

,QVLJKW 0RWLYDWLRQ DQG 2XWFRPH LQ 'UXJ
WKH 5HFHQW /LWHUDWXUH

5HEHFFD /LQQ :DOWRQVDFQLG 7LQD

)RUGKDP 8QLYHUVLW\ *UDGXDWH 6FKRRO RI 6RFLDO 6HUYLEH 1HZ <RUN 8QLWHG 6WDWHV

&RUUHVSRRGLG 5HEHFFD /LQQ :DOWRQ)RUGKDP 8QLYHUVLW\ *UDGXDWH 6FKRRO RI 6RFLDO 6HUYLEH
6WDWHV 7HO UOLQDULG RUGKDP HGX

5HFHLYHG GDWH 1RY -DGFHSHWHG3&D0LHV-10CG GDWH

&RS\ULJKW /LQQ :DOWRQ 5 DQG 0DVFKL 7KLV LV DQ RSHQ DFFHVV DUWLFOH GLVWULEXWHG XQGHU WKH
XQUHVWULFWHG XVH GLVWULEXWLRQ DQG UHSURGXFWRQ LQ DQ\ PHGLXP SURYLGHG WKH RULJLQDO D

\$EVWUDFW

5HVHDUHQH DGLFWLRQ DQG SV\FKRWKHUDS\ KDYH ORQJ DJUHHG WKDW LQVLJKW
IRU WUHDWPHQW DUH LPSRUWDQW FOLHQW IDFWRUV LQ VXFFHVVIXO WUHDWPHQW
DQG UHODSVH UDWHV SRVW WUHDWPHQW \$XWKRUV LQ ERWK ILHOGV DJUHH WKDW
WR SRVLWLYH WUHDWPHQW RXWFRPHV +RZHYHU WKLV OLWHUDWXUH UHYLHZ I
VXEVDQFH DEXVH OLWHUDWXUH ZLWK RIIHQGHUV \$UWLFOHV LGHQWLILHG FRQW
WUHDWPHQW ZHUH SDLUHG ZLWK WKH WHUP RIIHQGHUV LQ YDU\ LQJ FRPELQDW
, QGXFWLYH DQDO\VLV UHYHDOHG WKDW WKH PDMRULW\ RI WKH DUWLFOHV GLG Q
PHDVXUH RXWFRPHV 2QQ\ VHYHQ RI WKH DUWLFOHV LQFOXGHG PHDVXUHV RI L
VWXG\ PHDVXUH RXWFRPH DV ZHOO ,Q DGGLWLRQ TXDOLWDWLYH DVSHFV RI L
DVVHVVPHQW XVHG 5HFRPPHQGDWLRQV IRU IXWXUH UHVHDUFK LQFOXGH PHDVX
WUHDWPHQW RXWFRPH DQG WDLORULQJ WUHDWPHQW IRU WKLV SRSXODWLRQ DF
SRVW WUHDWPHQW

,QWURGXFWRQ

%DFNJURXQG

&RQVHTXRQFBZ XVHUV RI LOOHJDO GUXJV DUH VHYHUH DQG RIWHQ
LQFOXGH LQYROYHPHQW LQ WKH FULPLQDO MXVWLFH V\WHP 7KH PRVW UHFHQ
UHSRUW IURP WKH 8QLWHG 6WDWHV %XUHDX RI -XWLFH UHSRUWHG WKDW LQ

