Erratum

Lower Bounds for Some Factorable Matrices

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The purpose of this erratum is to correct both the mathematical and typographical errors made in 2006.

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The typos are as follows.

(i) Page 2, line 17, $t_0$ should read $t^p_0$.
(ii) Page 3, line 5, $j = r + 2$ should read $j = r + 1$.
(iii) Page 3, line 15, $\Delta yr^p$ should read $\Delta y^p_r$.
(iv) Page 3, line 16 should read

\[
g(r) - g(r + 1) = (r + 2) a^p_{r+1} \Delta y^p_r + (r + 2) \Delta y^p_r \sum_{j=r+2}^\infty a^p_j.
\]

(v) Page 4, line 7, $q < t < 1$ should read $r > 0$.
(vi) Page 4, line 11, $v(r)$ should read $u(r)$.
(vii) Page 6, line 17, $(t^{r+1}/(r + 2))^p$ should read $(t^{r+1}/(r + 2))^p \times$.
(viii) Page 6, line 18, $=$ should read $\times$.
(ix) Page 7, line 6, $-1 \rho$ should read $-1]$. 
(x) Page 7, line 21, $(n + 1)^{s-1}$ should read $(n + 1)^{1-s}$.
(xi) Page 8, line 7, $q(p - 1)$ should read $p(p - 1)$.
(xii) Page 8, line 14, $(r + 1)^{s-1} - (r + 2)^{s-1}$ should read $(r + 1)^{p-1} - (r + 2)^{p-1}$.
(xiii) Page 8, line 16, $(j + 1)^{(p-1)s}$ should read $(j + 1)^{(s-1)p}$.
(xiv) Page 10, line 12, $\geq P_r(r + 1)$ should read $\geq 1/(r + 1)$.
(xv) Page 10, line 14, $(r + 1)^{P_r^p}$ should read $(r + 1)$. 
The mathematical errors occur showing that \( \lim_r h(r) = 0 \) in Theorems 6 and 7.

In Theorem 6, from the formula on line 2 of page 4,

\[
\lim_r h(r) = \lim_r \frac{\Delta^p_{r+1} \Delta y_r^p}{\Delta^2 y_r^p} \\
= \lim_r \frac{[r+1]_p - [r+2]_p}{(r+2)_p^s[(r+1)_p^s - 2(r+2)_p^s + (r+3)_p^s]} \\
= \lim_r \frac{(1/(r+2)_p^s)[1 - ((r+2)/(r+1))_p^s]}{(1 - 2((r+2)/(r+1))^p_2 + ((r+3)/(r+2))^p_2) \\
= ((-s/(r+2)^{s+1})[1 - ((r+2)/(r+1))_p^s] \\
- ((-p/(r+2)^{s+1})((r+2)/(r+1))_p^{s-1} (-1/(r+1)^2)) \\
/(-2p((r+2)/(r+1))_p^{s-1} (-1/(r+1)^2) \\
+ p((r+3)/(r+1))_p^{s-1} (-2/(r+1)^2)) \\
= \lim_r ((-s(r+1)^2/2p(r+2)^{s+1})[1 - ((r+2)/(r+1))_p^s] \\
+ (1/(r+2)^s)((r+2)/(r+1))_p^{s-1}) \\
/((((r+2)/(r+1))_p^{s-1} - ((r+3)/(r+1))_p^{s-1} \\
= \lim_r \frac{(-s(r+1)/2p(r+2)^{s+1})[(r+1)_p^s - (r+2)_p^s] + ((r+2)_p^{s-1}/(r+2)_p^s)}{(r+2)_p^{s-1} - (r+3)_p^{s-1}) \\
= \lim_r \frac{(-s(r+1)/2p(r+2)^{s+1})[(r+1)/(r+2)_p^s - 1] + 1/(r+2)_p^s}{1 - ((r+3)/(r+2)_p^s)^{s-1}} \\
= \lim_r ((-s(r+2)^2/2p)((r+2 - s(r+1))/(r+2)^{s+1})((r+1)/(r+2))_p^{s-1}) \\
- ((s/2p(r+2)^{s-1})((r+1)/(r+2))_p^s - (s/(r+2)^{s-1}) \\
/((p-1)((r+3)/(r+2))_p^{s-2} = \lim_r A, \\

\tag{1.2}
\]

where

\[
A = \frac{-s(r+2 - s(r+1))}{2p(p-1)(r+2)^{s-1}} \left( \left( \frac{r+1}{r+2} \right)_p^s - 1 \right). \\
\tag{1.3}
\]
If $s \geq 2$, then, clearly $\lim rA = 0$. Suppose that $1 < s < 2$,

\[
\lim rA = \lim_r \frac{-s/2p(p-1)\left[\left((r+1)/(r+2)\right)^p - 1\right]}{(r+2)^{s-1}/(r+2-s(r+1))} = 0.
\]

(1.4)

Thus $g$ is monotone decreasing in $r$. The balance of the proof of [1, Theorem 6] is correct, and $L^p = f(\infty)$.

In Theorem 7,

\[
h(r) = \frac{[(r+1)^p - (r+2)^p]}{(r+1)^p[(r+1)^p - 2(r+2)^p + (r+3)^p]},
\]

which is the same $h$ as in Theorem 6, with $s$ replaced by $p$. Therefore, $\lim_r h(r) = 0$. In the proof of Theorem 7, $g(0) \leq 0$, so $L^p = f(0)$.

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