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## Personality and Individual Differences

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## Correspondence

**Reply to technical comment on Jonason, P. K., & Luoto, S. (2021). The dark side of the rainbow: Homosexuals and bisexuals have higher Dark Triad traits than heterosexuals. *Personality and Individual Differences*, 181, 111040**

## ARTICLE INFO

## Keywords

Sexual orientation  
Homosexuality  
Bisexuality  
Dark Triad  
Personality  
Life history  
Individual differences

## ABSTRACT

We thank Sharpe and colleagues for the opportunity to discuss our article titled “The dark side of the rainbow: Homosexuals and bisexuals have higher Dark Triad traits than heterosexuals” in more detail. Here, we address the methodological concerns raised by Sharpe et al. and conclude by discussing our critics’ suggestion that the findings on Dark Triad traits can reinforce negative stereotypes about nonheterosexual people. As scientists, we avoid moralizing on such topics, instead openly reporting the results of our research, even hypothesizing that elevated Dark Triad traits in nonheterosexual individuals might constitute an adaptive response or a predictive adaptive response to environmental harshness, whether such harshness may be experienced prenatally, in adolescence, or in adulthood. We further wish to reject and distance ourselves from any prejudiced views of homosexuality. The suggestion to *avoid* the term “homosexuality” is in itself prejudiced and in stark opposition to the liberation and empowerment of people with same-sex sexual attractions. We encourage other sex researchers to continue using the term “homosexual” as a purely descriptive scientific term which carries no moral implications, and the relevant communities and organizations to accept its continued use in science alongside other sexual orientation categories.

The “dichotomianic” suggestion that all findings with  $p > .05$  should be ignored reflects an outdated way of thinking about statistical significance—a blind worship of the  $p < .05$  altar. Statisticians have criticized it by stating that “[f]or the integrity of scientific publishing and research dissemination [...], whether a  $p$ -value passes any arbitrary threshold should not be considered at all when deciding which results to present or highlight” (Wasserstein et al., 2019). We followed good scientific practice by openly reporting results, accepting uncertainty, highlighting limitations, and being thoughtful about the wider context of the findings (Jonason & Luoto, 2021; cf. Wasserstein et al., 2019). Small effect sizes can be informative, practically meaningful, and theoretically consistent in the multivariate context of human life history, personality, and sexual orientation (Luoto et al., 2019a, 2019b).

Sharpe et al. criticized the *Dirty Dozen* measure, which is used extensively and with sufficient validity in the eyes of researchers around the world (Rogoza et al., 2021)—despite the insistence by a minority that because the scales do not cover the full space of the parent measures, they are not valid. This criticism assumes that the parent measures were good instruments to start with; that they are not bloated specific; that they do not contain downstream content; that brief measures must retain all content from the parent measures to be useful; and that some diminished coverage makes all findings worthless or untrustworthy. The use of good measures is preferred, but it does not *ipso facto* follow that using the *Dirty Dozen* comprises a fundamental flaw. A broader understanding of sexual orientation research reveals that our findings are neither out of line nor revolutionary (Jonason & Luoto, 2021; Luoto et al., 2019a, 2019b).

Snowball sampling has its shortcomings. Yet our data came from 42 countries, with participants responding in several different languages,

mitigating concerns that might arise from a sampling protocol that focused only on one country and one language. The geographical, cultural, and linguistic distance between the participants circumvents most problems associated with snowball sampling.

We adopted a natural groups design—a common correlational method—which is unlikely to ensure equal sample sizes across sexual orientation groups. Our sex-aggregated results have sample sizes common in personality research for the smallest groups, yielding non-negligible effect sizes and  $p$ -values. We do lose some power in within-sex analyses yet continue to find effects (Jonason & Luoto, 2021). Our natural groups design may have the advantage of better approximating the population. Our sample is more likely than those collected via targeted sampling approaches to reflect the rates of sexual orientations in the population, and therefore makes our study more ecologically valid. Given that nonheterosexuality is a relatively rare phenomenon (typically less than 10% of the population), focused sampling of homosexuals and bisexuals would require (1) placing an unnecessary cap on collection of heterosexual participants and/or (2) engage in targeted sampling of nonheterosexuals which is likely to make group comparisons confounded. Sharpe and colleagues claimed that because we had small nonheterosexual groups, participants in those groups are not representative of the groups. Nevertheless, the cross-national nature of our data minimizes much of these concerns and makes our paper a standout contribution in the fields of Dark Triad and sexual orientation research (Jonason & Luoto, 2021), paving the way for future research.

There is a broad literature suggesting that individual differences along the sexual orientation spectrum have strong biological underpinnings, many of which exert their influence on the developing organism prenatally. Sexual orientation *itself* is generally thought to be

<https://doi.org/10.1016/j.paid.2021.111435>

Received 15 September 2021; Received in revised form 24 September 2021; Accepted 25 November 2021

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calibrated via prenatal neurodevelopmental processes, highlighting the importance of biological underpinnings for the development of sexual preferences and possibly the personality traits and other traits that covary with sexual orientation (Luoto et al., 2019a, 2019b; Swift-Gallant et al., 2019). Yet we do not exclude the possibility that social experiences may cause an elevated expression of Dark Triad traits in some homosexual and/or bisexual individuals. It is also possible that such potentially adaptive responses to environmental stressors are calibrated during prenatal development (Luoto et al., 2019a; Swift-Gallant et al., 2019) rather than via experiences of discrimination in adolescence or adulthood.

The Dark Triad traits can be highly adaptive in many contemporary societies (as we noted), and findings on group differences in personality do not carry any moral implications. Even the APA guidelines cited by Sharpe et al. recommend acknowledging relevant differences that exist between different groups. Sharpe et al. further asserted that the term “homosexuality” should be avoided because it is purportedly associated with “negative stereotypes and pathology”. To us and to many other sex researchers, “homosexuality” is simply a scientific term that describes natural variation in sexual orientation. As such, the term is used ubiquitously in the sexual orientation literature, without being associated with negative stereotypes or pathology. We therefore stand by the use of the term “homosexual” alongside other sexual orientation categories such as “bisexual”, “heterosexual”, and “mostly heterosexual”. We encourage other sex researchers to do the same, all the while rejecting any prejudiced views of homosexuality.

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