RI WKH FDVHV WULHG FULPLQDO FRXUV LQ WKH 8QLWHG 6WDWHV ZHUH IRU
GUXJ FKDUJHV > @ :KLOH WKLV VWDWLVWLF DORQH LV VLJDEOH LW GRHV QR
DFFRXQW IRU WKH VLJQLILFDQW DPRXQW RI FULPHV FRPPLWWHG E\ LQGLYLGXDOV
ZLWK KLVWRULHV RI GUXJ XVH DQG DEXVH > @ :KLOH PDQ\ VFKRODUV DJUHH
WKDW WKH SRSXODWLRQ RI RIIHQGHUV ZLWK GUXJ SUREOHPV LV QRWDEOH DFW
VWDWLVWLFV YDU\ DQG WKRVH FLWHG DUH RIWHQ QRW FXUUHQW 7UHQQV VXJ
WKDW WKH QXPEHU RI DUUHVWV IRU GUXJ UHODWHG FKDUJHV LV LQFUHDVLQJ D
WKDW DV PXFK DV RI WKRVH FRQYLFWHG RI D FULPH ZHUH XQGHU WKH
LQIOXHQFH RI D VXEVDQFH DW WKH WLPH RI DUUHVW > @ 7KHVH ILQGLQJ
LQGLFDWH WKDW PDQ\ LQGLYLGXDOV DUH LQ WKH SULVRQ V\WHP IRU YDULRXV
FULPHV \HW FDQ KDYH XQGHUO\LQJ GUXJ SUREOHPV WKDW FDXVH WKHP WR
RIHQG

7KHVH VWDWLVWLFV VKRZ WKDW GUXJ FKDUJHV DUH WUHDWHG DV VHULRXV
RIHQVHV DQG WKDW D GUXJ UHODWHG DUUHVW DOPRVW DOZDV OHDGV WR
VHQWHQFLQJ ZKHWKHU WKDW VHQWHQFH LV SUREDWLRQ LPSULVRQPHQW RU
PDQGDWHG WUHDWPHQW > @ ,Q DGGLWLRQ ZKLOH 0RWLYDQV UHSRUWHG WKDW
DYHUDJH IHGHUDO FRXUW FRQYLFWLRQ XÐ` @HD € 0` 0QV+ JHV G0` D€D € 4`PÀÀ

LV SV\FKRWKHUDS\ OLWHUDWXUH ZKLVH D W F M Q Q R W . H L Q F Z K G G V V D X P S H G H V Z H R U H
VXEVDWQFH DEXVLQJ RIIHQGHUV /LQQ f L Q Q F D B E H X Q S K E Q L g / K R I G H R Q Q X M F g L S Q G f G U
)RU WKH SXUSRVH RI WKLV SDSHU LQFRB E W Q D W L G R V L Q H G H D W W H H F R V Q Z H U L R F K R I V
SUREOHP VHYHULW\ GHVLUH IRU KHOSL W D Q G W S H U H V R Q H Y O H E R P) R L Q D D I Q Q W D V G L W L
WUHDWPHQW > @ LQFOXVLRQ ZHUH ORFDWHG WKURXJK WKH
DUWLFOHV ORFDWHG

