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*Psychological Science* 2014 25: 1051 originally published online 18 February 2014  
DOI: 10.1177/0956797614521015

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# Let the Data Speak: A Response to Terracciano (2014)

Psychological Science  
2014, Vol. 25(4) 1051–1053  
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DOI: 10.1177/0956797614521015  
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Received 12/16/13; Accepted 12/27/13

In his commentary, Terracciano (2014) argues that we failed to present evidence supporting the hypothesis that cultural variation in personality development stems, in part, from age-graded life transitions in early adulthood (Bleidorn et al., 2013). His argument rests on four points, which we outline in the following sections.

## Operationalization of Social-Investment Theory

To create an index of the normative timing of transitions from education to the job role, we used data on the years of compulsory education and the percentage of tertiary education graduates for the 62 cultures in our sample. Terracciano questions the validity of our index by arguing (a) that the youth employment rate (of 20- to 24-year-olds) is a better measure of the normative age of entry into the workforce; (b) that if our index is valid, it should correlate positively with the youth employment rate; and (c) that our index actually correlates negatively ( $-.48$ ) with the youth employment rate. We disagree with all three points.

First, the youth employment rate is not a valid indicator of the number of people who have adopted a job role because it captures only the proportion of an economy's population that is *formally* employed. The index does not cover any type of *informal* labor, such as work for one's family or informal businesses, which is particularly prevalent in many of the newly industrialized and developing countries that characterized our sample (International Labour Office, 2013). For example, informal employment makes up 42% of all nonagricultural employment in Brazil and 83% in India (International Labour Office, 2011). Second, in light of the heterogeneity of our sample with regard to the prevalence of informal labor, there should be only a small correlation or no correlation between our index and the formal youth employment rate. Third, the

correlation between our index and youth employment is  $-.48$  only if computed across a select subsample of 33 countries. When computed across all 54 countries for which data are available (International Labour Office, 2011), the correlation is  $.02$  ( $p = .88$ ).

Before running any analyses, we invested much effort into deriving conceptually and empirically appropriate indexes of the timing of family- and job-role transitions across a diverse set of countries. We did not tailor our indexes to support social-investment theory (SIT) or any other theory. Of course, as we noted in our original article, these indexes are indirect markers of cultural norms, and future studies would certainly benefit from more proximal measures of the individual timing of adult-role transitions.

## The Premise of Social-Investment Theory

Terracciano's second critique does not refer directly to our study but criticizes the general premise of SIT. Specifically, he notes that people disagree about whether transitions to adult roles promote or stunt personality growth. We agree with Terracciano that people disagree about whether and how life tasks affect personality development. However, our focus is on what the data say. If Terracciano's point is that people disagree about the effects of life transitions, we readily concede that point; however, we remain puzzled about how it constitutes a critique of our article because it was a point we ourselves made in providing context for our analyses.

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## Previous Research on Social Investment Theory

Terracciano's third point likewise does not focus on our study. Instead, he points to some inconsistencies among previous longitudinal studies that have examined SIT. We acknowledge that some longitudinal studies have not supported SIT. However, there is also a large body of longitudinal research that has provided evidence for SIT (e.g., Bleidorn, 2012; Hudson, Roberts, & Lodi-Smith, 2012; Hutteman et al., 2013; Johnson, Hicks, McGue, & Iacono, 2007; Lehnart, Neyer, & Eccles, 2010; Neyer & Lehnart, 2007; Roberts & Chapman, 2000; Roberts, Walton, Bogg, & Caspi, 2006; Sturaro, Denissen, van Aken, & Asendorpf, 2008). Moreover, we would argue that the preponderance of research supports SIT. Of course, we recognize that no single study will resolve the debates about SIT and five-factor theory (FFT); such resolution will emerge with the accumulation of data across studies. So, in the absence of any argument for why the studies that support Terracciano's point should be privileged over the ones that do not, we prefer to wait for the findings of meta-analyses before making any conclusions about what the literature suggests.

## Operationalization of Five-Factor Theory

In his last point, Terracciano criticizes us for not testing all possible alternative explanations of our findings from the perspective of FFT. Terracciano is correct that we did not test all possible alternative explanations. The trouble is, FFT states that all kinds of social, ecological, and even economic factors can influence personality traits as long as these influences are mediated via "biological bases" (McCrae & Costa, 2008, p. 168). Thus, FFT can be falsified only if one measures all possible biological processes. In our opinion, this is a false dichotomy. SIT does not propose that change is not mediated through biological systems—all psychological changes must be mediated through biological systems, given that there is no tenable alternative. Rather, where FFT and SIT diverge is in their perspective on the origin of changes in biological systems, because FFT argues that these changes are not caused by environmental influences (McCrae & Costa, 2008, p. 167). Therefore, any evidence for environmental influences on personality change is inconsistent with FFT. This is the hypothesis we tested, and, like many past studies, ours showed evidence that the differential developmental patterns found in personality traits were at least partially associated with environmental differences. This finding is consistent with the predictions of SIT and inconsistent with the predictions of FFT.

## Conclusion

Terracciano has presented a four-pronged critique of our research. Two of his critiques refer directly to our study but do not stand up to closer examination; the other two critiques do not refer directly to our study but criticize research on SIT in general. Therefore, we stand by our conclusion that cultural differences in the timing of adult-role transitions are related to cultural differences in age effects on personality. With regard to job-role transitions, these findings support SIT, suggesting that cultures with an earlier onset of adult-role responsibilities are marked by an earlier onset of personality maturation.

## Author Contributions

W. Bleidorn drafted the manuscript, and S. D. Gosling, P. J. Rentfrow, J. J. A. Denissen, and T. A. Klimstra provided critical revisions. All authors approved the final version of the manuscript for submission.

## Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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