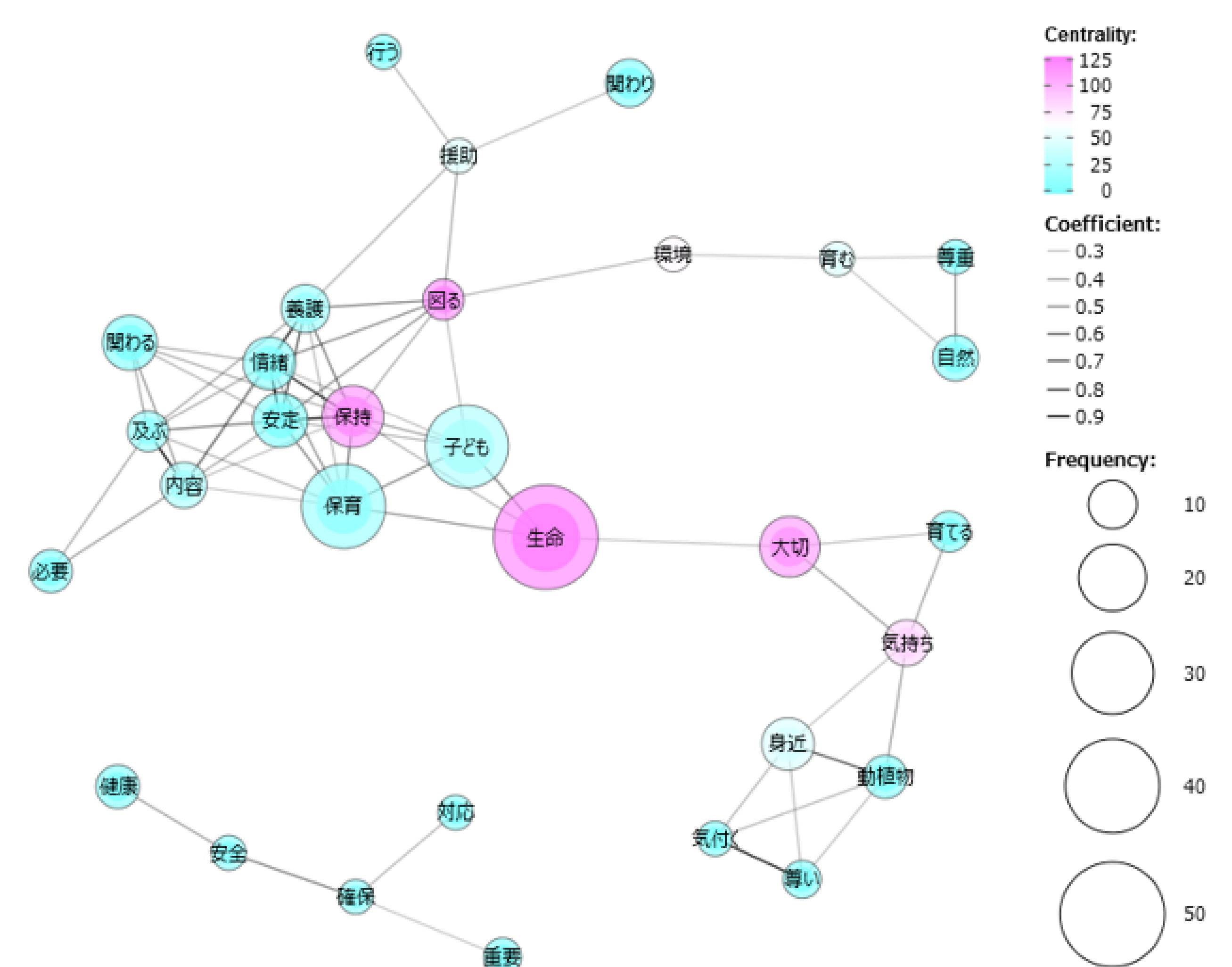


Figure 1. Analysis of "life" in "Nursery Child Care Guidelines Commentary" of Japan using KH Coder (Appearance: 5 or more)