0HDVXUHPHQW DQG 2XWFRPH

:KLOH WKHUH LV D ODUJH ERG\ RI OLWHUDWXUH H[DPLQLQJ GUXJ WUHDWPHQW
DQG UHFLGLYLVP DV ZHOO DV SURJUDPPH V L Q D Q D Q R Q H I F O X W L R Q F L V L W H U W L D Z H
LQIRUPDWLRQ DYDLODEOH DERXW RIIHQGHUV D D F W D U V L W Q H V Z H G H W K R H L D W H R G
LQVLJKW DQG PRWLYDWLRQ DQG WKHLU WKH F W P S O H R Q H L D W P H Q W R X W F R P H S X
(YLGHQFH KDV LGHQWLILHG WKDW WUHDWPHQW R I D G K H U H Q F H D Q G F H V D W L R Q R
VXEVDWQFH DEXVH LV DQ LPSRUWDQW IDFWRU LQ ORZHULQJ UHODSVH DQG
UHFLGLYLVP > @ , Q FRQWUDVW 5REHUWV HW DO > @ KDV LGHQWLILHG D SRVL
FRUOHODWLRQ EHWZHHQ LQGLYLGXDOLJHG WUHDWPHQW SODQV DQG WUHDWPH
RXWFRPH 7KLV ILQGLQJ LQGLFDWHV WKDW WUHDWPHQW DLPHG DW LPSURYLQJ
LQGLYLGXDO SDUWLFLSDQW FKDUDFWHULVWLFV VXFK DV LQVLJKW DQG PRWLYD
KDV D SRVLWLYH HIIHFV RQ EHKDYLRXU SRVW WUHDWPHQW +RZHYHU WKH OLQ
EHWZHHQ LQGLYLGXDOLJHG SODQV DQG WKH LQGLYLGXDO ZKR UHFHLYHV WKLV
WUHDWPHQW KDV EHHQ XQGHU HYDOXDWHG 7KH FXUUHQW UHYLHZ ZLOO LGHQW
DQG H[DPLQH WKH IDFWRUV RI PRWLYDWLRQ DQG LQVLJKW DQG WKHLU UROH L
GUXJ WUHDWPHQW IRU LQGLYLGXDOV ZLWK KLVWRULV RI LQDFUDWLRQ D
LGHQWLILHG LQ WKH H[LVWLQJ OLWHUDWXUH 6SHFLILFDOO\ D FRQWHQW DQDO\N
FRQGXFWHG IRU DUWLFOHV RQ WKLV WRSLF WR LGHQWLI\ WKH UROH RI LQVLJKW
PRWLYDWLRQ RQ WUHDWPHQW DGKHUHQFH SDUWLFLSDWLRQ HQJDJPHQW DQ
WKH RXWFRPHV RI UHGXFHG GUXJ DEXVH DQG UHFLGLYLVP UDWHV 7KLV VWXG\
DLPHG WR HYDOXDWH WKH H[LVWLQJ OLWHUDWXUH IRU FRQFHSWXDOL]DWLRQ D
PHDVXUHPHQW RI LQVLJKW DQG PRWLYDWLRQ IRU RIIHQGHUV LQ WUHDWPHQW
DQG KRZ WKHVH IDFWRUV DIIHFWHG RXWFRPHV RI UHODSVH DQG UHFLGLYLVP

0HWKRGV

7KH VSHFLILF UHVHDUFK TXHVWLRQV WR JXLGH DQDO\VLV DQG EH DQVZHUHG
DUH KRZ DUH WKH WHUPV PRWLYDWLRQ DQG LQVLJKW GHILQH DQG
RSHUDWLRQDOLJHG LQ WKLV DUHD RI UHVHDUFK" +RZ DUH WKHVH WHUPV
LQWHJUDWHG LQWR WUHDWPHQW PHWKRGV DQG DSSURDFKHV" +RZ DUH WKHVH
WHUPV LQWHJUDWHG LQWR RXWFRPH OLWHUDWXUH" +RZ GRHV UHVHDUFK
VXJJHVWLQJ WR VWUHQJWKHQLQJ WKHVH IDFWRUV LQ FOLHQWV DQG WUHDWPHQ
:KDW UROH GRHV PRWLYDWLRQ DQG LQVLJKW SOD\ LQ FOLHQW H[SHULHQFH GXUL
WUHDWPHQW" +RZ DUH LQVLJKW DQG PRWLYDWLRQ LPSRUWDQW WR WUHDWPHQ
IRU WKLV SRSXODWLRQ LQ SDUWLFXODU"

