

When a New Tool Is Introduced in Different Cultural Contexts: Individualism–Collectivism and Social Network on Facebook

Journal of Cross-Cultural Psychology
2015, Vol. 46(3) 355–370
© The Author(s) 2014
Reprints and permissions:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/0022022114563932
jccp.sagepub.com



Jinkyung Na¹, Michal Kosinski², and David J. Stillwell²

Abstract

What will happen if a new tool is introduced to different cultures? What if the tool can potentially bridge those cultures? Will it be used in the same way across cultures and contribute to a decrease in cultural differences? Or will it be used in culturally appropriate ways and eventually integrated into preexisting cultural practices? To answer these questions, we predicted and examined cultural differences in the use of Facebook focusing on social networks. In support of the prediction, the present work found that users in individualistic cultures had more ego-centric networks (i.e., members of networks were connected via the self) than users in collectivistic cultures. The results were consistent across a two-culture comparison and a multicultural analysis across 49 nations. Additional findings suggest that (a) living in individualistic/collectivistic cultures are closely linked to these differences in social networks and (b) the individualism–collectivism may have stronger influences than ecological factors that gave rise to it.

Keywords

Facebook, Social Networks, Individualism/Collectivism, Pathogen Prevalence, Cultural differences

Throughout the human history, numerous tools and technologies have been introduced and spread. Some of them have dramatically changed the world and, hence, our psychology. For example, the development of agriculture and domestication led to the rise of sedentary human civilization. In recent years, the advent of the Internet has had a huge impact on the way we think, feel, and behave. Interestingly, as the world is getting smaller and flatter, a tool developed in one culture can quickly travel around the world and influence people in other cultures. This raises an intriguing question, namely, how people in different cultures react to a new tool. On one hand, a new tool may have its own unique features and functions. Consequently, people may use the tool in pretty much the same way regardless of their cultural backgrounds. On the other hand, however, the usage of a tool is closely associated with our perception of it (Gibson, 1979), and cultural backgrounds have significant effects on how we perceive the world (Nisbett & Masuda, 2003) as

¹University of Texas at Dallas, Richardson, USA

²University of Cambridge, UK

Corresponding Author:

Jinkyung Na, School of Behavioral and Brain Sciences, University of Texas at Dallas, GR41, 800 W Campbell Road, Richardson, TX 75080-3021, USA.
Email: jinkyung.na@utdallas.edu

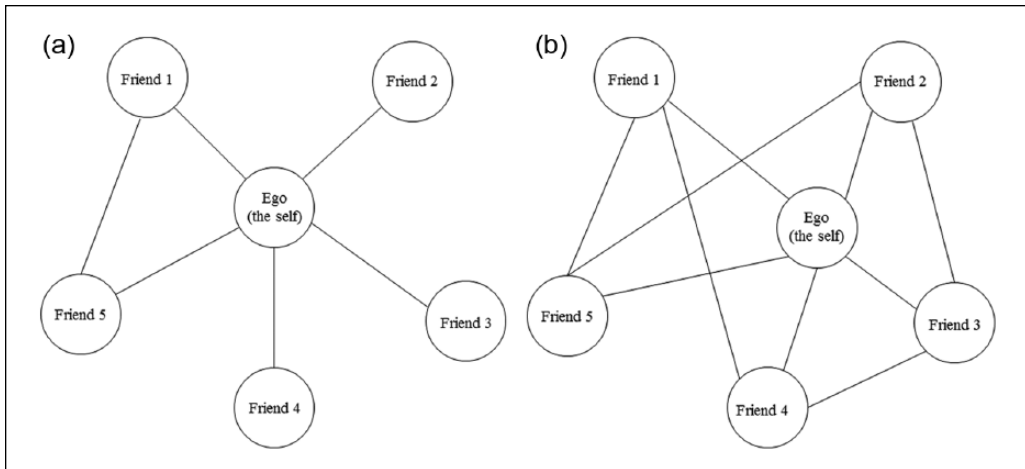


Figure 1. An illustration of social networks in (a) individualistic cultures and (b) collectivistic cultures.

well as functions of everyday products such as answering machines (Miyamoto & Schwarz, 2006). Therefore, we hypothesized that a new tool would be used in different ways across cultures. To test this hypothesis, the present work examined cultural differences in the use of Facebook. In doing so, we focused on how one would relate to others on Facebook, as this type of social orientation is the critical dimension of cultural differences (Markus & Kitayama, 2010; Na et al., 2010).