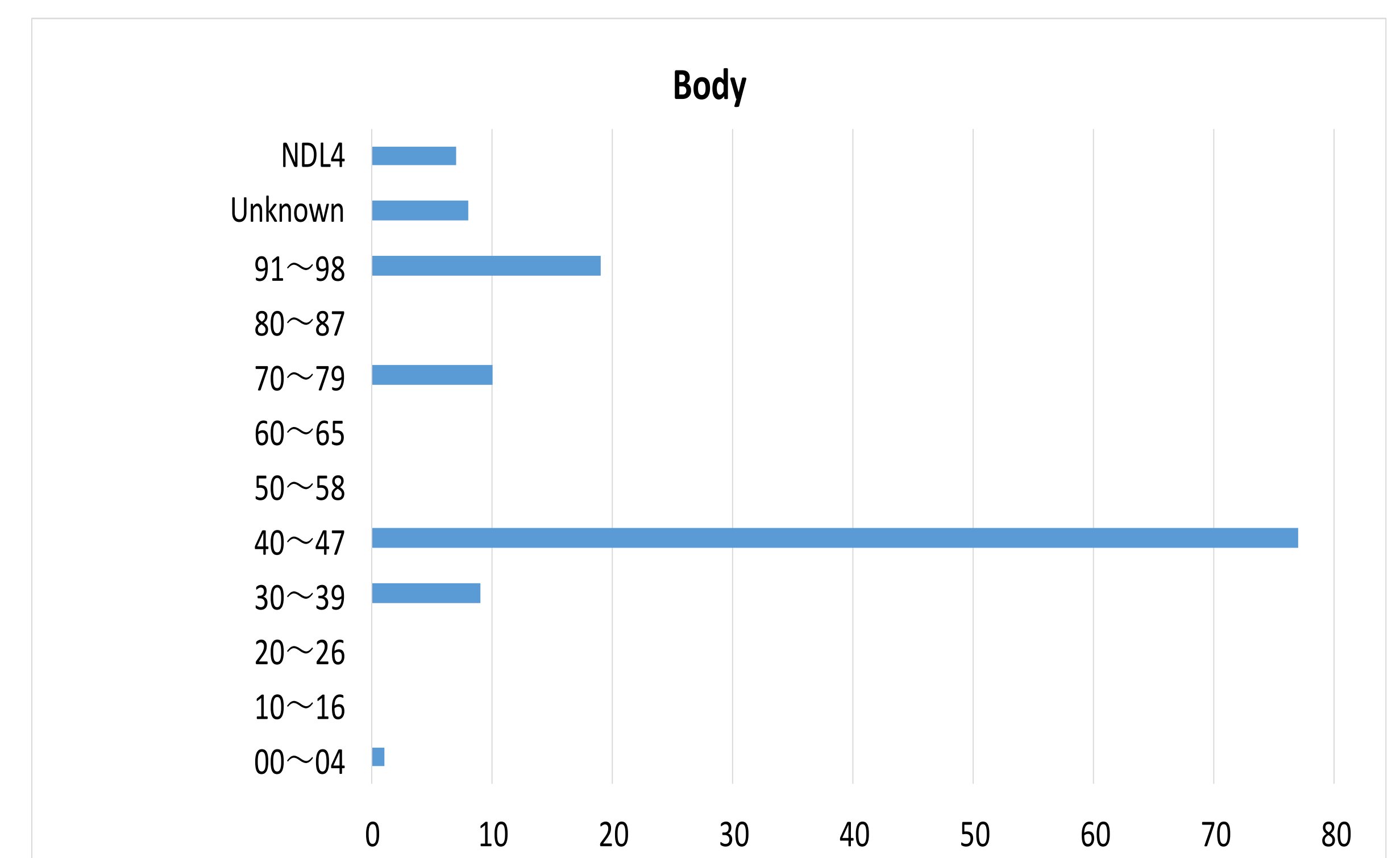


Figure 2. Analysis of the classification of the picture books on the book lists of the RIKADOKU program for the learning their body (showing the 3rd and 4th digits of C-code).

