

Inconsistent handers show higher psychopathy than consistent handers[†]

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ABSTRACT

Three hundred and forty-two university students completed the Short Dark Triad (SD3) and the Edinburgh Handedness Inventory (EHI). Inconsistent handers showed higher psychopathy scores than consistent handers, and no handedness differences were observed for narcissism or Machiavellianism. Participants were further subdivided by quartile into low, moderately low, moderately high, and high psychopathy groups (non-clinical). Absolute EHI scores were equally distributed among low and moderate groups, but were significantly lower for the high psychopathy group. These findings suggest that inconsistent handedness is only associated with the upper quartile of psychopathy scores. Also, males showed significantly higher psychopathy scores than females, and the ratio of male to female inconsistent handers decreased as psychopathy score increased. No gender \times handedness interaction indicated that both female and male inconsistent handers have higher psychopathy scores than consistent handers. Although significant, the effects were small and 99.6% of participants were not in the range of a potential clinical diagnosis. The reader, therefore, is strongly cautioned against equating inconsistent handedness with psychopathy.

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Psychopaths are often depicted as among the worst elements of society, the people that are the most dangerous, useless, and maladaptive. Dutton (2012), however, argued that different patterns of psychopathic characteristics can mean the difference between society's worst nightmare and a successful, valuable member. For example, a person with violent tendencies, low intelligence, and high scores on antisocial and interpersonal facets may be a serial

(Dutton, 2012), college students (Gao & Rain2010), business professionals, attorneys, and professors (Mullins-Sweatt, Glover, De10, Miller, & Widiger, 2010). These successful psychopaths differ from unsuccessful psychopaths mostly in that the former may have high conscientiousness (i.e. competence, achievement-striving, discipline, and deliberation) (Mullins-Sweatt et al., 2010) and high Facet 1 scores (Gao & Rain2010). Yet, even though we accept that there are many psychopaths integrated into normal

lower end of achievement, inconsistent handed children may show broad cognitive deficits (social/emotional, gross/fine motor, and receptive English skills) (Johnston, Nicholls, Shah, & Shields, 2009) relative to their more consistent handed peers. These broad cognitive deficits have also been observed in a pre-diagnostic category of kindergartners, and may be of predictive diagnostic value because they are notably consistent with maladaptive and violent tendencies in adolescent and adult offenders (Moffitt, 1993; Vaughn, DeLisi, Beaver, & Wright, 2008).

There are also some coincidences between inconsistent handedness and the classic psychopathy characteristics of risk seeking, impulsivity, trouble with the law, and low anxiety. Increased risk/sensation seeking and impulsivity have both been associated with psychopathy (Jones & Paulhus, 2014) and inconsistent handedness (Christman, 2014; Schmidt, Schmidt, Carvalho, & Carvalho, 2013). Both psychopaths and inconsistent handers are also more likely to have had trouble with the law (Bogaert, 2001; Bogaerts, Polak, Spreen, & Zwets, 2012; Mayer & Kosson, 2000). Psychopaths are also notorious for lack of emotion or low anxiety (i.e. keeping their cool) (Zágon & Jackson, 1994; also see Schmitt & Newman, 1999, who refute this). Similarly, Lyle, Chapman, and Hatton (2013) showed evidence for lower anxiety among inconsistent right handers than consistent right handers, and consistent handers may be more sensitive to disgust than inconsistent handers (Christman, 2014). Beratis, Rabavilas, Papadimitriou, and Papageorgi.3(s)0scms, jicBeal(g)(36)16(38)5t24(20)148(6ah)(M)9(5h)

unrelated to handedness. Frontal lobe dysfunction, especially prefrontal cortex, has also been associated with antisocial personality (includes psychopathy) (Yang & Raine, 2009), but has not been associated with inconsistent handedness. Furthermore, cortical thinning has been observed in psychopathic versus non-psychopathic inmates (Ly et al., 2012) but Li et al. (2015) observed greater cortical thickness in the same vicinity for non-right handers (left and inconsistent). Despite some fairly obvious and major differences between pathological psychopaths and inconsistent handers enough similarities have been reported for us to hypothesize that inconsistent handers will show higher psychopathic tendencies than consistent handers.

