

COMMENTARY

Discerning Cultural Shifts in China? Commentary on
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By examining the changes in the conceptual associations between individualism–collectivism and 10 other concepts based on the Google Ngram Chinese Corpus from the 1950s to the 1990s, Hamamura et al. (2021) inferred (a) no rise in individualism; (b) continuing collectivism; and (c) no effect of modernization on individualism in contemporary China. We question the validity of these conclusions given the following issues in their research: (a) misinterpretation of statistical results; (b) improper calculation of cultural associations; and (c) inappropriate generalization of specific findings. Contrary to their original findings, our reanalysis of their data suggests that individualism has been increasingly accepted and associated with some positive (vs. negative) aspects of life (e.g., *income* vs. *loss*, *richness* vs. *poverty*) over recent decades in China. Future research should use more rigorous methods and diverse corpora to clarify and explain changes in individualism and collectivism in China.

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Hamamura et al. (2021) investigated cultural characteristics and changes in China by examining cultural associations and their shifts from 1950 to 1999. They used the

single-target variant of the Word-Embedding Association Test (WEAT)—the Word-Embedding Factual Association Test (WEFAT; Caliskan et al., 2017)—to measure the associations between individualism–collectivism (IND–COL) and some other concepts (e.g., *positivity*, *negativity*, *achievement*, *money*, *modernity*). They analyzed the data with multilevel modeling and addressed four research questions (RQ). They inferred that individualism might not be rising (or collectivism might be continuing) and modernization might not lead to a rise in individualism. We find their conclusions unwarranted due to some issues. We discuss these issues and illustrate the problems with our reanalysis. Online Supplemental Materials provide additional details.

Misinterpretation of Statistical Results

Throughout their article, Hamamura et al. (2021) employed multilevel modeling to analyze the data, with word similarity as the outcome, and decade (Level 1: 1950s = 0, 1990s = 4), IND–COL (Level 2: COL = 0, IND = 1), and their cross-level interaction as predictors. In this case, the fixed effect of IND–COL actually denotes its *simple effect* when

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decade = 0 (i.e., 1950s; Cohen et al., 2003; Hox et al., 2018). However, they (mis)interpreted the fixed effect of IND–COL at the 1950s as its *main effect* (i.e., average effect across 1950s–1990s) in all analyses.

Hamamura has graciously shared their data with us so that we could reanalyze the data and illustrate how main effects and simple effects are different from each other in their analyses. We used the same models as they used. We obtained simple effects of IND–COL by coding 1950s, 1960s, 1970s, 1980s, and 1990s as 0 one at a time, and its main effect by using the R function `anova()`. We display all main effects and simple effects in Table 1. As can be seen, the simple effects for 1950s were identical to those reported in Hamamura et al. (2021; see their Tables 2–5), suggesting our replication of their analyses was correct. Importantly, the simple effects at different decades were different from each other and also from the main effects, suggesting interpreting simple effects at 1950s as main effects was incorrect. In their article, Hamamura et al. (2021) mistakenly concluded significant main effects for *negative* and *money* (actually not significant) and nonsignificant main effects for *achievement* and *leisure* (actually significant).

Appropriate interpretations of the results yielded several different findings. First, negativity was significantly associated with individualism (vs. collectivism) *only* in the 1950s but *not* in the following decades. Second, achievement was significantly and increasingly associated with collectivism (vs. individualism). Third, leisure was significantly and increasingly associated with individualism (vs. collectivism). Fourth, money was significantly associated with individualism (vs. collectivism) in the 1950s–1960s but not in the 1970s–1990s.

Improper Calculation of Cultural Associations

We also found that Hamamura et al. (2021) have not appropriately taken into account the valence of target concepts or their word exemplars when analyzing cultural associations. When addressing their RQ1, they computed

the relative strength of *IND* (vs. *COL*)-positivity association and the relative strength of *IND* (vs. *COL*)-negativity association, as indices of positive attitude and negative attitude toward individualism (vs. collectivism), respectively. Since such cultural associations with positivity and negativity can be contradictory as in the case of their study (e.g., both are similarly strong), a more proper index should be the *difference* between them (Caliskan et al., 2017; Greenwald et al., 1998). Our reanalysis with this correct algorithm showed that Chinese people's attitude toward individualism (vs. collectivism) has shifted from negative in the 1950s to neutral in the next decades ($t_{1960s-1990s \text{ vs. } 1950s} = 2.064, p = .043$; see Table S2 and Figure S1), which is also evident in Figure 2 of Hamamura et al.'s (2021) article (p. 896). This suggests that individualism was indeed increasingly accepted in China.

When addressing their RQ2 and RQ3, they did not distinguish between positive and negative words representing achievement (e.g., *success* vs. *failure*) and money (e.g., *rich* vs. *poor*, *wealthy* vs. *bankrupt*). This may conceal the nuances because positive and negative words may be differentially associated with individualism versus collectivism just as shown above. Indeed, when positive and negative words were distinguished and association was properly calculated (Caliskan et al., 2017), we found that individualism (vs. collectivism) was associated with negative (vs. positive) achievement words with a steady trend (see Table S2 and Figure S2) but increasingly associated with positive (vs. negative) money words from the 1950s to the 1990s in China ($t_{1990s \text{ vs. } 1950s-1980s} = 2.874, p = .005$; see Table S2 and Figure S3).

Inappropriate Generalization of Specific Findings

Cultural shifts may manifest as shifts in cultural level, cultural prevalence, and cultural associations (or meanings) in numerous domains. Hamamura et al. (2021) have only examined the changes in some specific cultural associations. There is no reasonable logic for them to generalize their findings about specific cultural association shifts to “cultural shifts” in general. The Title, Abstract, Public Significance

Table 1
IND–COL's Main Effects, Simple Effects, and Interactions With Decade

Outcome	Main effect (<i>F</i> statistics)	Simple effect (regression coefficient)					Interaction (time trend)
		1950s	1960s	1970s	1980s	1990s	
Positive	.03	-.013	-.009	-.005	-.001	.003	.004
Negative	1.65	.093*	.070 [†]	.048	.026	.003	-.022 [†]
Achievement	7.35**	-.016	-.042	-.068**	-.095***	-.121***	-.026***
Work	99.86***	-.189***	-.199***	-.209***	-.219***	-.229***	-.010 [†]
Leisure	6.21*	.048	.087	.126*	.166**	.205**	.039*
Home	.02	-.090	-.052	-.014	.024	.062	.038
Money	1.34	.138**	.093*	.047	.002	-.043	-.045***
Religion	1.48	-.114	-.111	-.107	-.103	-.099	.004
Death	.86	.132	.114	.097	.079	.061	-.018
Modernity	.17	.089	.060	.030	.000	-.030	-.030

Note. IND–COL = individualism–collectivism. Effects leading to inconsistent conclusions are in bold.

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Statement, and Conclusion of their article are confusing because all of them communicate information about the changes of culture in general in China.

Conclusion

Hamamura et al.'s (2021) conclusions are unwarranted. Our reanalysis of their data yielded some new findings: Individualism has been increasingly accepted and associated with some positive aspects of life (e.g., earning money, time for enjoyment) over recent decades in China.

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