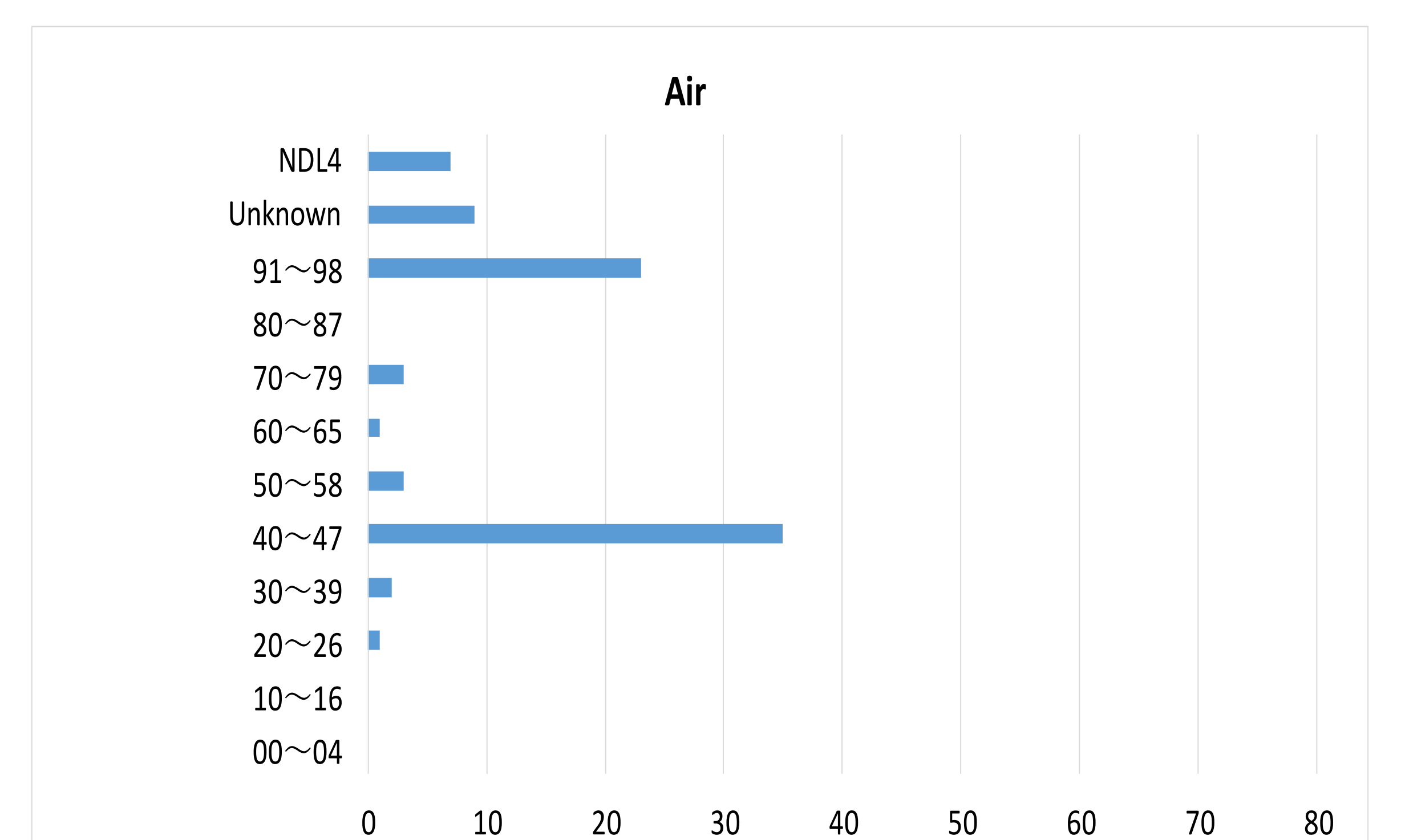


Figure 3. Analysis of the classification of the picture books on the book lists of the RIKADOKU program for the learning about air. (showing the 3rd and 4th digits of C-code).