Participants. 342 Stockton University Introduction to Psychology students (Age $M = 19.3$, $SD = 2.3$; 241 Females, Mean Age = 19.2; 97 Males, Mean Age = 19.6; 4 gender unknown) participated for extra or required credit in their course. This population was especially chosen for its inherent diversity in major and background, as this course is required by a variety of social science, natural science, and health science majors. These participants are also similar in their limited knowledge of psychological concepts because Introduction to Psychology is a required prerequisite for all other psychology courses. All other populations were excluded from participation. These data were collected across three semesters and four, large section introductory psychology courses.

Instructions were typed on a separate piece of paper as follows:

Thank you for agreeing to participate in this study. We are currently collecting information on personality characteristics. You are being asked to complete the two accompanying questionnaires. There are no right or wrong answers on either questionnaire. There is no risk to your participation and we thank you for your time. Your decision of whether or not to participate in this study will have no bearing on your current or future standing with the researchers, the Psychology program, or the Richard Stockton College of New Jersey [Stockton University for data collected during Spring, 2015 semester]. All information obtained through this study will remain confidential in a locked area and will be destroyed within 5 years.

Short Dark Triad (SD3; Jones & Paulhus, 2014). This measure was administered by paper, and titled SHORT Personality Personality Characteristics but was otherwise identical to the SD3. It consisted of 27 typed items corresponding to three subscales (nine questions per): narcissism, Machiavellianism, and psychopathy. The SD3 psychopathy scale included three

items that reflect the antisocial facet (disregard for law or consequences), two items reflecting the lifestyle facet (need for stimulation and impulsivity/irresponsibility), three reflecting affective facet (mainly callousness and emotional shallowness), and one item that refl

176, right-sided n = 164, left-sided n = 13), and inconsistent handers scored 75 (n = 166, right-sided n = 140, left-sided n = 25). The EHI score of 80 (which was also our observed EHI median score) is the population median and is also the most commonly used and the recommended method of dividing consistent from inconsistent handers by Prichard, Propper, and Christman (2013

there were more consistent than inconsistent handers in the Q1, Q2, and Q3, but more inconsistent than consistent handers in the Q4.

To test for significant differences in handedness between psychopathy groups, a one-way analysis of variance (ANOVA), using the four psychopathy groups as a factor and handedness scores (absolute value) as a dependent measure revealed a barely significant effect, $F(3, 338) = 2.56$, $p = .055$, $\eta^2_p = .02$. Simple contrasts con

groups (Q1 + Q2) and the combined two highest groups (Q3 + Q4), $t(338) < 1$. Taken together, these analyses indicate that only the highest quartile of psychopathy includes more inconsistent than consistent handedness, where inconsistent handedness is more likely to be observed at the highest level of psychopathy than consistent handedness. Lower and moderate levels of psychopathy do not appear to be associated with handedness (Figure 2).

Gender. Secondary analyses were conducted on gender because there have been several reports where males show significantly higher psychopathy than females in normal (Levenson, Kiehl, & Fitzpatrick, 1995; Wilson, Frick, & Clements, 1999) and clinical (Cale & Lilienfeld, 2002) populations. Also, while males are equally likely to be consistent or inconsistent handed, females are more likely to show consistent handedness, and males are more likely than females to show inconsistent handedness (Prichard et al., 2013). We wondered whether the observed effect of handedness consistency could potentially be due to more males than females in the high psychopathy group, and whether there was a gender \times handedness interaction. To test whether the number of males and females differed within each psychopathy group, Psychopathy Group (Q1, Q2, Q3, and Q4) and Gender (M, F) were submitted to a chi-square test for independence, $\chi^2(3, n = 338) = 11.09, p = .01$. There was a higher frequency of females in each group, due to the many more females in the study, and so we report the percentages because they are more informative. For Q1, 18% were male (82% female); for Q2, 25% were male (75% female); for Q3, 29% were male (71% female); and for Q4, 44% were male (56% female). These percentages suggest a much higher

