

5IF 0VUDPNF PG 1FSDVUBOFPVT 5SBOTMVNJOB
\$SJJDBM -JNC *TDIFNJB BOE IPX %JBCFUFT .E

\$ZV \$OIDKDG 0RKDPHGH \$KPHG DQG 5DJKXUDP /DNVKPLQDUD\DQ

+XOO 5R\DO ,QILUPDU\ 8.

&RUUHVSRRGLQJ DXWKRU \$ZV \$OIDKDG ,QWHUYHQWLRQDO UDGLRORJ\ IHOORZ +XOO 5R\DO ,QILUP
\$ZV \$OIDKDG#QKV QHW

5HFHLYHG GDWH -~~5R~~HSWHG GDWH \$XJXVW 3XEOLVKHG GDWH \$XJXVW

&RS\ULJKW < \$OIDKDG \$ HW DO 7KLV LV DQ RSHQ DFFHVV DUWLFOH GLVWULEXWHG XQGHU WKH WHU
XVH GLVWULEXWLRQ DQG UHSURGXFWRQ LQ DQ\ PHGLXP SURYLGHG WKH RULJLQDO DXWKRU DQG VRXU

\$EVWUDFW

3XUSR\KLV VWXG\ VRXJKW WR HVWDEOLVK WKH RXWFRPH IROORZLQJ SHUFXWDQ
SDWLHQWV ZLWK FULWLFDO OLPE LVFKHPLD &/, DQG KRZ GLDEHWHV PD\ LQIOXHQ

0HWKRG \$ UHWURVSHFWLYH VWXG\ LQFOXGHG FRQVHFXWLYH SDWLHQWV ZLW
DQG ZLWK D IROORZ XS SHULRG RI PRQWK \$QDO\VLV RI GDWD ZDV GRQH
7KH \$ø WHVW W WHVW = WHVW VLPSOH DQG PXOWLSOH ORJLVWLF UHJUHVVRQ

5HVXOWV 7KH VWXG\ LQFOXGHG GLDEHWLF DQG QRQ GLDEHWLF SDWLHQWV
LQ ERWK GLDEHWLF DQG QRQ GLDEHWLF JURXS DQG UHVSHFWLYHO\ ,Q W
OLPEV VDOYDJH UDWHV ZHUH DQG UHVSHFWLYHO\ UDWHV RI PDMRU
UHVSHFWLYHO\ UDWHV RI PLQRU DPSXWDWLRQ ZHUH DQG UHVSHFWLYHO\
UHVSHFWLYHO\ 7KHUH ZDV KLJKHU SHUFHQW DJH RI XOFHU RU DGYDQFH WLVV

&RQFOXVLRQV 7KH WHFKQLFDO VXFFHVV RI DQJLRSODVW\ ZDV DOPRVW VLPLOD
JDQJUHQH RQ LQLWLDO FOLQLFDO DVVHVVRPHQW LV DVVRFLDWHG ZLWK VHYHQ IRO
IDFWRUV DUH DGMXVWHG IRU

'DWD ZDV DQDO\]HG/RWZLQHUWKRQ6366'DWD ZDV
H[SUHVHVG DV PHGLDQ PHDQ s 6' &RPSDULVRQV EHWZHHQ JURXS
FKDUDFWHULVWLFVtZHUHWPDGHTZHWK\GDWD W RU = WHVW
FRQLQXR XV GDWD 8QL YDULDEOH ORJLVWLF UHJUHVLRQ DQDO\VHV ZHUH
SHUIRUPHG IRU SRWHQWLDO SUHGLFWRU RI DPSXWDWLRQ ZLWK YDOXHV SUHVHQ
DV XQL YDULDEOH RGGV UDWLR 25 ZLWK WKH UHVSHFWLYH & \$OO
SRWHQWLDO SUHGLFWRUV ZHUH HQWHUHG LQ D PXOWLYDULDEOH UHJUHVLRQ
YDULDEOH WKDW EHVWLSUHQWLFVW ZWFRPH ZDV
FRQVLGHUHG\JQD\WLDQW\FDOO\

H FOLQLFDO DXGLW ZDV UHJLWVWHUHQG ZLWK WKH 7UXVW \$XGLW
&OLQLFDO \$XGLFWLWLRQPHVWWHH RI WKH +XOO 5R\DO
,Q}UPDU6 7UXVW DQG DSSURYHG ,QIRUPHG FRQVHQW ZDV REWDLQHG
IURP HDFK SDWLHQW DV SDUW RI KLV RU KHU URXWLQH FDUH \$OO GDWD DQDO\}
ZHUH FROOHFWHG DV SDUW RI URXWLQH GLDJQRVLV DQG WUHDWPHQW

