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Trend free designs under two source of heterogeneity useful for Animal Experiments

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ABSTRACT

In any scientific experiments, heterogeneitymay present either in one direction or may be more than one directions. Designs under two source of heterogeneity is mainly used for such situations where there are evidences of two-source of heterogeneity. In this article, we have discussed some aspects of designs under two-source of heterogeneity along with examples of trend free designs for such situations.

Keywords : Heterogeneity, Trend, Designs.

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¹d§nh; lerh ekfRl;dh vun¡/kku laLFkku]dkph& 682018

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vU; ½2014a½ Hkkf§ed ,oavU; ½2014b½ Hkkf§ed ,oavU;
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iofr dh mifLFkfr eafo"kekr ds nksL=krka ds vrxr
vfHkdYiukvka dsfy, Ipuk vk0;g Hkh irr fd;k g§A
bl y§[k esfofo/krk dsnksL=kadsvrxr 0;ofLFkr iofr
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fd ,d Ik'kqdsnwk mRiknu dh ixfr nwk Lruiku dh
vof/k eade gkrh tk;xhA bIfy;si iz;kxka Iscgrj
ifj'kdk½rk iklr djusdsfy, 0;ofLFkr iHkkko dks
ekMy ea'kkfeey djuk pkfg;sA mijkDr iz;kxkRed IS/vi
dsvk/kkj ij r; iHkkko fuEufyf[kr eSVDI &ukV/ku es
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$$Y = \mu 1 + \Delta' \tau + D_1' \rho + D_2' \chi + Z\theta + e$$

tgkaij YvkdMkadk oDVj g§Sogk§Wu,d Ikeku; ek/
; g§ 1 ,d oDVj dh ,drk g§A Δ' ,d mipkj cuke
vkdMkadh eSVDI g§ τ ,d mipkj iHkkko ¼t§ pkjk½dk
oDVj g§ $D'1$fofo/krk dh ,d L=krcuke vkdMkadh
eSVDI g§tksfd uLy g§A ρuLy iHkkko dk oDVj g§ $D'2$
fofo/krk dsnw jsL=kr cuke vkdMkadh eSVDI g§tksfd
mez g§A χ meziHkkko dk oDVj g§A

$$Z = 1_p \otimes F$$ tgka xqkad dkeSVDI g§vk§j F,d eSVDI g§
ftl dk dk\\ye vkFkkxxuy iksyhukfe;y dk ifrfuf/kRo
djrsg§A ;gka e={V dk oDVj g§ ftl dk ek?; vk§j
fHkUurk $\sigma 2$ g§A

    mijkDr ekMy dsvk/kkj ij tc IHkh dkjdkadk
Lrj cjkcj gkrk g§rksmipkj dsiHkko I IEcfU/kr vkdyu
dh tkudkjh dsfy; sfuEufyf[kr eSVDI iklr fd;k tk
Idrk g§%

$$C = v\left(I - \frac{11'}{v}\right) - \frac{1}{v}\Delta Z Z' \Delta'$$

    ## fMtkbu dsfy, çofr eDr fLFkfr
    tc ,d mfpr ekMy fofunZ"k dsfy;sekMy es
0;ofLFkr iHkkko ?kVd 'kkfeey gkrk g§ ,1h fLFkfr Is
fuiVusdsfy, ,d iHkkoh rjhdk tks0;ofLFkr iHkkko ds
iHkko dsfy;sifrjksftkd gkrk g§ vfHkdYiuk dsvuqcy g§
tgkaij iofr iHkko fujLr dj fn;k tkrk g§A iofr eDr
fMtkbu dsfy;} mipkj ½pkjk½iHkko vk§j iofr iHkko ,d

nwl jsdlsvkjiFkkxkuy gkrsgSvkj rc fMtkbu dk fo'y'k.k
lkekU; rjhdls lsfd;k tk ldrk gSA vxj dkbl iofr
ilkko ughagksrk rks lkf[;dh; #i ls dgk tk ldrk gSfd
fMtkbu iofr eDr gSA

iofr ?kVd dslkFk mijkDr dsrgr mipkj ds
ilkko ls vxj mipkj ;ksx dsoxZ dks lek;ksftr fd;k
tk;svkj ;fn iofr ?kVd dsfcuk vfirql kekU; dsrgr
lek;ksftr fd;k tk;srksnksuka ,d tSl gksrsgSA blfy;s
iofr eDr vfHkdYiuk dsfy;svko';d vkj lk;kkr 'krZ
$\Delta \mathbf{Z} = \mathbf{0} = \mathbf{0}$ gksrh gSA vr%iofr eDr fMtkbu dsfy;s
tc lHkh dkjd dsLrj leku gksa tSls¼&½ rc mipkj ds
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$$\mathbf{C} = \mathrm{v}\left(\mathbf{I} - \frac{\mathbf{11'}}{\mathrm{v}}\right)$$

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mipkjkadh l{;k v(d" 10) dsfy;, fofo/krk ds
nksL=ksrka dsvarxZr iofr eDr vfHkdYiuk,¡fuEu gS%
;gka ij LrHk ukEa&ukeyksbTM jsf[kd iofr ?kVd dks]
ifDr fofo/krk de L=ksr dks]ifDr&LrHk dsdYku fcnq
dsv{kj fofo/krk dsnwl jsL=kr dks,oafofHkUu vad fofHkUu
mipkjkadksinf'kr djrsgSA

Design_1 (for v = 3)			
	-1	**0**	**1**
1	A 1	B 2	C 3
2	C 2	A 3	B 1
3	B 3	C 1	A 2

Design_2 (for v=5)					
	-2	**-1**	**0**	**1**	**2**
1	A 1	B 2	C 3	D 4	E 5
2	C 2	D 3	E 4	A 5	B 1
3	E 3	A 4	B 5	C 1	D 2
4	B 4	C 5	D 1	E 2	A 3
5	D 5	E 1	A 2	B 3	C 4

Design_3 (for v=7)							
	-3	**-2**	**-1**	**0**	**1**	**2**	**3**
1	A 1	B 2	C 3	D 4	E 5	F 6	G 7
2	C 2	D 3	E 4	F 5	G 6	A 7	B 1
3	E 3	F 4	G 5	A 6	B 7	C 1	D 2
4	G 4	A 5	B 6	C 7	D 1	E 2	F 3
5	B 5	C 6	D 7	E 1	F 2	G 3	A 4
6	D 6	E 7	F 1	G 2	A 3	B 4	C 5
7	F 7	G 1	A 2	B 3	C 4	D 5	E 6

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