for Q4, where the number of males increased from previous quadrants and the number of females decreased from previous quadrants. Additional chi squares were calculated to test for a relationship between the number of males and females in each psychopathy group by handedness consistency. Among inconsistent handers, gender was related to psychopathy, $\chi^2(3, n = 338) = 10.1, p = .02$, but this was not significant for consistent handers, $\chi^2(3, n = 338) = 10.1, p = .02$. This pattern for inconsistent handers was similar to the overall gender \times psychopathy chi-square, confirming that inconsistent handed males comprise an increasing percentage of each psychopathy group (13% in Q1, 32% in Q2, 39% in Q3, and 51% in Q4). Thus, for inconsistent handers only, the highest psychopathy quartile is split between males and females, but females comprise the much larger percentage of Q1, Q2, and Q3. As such, to determine whether psychopathy scores depended on gender and handedness, psychopathy scores were submitted to a 2 (Handedness: Consistent, Inconsistent) \times 2 (Gender: Female, Male) univariate ANOVA. There were small main effects of handedness, $F(1, 334) = 5.3, p = .02, \eta^2_p = .02$ (M reported, above); and of gender, $F(1, 334) = 10.6, p = .001, \eta^2_p = .04$, where males ($M = 2.37, SE = .66$) had significantly higher psychopathy scores than females (M

the top psychopathy group showed significantly more inconsistent than consistent handedness, neither these findings nor previous research warrants the conclusion that inconsistent handers are psychopaths (successful or unsuccessful) or serial killers. We also strongly caution against the suggestion that inconsistent handers have a propensity towards psychopathy. Rather, because handedness was used here as a quasi-experimental variable, it is more reasonable to conclude that the similarity between inconsistent

entirely if the population from which this sample was drawn was from a different school where there is a pervasive cultural expectation for graduates to become leaders of industry or other professional fields. Moreover, even though the estimated 2 million (or 5 million, today) psychopaths in N. America is a lot of people, high psychopathy is actually somewhat rare.

- Bartha, L., Brenneis, C., Schocke, M., Trinka, E., Köylü, B., Trieb, T., & Benke, T. (2003). Medial temporal lobe activation during semantic language processing: fMRI findings in healthy left- and right-handers. *Cognitive Brain Research* 17(2), 339–346.
- Beratis, I. N., Rabavilas, A. D., Papadimitriou, G. N., & Papageorgiou, C. (2011). Eysenck's model of personality and psychopathological components in right- and left-handers. *Personality and Individual Differences* 50(8), 1267–1272.
- Blair, K. S., Richell, R. A., Mitchell, D. G. V., Leonard, A., Morton, J., & Blair, R. J. R. (2006). They know the words, but not the music: Affective and semantic priming in individuals with psychopathy. *Biological Psychology* 73(2), 114–123.
- Bloom, J. S., & Hynd, G. W. (2005). The role of the corpus callosum in interhemispheric transfer of information: Excitation or inhibition? *Neuropsychology Review* 15(2), 59–71.
- Boccardi, M., Frisoni, G. B., Hare, R. D., Cavado, E., Najt, P., Pievani, M., & Tiihonen, J. (2011). Cortex and amygdala morphology in psychopathy. *Psychiatry Research: Neuroimaging* 193