6DPSON ,GHQWLILFDWLRQ

6WHSV RI &RQWHQW \$QDO\VLV

7KH FRQWHQW DQDO\VLV ZDV FRQGXFWHG LQ WKUHH VWDJHV DUWLFOH
LGHQWLILFDWLRQ DUWLFOH UHYLHZ DQG DQDO\VLV RI WKH GDWD FROOHFY
\$UWLFOHV ZHUH VHDUFKHG DQG VHOHFWHG EHWZHHQ WKH VSULQJ RI DQG WK
HQG RI 6WHS RQH LQYROYHG LGHQWLI\LQJ WKRVH DUWLFOHV WKDW PHW
VHOHFWLRQ FULWULD 7KH VHFRQG VVHS LQYROYHG DQDO\VLQJ DQG FRGLQJ W
DUWLFOHV VHOHFWHG DQG WKH ILQDO VVHS ZDV WR ZULWH XS WKLV UHSRUW F
ILQGLQJV \$ FRPSUHKHQVLYH UHYLHZ RI WKH DYDLODEOH OLWHUDWXUH ZDV
FRQGXFWHG LQ RUGHU WR LGHQWLI\ DUWLFOHV WKDW H[DPLQH WKH UROH RI LQ
DQG PRWLYDWLRQ LQ WUHDWPHQW RXWFRPH \$UWLFOHV (QJOLVK ODQJXDJH LQ
SHHU UHYLHZHG MRXUQDOV ORFDWHG WKURXJK (%6&2KRWW ZKLFK LQFOXGHV
GDWDEDVHV ZLWK MRXUQDOV RQ WKH WRSLF RI GUXJ WUHDWPHQW IRU
RIHQGHUV LQFOXGLQJ 3V\FK \$57,&/6 0HGOLQH DQG VRF ,1'(;
7KHVH GDWDEDVHV LQFOXGHG D ZLGH YDULHW\ RI UHVHDUFK RQ GUXJ WUHDWPHQ
LQVLJKW PRWLYDWLRQ RXWFRPH DQG FULPLQDO RIIHQGHUV XQGHUJRLQJ

FRQFHSWXDOLJHG QHJDWLYH SRVLWLYH S B W V E G S D Q M V X H R F E H D D Z S D H W R I F S S I R G W H E
WKDW WKH\ KDG EHHQ LQFDUFHUDWHG D I Q G X P I Q M D Q R H W U H D W P H Q Q Q R W D R D D U R H V
WKHLU GUXJ XVH DQG GUXJ UHODWHG F V I R P L O Q F U C H D F M I S Y L U W W L E L X S D G E W F D Z D V H H Q K M V F I
V\ VWHP ZDV DJDLQVW WKHP WKLV Z D D X W K B H V X O R X Q G R O H K O W R N X L Q K V W L Q W X W Y R I Q D V
UDFLVP RU WKDW WKH\ KDG WR WDNH S B W H B F D S V Q R O V E R I W X X G H W M Q U V D O K H Q R W
WKHLU VRFLDO HQYLURQPHQW > L Q W H @ Y H Q W L R U C D D L P R I Q L Y D W L Q F Q H Z D M L Q J
LGHQWLILHG DV UHFRJQLWLRQ RI SURDOEAPSUREGKBLWRI RIWHFQ L V W H H V B H O J V P U H R P V
ORQJHU GXUDWLRQV RI XVH WKHRU D O L F D O O @ E B W B G I R Q J Q V R V K I D W Y L Q Q F U H D U H G
fHYLGHQFHg RI D GUXJ SUREOHP > H Q J D K H F H Q M Q D G G S D O V D I Q G S H I W I H R Q S O R F H
S\VKRORJLFDQ IDFWRUV OHG WR ORZHU RU KLJKHU OHYHOV RI PRWLYDWLRQ Z I
LQFUHDVHG QHJDWLYH LQIOXHGHV \ L H O G L O J O R Z H U P R W L Y D W L R Q D Q G L Q V L J K
OHYHOV I R X Q G W R E H P R V W V X F F H V V I X O L Q U H G X F
UDWHV IRU RIIHQGHUV \$ O O V W X G L H V
L P S O L F L W O \ W K D W V X F F H V V I X O W U H D W P
W K U R X J K L Q F U H D V H G S U R E O H P D Z D U H Q H V

