'$7(
1$0(2¶1HLO 0DUJDUHW (
'HSDUWP3HQWLFDO 7KHUDS\ DQG .LQHVLRORJ\ 37.
&ROOHJXH NHUEHUJ &ROOHJH RI +HDOWK 6FLHQFHV
5DQN RU S7LWOHOLDWH 3URIHVVRU 7HQXUHG 7HQXUH 7UDFN 7KHUDS\

$ ('8&$7,21 $1' $&$'(0,& 48$/,),&$7,216

± 3K ' 3HGLDWULF 5HKDELOLWDWLRQ 0&3 $Ía

%DFKHORU R%6FLHQFH%QR2RJ\ &R,OHJH 3URY

$FDGHPLF ([SHULHQFH OHQQWKLPXWLRQ DWHQNF K HOG HWF
SUH8QLYHUVLWV VDFKXVHWWV =XF+HUJEWLKQ&RO OHJH RI
/RZHOOVVRFSUHVWHÑ0 •

O²ä Â O0A6G˜Ð 0

x ,QYLWHG NH\QRWH VSHDNHUV IURP WKH LQGXVWULDO HQHUJ
.DOLVSHOO

x %DQGD +HDOWK &DUH /HFWXUHVKLS 7HFKQRORJ\ L
6HQVRUV WR 0HDVXUH 3K\VLFDO $FWLYLW\ LQ <RXWK ZLW

x $QQXDO 6XVDQ . +DUU\PDQ /HFWXUHVKLS RQ &HU
.ULHJHU ,QVWLWXWH %DOWLPRUH 0' 6WUHQJWK DQG)LV
,QYLWHG VSHDNHU IRU SDQHO GLVFXVVLRQ RQ EHKDYLRU

1RQ7HDFKLQJ $FWLYLWLHV &RQVXOWLQJ DQG 2WKHU 3URIHVVL
*UDQW 5HYLHZHU

SUHV1DWLRQDO 6FLHQFH)RXQGDWLRQ :RUN:RUOG :RUN

+RVSLWDO &OLQLFDO $SSRLQWPHQWV
SUHVHQW %RVWRQ &KLOGUHQ¶V +RVSLWDO %&+ %RVWRQ 0
5HVHDUFK $VVRFLDWH RI WKH DQG 028 EHWZHHQ %&+ D
FROODERUDWLRQ WR GHYHORSHG ,&(H[SHUWLVH
FRXUVH
&OXPELD 8QLYHUVLW\ &ROOHJH 1HZ <RUN DQG 6XUJ

6HOHFW *&RQWUROV
1,+5 1,&±5)$+' $JUDZDO 3,
&RXQELD 8QLYHUVLW\ SRVWGRFWRUDO SURJUDPV PLOOLRQ
7LWOH ,PSURYLQJ VHDWHG SRVWXUDO FRQWURO DQG XSSHU[WUHP
6XSSRUWLQJ 7UDLQHU 7UX67
5ROH ,&R P\ UROH RQ WKH JUDQW LV FRPSOHWHG

\$3HUVRQ a"ë 3Â ‘e m æÄT D ÛÊlEO ~Â|p ÄT D ÞÐEHÀQ TDE KÀ 03 FN ° F D E@ P p 0
$FDGHP\ RI 3HGLDWULF 3K\VLFDO7KHUDSHXWLF *UDQW
7LWOH 0HDVVP ¯J¼ã F D Ð p @

7LWOH 9LUWXDO UHDOLW\ IRU \RXWK ZLWK FHUHEUDO SDOV\ (VWDE
RXWFRPH PHWULFV IURP PRWLRQ WUDFNLQJ GDWD

37 $FDGHP\ RI 3HGLDWULFV 2¶1HLO 0(3,
$FDGHP\ RI 3HGLDWULF 3K\VLFDO 7KHUDS\
7LW,QHRUPLQJ FOLQLFDO SUDFWLFH (VWDEOLVKLQJ TXDQWLWDWLYH
PHDVXUHV XVLQJ GDWD UHFRUGHGYLURPXDOWLRQOWWDEQHUGXQWLQJR
ZLWK FHUHEUDO SDOV\
5RLH 3,

&8,0& ,UYLQJIRQVWQWGHV .LP 3,
5HVHDUFK ,QWHUYHQWLRQ DQG ,PSOHPHQWDWLRQ 6FLHQFH 3LORW S
7LWOH7HDHK DELOLWDWLRQ +RPH7 5[HU3F L&VHQJUR,UeP ð,Ä Cb' • ì * ì H y0$Y