Decades of research has demonstrated cultural differences in how the self relates to others (Markus & Kitayama, 1991; Triandis, 1989). In individualistic cultures (e.g., the United States), the self is viewed as an independent entity that is separated from others. People with an independent self tend to emphasize uniqueness (Kim & Markus, 1999), relatively ignore social cues (Ishii, Reyes, & Kitayama, 2003), and try to control social worlds including other people (Morling, 2000). However, in collectivistic cultures (e.g., East Asia), the self is viewed as an interdependent entity embedded in social relations with others. People with an interdependent self tend to emphasize social harmony (Kim & Markus, 1999), closely attend to social cues (Na & Kitayama, 2012), and try to adjust the self to social worlds including other people (Morling, 2000). That is, people in individualistic cultures prefer the self to “stand out,” whereas people in collectivistic cultures prefer the self to “be effaced and dissolved into” their in-groups. Building on those findings, we hypothesized that people in individualistic versus collectivistic cultures would build different types of social networks around themselves because different types of social networks are suited for important goals in the respective cultures. Specifically, we predicted that people in individualistic cultures would form ego-centric social networks. In an ego-centric network (see Figure 1a), many connections between members are missing, and thus, they are only connected via the self/ego (i.e., the self serves as a focal node). Therefore, we reasoned that an ego-centric network would be good for achieving important goals in individualistic cultures such as being unique or controlling others. In contrast, we also predicted that people in collectivistic cultures would form tight-knit social networks. In a tight-knit network (see Figure 1b), most members are directly connected to each other without any mediation through the self, and hence, they do not have to communicate via the self/ego. Therefore, we reasoned that this type of decentralized (or less ego-centric) networks would be good for achieving important goals in collectivistic cultures such as maintaining social harmony or being adjusted.

Previous studies provide initial support to our hypothesis, albeit indirectly. First of all, the structures of social network have been shown to vary across cultures (e.g., Himanen & Castells, 2004). In addition, Wheeler, Reis, and Bond (1989) showed that Hong Kong Chinese students had longer interactions with fewer people than American students. This suggests that compared with American students, Hong Kong Chinese students would have a tighter and closer network,

as we predicted. Similarly, when drawing their social network with a set of circles, Americans put themselves in the center of the network and drew a much larger circle representing the self, whereas such tendencies were significantly attenuated among Japanese (Duffy, Uchida, & Kitayama, 2013). Although they measured one's mental representation of their social network rather than their actual network, the findings in the study are consistent with our hypothesis.

Despite abundant evidence largely supporting our prediction, Igarashi and colleagues (2008) reported seemingly contradictory results. In this study, students in West (Australia, Germany, and the United Kingdom) and East Asia (Japan and Korea) were asked to list up to eight friends and also indicate whether these people were friends with each other. They analyzed two measures of the ego-centrality of social networks and found that East Asians had more ego-centric networks than Westerners although only one of two measures reached statistical significance. The results are directly conflicting with the current prediction, and yet, we think that this study had a couple of issues. First, only friends were able to be listed as members in one's social network. Given that family and relatives are crucial members of one's in-group in collectivistic cultures such as East Asia (Markus & Kitayama, 1991; Triandis, 1989), one's friend network may not adequately capture the predicted tight-knit (or less ego-centric) network among in-group members in collectivistic cultures. Second, participants in this study indicated whether their friends were friends with each other, not whether they knew (or simply connected to) each other. As the meaning of friendship substantially varies across cultures (Adams & Plaut, 2003), what they measured in the study may be confounded by cultural differences in what kinds of relations were considered to be friends. Taken together, there remains a need to systematically examine the predicted cultural differences in social networks. Thus, the current research did such an investigation by examining social networks on Facebook. Furthermore, this investigation could speak to whether a new tool would be used similarly or differently across different cultures.