5HVXOWV

\$ WRWDO RI SDWLHQWV ZLWK &/, ZHUH LQFOXGHG RI ZKLFK ZHUH PDOH
DQG ZHUH IHPDOH SDWLHQWV ZHUH GLDJQRVHG
WR KDYH W\SH GLDEHWHV DQG H ZHUH QRQ GLDEHWLF SDWLHQWV
PHDQ 6' DQG PHGLDQ DJH YDOXHV IRU GLDEHWLF SDWLHQWV ZHUH s
DQG \HDUV UHVSHFWLYHO\ ZKLOH IRU WKH QRQ GLDEHWLF SDWLHQWV
WKH\ ZHUH s DQG \HDUV UHVSHFWLYHO\ 'LDEHWLF SDWLHQWV
FRPSDUHG WR QRQ GLDEHWLFV KDG KLJKHU IUHTXHQF\ IRU K\SHUWHQVLRQ
9V 3! K\SHUOLSLGHPLD 9V 3! DQG
KLVWRU\ RI &9' 9V 3 +LVWRU\ RI VPRNLQJ ZDV
UHSRUWHG E\ GLDEHWLF DQG QRQ GLDEHWLF SDWLHQWV WKH
GLVHUHQD\}EDQW

+ \SHUWHQVLRQ					
<HV					
+ \SHUOLSLGBHPLD					
<HV					
&9'	1R				
<HV					
6PRNLQJ	1R				
<HV					
'LDEHWHV	1R				
<HV					
5XWKHUIRUGDQG &DWHJRUI					
1XPEHU R UXQRII	GLVWDO				
\$JH \HDU					
&25 &UXGH 2GGV\$25V\$GMXVWHG 2GGV 5DWLR					

DJUHHPHQW QG HQW 3U HPMFWHQV QG KQVH
D KLJKHU DPSXWDWLRQ UDWH DPRQJ GLDE
GLDEHWLF JURXS 7DNDKDUD HW DO > @
ZKLFK WKH ULVN RI DPSXWDWLRQ IRU &/,
RI GLDEHWHV DQG +E \$ & OHYHO 3
ZKHUHDV RWKHU FOLQLFDO FRPRUELGLWLH
QRWLJQL}HDFWRUV

7DEORJLVWLF UHJUHVVLRQ DQDO\VLV SUHGLFWRUV RI OLPE DPSXWDWLRQ

'LVFXVVLRQ

(QGRYDVFXODU UHYDVFXODULJDWLRQ IRU WKH WUHDWPHQW RI FULWLFDO OLP
LVFKHPLDULVWV DKSURDFK LQ PDQ\ FHQWHUV > @ ,Q WKLV VWXG\
RI SDWLHQWV ZLWK &/, VWXGLHG KDG GLDEHWHV DQG WKLV LV LQ
DJUHHPHQW ZLWK WKH HVWLPDWHG UDWH RI UHSRUWHG HDUOLHU > @ ,W KD
EHHQ VXJJHVWHG WKDW SUHPDWXUH DQG DGYDQFHG DWKHURVFOHURVLV WRJHW
ZLWK SHULSKHUDO QHXURSDWK\ LPSDLUHG FHOOXODU LPPXQLW\ DQG LPSDLUHG
ZRXQG KHDOLQJ PDNH &/, D FRPSOH[SUREOHP DPRQJ GLDEHWLF SDWLHQWV
DQG LI QRW DGHTXDWHO\ WUHDWHG PD\ OHDG WR DPSXWDWLRQ DQG GHDK > @
LVFRXOG H[SODLQ WKH KLJKHU UDWH RI GLDEHWLF SDWLHQWV ZKR KDG WLVVXH
ORVV RU JDQJUHQH DW WLPH&RDSULHFDQWLRQ 5XWKHUIRUG
JUDGH FRPSDUHG WR QRQ GLDEHWLF SDWLHQW REVHUYHG LQ WKLV VWXG\
\$OWKRXXJK WKH WHFKQLFDO VXFFHVV UDWH ZDV KLJKHU DPRQJ WKH GLDEHWLF
JURXS OLPE VDOYDJH UDWH DW PRQWKV IROORZ XS ZDV ORZHU
LV LV D PXOWLIDFWRULDO DQG FRXOG EH H[SODLQH E\ WKH
VLJQL}HDFWHDVHG IUHTXHQF\ RI JDQJUHQH DGYDQFH WLVVXH QHFURVLV
DQG GHOD\HG SUHVHQWDWLRQ LQ GLDEHWLF JURXS
,Q D SURVSHFWLYH FRKRUW VWXG\ ZLWK \HDU IROORZ XS RI SDWLHQWV
'LFN HW DO > @ IRXQG WKDW WKH VXVWDLQH FOLQLFDO VXFFHVV RI
UHYDVFXODULJDWLFHQWU LQ QRQ GLDEHWLF SDWLHQWV
H KLJKHU SHUFHQWDJH RI FOLQLFDO FRPRUELGLWLHV QRWLFHG DPRQJ WKH
GLDEHWLF SDWLHQWV FRPSDUHG WR QRQ GLDEHWLFV LV LQ DJUHHPHQW ZLWK
DQRWKHU VWXG\ ZKLFK VKRZHG WKDW KLVWRU\ RI K\SHUWHQVLRQ
K\SHUWKROHVWHUROHPLD FRURQDU\ DUWHU\ GLVHDSVH LQ DGGLWLRQ WR GLDEH

