

0LFUR51\$ DQG *HQQ ([SUHVVLQR &KDQJHV LQ
/HXNRF\WHV \$ 6KRUV &RPPXQLFDWLRQ

/LODFK 6RUHT

,QVWLWXWH RI 1HXURORJ\ 8QLYHUVLW\ &ROOHJH /RQGRQ /RQGRQ :& 1 %* 8QLWHG .LQJGRP

&RUUHVSRQVLRQ\LODFK 6RUHT ,QVWLWXWH RI 1HXURORJ\ 8QLYHUVLW\ &ROOHJH /RQGRQ /RQGRQ :& 1 %* 8QLWHG .LQJGRP

5HFHLYHG XQ 0DQXVFULSW 1R (-GLWRU DVVLJQHG 3UH4& 1R -\$'3 5HYLHZHG XQ 4& 1R
-\$'3 5HYLVHG -XQ 0DQXVFULSW 1RXE\$'BVKHGXO 5 '2,

&LWDV\RRJ\ 0LFUR51\$ DQG ([SUHVVLQR &KDQJHV LQ /HXNRF\WHV \$ 6KRUV &RPPXQLFDWLRQ
3DUNLQVRQLVP

&RSULJKW 6RUHT 7KLVDQRSHQ DFDW\GLVHUV\XQGHUWHURVWK\BUHDWLYH &RPPXQLFDWLRQ
XQUHVWULSW\GLVHUV\XWLRQ DQG UHSURGXFWLRQ LQ DQ\ PHGLXP SURYLGHG WKH RULJLQDO DXWKRU DQG

\$EVWUDFW

3DUNLQVRQ\V GLVHUVH KDV LQFUHDVLQJ SUHYDOHQFH ZRUOGZLGH 6HYHUDO
GLVHUVH VR IDU H J 3DUN 61&\$ 0\$37 3,1. DV ZHOO DV VHYHUDO PROHFXODU

.H\ZRUG\ORRG 0HQWDO GLVRV\XOD\WHSQ EUDLQ
/HXFRF\WHV 3DUNLQVRQ\V GLVHUVH 0LFURDUUD\ 51\$ 6HT

\$EEUHYLD\W\RRJ\HHS %UDLQ 6WLPX\ODWLRQ %* %DVDO
671 6XE 7KDODPLF 1XFOHXV 3' 3DUNLQVRQ\V 'LVHUVH

'HVFULSWLRQ

3DUNLQVRQ\V GLVHUVH 3' LV D GHYDVWDWLYH PRWRU GLVHUVH ZLWK QR
FXUUHQW HDUO\ GHWHFWLRQ RU HIIHFWLYH WUHDWPHQW PHWKRGV ,W LV D
SUHYDOHQW PXOWLIDFHWHG QHXURGHJHQHUDWLYH GLVHUVH FDXVHG E\ PRVW
XQNQRZQ IDFWRUV +RZHYHU WKHUH DUH PDQ\ SRVWXODWHG
SDWKRSK\VLORJLFDQ K\SRWKVHV WR H[SODLQ LW 7KH '\$ SRSXODWLRQ RI
61SF LV DIIHFWHG E\ 3' %\ WKH WLPH RI GLVHUVH GLDJQRVLV WKH PDI\pI€pD& F
VWXGLHV RI SDWLHQW\V EORRG OHXNRF\WHV SULRU WR DQG IROORZLQJ 'HHS
%UDLQ 6WLPXODWLRQ '%6 WUHDWPHQW FDQ UHYHDO LPSRUWDQW PROHFXODU
FKDQJHV LQ SDWLHQW\V JHQH H[SUHVVLRQ SDWWHUQV LQFOXGLQJ RI FRGLQJ DQ
QRQ FRGLQJ 51\$V 7KH GDWD FDQ EH JHQHUDWHG XVLQJ PLFURDUUD\ RU
51\$ 6HT LQFOXGLQJ VLQJOH FHO 51\$ 6HT +HUH ZH FRPPHQW RQ RXU
UHFHQW VWXGLHV UHODWHG WR WKLV VEHMFW KLJKOLJKWLQJ WKH LPSRUWDQW

