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## A Response to Cimpian and Timmer (2020): Limitations and Misrepresentation of “Mischievous Responders” in LGBT+ Health Research

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Recent literature has seen the emergence of a critical new practice in population-level health analysis: screening for “mischievous responders” (respondents who may deliberately falsify information on health surveys as a joke or prank) to ensure the highest quality datasets for use in analyses (Cimpian et al., 2018; Fish & Russell, 2018; Robinson-Cimpian, 2014). Credit is certainly due to Cimpian and Timmer for advancing this discourse, and for proposing a novel model for this work which seeks to ensure reliable and valid data on the health of sexual minority youth (SMY) (Cimpian & Timmer, 2020). Although we agree wholeheartedly with the need to ensure accurate, representative, and honest data in research, we worry that the model proposed by Cimpian and Timmer has been unfortunately misrepresented, insufficiently validated, and at times sensationalized. Consequently, we believe the strength of the approach itself and its implications for health disparities research have been overstated. As SMY health disparities researchers ourselves who have published with Cimpian on the topics of mischievous responders (GP, MB) we feel it is necessary to point to some assumptions and limitations with their proposed model, and integrate some much-needed nuance and judicious caution into the conversation. In particular, we wish to emphasize four distinct points:

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1. Critical health disparities exist among sexual and gender minority youth (SGMY) populations as compared to their cisgender, heterosexual counterparts; methods such as Cimpian and Timmer’s risk erasing these disparities. Although some evidence has shown that youth may misreport data (including sexual minority status) because they think it is “funny,” research must be careful not to conflate SGM identity with “mischievousness.”
2. Identifying and removing mischievous responders is not a panacea for addressing concerns of inaccurate data, more broadly conceived. However, solely focusing on this approach overlooks other potential explanations for data inaccuracies, particularly given the lack of empirical evidence of the scope of this problem across datasets, or even the extent to which it is present in any given dataset.
3. The approach put forth by Cimpian and Timmer relies on sensationalist and misleading rhetoric to spur uptake. As scientists and as allies of SGMY, we owe it to ourselves and the populations we study to be mindful of how our statements and conclusions will be interpreted and can influence policies and the public discourse.
4. Much additional work is needed to evaluate any approach to identifying and removing mischievous responders within population-level datasets, and to be clear on any potential bias in the approach. We make suggestions here for what work will be required in order to validate this methodology.

## **1. Models using extreme responses as a basis on which to identify inaccurate responders carry a risk of conflating SGMY with mischievous responders**

Cimpian and Timmer’s method (2020) utilized a “screener” —a checklist of sorts composed of items to identify mischievous responders—for example, checking a participant’s pattern of offering extreme responses to a set of questions purportedly unrelated to sexual orientation, including asthma diagnosis, carrot intake, height, pregnancy, carrying a gun to school, and dentist visits (Cimpian et al., 2018). Based on responses to the screener, a “mischievousness index” is constructed, which serves as an estimate of the likelihood that an individual’s responses have been falsified. Using this method, respondents who score above a given threshold on the mischievousness index can be eliminated from the data—in theory then removing bias attributed to mischievous responders and allowing for more accurate analysis of a dataset.

An absolute wealth of research at both the population level (Branstrom, Hatzenbuehler, & Pachankis, 2016; Corliss, Rosario, Wypij, Fisher, & Austin, 2008; Duncan et al., 2018; Fredriksen-Goldsen, Kim, & Barkan, 2012) and within smaller research settings (Charlton et al., 2019; Marshal et al., 2012) has identified disparities in health outcomes for sexual minority youth across a number of critical domains, from sexual risk (Finneran & Stephenson, 2014; Rasberry et al., 2018) and healthcare access (Hafeez, Zeshan, Tahir, Jahan, & Naveed, 2017; McKirnan, Du Bois, Alvy, & Jones, 2013; Trinh, 2017) to inequities

in chronic health conditions (Clark et al., 2015; Hatzenbuehler, McLaughlin, & Slopen, 2013; Rosario et al., 2016). Therefore, one of our primary concerns with this approach is that screeners reliant on using patterns of extreme responses to identify inaccurate (or mischievous) responders carry a risk of conflating sexual and gender minority youth (SGMY) with mischievous responders. Given that this large and ever-growing body of research—triangulated across settings (schools, in-home, medical settings), scope (from local to national levels), and methodology (quantitative and qualitative)—identifies robust health disparities across a number of critical domains, SGMY's accurate survey responses are more likely to be "extreme" on some items than their heterosexual, cisgender peers. Depending on the items selected for a screener, they would be more likely to be flagged, especially those who may face greater adversities (e.g., discrimination, stigma) known to underlie health risks.

