



'HQWDO ,PSODQWV DQG 'HQWXUHV 2SHQ \$FFHVV

-RVKXD DQG &DUPHO 'HQW ,PSODQW

6KRUW &RPPHQWU\

20,&6 ,QWH\

1FSJPEPOUBM TUBUVT

-DPHV -RVKXD *DEULHOOD &DUPHO

0DVWHU RI 6FLHQFH LQ \$OLQLFDO 3V\FKRORJ\ \$ELOHQH &KULVWL

&RUUHVSRLQLQJ DXWKRU -RVKXD - 0DVWHU RI 6FLHQFH LQ &OLQLFDO 3V\FKRORJ\ \$ELOHQH &KULVWL
MRVKXDBMDPHV #\DKRR FRP

5HFHLYHG-GDWH \$FFHSWHE GDWH 3XEOLVKHG GDWH)HE

&RSULJKW < -RVKXD - HW DO 7KLV LV DQ RSHQ DFFHVV DUWLFOH GLVWULEXWHG XQGHU WKH WHUPL
EP /LFHQVH il SUSjH D VODEM / A`pA`%QEd pOV`* @ \('SUS@@ &o <lpH @&P\$@ &p\

UHFHVLRQ OHYHO SHULRGRQWDO SRFNHW GHSWK DQG FDOFXOXV ZHUH PDGH E\

GHQWDO H[DPLOHUV \$VVHVPHQWV ZHUH PDGH DW WKH PHVLREXFFDO DQG PLG

EXFFDO VLWHV RI DOO IXOO\ HUXSWHG SHUPDQHQW WHHWK SUHVHQW LQ WZR

UDQGRPO\ VHOHFWHG TXDGUDQWV RQH PD[LOODU\ DQG RQH PDQGLXODU \$OO

GDWD ZHUH ZHLJKWHG DQG VWDQGDUG HURVZDWHG E\ VSHFLDO

WR DGMXHW RRUW DPHOH GHVLJQ \$OWKRJK RYHU RI SHUVRQV

DQG WKH XVH RI D FRPELQDWLRQ RI SUR
HvHFVLDQGHDFHSHWDEOH 5HJDUGLQJ WKH I
> @HPLIHQWDQLO LV D QHZ PHGLFDWLRQ
PLGD]RODP LQFUHDDVHWKRU SHUFXICXWV FR
PLGD]RODP DORQH FOLQLFDWLRQV VVXGLHV
IHDUV RI DJH RU ROGHU KDG H[SHULHQFH
DWWDFKPHQW /\$ RQO\ H[KLELWHG PRPELQDWLRQ GHVWLJQ RRUW DPHOH V
PP 3UHYDOHQFH RI PRGHUDWH DQG ZYXGHHW DPHQ WRQH YDOHQH H[DPLOHUV
LQFUHDDVHG ZLWK DJH ZKLOH SUHYDOHQFH SRFNHW GD]RUDP NHWUHQH
PP GLGHORV DWD VXJJHVW WKDW WKH LQFUHDDVLRQ SUHYDOHQFH RI \$SLWDO 'HQ
ZLWK DJH LV PRUH DVVRFLDWHG ZLWK LQFUHDDVLRQ SUHYDOHQFH LQFOXVLRQ
WKDQ ZLWK FKDQJHV LQ WKH SUHYDOHQFH SRFNHW RU DJH GL
QPEHUDRHHFWLW\ HV ZLWK DGYDQFHG FRQGLWLRQV IRU ORVV RI
DWWDFKPHQW SRFNHW GHSWK RU UHFHVLRQ ZDV QRW ODUJH IRU DQ\ DJH JURXS
'LVHUHQH SUHYDOHQFH RI PRGHUDWH DQG VYHUH ORVV RI DWWDFKPHQW
PRGHUDWH DQG GHHS SRFNHWV DQG UHFHVLRQ ZHUH IRXQG DPRQJ JHQGHU
DQG UDFH HWKQLFLW\ JURXS)HPDOHV H[LVWLWV EHWWHU SWKHREBQWDO KHD
WKDQ PDOHV DQG QRQ +LVSDQLF ZKLWHW KKLFLW\ EHWWHU SWKHREBQWDO
KHDWK WKDQ HLWKHU QRQ +LVSDQLF FRPHQ RROH RFDQ \$PHULFDQV UREOHV 3
3URS DQRG UDFH RRODP3 NHW DPHOH H[SHULHQFH OWHHQGHORV DQWDO ZRUN WLP H[PHUHQH
VLJQL}RQW WHU LQ UHPLIHQWDQLO JURXS H[DFK JURXS ZDV VLJQL}RQW VRDW D
F SRZHU RI CE . XVLLQJ WKH
HWLPDWHG WBLVKRIZDFWKH PHDQ RI %,6 LQ
WKH WZR JURXS > @ 6HGDWLRQ SDVHURFF
REWDLQLQJ LQIRUPHG FRQVHQW IURP WK
GHFHVVDU\ LQVWUXFWLRQV IRU WKH VHGD
ZHUH DVNHG WR UHWHU LQ WKH PRUQLQJ I
HDW E\ PRXWK RU QRQ SHU RV IRU W
SHUIRUPHG DW 'HSDUWPHQW RI +RVSLWDO
OHGLFDO 6FLHQFHV ,VIDKDQ ,UDQ 5DQG
IROORZV 2Q WKH GD\ RI WKH SURFHGXUH
ZKLFK RQO\ WKH DQHVWKHVLRRJLVW ZDV
RWKHU UHVHDFKHUV ZHUH DZDUH RI FRG
LQWR WZR JURXS EHWHURG ZLWK 305 R
HYHQ FRGHV SURWRRO PLGD]RODP NH
LOW DPHOH RRUW DPHOH WKH RRUW DPHOH
VHGDWLRQ ZLWK VKRUWHU UNJRY DQ PLGD]RODP RRUW DPHOH XVH R
> @ FRGHV PLGD]RODP SURWRRO UHPLIHQ
LQWUDYHQRXVO\ &RPSDUDWLRQV H[DPLOHUV