PLFUR51\$ DUUD\ H[SUHVVLRQ GDWD IURP SDWLHQWV DQG DJH DQG
JHQGHU PDWFKLQJ FRQWURO YROXQWHUUV , LVRODWHG OHXNRF\WHV IURP

&RQFOXVLRQ

51\$ 6HT VWXGLHV RI 3' SDWLHQWV EORRPHXQURFWRV PKLWRFKBOGWLCKBURWH
LPSRUWDQFH RI GLVHVVH VWXGLHV LQ WKH KRSH IRU IXWXUH LGHQWLILFDWLRQ
IXUWKHU JHQHV DQG SDWKZD\ LQYROYHG LUT WKH HQIRPHVH VUDXUH VUXGLHV
PD\ HQWUHS SDWLHQW FRKRUW DQG DSSO\W HQWLFHOVS 94\$ 6HTD 51\$ DUDWLRQV L
DGYDQFHG FRPSXWDWLRQDO ELRLQIRUPDWLF DGDVVDK IDFXOW\ RI PHGLFLQH VUDHO IRU

6RUHT%HQ 6KDXO < ,VUDHO = %HUJPDQ +
DQDO\VLV RI JHQHWLF DQG HQYLURQPHQWDO
FRORPHXQURFWRV PKLWRFKBOGWLCKBURWH
LPSRUWDQFH RI GLVHVVH VWXGLHV LQ WKH KRSH IRU IXWXUH LGHQWLILFDWLRQ
IXUWKHU JHQHV DQG SDWKZD\ LQYROYHG LUT WKH HQIRPHVH VUDXUH VUXGLHV
PD\ HQWUHS SDWLHQW FRKRUW DQG DSSO\W HQWLFHOVS 94\$ 6HTD 51\$ DUDWLRQV L
DGYDQFHG FRPSXWDWLRQDO ELRLQIRUPDWLF DGDVVDK IDFXOW\ RI PHGLFLQH VUDHO IRU

\$FNQRZOHGJHPHQW

, WKDQN 3URI +DJDL %HUJPDQ WKH +HEUHZ XQLYHUVLV\ RI -HUXVDOHP
,VUDHO 3URI +HUPRQD 6RUHT +HEUHZ 6RUHT / 6DORPRQLV 1 *XIIDQWL \$ %HUJPD
DQG 'U =YL ,VUDHO +DGDVVDK IDFXOW\ RI PHGLFLQH VUDHO IRU
VXSHUYLVLRQ GXULQJ P\ 3K '

3DUNLQVRQ V OHXNRF\WHV LGHQWLILHG E\
%LRO XQLYHUVLV\ RI -HUXVDOHP
6RUHT / 6DORPRQLV 1 *XIIDQWL \$ %HUJPD
6RUHT / 6DORPRQLV 1 *XIIDQWL \$ %HUJPD
WUDQVFLSWRPH 51\$ VHTXHQFLQJ GDWD IUR
3DUNLQVRQ V GLVHVVH SDWLHQWV SULRU W
WUHDWPHQW *HQRP'DWD

\$XWKRU &RQWULEXWLRQV

/LODFK 6RUHT ZURWH DQG SUHSDUHG WKHFRPSXUH ZLWK FRQWURO GRQRUV *HQRP'D

6RUHT / 6DORPRQLV 1 *XIIDQWL \$ %HUJPD
\$QDO\JLQJ DOWHUQDWLYH VSOLFLQJ GDWD
3DUNLQVRQ SDWLHQWV OHXNRF\WHV EHIRUH
FRPSXUH ZLWK FRQWURO GRQRUV *HQRP'D

&RQIOLFW RI ,QWHUHVW

1RQH GHFODUHG

%HQPR\DO 6HJDO / 6RUHT / %HQ 6KDXO <
DO \$GDSWLYH DOWHUQDWLYH VSO
HQYLURQPHQWDO ULVN RI SDUNLQVRQLVP 1
/LODFK 6 +DJDL % ‡S

5HIHUHQFHV

3DQNUDWJ 1 1LFKROV :& 8QLDFNH 6. +DOWHU & 5XGROSK \$ HW DO
*HQRPH VFUHHQ WR LGHQWLI\ VVVFHSWLELQW\ JHQHV IRU 3DUNLQVRQ
GLVHVVH LQ D VDPSOH ZLWKRXW SDUNLQ PXWDWLRQV \$P - +XP *HQHW

5 ,u 3 ‡ST@~€Vq„DÀ0%J 0P EORRG À50@pÄZLWK
FRPXUAAA VS @ à5' W D €à5' •° 0 •,©m... €,Q