Erratum: Simple and tight monogamy relations for a class of Bell inequalities [Phys. Rev. A **95**, 012113 (2017)]

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The correlations defined in Eq. (13) and in the following text do not saturate the Bell inequality (9) in all scenarios (N, m, d) . The correct ones that do saturate (9) are bilocal correlations given by

$$p_{A_1 \dots A_N}^{\text{bi}}(\mathbf{a}|\mathbf{x}) = p_{A_1 \dots A_{N-1}}(a_1, \dots, a_{N-1}|x_1, \dots, x_{N-1})p_{A_N}(a_N|x_N), \quad (1)$$

where $p_{A_N}(a_N|x_N)$ is a single-party probability distribution defined as $p_{A_N}(0|x_N) = 1$ for any x_N whereas to introduce $p_{A_1 \dots A_{N-1}}$ we need to consider the case of even and odd N 's. For even N we have

$$p_{A_1 \dots A_{N-1}}(\mathbf{a}|\alpha_1 + 1, \alpha_1 + \alpha_2 - 1, \dots, \alpha_{N-2} + \alpha_{N-1} - 1) = \begin{cases} \frac{1}{d^{N-2}}, & \sum_{i=1}^{N-1} (-1)^{i-1} a_i = \tilde{f}_e(\boldsymbol{\alpha}), \\ 0, & \text{otherwise,} \end{cases} \quad (2)$$

whereas for odd N ,

$$p_{A_1 \dots A_{N-1}}(\mathbf{a}|\alpha_1, \alpha_1 + \alpha_2 - 1, \dots, \alpha_{N-2} + \alpha_{N-1} - 1) = \begin{cases} \frac{1}{d^{N-2}}, & \sum_{i=1}^{N-1} (-1)^{i-1} a_i = \tilde{f}_o(\boldsymbol{\alpha}), \\ 0, & \text{otherwise,} \end{cases} \quad (3)$$

where $\alpha_i = 1, \dots, M$ for $i = 1, \dots, N - 2$ and $\alpha_{N-1} = 1, \dots, M - 1$. The factors $\tilde{f}_o(\boldsymbol{\alpha})$ and $\tilde{f}_e(\boldsymbol{\alpha})$ are defined as

$$\tilde{f}_o(\boldsymbol{\alpha}) = \sum_{i=1}^{N-2} (-1)^{i+1} H(\alpha_i + \alpha_{i+1} - M - 1), \quad (4)$$

and $\tilde{f}_e(\boldsymbol{\alpha}) = \tilde{f}_o(\boldsymbol{\alpha}) - H(\alpha_1 + 1 - M)$, where $H(x)$ is the step Heaviside function, that is, $H(x) = 1$ for $x > 0$ and $H(x) = 0$ for $x \leq 0$.

For the remaining choices of measurements that are not included in Eqs. (2) and (3), for both odd and even N 's, we simply assume that $p_{A_1 \dots A_{N-1}}(a_1, \dots, a_{N-1}|x_1, \dots, x_{N-1}) = 1/d^{N-1}$. Also, we remember that, whenever in Eqs. (2) or (3), $\alpha_i + 1$ or $\alpha_i + \alpha_{i+1} - 1$ for some i exceeds M , one needs to subtract M from it.

It is not difficult to see that the probability distribution $p_{A_1 \dots A_{N-1}}$ for both odd and even N 's is nonsignaling as by tracing one of the parties one obtains a fully random $(N - 2)$ -partite probability distribution $1/d^{N-2}$. Moreover, to see that $p_{A_1 \dots A_N}^{\text{bi}}(\mathbf{a}|\mathbf{x})$ saturates inequality (9) of the original article one uses the identities (39) and (47) proved therein.

Then, the correlations $p_{A_1 \dots A_N}^{\text{loc}}(a_1, \dots, a_N|x_1, \dots, x_N)$ appearing in Eq. (51) need to be replaced by $p_{A_1 \dots A_N}^{\text{bi}}(a_1, \dots, a_N|x_1, \dots, x_N)$ defined in Eq. (1), whereas $p_{A_{N+1}}(a_{N+1}|x_{N+1})$ introduced in the text after Eq. (51) should be defined as $p_{A_{N+1}}(0|x_{N+1}) = 1$ for all choices of x_{N+1} .

Finally, the conditions in Eqs. (10) and (12) of the original paper should read

$$\sum_{i=0}^{N-1} (-1)^i a_{i+1} = f(\boldsymbol{\alpha}), \quad (5)$$

where f is given by Eq. (11).

These amendments do not affect our main results; our monogamy relations still hold true and they are tight.