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ERRATUM: EQUIVALENCE OF COMPOSITIONAL EXPRESSIONS AND INDEPENDENCE RELATIONS IN COMPOSITIONAL MODELS

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In the Closing Note of the article [1] (see page 352), the number of *simple* compositional expressions was calculated incorrectly. Recall that a compositional expression is simple if it contains exactly one subexpression of the form "$X \triangleright Y$". The correct number s_n^* of simple compositional expressions with n sets, $n \geq 2$, is

$$s_n^* = \begin{cases} 2 & \text{if } n = 2 \\ 2 \cdot (n-2) \cdot n! & \text{otherwise} \end{cases} \tag{1}$$

which for $n > 3$ is larger than that reported in [1]. The error has no effect on the rest of the article, except that the table reported at page 353 of the article should be

n	s_n	s_n^*	e_n
2	2	2	2
3	6	12	12
4	24	96	120
5	120	720	1680

In order to prove (1), consider first the simple compositional expressions with a given base sequence, say $(X_1, \ldots, X_n)$. Such a simple compositional expression contains exactly one subexpression of the form "$X_i \triangleright X_{i+1}$" for some i, $1 \leq i \leq n-1$.

If $n = 2$ then trivially we have only one simple compositional expression, namely $X_1 \triangleright X_2$.

If $n = 3$ then we have only two simple compositional expression, namely $(X_1 \triangleright X_2) \triangleright X_3$ and $X_1 \triangleright (X_2 \triangleright X_3)$.

Assume that $n \geq 4$ and let us distinguish the following three cases.

Case 1: $i = 1$. We have only the following simple compositional expression

$$(\ldots(X_1 \triangleright X_2) \triangleright \ldots) \triangleright X_n\,.$$

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Case 2: $i = n - 1$. We have only the following simple compositional expression

$$X_1 \rhd (X_2 \ldots \rhd (X_{n-1} \rhd X_n) \ldots) .$$

Case 3: $2 \le i \le n-2$. We have only the following two simple compositional expressions

$$(\ldots((X_1 \rhd (\ldots \rhd (X_i \rhd X_{i+1}) \ldots)) \rhd X_{i+2}) \rhd \ldots X_{n-1}) \rhd X_n$$

$$X_1 \rhd (\ldots \rhd ((\ldots((X_i \rhd X_{i+1}) \rhd X_{i+2}) \rhd \ldots X_{n-1}) \rhd X_n) \ldots) .$$

Therefore, for $n \ge 3$ the number of simple compositional expressions with the same base sequence is $2 + 2 \cdot (n-3) = 2 \cdot (n-2)$. Finally, since the number of possible base sequences is $n!$, we get (1).

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REFERENCES

[1] F. M. Malvestuto: Equivalence of compositional expressions and independence relations in compositional models. Kybernetika *50* (2014), 322–362. DOI:10.14736/kyb-2014-3-0322

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