Adapting the process of public symbol creation and comprehensibility testing to people with intellectual disabilities according to ISO 22727: 2007 and ISO 9186-1:2014

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The aim of this research was to examine whether symbols created according to the international standard for the creation and design of public symbols (ISO 22727: 2007) are accessible and comprehensible for people with intellectual disabilities as compared to people without intellectual disabilities. The examination of comprehensibility was conducted according to the international standard for testing the comprehensibility of public symbols (ISO 9186-1: 2014), which was made accessible and linguistically simplified for people with intellectual disabilities.

The research instrument used to test the accessibility of the symbols in this study (ISO 9186: Graphical Symbols — Test Methods) is used to test the accessibility of the symbols created by the international standard for the creation and design of public symbols (ISO 22272: 2007). ISO 9186 is divided into three different tests. According to the standard's guidance, it is possible to use all the tests or only some of them. This research used only the first test, the ISO 9186-1 "Method for Testing Comprehensibility" from 2014 (see Appendix 10). This is a test that examines the extent to which the graphical symbol of an idea or object is easily comprehended by observers.

In this research, 15 symbols were constructed according to ISO 9186-1: 2014 and the research instrument for testing comprehensibility was simplified and made accessible for participants with intellectual disabilities.

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The research population comprised two groups: a group without intellectual disabilities (N=60) and a group with intellectual disabilities (N=60). The size of the research population was derived from ISO 9186-1: 2014, which stipulates that the comprehensibility test must be taken by a group of at least 50 participants, with a maximum of 15 symbols being shown.

The main research findings show that among people with intellectual disabilities, only 2 of 15 symbols reached a level of comprehensibility as defined by ISO 9186-1: 2014 (i.e., the symbol is comprehended by at least 66% of the participants): "playground" and "cultural hall". On the other hand, among people without intellectual disabilities, 13 of 15 symbols reached the level of comprehensibility defined by ISO 9186-1: 2014.

Among both populations, the least understood symbol was "meeting point" and this by a significant margin over the other symbols. For each of the 15 symbols, the number of respondents who understood the symbols was significantly higher among the respondents without intellectual disabilities compared to the respondents with intellectual disabilities. Nonetheless, for three symbols the gap between the two groups was relatively small, with two symbols reaching a valid level of comprehensibility among participants with intellectual disabilities according to ISO 9186-1: 2014 ("playground" and "cultural hall"), and a third ("meeting point") reaching the lowest level of comprehensibility of all the symbols among both populations.

For most symbols, the two groups did not tend to grant opposite meanings. Another finding was that the group with intellectual disabilities tended to reply "don't know" more than the respondents in the group without intellectual disabilities. Analysis of the relationship between the level of intellectual disability and comprehension of symbols among the group with intellectual disabilities showed that 6 of the 15 symbols were comprehended better by respondents with light intellectual disability compared to those with moderate intellectual disability. Examination of the comprehensibility of symbols among respondents with light intellectual disability showed that in this sub-group, two symbols reached the standard-acceptable level of comprehensibility: "No drinking allowed" (66% comprehended) and "Conservatory" (67% comprehended).

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This in addition to the two symbols that were comprehended by all the participants with intellectual disabilities: playground" and "cultural hall".

The findings also showed that 4 of the 15 symbols were better comprehended by participants with intellectual disabilities who are employed in a supported, free-market employment context compared to respondents who work in a rehabilitation work factory (MAAS). Examination of the relationship between reading ability and symbol comprehension among the respondents with intellectual disabilities who can read did not show a higher level of comprehensibility of the symbol "activity hours", which was the only symbol that was accompanied by supporting text (although, obviously, one symbol is an initial indication only and requires further investigation).

The findings show that symbols that were comprehended by the general population were not necessarily comprehended by people with intellectual disabilities, leading to the conclusion that the international standard for creating public symbols (ISO 22727: 2007) and the international standard for testing the comprehensibility of public symbols (ISO 1986-1,2014) must be re-thought and adapted so that people with intellectual disabilities can realize their right to accessible information in public spaces to the largest extent possible.

The main recommendations emerging from this study are (1) that the symbol creator include people with intellectual disabilities in the design stage, when brainstorming and raising associations; (2) to re-examine the optimal way of graphically representing a prohibition; (3) to expand the guidelines for testing comprehensibility among people with disabilities to include people with intellectual disabilities; (4) to create a glossary when testing for comprehensibility; (5) to present the symbol in a tangible context; (6) to have the responses rated by judges that are familiar with the characteristics of people with intellectual disabilities

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