Reliability and Validity of Self-Reported Stress Measures

Anonymous

Abstract

The report provides a literary overview on how the reliability and validity of self-report style questionnaires and surveys are effected by the topic of stress. Often being in connection with negative physiological and psychological symptoms, stress has been shown to have adverse effects on cognitive performance and functioning that can reduce the validity and reliability of self-reported survey answers. Traits of Emotional Intelligence (EI) and high interpersonal functioning are identified as precursors to faking behavior and exaggerating one's mental health, both of which also have negative effects on self-report scores.

Introduction

Stress is commonly measured from the angle of three broad categories: environmental and social effects from life events; cognitive perceptions, affectivity, and appraisal of stressful stimuli; and biological or physiological symptoms as a stress-induced response [8]. In-depth studies have sought to understand motivations of individual behavior when assessing truthfulness in survey responses—although with more attention on cognitive ability and less on willful intent–while numerous self-report scales have been developed to ameliorate the effects of human cognition and perception on individuals' disclosures of stress.

Measures in Use

The most common and widely used survey is the Perceived Stress Scale (PSS)[3]. The PSS focuses on life events and how they are subjectively interpreted by individuals. Originally a 14-item scale, later there was a 10-item and 4-item version developed, and it has been translated into 25 different languages [8]. As the PSS is a general measure of stress, it asks participants to label the level of appraisal they give to events that made their life feel uncontrollable and unpredictable in the prior month, rather than focusing on specific events. Other common measures include the Perceived Stress Questionnaire (PSQ)[9], which measures stress by highlighting cognitive perceptions over emotional states, physiological symptoms, or life events; the Stress Appraisal Measure (SAM)[12] examines participants' categorization of perceived stressful events; the Daily Stress Response Scale (DSRS)[4] assesses both physiological and psychological reactions to stressors equally; the Daily Stress Inventory (DSI)[2] was developed to measure reactions to 'minor' stress events as opposed to major or traumatic ones; and the Depression Anxiety Stress Scale (DASS)[10] includes anxiety and depression in a combined measure as the three share similar affective conditions.

Cognitive Biases

Regardless of how studies are controlled for reliability and validity of survey responses, the subjective nature of the interpretation of experiences that self-reports provide tends to invariably introduce bias. Certain biases result from internal motivations of the participant when providing responses. Survey questions seen as 'threatening' to the participant can motivate them to answer inaccurately, while the 'non-threatening' questions are typically invalidated by memory or cognitive processing errors [1]. Context effects can alter the objectivity of reported stress [9], as one study showed that stress-inducing questions predisposed participants to answer more negatively about their mental health [13]. Social desirability bias is a phenomenon that motivates individuals to answer survey questions in a more socially acceptable way, avoiding unpopular beliefs they may hold as an attempt to impress the interviewer [19]. Although detrimental for self-reports, it is possible to control for social desirability bias in responses, as researchers [4] have done by using the Eysenck Personality Questionnaire-Revised Lie Scale [5]. As well, sex biases exist in the way that stress is self-reported, with men being more likely to answer with 'I am calm' as opposed to 'I feel calm' [9]. Finally, even the day of the week may bias how individuals respond to their experiences [20].

Memory and Faking Behavior

Cognitive functioning alters self-reported survey responses due to how memory is processed and recalled. People tend to use the most conveniently accessible answer in short-term memory in their survey answers even when it may not reflect the truth about how they perceive a stressor [7]. Memory is open to influence from primacy and recency biases, where the recall of experiences is impacted by environmental stimuli or the most recent events in relation to the experience [17]. More extreme cases of stress such as Chronic Mild Stress (CMS) and Learned Helplessness (LH) have been biologically correlated with an impaired memory, learning, and overall cognitive performance [18]. Burnout, a syndrome formed by chronic stress, influences cognitive performance on self-reported surveys [14]. In relation to the truthfulness of participant responses, it has been suggested that individuals will use their cognitive abilities for 'faking' a personality to achieve favorable outcomes [6], while researchers [15] provided evidence of individuals being able to bias self-reports by feigning symptoms of Post-Traumatic Stress Disorder (PTSD) on personality tests. Researchers hypothesized that faking abilities are linked to having traits of strong interpersonal skills and fluid intelligence [6]. Additionally, the trait of Emotional Intelligence (EI) is a common precursor to faking behavior that effects the reliability of self-reported test scores [16].

Conclusion

While using self-report techniques such as questionnaires and surveys allows researchers to analyze firsthand recounting of perceived stress and prove to be a powerful tool in qualitative analysis, the self-report method is vulnerable to cognitive biases and report answers are weakened when participants' motivations are questionable. Nevertheless, such biases and motivations can be thoroughly controlled for in common self-report surveys such as the PSS and PSQ depending on the type and quality of analysis completed.