$KPDGL 0 2¶1HLO 0 %DTXH (%R\G 5 7URVW 6* 0DFKLQH OHDUQL
ZLWK FHUHEUDO SDOV\ FRPSHUVRQDOL]HG XSGUXRXS\

)UDJDOD 0 2¶1HLO 0(5XVVR . 'XPDV + ,PSDLUPHQW GLVDELOLW

0HQGRQFD &- 6PLWK 6 2¶1HLO 0(7KH UHODWLRQVKLS EHWZHHQ
DHURELF SHUIRUPDQFH LQ \RXQJ DGXOWV DQG FHUHEUDO SDOV\
+DZNLQV - 2¶1HLO 0(<RXWK ZKR DUH REHVH VXVWDLQ PRGHUDWH
YLGHR JDPH SOD\ 6FL 6SRUW0HG ([HU
2¶1HLO 0(6KLHOGV 1 2¶0DOOH\ * 2EHUJ *. 9DQ 6DQW $) $Q ,QW
WKHUDSLVW UHVHDUFKHUV $VVHVVLQJ TXDOLILFDWLRQV UHVRXU
UHVHDUFK\HUV RI WKH $PHULFDQ 6 H
)UDJD0QQNKDP 0$ 2¶1HLO 0(/HQQRQ 1 7URXWW 6 R9DWW6 R9ID3HLGEHWLYRHIGW([H
IRU \RXWK 'HYHORSPHQW &3 &KLOG 1HXURO
2¶1HLO 0(6PLWK 6 6KHZ2RQNDP)UDJURVW 6 3K\VLFDO WKHUDSL
PDQDJHPHQW RI FKLOGKRRG REHVLW\ 0HDV3XHGLQDWULF3V\FKRORJ
6SULQJ
/HQQRQ 1 *HRUJH3$QNKDP0D2¶1HLO 0(0LOOHU) ,QWHQVLW\ RI
FHUHEUDO SDOV\ ZKHQ SDUWL3HLSDWLQJ3K\V7KHU\ DFWLYLWLHV
%HQHGHWWR 0 2¶1HLO 0(,GHLVKL5RR0HFKLO6U+RQJDQR-UDSG6WD
3URPRWLQJ PRWRU DQG VRF3HGDWULF3K\V7KHUDSHQW
%HQHGHWWR 0 2¶1HLO 0(,GHLVKL 5 ,GHLVKL 6 7HDFKHUKRQG WI
FKLOGUHQ LQ +HDG 6WDUW 3URJUDPV WR SURPR0RWHLDWRU3K\VQ7KHU
)LVKHU . +DUGLH 7 2¶1HLO 0(9HQWXUD $ 6RFNRORZ 3 0LOOHU

&$ *URXSXDWLF ([HUFLVH 3URJUDP IRU &KLOGUHQ ZLWK $XW
6WXG\ )UDQNKDP 0$ +DOH\ 60 2¶1HLO 0(
$PHULFDQ &RQJUHVV RI 5HKDELOLWDWLRQ 0HGLFLQH $QQXD
1 3DOLVDQR 5 'XQVW & &KLDUHOOR / 2¶1HLO 0(3RODQVN
RI &KLOGUHQ DQG <RXWK ZLWK &HUHEUDO 3DOV\

