Constraint diagrams can be used to interpret program specification expressions: an evaluation experiment with novice users

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Constraint diagrams (CDs) are a graphical notation used for program specification. For the purposes of formal software specification using a visual method, Kent designed constraint diagrams as an intuitive approach to formally specify programs. This paper presents an experiment that evaluates the interpretation of constraint diagrams compared with natural language (NL) for understanding program specification statements. In a web-based training competition, participants were randomly divided into two groups and were given 8 training examples either on the CD notation or equivalent NL expression. Each example is followed by 3 questions about the specification statements. In total there were 24 questions presented in each notation. It was predicted that the CD participants would find that learning concepts and answering questions would be harder than those in the NL group, because they had no prior experience of the CD notation. Surprisingly despite the fact that CD notation was new for participants, the CD group spent less time answering the questions and achieved the same proportion of correct answers as the NL group. However, as predicted, they were less confident in their answers and they spent more time on the training examples to learn the new concepts.