&RQFOXVLRQ

,Q RXU SDWLHQW FRKRUW WKH WHFKQLFDO VXFFHV RI DQJLRSODVW\ ZDV
DOPRVW VLPLODU LQ ERWK GLDEHWLF DQG QRQ GLDEHWLF JURXSV

,Q ERWK JURXSV KDYLQJ JDQJHQH RQ LQLWLDO FOLQLFDO DVVHVPPHQW LV
DVVRFLDWHG ZLWK VYHQ IROGV LQFUHDVH LQ WKH ULVN RI DPSXWDWLRQ ZKH
RWKHU IDFWRUV DUH DGMXVWHG IRU

5HIHUHQFHV

OLQDU (&ULWLFDO OLPE LVFKDHPLD +DPRVWDVHRORJLH
'DYLHV 0* &ULWLFDO OLPE LVFKHPLD HSLGHPLRORJ\ 0HWKRGLVW
'HEDNH\ &DUGLRYDVF -
1RUJHQLDWW :5 'RUPDQG\ -\$ 1HKOHU 05 +DUULV .\$ HW DO
,QWHU 6RFLHW\ &RQVHQVXV IRU WKH ODQDJHPPHQW RI 3HULSKHUDO \$UWHULDO
'LVHDSVH 7\$6& ,, (XU - 9DVF (QGRYDVF 6XUJ 6 6
%DVHU 2 9HUSLOODW 3 *DEULHO 6 :DQJ / 3UHYDOHQFH ,QFLGHQFH DQG
2XWFRPHV RI &ULWLFDO /LPE ,VFKHPLD LQ WKH 86 0HGLFDUH 3RSXODWLRQ
9DVFXODU 'LVHDSVH ODQDJHPPHQW
&ULWXL'HQHQEHUJ -2 /DQJHU 5')HRSRHS HW DO
PLRORJ\ RI SHULSKHUDO DUWHULDO GLVHDSVH LPSRUWDQFH RI LGHQWLI\LQJ WKH
SRXODWLRQ DW ULVN 9DVF 0HG
%RZHUV %/ 9DOHQWLQH 5- 0\HUV 6, &KHUYX \$ &ODJHWW *3 HW DO
H QDWXUDO KLVWRU\ RI SDWLHQWV ZLWK FODXGLFDWLRQ ZLWK WRH SUHVXUHV RI
PP +J RU OHVV - 9DVF 6XUJ
3RPSRV\%OODQVDO 1 +DPCDQK HDKDQ 0 HW DO
\$ GHFDGH RI H[SHULHQFH ZLWK GRUVDOLV SHGLV DUWHU\ E\SDVV DQDO\VLV
RI RXWFRPH LQ PRUH WKDQ FDSHV - 9DVF 6XUJ
'H5XEHW\%ULHV 3/ 0F.LQVH\ -) &KDHU 5\$ 3LHUFH 0 HW DO
6KLVSUJ DGLJPV LQ WKH WUHDWPPHQW RI ORZHU H[WUHPLW\ YDVFXODU GLVHDSVH
\$ UHSRUW RI SHUFXWDQHRXV LQWHUYHQWLRQV \$QQ 6XUJ
8FFLROLDQGLQL 5 *LXUDWR /)DELDQR 6 3DPSDQD (HW DO
/RQJ WHUP RXWFRPHV RI GLDEHWLF SDWLHQWV ZLWK FULWLFDO OLPE LVFKHPLD
IROORZHG LQ D WHUWLDU\ UHIHUUDO GLDEHWLF IRRW FOLQLF 'LDEHWHV &DUH