

## Errata to “Axiomatizability of positive algebras of binary relations”, AU 66:7–34

HAJNAL ANDRÉKA AND SZABOLCS MIKULÁS

The varieties  $V(\Lambda)$  generated by the representable algebras of binary relations of the similarity types  $\Lambda = \{., ;, 1'\}$  and  $\Lambda = \{+, ., ;, 1'\}$  were stated to be finitely axiomatizable in [AM11] (Theorem 4.3 and Theorem 4.1(1), respectively), but their proofs relied on false lemmas. Finite axiomatizability of these varieties remain open.

In more detail, the third case of Definition 4.6 is ambiguous, and Lemmas 4.7 and 4.8 are not true. These lemmas are used in the proof of Theorem 4.3. As a consequence, the proof of Theorem 4.3 breaks down for the equation  $1' \cdot x; y \leq x; (1' \cdot y; x); y$ . This equation is easily seen to be valid, but so far we did not manage to derive it from the axioms  $Ax(\cdot, ;, 1')$  of Theorem 4.3. In fact, we conjecture that this equation does not follow from the axioms presented in [AM11]. Theorem 4.3 is used in the proof of Theorem 4.1(1).

Since we could not find other proofs for Theorem 4.3 and Theorem 4.1(1), we state them below as open problems.

**Problem 1.** Are the varieties generated by the representable algebras of binary relations of the similarity types  $\{., ;, 1'\}$  and  $\{+, ., ;, 1'\}$  finitely axiomatizable?

### REFERENCES

- [AM11] H. Andréka and Sz. Mikulás, “Axiomatizability of positive algebras of binary relations”, *Algebra Universalis*, 66:7–34, 2011.

HAJNAL ANDRÉKA

Alfréd Rényi Institute of Mathematics, Hungarian Academy of Sciences, 13–15  
Reáltanoda u., 1053 Budapest, Hungary  
*e-mail*: andreka@renyi.hu  
*URL*: <http://www.renyi.hu/~andreka/>

SZABOLCS MIKULÁS

Department of Computer Science and Information Systems, Birkbeck, University of  
London, Malet Street, London WC1E 7HX, UK  
*e-mail*: szabolcs@dcs.bbk.ac.uk  
*URL*: <http://www.dcs.bbk.ac.uk/~szabolcs/>

---

2010 *Mathematics Subject Classification*: Primary: 03G15; Secondary: 06F05.

*Key words and phrases*: representable relation algebras, finite axiomatizability, ordered semigroups.

Andréka’s research was supported by OTKA grant No. 81188.