With this potential bias in mind, it would be imperative for any screener applied to the study of health disparities between SMY and heterosexual peers to (1) appropriately identify response items indicative of "mischievousness" and (2) ensure that the items selected to create the mischievousness index were not independently associated with sexual identity (which can vary by specific sexual minority population). The screener proposed by Cimpian and Timmer (2020) has relied on assumptions contrary to existing empirical evidence. In one example, items such as pregnancy, carrying a gun to school, and asthma were included within a mischievous responder screener, despite the fact that each of these health outcomes or behaviors is independently associated with sexual minority status among youth (Charlton et al., 2018; Curry et al. 2020; Goldberg, Reese, & Halpern, 2016; Goodenow, Watson, Adjei, Homma, & Saewyc, 2016). In this case, even if researchers were to consider a pattern of extreme responses on multiple items, versus an extreme response on only one item, there is a risk of bias in disproportionately excluding SGMY relative to heterosexual cisgender youth.

Although Cimpian and Timmer (2020) present their screener as an impartial, objective approach to identify mischievous responders, bias is inevitable and should be acknowledged. First, bias may be introduced on account of which items researchers select for the screener. This is further complicated by the fact that the screening approach proposed by Cimpian and Timmer cannot be standardized: not all population health surveys include the same items. It may work well in some datasets, but may actually compromise the validity of the data in others. Other screening approaches may be better suited for universal application, which we note later. Second, bias may be introduced in determining any arbitrary threshold used to exclude or retain participants. Ultimately, it is important that researchers not project a false level of assurance of their objectivity or the increased validity of their data without fully evaluating the biases and limitations of the screener and the screening process itself. Moreover, the "cutoff" at which potentially mischievous responders are to be removed from the dataset is arbitrarily selected and has no clear justification. In one publication, 10–20% of all data were removed before significant changes in the magnitude of disparities were observed (Cimpian et al., 2018). While an interesting experiment, this does not provide meaningful or evidence-based guidance for the removal of potentially mischievous responses. Not only are the potential consequences of the biases described above

significantly magnified when removing such large percentages of study data, but the deletion of a substantial proportion of data is likely untenable in smaller observational studies.

Prior work, including by Cimpian and by one of this Letter's authors, has successfully applied approaches to identifying and removing mischievous responders within datasets using the screening method, but avoiding items associated with sexual minority status. This is a necessary approach if we are to ensure that the removal of mischievous responders does not lead to an underestimation of disparities between SGMY and their cisgender, heterosexual peers (Fish & Russell, 2018). Without rigorously testing whether or not all items selected for the screener are independently associated with having a sexual minority identity, it is impossible to know whether dropping those with high likelihood to be "mischievous" is, in fact, the same as removing sexual minorities from the dataset. As it stands, this is a fatal flaw of Cimpian and Timmer's (2020) approach.

## 2. Mischievous responding is not the only explanation

Fundamentally, we cannot know the rationale behind an individual's responses to a survey without directly talking to them (Smith, Roster, Golden, & Albaum, 2016). To the best of our knowledge, extant literature on mischievous responding has relied solely on investigator-developed assumptions and not on direct empirical evidence. Though some investigator assumptions are certainly reasonable, they remain, without confirmation from the survey subjects, assumptions. There are inherent challenges with asking a potentially mischievous responder about their motivation for selecting certain response options; it is nonetheless the only method to show that an individual is responding inaccurately with the intention to be "funny." The interpretations made by Cimpian and Timmer (2020) imply that responses are indeed intended as pranks, and further imply that these respondents are "willfully misleading" researchers by providing inaccurate data (Cimpian et al., 2018). This interpretation goes beyond what can be stated based on the available data. Such assertions about a participant's motivation cannot be made responsibly without interviewing respondents to determine their motivation.

Further, this assumption reinforces negative stereotypes about adolescents, namely, that they are untrustworthy, unreliable, and, of course, "mischievous." Speaking as researchers devoted to improving the health of youth and adolescents, we find this narrative somewhat troubling in how it positions researchers over participants and shapes the research process. We are not naïve to the fact that some respondents do complete these surveys with "mischievous" intent. Nevertheless, the proposed screener raises unsettling questions in its use:

- a. Should we approach participants with the expectation that they must first "prove" that their responses on certain items—items which were of genuine interest to researchers and whose response options all were considered legitimate when constructing the survey—are sufficiently "within reason" for them to be retained (which, in the case of Cimpian and Timmer's (2020) screener, essentially equates to responses that are not "too far" above average)?

- b. On what grounds do we decide that participants who report one or two extremes are allowed to be represented, but “too many” (as to be determined by the researchers) must be evidence of them lying? This gives us reason for pause. As we note in a later point, other screening approaches are better suited to identify inaccurate responders (including mischievous responders) than the approach proposed by Cimpian and Timmer (2020).