OHDVXUHV

+DOI RI WKH DUWLFOHV Q XWLOLJ Q G W K A W F R P H Q D I F K D Q G H V H E V W X U Q S U
&KULVWLDQ 8QLYHUVLW\ &ULPLQDO -X D Q K H H Q G E H Q Q G Y O T O X W R L R Q Z H U J P D W H V Q F
7UHDWPHQW &- &(67 D VHULHV RI VFDQHV > W R Z P L Q F K R P Q V M Y C V W R P H D V U
WKH SUHGLFWRU YDULDEOH OHYHOV K R Z W U H D W P H Q W K L F Q L Q F U H D W L Y D A Y R K
HQJDJHPHQW DQG WUHDWPHQW SDUWLFLSDWLRQ V P R F R X Q R W K S U R J U D P H W R U H D W P
&ULPLQDO WKLQNLQJ ZDV WKH WHUP XVHG WR GHVFULEH LQVLJKW DV KLJKHU
OHYHOV RI FULPLQDO WKLQNLQJ ZHUH Z W A R F H D W H G Z L W K O R Z H U O H Y H O V R I
SUREOHP DZDUHQHV 7KH IDFWRUV RI FULPLQDO WKLQNLQJ ZHUH H Q W L W O H P H Q
MXVWLILFDWLRQ SRZHU RULHQWDWLRQ S H Y H O R I W K H D W L U W X G L H V F R O W P L O H G V
UDWLRQDOLJDWLRQ DQG SHUVRQDO LUUH\ S R O V I E L Q W \ L Q W H U Y H Q W L R Q V V U H Q J W K H Q L Q J S D U W L

6RPH VWXGLHV GLG QRW PHDVXUH PRVLSURVHR & X R U F D R H V D V S U H F S D W V R L F L S D L Q W W
Q EXW KDOI RI WKH VWXGLHV Q R X M P S O R M G D Y D L U V R L W W R S H Q & R V G H Q H V
PHDVXUHV RIWHQ PXOWLSOH DLPHG D W U H D W P H Q W Q V F O D H Q R V F K D W R F W B B U H V D V F V
DV PRWLYDWLRQ IRU WUHDWPHQW S V R F X R R P H L V D O K H D R W R W H W W K D W H F R W O G L O R Z
WUHDWPHQW HQJDJHPHQW VXFK DV H [S O L P L Q D O \ U G M L R U L E O L S U R L R J O P R O H Y C R O L
WKLQNLQJ GUXJV DUH D SUREOHP RU L Q V L J K R V I D Q G X P R K W D V D R L R Q T O M X B B W R B V
6WUHV 'LVRUGHU 6DFNV HW DO > @ H F R X Q F H S W X D O L J W G W L Q Y L D K W S H B W V F R U H R X
UHFRJQLWLRQ RI SUREOHP DQG WDNH E H I L Q H V S R Q F K R O O L W F D I Q U X E F W K R E L I Q Q J H R S
WUHDWPHQW DQG VXFFHHGLQJ LQ WUHDWPHQW 7KH VWXG\ H P S O R \ H G W K H &-
&(67 DV ZHOO DV DQ DGGLWLRQDO PHDVXUH Z K L F K P H D V X U H G F O L H Q W d v
SHUFHSWLRQ RI SUREOHP VHYHULW\ D Q G U H D G L Q H V V I R U W U H D W P H Q W 6 D F N V
DO > @ I L Q G L Q J V G L I I H U H G I U R P V W X G L H V X V L Q J R Q O \ W K H &- &(67 L Q W K D W
SDUWLFLSDQV ZHUH LGHQWLILHG IRU D P O L O V E R L F L S D W L R Q D P G W R D W E A O H
UDWKHU WKDQ WKH &- &(67 Z K L F K W H V W Y I R U P W R O O E N O R P V X F E D W L
DO > @ L Q F O X G H G W K H & L U F X P V W D Q F H W K D S U L F S H D Q € D Q G 5 H D G L Q H V V 6 F D O H
7KLV VFDOH DWWHPSWHG WR PHDVXUH ERWK FRQWH[WXDO IDFWRUV D I I H F W L Q
PRWLYDWLRQ DV ZHOO DV L Q G L Y L G X D O P R W L Y D W L R Q

7KH HLJKW DUWLFOHV WKDW HYDOXDWHG DVSHFWV RI PRWLYDWLRQ DQG LQVLJ
VRXJKW WR DFWLYHO\ GHILQH WKHVH WHUPV DQG RSHUDWLRQDOLJH WKHLU HIIHF
WUHDWPHQW DQG RXWFRPH XVLQJ H[SOLFLW GHILQLWLRQV IRU LQVLJKW DQG
PRWLYDWLRQV LQFOXGLQJ PRWLYDWLRQ WR FRPSOHWH WUHDWPHQW
FRPLWPHQW WR FKDQJH DQG DWWHQGDQFH DQG SURJUDP SDUWLFLSDWLRQ
FRPSOHWLRQ DQG HQJDJHPHQW

