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Correction of the Proof of Theorem 1 in D. P. S. No.913

by

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Correction of the proof of Theorem 1 in D. P. S. No. 913.

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Abstract.

The author corrects the proof of Theorem 1 in Section 2 of D. P. S. No. 913.

Correction.

Proof.) Let $y_1=\theta_0-r$ and $y_2=\theta_0+r$. Since $d\psi(\theta)/d\theta=g_Y(y_2|\theta)-g_Y(y_1|\theta)$, we have that

$$(1)\qquad [d^2\psi(\theta)/d\theta^2]_{\theta=\theta_0} =[dg_Y(y_2|\theta)/d\theta]_{\theta=\theta_0} -[dg_Y(y_1|\theta)/d\theta]_{\theta=\theta_0}.$$

On the other hand, by (4) in D.P.S. No. 856 we have that

$$(2)\qquad dg_Y(y|\theta)/d\theta= kmf(y|\theta)(dF(y)/d\theta)(F(y))^{m-1}(1-F(y))^{m-1}(1-2F(y))$$

$$+ k(F(y))^m(1-F(y))^m(df(y|\theta)/d\theta).$$

Since $[F(y_1)]_{\theta=\theta_0}=[1-F(y_2)]_{\theta=\theta_0}=\beta(\alpha/2)$ and $dF(y)/d\theta=-f(y|\theta)$ and since $[df(y_2|\theta)/d\theta]_{\theta=\theta_0}=-[df(y_1|\theta)/d\theta]_{\theta=\theta_0}=\frac{2r\pi}{S}(f(y_2|\theta_0))^2$, and $f(y_1|\theta_0)=f(y_2|\theta_0)$, putting these together leads to

$$[dg_Y(y_2|\theta)/d\theta]_{\theta=\theta_0}=k(f(y_2|\theta_0))^2(1-\beta(\alpha/2))^{m-1}(\beta(\alpha/2))^{m-1}\{m(1-2\beta(\alpha/2)) +$$

$$\frac{2r\pi}{S}\beta(\alpha/2)(1-\beta(\alpha/2))\} \quad (>0)$$

and $[dg_Y(y_1|\theta)/d\theta]_{\theta=\theta_0}=-[dg_Y(y_2|\theta)/d\theta]_{\theta=\theta_0}$. By (1) $[d^2\psi(\theta)/d\theta^2]_{\theta=\theta_0}>0$.

(q. e. d.)