More concretely, the “mischievous responders” literature fails to account for a plethora of other potential explanations for extreme or atypical responses. These include: (1) poor or confusing survey design (Kalton & Schuman, 1982; Sullivan & Artino, 2017), (2) items written for a level of literacy inappropriate for the population considered or without regard to English language learners (Hahn et al., 2007; Randall, McNeil, Crout, Weyant, & Marazita, 2013), (3) social desirability bias (Brenner & DeLamater, 2014; Nederhof, 1985), (4) survey fatigue (Egleston, Miller, & Meropol, 2011; Porter, Whitcomb, & Weitzer, 2004), (5) survey straightlining (Kaminska, McCutcheon, & Billiet, 2010), and (6) data entry/cleaning errors (Barchard & Pace, 2011; Van den Broeck, Cunningham, Eeckels, & Herbst, 2005), among others. Each of these could individually, or in combination, substantially impact the quality of data collected and reported due to no fault or intention of the individual completing the survey. Thus, the label “mischievous responders” is presumptuous and fails to allow room for any researcher accountability in the survey design/administration process if confusing results do emerge. This further calls into question the dubiousness of the term “mischievous responder” itself (see our suggestions for more appropriate terminology below).

### 3. Sensationalism is irresponsible and misleading

The work led by Cimpian and Timmer (2020), and others, to test the possibility that mischievous responding may be biasing health disparities research is important. To us, as researchers of health disparities ourselves, it is also exciting and represents a potentially highly valuable contribution to our field. However, it is incumbent upon us as scientists and as allies of SGMY to be thoughtful, critical, and cautious in how we present and discuss our findings among colleagues and the general public. To date, the narrative surrounding Cimpian’s work has tended to prioritize a simplistic narrative which overstates the objectivity and certainty associated with the screener, to the detriment of his work and ours.

In 2018, after the publication of a paper on mischievous responders in the Youth Risk Behavior Survey (YRBS) in the *American Journal of Public Health*, Cimpian and Timmer’s work received national attention in the popular media. With catchy headlines, including “Teens Prank Health Surveys but Researchers Fight Back” (Jordan, 2018) and “These Teenage Trolls are Pretending to be LGBT and Screwing Up Scientific Studies” (Allen, 2018), news outlets have used the study and its subsequent press releases to imply that sexual minority health disparities have been exaggerated and that teens are intentionally trying to interfere with data collection—neither of these claims can be proven based on the 2018 publication. Although it is expected that media sources will simplify study results in order to better communicate them to a mass audience, studies on mischievous responders especially have had their results overstated and sensationalized. To quote an article from *The Daily Beast*, “The allure of depicting yourself as a 10,000-foot-tall, carrot-chomping, gay

cocaine addict may, for some youth, be too great to resist” (Allen, 2018). This type of coverage has real consequences: not only does it unjustly undermine the credibility of all research undertaken with teenagers, but also the integrity of health disparities research as a whole among the general public.

The sensationalistic language used in reference to the mischievous responders literature has resulted in multiple news articles which have implied that SMY do not experience health disparities in critical areas including substance use, (Allen, 2018; Jordan, 2018) and lack the nuance to be able to explain the extreme limitations and infancy of this work, which may lead people to the dangerous conclusion that all SGM health disparities research is inaccurate to the point of being untrustworthy. In a social and political climate where SGM rights are being challenged, it is critical that we defend and advance health equity practices. We must be cautious not to overstate the implications or the meanings of our research. On the one hand, researchers are not solely responsible for how popular media represents their work. Still, when we see our work misrepresented, we have an ethical duty to our profession and our participants to correct the narrative. In this respect, we hope to see a stronger and more adamant response moving forward.

#### **4. The “mischievous responder” screener proposed by Cimpian and Timmer has been insufficiently evaluated, and other approaches may be simpler and better**

Any approach to identify mischievous responders must be evaluated and supported based on clear evidence of its utility. Despite notable and critical gaps in this work so far, we emphasize that it is by no means unsalvageable or not worthwhile. Rather, we encourage several actionable strategies to help support its value and impact.

First and foremost, we advocate for a change in terminology from “mischievous responders” to “inaccurate responders.” This is not only a less stigmatizing turn of phrase, it is a more accurate one, and encompasses potential discrepancies in datasets as a result of any number of factors as described above, inclusive of “pranksters.” Labeling such issues as being the fault of pranksters alone is irresponsible and, in all likelihood, inaccurate.