,QVLJKW DQG ORWLYDWLRQ

([SOLFLW GHILQLWLRQV RI LQVLJKW ZHUH UHFRJQLWLRQ RI SUREOHP OHYHO R
FULPLQDO WKLQNLQJ ZLWK ORZHU OHYHOV LQGLFDWLQJ SRRUHU LQVLJKW DQ
DFNQRZOHGJHPHQW RI SUREOHP VHYHULW\ 2SWLPDO WUHDWPHQW RXWFRPHV
ZHUH GHILQHG DV ORZHUHG UDWHV RI XVH DQG UHFLGLYLVP SRVW WUHDWPHQW
WUHDWPHQW FRPSOHWLRQ DQG VHHNLQJ DIWHUFDUH XSRQ UHOHDVH IURP SULVR
FRXUW RUGHUHG WUHDWPHQW)RXU RI WKH DUWLFOHV GLVFXVVHG LQVLJKW DQ
PRWLYDWLRQ LQ LPSOLFLW UDWKHU WKDQ H[SOLFLW WHUPV

6WXGLHV IRXQG WKDW LQVLJKW SOD\HG DQ LPSRUWDQW UROH DW WKH SURJUD
OHYHO \$W WKH SURJUDP OHYHO LQVLJKW ZDV GHILQHG DV HQDEOLQJ

'LVFXVVLQR

7KLV VWXG\ VRXJKW WR H[DPLQH WKH LSHLDWLRQ... PRWLYDWLRQ DQG WKDW WKH SUHVHG... DGKHUHQFH HQJDJHPHQW SDUWLFLSD... RIIHQGHUV LQ GUXJ WUHDWPHQW SUR... LQGLYLGXDO OHYHOV RI LQVLJKW DQG... JHDUHG WR LQFUHDVH OHYHOV RI WKH... SDUWLFLSDQWV 2XWFRPHV LQFOXGH VHN... SULVRQ RU WKH FRXUW \VWHP UHGXFH... UHGXFHG UHFLGLYLV UDWHV 6SHFLIL... VWXGLHV PHDVXUH LQVLJKW TXDQW... PRWLYDWLRQ DQG VHYHQ PHDVXUHG... IDLOHG WR PHDVXUH ERWK LQVLJKW DQ... DQG RXWFRPH 7KHVH ILQGLQJV DUH L... RQO\ &RVGHQ HW DO > @ PHDVXUH...

4XDOLWDWLYH ILQGLQJV GHPRQVUD... PRWLYDWLRQ DUH PXFK PRUH FRPSO... DFFRXQW IRU 7DEOH VKRZV WKH WKH... DUWLFOHV 7KH PRVW LPSRUWDQW IL... PRWLYDWLRQ DUH FRQFHSWXDOO\ PRU... DYDLODEOH LQVWUXPHQWV \$OO VWXG... OHYHOV RI UHFRJQLWLRQ RI SUREOHP... LQGSHQGHQW RI WKH WUHDWPHQW LW... SDUWLFXODU WUHDWPHQW PLJKW EH D... VXEWDQFHV DOO RI WKH VWXGLHV PH... ZLWK OHVV PRWLYDWLRQ DQG LQVLJKW... > @ DGGUHVVHG WKLW LVVXH VSHFLIL... DGDSWHG WR PHHW WKH QHHGV RI WKL... PHDVXULQJ UHODSVH DQG UHFLGLYLV... IDPLO\ VXSSRUW EHLQJ LQWHJUDO WR... QRW DGGUHVVHG LQ PHDVXUHPHQWV R... IDPLO\ VXSSRUW FRXOG OHDG WR LQ... NQRZ WKLW GHILQLWLYHO\ IURP FXU... \$ ILQDO OLPLDWLRQ ZDV WKH IDFW...