- Christman, S. D., Propper, R. E., & Dion, A. (2004). Increased interhemispheric interaction is associated with decreased false memories in a verbal converging semantic associates paradigm. *Brain and Cognition*, *56*, 313–319.
- Cleckley, H. (1988). *The mask of sanity* (5th ed.). Augusta, GA: Emily S. Cleckley (Original work published 1941).
- Coid, J., Yang, M., Ullrich, S., Roberts, A., & Hare, R. D. (2009). Prevalence and correlates of psychopathic traits in the household population of Great Britain. *International Journal of Law and Psychiatry*, *32*(2), 65–73.
- Cooke, D. J., & Michie, C. (1999). Psychopathy across cultures: North America and Scotland compared. *Journal of Abnormal Psychology*, *108*(1), 58–68.
- Cooper, B. S., Hervé, H., & Yuille, J. C. (2007). Psychopathy and memory for violence. *International Journal of Forensic Mental Health*, *12*(2), 123–135.
- Day, R., & Wong, S. (1996). Anomalous perceptual asymmetries for negative emotional stimuli in the psychopath. *Journal of Abnormal Psychology*, *105*(4), 648–652.
- Downhill, J. E., Buchsbaum, M. S., Wei, T., Spiegel-Cohen, J., Hazlett, E. A., Haznedar, M. M., ... Siever, L. J. (2000). Shape and size of the corpus callosum in schizophrenia and schizotypal personality disorder. *Schizophrenia Research*, *42*(3), 193–208.
- Dutton, K. (2012). *The wisdom of psychopaths: What saints, spies, and serial killers can teach us about success*. New York, NY: Macmillan.
- Edlin, J. M., Leppanen, M. L., Fain, R. J., Hackländer, R. P., Hanaver-Torrez, S. D., & Lyle, K. B. (2015). On the use (and misuse?) of the Edinburgh Handedness Inventory. *Brain and Cognition*, *94*, 44–51.
- Fazio, R., Coenen, C., & Denney, R. L. (2012). The original instructions for the Edinburgh Handedness Inventory are misunderstood by a majority of participants. *Laterality: Asymmetries of Body, Brain and Cognition*, *17*(1), 70–77.
- Gao, Y., & Raine, A. (2010). Successful and unsuccessful psychopaths: A neurobiological model. *Behavioral Sciences & the Law*, *28*(2), 194–210.
- Grimshaw, G. M., & Kranz, L. (2015). Hemispheric asymmetries in schizotypy. In O. Mason & G. Claridge (Eds.), *Schizotypy: New dimensions* (pp. 62–80). New York: Routledge.
- Habib, M., Gayraud, D., Oliva, A., Regis, J., Salamon, G., & Khalil, R. (1991). Effects of handedness and sex on the morphology of the corpus callosum: A study with brain magnetic resonance imaging. *Brain and Cognition*, *16*(1), 41–61.
- Hare, R. D. (1996). Psychopathy a clinical construct whose time has come. *Criminal Justice and Behavior*, *23*(1), 25–54.
- Hare, R. D. (1999). *Without conscience: The disturbing world of the psychopaths among us*. New York, NY: Guilford Press.
- Hare, R. D. (2003). *Manual for the revised psychopathy checklist* (2nd ed.). Toronto, ON, Canada: Multi-Health Systems.
- Hare, R. D., & McPherson, L. M. (1984). Psychopathy and perceptual asymmetry during verbal dichotic listening. *Journal of Abnormal Psychology*, *93*(2), 141–149.
- Herpers, P., Scheepers, F. E., Bons, D., Buitelaar, J. K., & Rommelse, N. N. (2014). The cognitive and neural correlates of psychopathy and especially callous–unemotional traits in youths: A systematic review of the evidence. *Development and Psychopathology*, *26*(01), 245–273.
- Hirstein, M., & Hugdahl, K. (2014). Excess of non-right-handedness in schizophrenia: Meta-analysis of gender effects and potential biases in handedness assessment. *British Journal of Psychiatry*, *205*, 260–267.

