Smallest defining sets for 2-(9,4,3) and 3-(10,5,3) designs: Corrigendum

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In [1], sizes and numbers of smallest defining sets for each of the eleven non-isomorphic 2–(9,4,3) designs and the seven non-isomorphic 3–(10,5,3) designs were given.

The size of the smallest defining sets for the 3–(10,5,3) design N_1 was given as six blocks. Ramsay [2] has, however, found a defining set of five blocks for this design. There are, as stated in Section 6 of [1], 99 feasible sets of five blocks for N_1. Of these 99 sets, 95 are isomorphic to 5-sets of blocks in the design N_5. Four of the remaining five feasible sets are isomorphic to 5-sets of blocks in the design N_2. This leaves one set of five blocks, which does not have an isomorph in any of the other 3–(10,5,3) designs; this set is consequently a defining set for N_1 and is isomorphic to that found by Ramsay. Thus Theorem 2 should be amended to the following statement.

Theorem 2 *The* 3-$(10,5,3)$ *designs* N_2, N_3, N_4 *and* N_7 *have smallest defining sets of eight blocks each; the designs* N_5 *and* N_6 *have smallest defining sets of six blocks, while the remaining* 3-$(10,5,3)$ *design* N_1 *has smallest defining sets of five blocks.*

A representative of the isomorphism class of smallest defining sets of five blocks for N_1 is the set of blocks $\{\mathbf{1}, \mathbf{2}, \mathbf{6}, \mathbf{15}, \mathbf{34}\}$. The set has trivial automorphism group and there are 720 sets of blocks in the isomorphism class, and consequently exactly 720 smallest defining sets for N_1.

Ramsay has also pointed out that the remark at the end of Section 6 (that a case has been found of the strict inequality of Corollary 9.1 holding) is therefore not correct.

The incorrect results were due to human error in compiling the isomorphism classes of 5-sets of blocks in the design N_7.

The total numbers of smallest defining sets of the 3-(10,5,3) designs N_4 and N_7 given in Table 19 in [1] are also incorrect. There are actually 824 304 smallest defining sets of N_4 and 819 612 of N_7. The incorrect figures were due to arithmetic error.

Finally, in Section 6 of [1], the phrases 'Type I' and 'Type II' should be interchanged.

References

[1] Tony Moran, *Smallest defining sets for* 2-(9,4,3) *and* 3-(10,5,3) *designs,* Australasian Journal of Combinatorics **10** (1994), 265-288.

[2] C.Ramsay, *An algorithm for enumerating the trades in designs, with an application to defining sets,* Journal of Combinatorial Mathematics and Combinatorial Computing, to appear.

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