ABSTRACT

The interpretation of brackets in algebraic expressions depends on a learner's understanding of the role that brackets play in different types of structures. Working from a Vygotskian perspective, this study investigated how learners interpret brackets as a tool and a sign, by investigating and analysing the surface and systemic structural errors in typical/atypical and simple/complex structures. Fifty-eight Grade 10 learners from under-resourced schools in Johannesburg wrote a test designed for Grade 9 learners. This study focused on their responses to five test items. While it was expected that Grade 10 learners would demonstrate competency and structure sense in dealing with Grade 9-level expressions, the error analysis revealed that this was not the case. Findings suggest that: 1) more brackets in typical expressions encourage surface structure sense; 2) better surface structure sense is displayed in atypical expressions with brackets that include fewer elements; 3) surface structure sense is displayed on typical and atypical structures if brackets indicate multiplication, rather than subtraction; 4) systemic structure sense is evident on simple structures when brackets signify one operation, such as multiplication or subtraction; 5) systemic structure sense appears to be affected by the positioning of elements in simple structures; and 6) systemic structure sense is less evident in complex structures which involve more than one operation of multiplication. The study concludes that the participating Grade 10 learners are not yet able to cope with algebraic structures at Grade 9 level.