References

1. Blair, E., & Burton, S. (1987). Cognitive Processes Used by Survey Respondents to Answer Behavioral Frequency Questions. Journal of Consumer Research, 14(2), 280–288.
2. Brantley, P. J., Waggoner, C. D., Jones, G. N., & Rappaport, N. B. (1987). A daily stress inventory: Development, reliability, and validity. Journal of Behavioral Medicine, 10(1), 61–73. https://doi.org/10.1007/BF00845128
3. Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A Global Measure of Perceived Stress. Journal of Health and Social Behavior, 24(4), 385. https://doi.org/10.2307/2136404
4. Debowska, A., Horeczy, B., Boduszek, D., Dolinski, D., & von Bastian, C. C. (2022). Development and validation of a stress response measure: the Daily Stress Response Scale (DSRS). Health Psychology Report, 10(3), 238-248.
https://hpr.termedia.pl/Development-and-validation-of-a-stress-response-measure-the-Daily-Stress-Response,149819,0,2.html
5. Eysenck, S. B. G., Eysenck, H. J., & Barrett, P. (1985). A revised version of the psychoticism scale. Personality and Individual Differences, 6(1), 21–29. https://doi.org/10.1016/0191-8869(85)90026-1
6. Geiger, M., Olderbak, S., Sauter, R., & Wilhelm, O. (2018). The "g" in Faking: Doublethink the Validity of Personality Self-Report Measures for Applicant Selection. Frontiers in Psychology, 9, 2153. https://doi.org/10.3389/fpsyg.2018.02153
7. Harrison, D. A., McLaughlin, M. E., & Coalter, T. M. (1996). Context, Cognition, and Common Method Variance: Psychometric and Verbal Protocol Evidence. Organizational Behavior and Human Decision Processes, 68(3), 246–261. https://doi.org/10.1006/obhd.1996.0103
8. Lee, E.-H. (2012). Review of the Psychometric Evidence of the Perceived Stress Scale. Asian Nursing Research, 6(4), 121–127. https://doi.org/10.1016/j.anr.2012.08.004
9. Levenstein, S., Prantera, C., Varvo, V., Scribano, M. L., Berto, E., Luzi, C., & Andreoli, A. (1993). Development of the perceived stress questionnaire: A new tool for psychosomatic research. Journal of Psychosomatic Research, 37(1), 19–32. https://doi.org/10.1016/0022-3999(93)90120-5
10. Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. Behaviour Research and Therapy, 33(3), 335–343. https://doi.org/10.1016/0005-7967(94)00075-U
11. Morgan, E. S., Umberson, K., & Hertzog, C. (2014). Construct validation of self-reported stress scales. Psychological Assessment, 26(1), 90–99. https://doi.org/10.1037/a0034714
12. Peacock, E. J., & Wong, P. T. P. (1990). The stress appraisal measure (SAM): A multidimensional approach to cognitive appraisal. Stress Medicine, 6(3), 227–236. https://doi.org/10.1002/smi.2460060308
13. Russell, D. W., & Russell, C. A. (2021). The stress bias in mental health reporting: Death anxiety biases mental health self-assessments amongst deployed soldiers. Psychological Services, 18(2), 237–248. https://doi.org/10.1037/ser0000391
14. Sandström, A., Rhodin, I. N., Lundberg, M., Olsson, T., & Nyberg, L. (2005). Impaired cognitive performance in patients with chronic burnout syndrome. Biological Psychology, 69(3), 271–279. https://doi.org/10.1016/j.biopsycho.2004.08.003
15. Scragg, P., Bor, R., & Mendham, M.-C. (2000). Feigning post-traumatic stress disorder on the PAI. Clinical Psychology & Psychotherapy, 7(2), 155–160. https://doi.org/10.1002/(SICI)1099-0879(200005)7:2¡155::AID-CPP237¿3.0.CO;2-Z
16. Sjöberg, L., & Engelberg, E. (2004). Measuring and Validating Emotional Intelligence as Performance or Self-Report. SSE/EFI Working Paper Series in Business Administration.
17. Smyth, J. M., & Smyth, J. M. (2003). Ecological Momentary Assessment Research in Behavioral medicine. Journal of Happiness Studies, 4(1), 35–52. https://doi.org/10.1023/A:1023657221954
18. Song, L., Che, W., Min-wei, W., Murakami, Y., & Matsumoto, K. (2006). Impairment of the spatial learning and memory induced by learned helplessness and chronic mild stress. Pharmacology Biochemistry and Behavior, 83(2), 186–193. https://doi.org/10.1016/j.pbb.2006.01.004
19. Welte, J. W., & Russell, M. (1993). Influence of Socially Desirable Responding in a Study of Stress and Substance Abuse. Alcoholism: Clinical and Experimental Research, 17(4), 758–761. https://doi.org/10.1111/j.1530-0277.1993.tb00836.x
20. Zawadzki, M. J., Scott, S. B., Almeida, D. M., Lanza, S. T., Conroy, D. E., Sliwinski, M. J., Kim, J., Marcusson-Clavertz, D., Stawski, R. S., Green, P. M., Sciamanna, C. N., Johnson, J. A., & Smyth, J. M. (2019). Understanding stress reports in daily life: A coordinated analysis of factors associated with the frequency of reporting stress. Journal of Behavioral Medicine, 42(3), 545–560. https://doi.org/10.1007/s10865-018-00008-x