6WUHQJWKV

7KLV VWXG\ LQFOXGHG VHYHUDO VW... SXUSRVH 6XEVWDQFH DEXVH UHVHD... PRWLYDWLRQ DUH LPSRUWDQW IDFWR... FRPSOHWLQJ WUHDWPHQW > @ +RZHYHU... VWXGLHV PHDVXUH WKHVH IDFWRUV... WUHDWPHQW RU UHOHDVH 7KH ILQGLQ... FRQFHSWXDO\DWLRQV DUH RIWHQ XQ... SURJSDP FRQVWUXFWHG LQVLJKW DQG... UHFLGLYLV UDWHV IRU RIIHQGHUV 7... DUHD LV XQGHUGHYHORSHG 7KH ILQ... D NH\ UROH LQ WUHDWPHQW RXWFRPH... SUHOLPLQDU\ ILQGLQJV RI WKLW FR... WKH GHYHORSHPHQW DQG RU LPSURYH... LQ WKLW DUHD .QRZLQJ WKH VWDWH... UHVHDUFKHUV DQG FOLQLFLDQV WR... VWUHQJWKHQHG DQG DGDSWHG

6WUHQJWK ZDV WKH PHWKRGRORJ\ XVHG WR DQDO\H WKH VDPSOH 7KH PHWKRGV XVHG LQ WKLW VWXG\ DOORZHG WKH DXWKRUV WR XQGHUVWDQG TXDQWLWDWLYH DQG TXDOLWDWLYH DVSHFWV RI WKH VDPSOH JURP WKLW XQGHUVWDQGLQJ D FRPSUHKKHQVLYH SLFWXUH RI WKH LVVXH HPHUJHG 4XDQWLWDWLYH GDWD \LHOGHG UHVXOWV WKDW WRR IHZ VWXGLHV PHDVXUH IDF RI LQVLJKW PRWLYDWLRQ DQG RXWFRPH 2WKHU ILQGLQJV VKRZHG WKDW WKH TXDOLWDWLYH VWXGLHV VDPSOHG RIIHUG D FRQFHSWXDO XQGHUVWDQGLQJ R

DVVHVVP HQWV DW WKH VWDUW RI WUHDWPHQW VWDQGDUG SUDFWLFH LQ RUGH

ODUPDURVK 7KH 5HDO 5HODWLRQVKLS'ORCPAVFKR,PAHUBA\
5HODWLRQVKLSV D WR \$GXOW \$WWDFKPHQWV :RUNLQJ \$OOLDQFH 7UDQVIHUHQFH
DQG 7KHUDES\ 2XWFRPH -RXUQDO RI &RXQVHOOLQJ 3V\FKRORJ\
&RVGHQ%DVFK -(&DPSRV (*UHHQZHOO \$ %DUDJDQL 6 HW DO
(IIHFWV RI 0RWLYDWLRQ DQG 3UREOHP 6HYHULW\ RQ &RXUW %DVHG 'UXJ
7UHDWPHQW &ULPH DQG 'HOLQTXHQF\
5REHUWV (\$ &RQWRLV 0: :LOOLV -& 6U :RUWKLQJWRQ 05 .QLJKW .
\$VVHVVLQJ 2IIHQGHU 1HHGV DQG 3HUIRUPDQFH IRU 3ODQQQLQJ DQG
0RQLWRULQJ &ULPLQDO -XVWLFH 'UXJ 7UHDWPHQW &ULPLQDO -XVWLFH DQG
%HKDYLRXU
0DWWVRQ & 3RZHUV % +DOIDNHU ' \$NHVRQ 6 %HQ 3RUDWK <
3UHGLFWLQJ GUXJ FRXUW WUHDWPHQW FRPSOHWRQ XVLQJ WKH 003, 5)
3V\FKRO \$VVHV
+LOOHU 0 .HOO\ & 6DXP & .QLJKW . +,9 5LVN %HKDYLRXUV
)ROORZLQJ 5HOHDVH IURP 3ULVRQ 7UHDWPHQW (WKQLFLW\ DQG 3RVW 5HOHDVH
'UXJ \$EXVH &RQIHUHQFH 3DSHUV \$PHULFDQ 6RFLHW\ RI &ULPLQRORJ\