)HDVLELOLW\ RI DQ LQWHUGLVFLSOLQDU\ SURJUDPPH RU%SHUDWH
,GHLVKL 5 ,GHLVKL 6
$PHULFDQ 3XEOLF +HDOWK $VVRFLDWLRQ 6DQ)UDQFLVFR &
EHKDYLRU FKDQJH LQ WKH PDQDJHPHQW RI FKLOGKRRG REH
3$ 6PLWK 6 'H/DJR &: &RVWLJDQ 7
$PHULFDQ 3K\VLFDO 7KHUDS\ $VVRFLDWLRQ &RPELQHG 6HFV
SK\VLFDO DFWLYLWLHV EHWLVFKURHQ ZLWK FHUHEUDO SDOV\ $ SL
3LQNKDP 0)RUPDQ - &DQHOOD 0 7URVW 6
3HQQV\OYDQLD 3XEOLF +HDOWK $VVRFLDWLRQ 3KLODGHOSK
DQG HDWLQJ KDELWV LQ FKLOGUHQ ZLWK VSHFLDO KHDOWK
$EGDOOD ' .RQGUDG 0
$PHULFDQ 3K\VLFDO 7KHUDS\ $VVRFLDWLRQ &RPELQHG 6HFV
0HDVXUHPHQW 9DOLGLW\ RI 3URWRFROV ZKLFK 7HVW $HURE
ZLWK &HUHE/UDQQR3DOV\7KRUSH ' 'DOOH2HQMKDP0U2¶1HLO
0(%MRUQV%RRG. 5
$PHULFDQ 3XEOLF +HDOWK $VVRFLDWLRQ 'HQYHU &2 ,GHQ
3HUVSHFWLYHV RI SDUHQWV RI FKLOGUHQ DQG \RXWK ZLWK
3DOLVDQR 5- 'XQVW & &KLDUHOOR / 3RODQVN\ 0
$PHULFDQ $FDGHP\ IRU &HUHEUDO 3DOV\ DQG 'HYHORSPHQW
V\VWHPDWLF UHYLHZ RI WKH FOLQLPHWULF SURSHUWLHV RI
DGROHVFHQWV DQG DGXOWV ZLWK &3LQHQKDP2¶1HLO7KRUSH '
%MRUQVRQ . &ODQFK\ . %R\G 51
$PHULFDQ $FDGHP\ IRU &HUHEUDO 3DOV\ DQG 'HYHORSPHQW
6\VWHPDWLF UHYLHZ RI WKH FOLQLPHWULF SURSHUWLHV RI
DHURELF DQG DQDHURELF ILWQHVV LQ DPEXODWRU\ FKLOGUHQ
0$ /HQQRQ 1 7KRUSH ' %R\G 51 2¶1HLO 0('O{ð 4 7 U{ð7 1WP4

1HPRXUV &KLOGUHQ¶V +HDOWK 6\VWHP &HUHEUDO 3DOV\ &R
7KHUDSLVWV :LOPLQJWRQ '(LVWUXDXODJDPRQJHDVHQFWKHUDSH
\RXWK ZLWK FHUHEUDO SDOV\ 3R¶1HLOVRQ(DQG RSSRUWXQLW
$PHULFDQ 3K\VLFDO 7KHUDS\ $VVRFLDWLRQ $FDGHP\ RI 3HGLDWULF
VFKRODVWLF SK\VLFDO WKHUDS\ SUDFWLFH 6FKRRO&RQWH[W
DFWLYLW\ IRU WKH 3K\VLFDO 7KHUDSLVW $FWLYLW\1RWH
$PHULFDQ 3K\VLFDO 7KHUDS\ $VVRFLDWLRQ $FDGHP\ RI 3H
&RPPLWWHH *UDQWV :HOOQHVV 3K\VHQW1HHO*UDQW
&ROXPELD 8QLYHUVLW\ ,UYLQJ 0HGLFDO &HQWHU 3URJUDPV
6SHDNHU7HUUHKDELOLWDWLRQ +RPH ([HUFLVH 3URJUDP WR 3UR
0RELOLW\ LQ $PEXODWRU\ $GXOWV ZLWK &HUHEUDO 3DOV\
&ROXPELD 8QLYHUVLW\ ,UYLQJ 0HGLFDO &HQWHU :HLQEHUJ
3DOV\ %ULGJLQJ WKH *DS IURP +RVSLWDO WR 'RPH
7KHUDS\ IRU 3DWLHQWV ZLWK &HUHEUDO 3DOV\
$PHULFDQ 3K\VLFDO 7KHUDS\ $VVRFLDWLRQ 1HZ3UHVLGHQW
3K\VLFDO $@(

3 7 7 R S L F V L Q $ G P L Q L V W U D W L Y H 3 U R F H G X U H 5 H Y L H Z

' U H [H O 8 Q L Y H U V L W \

-XQLRU '37 FHUWLILFDWLRQ &KLOGUHQ¶V +RVSLWDO 0HGLFDO &HQWHU
3HGLDWULF &RXUVH ,&(H[SHULHQFH

- 0HQWRUHG KHU LQ SUHSDUDWLRQ IRU &HUWLILFDWLRQ H[DP DQG VXFFHVVIXOO\ FRPSOHWHG
  SUHVHQWDWLRQ DW $3 37$&
- 3URMHFW 0DQDJHPHQW SHUVSHFWLYHV RQ D SHGLDWULF LQ
  H[SHULHQFH . 2¶1HLO 0

±SUHVHQWHU JUDGXDWH +RVSLWDOLW\ &RRUGLQDWRU JHQHUDO SURMHFW

- 3URMHFW &RRUGLQDWLRQ PHYLUWXDO UHDOLW\ WR SURPRWH SK\VLFD