Work in this field is clear that disparities in health outcomes between SGMY and cisgender or heterosexual youth persist; they persist even when potentially inaccurate responses are identified and removed. We recognize the desire to identify smaller-magnitude disparities between groups, in that this might suggest that decades of efforts among interventionists and by youth themselves are resulting in encouraging progress. Solutions to eliminating these health disparities include the creation and implementation of appropriate interventions and the re-orientation of social norms and structures to eliminate the homophobia, biphobia, transphobia, and other forms of discrimination which create these disparities—a point that remains whether or not the identification and removal of mischievous responders attenuate SGM-related disparities among youth. These efforts must be based on accurate data, and for this we support aspiration of Cimpian and Timmer (2020) while raising our points of caution.



Third, this work must be appropriately attenuated to the complexities and nuances of large population datasets. There is no simple or easy solution to data cleaning in this regard. Although a straightforward screening tool is an extraordinarily attractive measure, it presents serious flaws in the ability to validate it against the perspectives of respondents themselves. In addition to the steps described above to ensure that screening items do not conflate mischievousness with SGM status, researchers should also consider differences in survey administration that may impact the data. For example, home-based surveys, such as Add Health, may have lower levels of “mischievous” or inaccurate responders than school-based surveys like the YRBS (Fish & Russell, 2018). Applying a universal screening method, therefore, may more greatly impact the validity of data in home-based surveys, imploring us to take into consideration the complexities of survey design and administration when designing data cleaning methodologies as opposed to making broad assumptions or recommendations.

The screener proposed by Cimpian and Timmer (2020) should be evaluated and compared to other screeners already in use. Identifying smaller-magnitude disparities after removing a group of participants vis-à-vis their screener is not itself evidence that the screener is valid or effective. This would rely on the assumption that smaller-magnitude or more conservative differences are indeed more accurate reflections of reality.

In the end, simpler screeners could be more accurate, applied more easily, and be less prone to bias than Cimpian and Timmer’s (2020). For instance, some surveys include “attention checks” that instruct participants to select a specific response option (e.g., “please mark B for this item”) or ask them to select the correct response to a basic addition question (e.g.,  $2 + 2 = ?$  (a) 100 (b) 50,000,000, (c) 4, or (d)  $-36$ ). Unlike Cimpian and Timmer’s composite use of otherwise legitimate items whose response options are all also legitimate, there is a single and clearly correct response for these items; they are otherwise of no interest to health researchers and they should be uncorrelated with participants’ sexual orientation or gender identity. The burden remains on Cimpian and Timmer, in proposing a different screening approach, to show that theirs is superior or carries added value.

Would Cimpian and Timmer’s (2020) screener flag the same participants as these simpler existing screeners? If so, then these other approaches are far easier to integrate into surveys, do not introduce heightened concerns of bias on the part of the researcher, and would be relatively undisputed in justifying removal of participants from the dataset. If not, we must carefully evaluate what differentiates the individuals who are flagged by Cimpian and Timmer’s screener but not by these other screeners. To justify its use, we must have a higher level of confidence than given so far that their screener has in fact identified additional inaccurate responders as opposed to “false positives.”

Moreover, it is incumbent upon us as researchers to consider all possible explanations for the patterns observed within our data, and to inject discussion of our results with such appropriate care. There is a long history of bias within science—from the values we hold that shape our questions, the methods we apply in the process or testing them, to the interpretations we make of our findings—to which none of us, as individuals, are immune (Ashley, 2019). We therefore have the obligation to seek out and critique alternative

explanations, and to ensure our interpretations of findings are appropriately grounded in relevant literature. In particular, we would suggest that this work would benefit from rigorous qualitative study to test alternative explanations as described above.

Finally, and relatedly, we must present and discuss this work with appropriate care and nuance. We cannot blind ourselves to the political realities which take place outside of our research labs. It is readily apparent that SGMY still face significant challenges to health and wellbeing (Cochran & Mays, 2017; Hafeez et al., 2017; Shumer, Harris, & Opiari, 2016). The work we do, in identifying and discussing these challenges and the disparities in health outcomes they create, has the potential to help or hurt the cause of health equity for all, including vulnerable SGMY. This is even more true as this work will undoubtedly extend to and have serious implications for gender minority youth—a notably vulnerable group against whom harmful policy is in various stages of implementation across the United States (Karasic, 2016) or when we discuss racial/ethnic minority, poor, unhoused, unsupported, or otherwise notably marginalized SGMY. Misleading rhetoric regarding the nature of disparities in health outcomes is dangerous in this (or in any) context, and it is our responsibility to leverage our positions as health researchers to ensure our work is presented with care and consideration for the human lives which give us the data we write about.

In summary, we wish to reiterate our excitement at the potential this work has, and to urge serious caution in its application until appropriate testing, validation, and replication activities have been carried out. In particular, we encourage our fellow health disparities researchers to exercise serious care in their discussions with popular media, to ensure that this work, while still in its infancy, is not misrepresented in a way that creates additional danger for already vulnerable groups such as SGMY.

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