&LWDWLRQKXD -

3HULRGRQWDO VWDWXV 'HQW ,PSODQWV 'HQWXUHV

3DJH RI

'HQWDO 5HVHDFK -RXUQDO 0LGD]RODP)LYHP JNORUSURWRFRU'+ 0LQW] .3 %ULV
 NJ DQG UHPLHQWDQLO ZHUH SXPSHG LQVWURUJQRXV\$FWLQREDFLWQXJPEW
 H GHSWK RI VHGDWLRQ %,6 KHDUW UDWK WKH QXPEHU RI UHVSLUDWLRQV
 EORRG SUHVXUH DQG R[\JHQ VDWXUDWLRQ SHUHQWVJHV ZHQHUFRUJHQYFK
 HYHU\ PLQ E\ WKH HQHVRVSRUJH VWRQWUHQNLQ' EHWDOOH DVVRF
 ZKLFK LV HVVHQWDO IRU JHQHUDO DQHVWKHVLDRU GHHS VHGDWLRQ ZDV
 SHUIRUPHG IRU ERWKQULXSRQV IRU FDUUHQJ &KHQ & %DNNHU , &RQWUHUDV\$ OR
 SURFHGXUH ZHUH HYDOXDWHG E\ DQRWKHU UHVHDFKHU EDVHG RQ WKH HQWDO
 6HGDWLRQ 7HDFKHUV *URXS '67* > @ VFDQH DQG UHFRUGHG LQ VSHELDQ
 GDWD VKHHWV \$W WKH HQG RI WKH SURFHGXUH HDFK SDWLHQW ZDVPROLWRUHQ
 WKH UHFRYHU\ URRP DQG WKH WLPH QHHGHG IRU UHFRYHU\ ZDV UHFRUGHG
 \$VHD\DFKLHYLQJ WKH QHFHVVDU\ FRQGLWLRQV IRU EHLOQ#GLV\FKDUJHG EDVHG RQ
 WKH SRVW DQHVWKHWF GLVFKDUJH VFRULQRWV\$PEQ>DPEQJHDFKSDWVHQMG ZDV
 GLVFKDUJHG EDVHG RQ WKRURXJK FRXQVHDEHQDQSDFRUHVORQ RI D\SKRQH \$
 QXPEHU IRU HPHUJHQF\ FDOOV

5HIHUHQFHV

- *DOEUDLWK *0 6WHHG 5% 6DQGHUV -- 3DQGH\ -3 7XPRU QHFURVLV
- IDFWRU DOSKD SURGXFWQRQHEIFWQDQKFRDWRUW +D\HV 7D\ORU *:
- IDFWRU JHQRW\SH - 3HULRGRQWRO DQG VYIHU SHULRGRQWDO GLVHVVH LQ W
- :H\DOV 3HDOOVWHLQ 0(&KXUDN \$3)RUUH\WV 2DPEQ(SLQGHUW RQ
- H DVVRFLDWLRQ EHWZHHQ RVWHRSHQLD DQG SHULRGRQWDO DWWDFKPHQW ORVV LQ
- ROGHU ZRPHQ - 3HULRGRQWRO
- *ULVHQ %HFNHU 05 /\RQV 65 0RHVFEHUJHU 0/ /H\ (- HW DO
- 3UHYDOHQFH RI 3RUS\URPRQDV JLQJLYDOLV DQG SHULRGRQWDO KHDOWK
- VWDWXV - &OLQ 0LFURELRO