- Hodson, G., Hogg, S. M., & MacInnis, C. C. (2009). The role of “dark personalities” (narcissism, Machiavellianism, psychopathy), Big Five personality factors, and ideology in explaining prejudice. *Journal of Research in Personality*, *43*(4), 686–690.
- Holmes, S. T., & Holmes, R. M. (2008). *Sex crimes: Patterns and behavior*. Thousand Oaks, CA: Sage.
- van der Hoorn, A., Oldehinkel, A. J., Ormel, J., Bruggeman, R., Uiterwaal, C. S., & Burger, H. (2010). Non-right-handedness and mental health problems among adolescents from the general population: The Trails Study. *Laterality: Asymmetries of Body, Brain and Cognition*, *15*(3), 304–316.
- Hopper, K. D., Patel, S., Cann, T. S., Wilcox, T., & Schaeffer, J. M. (1994). The relationship of age, gender, handedness, and sidedness to the size of the corpus callosum. *Academic Radiology*, *1*(3), 243–248.
- Johnston, D. W., Nicholls, M. E., Shah, M., & Shields, M. A. (2009). Nature’s experiment? Handedness and early childhood development. *Demography*, *46*(2), 281–301.
- Jakobwitz, S., & Egan, V. (2006). The dark triad and normal personality traits. *Personality and Individual Differences*, *40*(2), 331–339.
- Jones, D. N., & Paulhus, D. L. (2014). Introducing the short dark triad (SD3) a brief measure of dark personality traits. *Assessment*, *21*(1), 28–41.
- Jörgens, S., Kleiser, R., Indefrey, P., & Seitz, R. J. (2007). Handedness and functional MRI-activation patterns in sentence processing. *Neuroreport*, *18*(13), 1339–1343.
- Keshavan, M. S., Diwadkar, V. A., Harenski, K., Rosenberg, D. R., Sweeney, J. A., & Pettegrew, J. W. (2002). Abnormalities of the corpus callosum in first episode, treatment naive schizophrenia. *Journal of Neurology, Neurosurgery & Psychiatry*, *73*(6), 757–760.
- Knecht, S., Dräger, B., Deppe, M., Bobe, L., Lohmann, H., Flöel, A., & Henningsen, H. (2000). Handedness and hemispheric language dominance in healthy humans. *Brain*, *123*(12), 2512–2518.

- Rose, J. P., Jasper, J. D., & Corser, R. (2012). Interhemispheric interaction and egocentrism: The role of handedness in social comparative judgement. *British Journal of Social Psychology*, *51*(1), 111–129.
- Salekin, R. T., Neumann, C. S., Leistico, A. M. R., & Zalot, A. A. (2004). Psychopathy in youth and intelligence: An investigation of Cleckley's hypothesis. *Journal of Clinical Child and Adolescent Psychology*, *33*(4), 731–742.
- Schmidt, S. L., Schmidt, G. J., Carvalho, A. L. N., & Carvalho, A. L. N. (2013). The effects of hand preference on attention. *Psychology*, *4*(10), 29–33.
- Schmitt, W. A., & Newman, J. P. (1999). Are all psychopathic individuals low-anxious? *Journal of Abnormal Psychology*, *108*(2), 353–358.
- Shobe, E. R., Ross, N. M., & Fleck, J. I. (2009). Influence of handedness and bilateral eye movements on creativity. *Brain and Cognition*, *71*, 204–214.
- Somers, M., Sommer, I. E., Boks, M. P., & Kahn, R. S. (2009). Hand-preferences and population schizotypy: A meta-analysis. *Schizophrenia Research*, *108*, 32 doi:10.1016/j.schres.2008.11.010
- Sommer, I., Ramsey, N., Kahn, R., Aleman, A., & Bouma, A. (2001). Handedness, language lateralisation and anatomical asymmetry in schizophrenia meta-analysis. *The British Journal of Psychiatry*, *178*(4), 344–351. <http://dx.doi.org/10.1192/bjp.178.4.344>.
- Spaniel, F., Tintera, J., Hajek, T., Horacek, J., Dezortova, M., Hajek, M., ... Höschl, C. (2007). Language lateralization in monozygotic twins discordant and concordant for schizo-