Facebook is a relatively new tool, and yet, it has gradually become one of the most important communication tools of our time since its birth in 2004. In fact, people are joining Facebook all over the world. According to Facebook, there are approximately 168 million users in the United States alone and 1 billion worldwide as of October 2012. Thus, Facebook provides a unique opportunity to examine the usage of a newly developed tool in different cultural contexts. With dramatic increase in the use of Facebook, there has been the corresponding increase in psychological research on human behaviors on Facebook (e.g., Back et al., 2010; Kosinski, Stillwell, & Graepel, 2013). For example, a recent study demonstrates that activities on Facebook (i.e., as recorded by Liked objects) can accurately predict a wide range of often-sensitive personal attributes such as sexual orientation (Kosinski et al., 2013). Moreover, Qiu, Lin, and Leung (2013) showed cultural differences in behaviors on social networking sites (SNSs) by comparing Facebook and Renren (a Chinese equivalent of Facebook). Similarly, it is shown that family oriented and territorially rooted culture of Catalonia was reflected in the way Catalonians formed social relationships on the Internet (Castells, Tubella, Sancho, Díaz de la Isla, & Wellman, 2004). All in all, this emerging literature suggests that one's behaviors on SNSs (or the Internet in general) closely resemble his or her off-line behaviors and, consequently, reflect their personal and social attributes. As one's personal and social attributes are massively influenced by cultural contexts (Na et al., 2010), we hypothesized that cultural contexts would substantially influence how Facebook is used, although the interface of Facebook is universal across cultures.

In addition to the primary hypothesis, the present research also examined the effect of pathogen prevalence because of its implications for the individualism–collectivism as well as social networks. As pathogen prevalence is critical to human survival, various psychological mechanisms for antipathogen defense have evolved in human beings (Faulkner, Schaller, Park, & Duncan, 2004; Navarrete, Fessler, & Eng, 2007). Consequently, pathogen prevalence is linked to diverse psychological tendencies. In particular, it can have implications for one's social network. Those who have lived in regions with a greater prevalence of pathogens prefer tight-knit networks among in-group members, as this type of networks could minimize potential contacts with strangers and, hence, their novel pathogens. In contrast, such danger would be negligible in regions with a lower prevalence of pathogens. In

other words, more tight-knit (or less ego-centric) networks are encouraged in regions with a greater prevalence, compared with regions with a lower prevalence. Consequently, a greater prevalence of pathogen is expected to be associated with more tight and less ego-centric networks. Moreover, given that collectivism is characterized by close relations among in-groups and the wariness of contact with out-groups (Sagiv & Schwartz, 1995), it is theorized and found that high pathogen prevalence promotes collectivism (Fincher, Thornhill, Murray, & Schaller, 2008). Furthermore, Fincher and colleagues (2008) argued that pathogen prevalence was an ecological factor that played a critical role in giving rise to cultural variations in the individualism–collectivism. Thus, a couple of interesting questions could be brought to the fore by looking at pathogen prevalence with respect to the ego-centrality of networks on Facebook. First, this study tested whether pathogen prevalence would show similar effects on social networks that do not require physical contact, such as ones on Facebook. Moreover, it is interesting to test which level of causation would show stronger effects on social networks, ecological factors (i.e., pathogen prevalence) or cultural orientations (i.e., individualism–collectivism) that likely developed from those ecological factors.

Regarding these questions, we expected that pathogen prevalence would be only weakly associated with the ego-centrality of networks on Facebook. First, pathogen prevalence may not have significant impacts on social networks that do not require physical contacts among members of networks. Second, the influences of pathogen prevalence might become weaker in general. For example, a recent study showed that pathogen prevalence was not significantly associated with collectivism and behavioral practices associated with it (e.g., in-group favoritism) after controlling for relevant cultural and historical factors including governance structure (i.e., the quality of public and civil services) and religion (Hruschka & Henrich, 2013). This indicates that the effects of pathogen prevalence are attenuated in modern societies as one's basic need such as pathogen-related threats can be taken care of by institutionalized systems such as governments.

Present Research

The primary goal of the present research was examining whether a newly developed tool such as Facebook would be used similarly or differently across cultures. It was hypothesized that the way individuals use a new tool would systematically vary across cultures. Specifically, we predicted that Facebook users in individualistic cultures would have more ego-centric social networks than Facebook users in collectivistic cultures. We further explored the effect of pathogen prevalence with respect to social networks and individualism–collectivism. Toward this end, we investigated social networks of Facebook users from 49 nations and also their relations with the national indices of cultural orientation (i.e., individualism–collectivism) and pathogen prevalence. Taken together, the present investigation can clarify the usages of a newly introduced tool across cultural contexts and the effects of various contributing factors (e.g., cultural orientation and ecological factors).

Method

Facebook Users

A total of 26,847 Facebook users were examined in the present research across 49 nations whose individualism–collectivism scores were known from a previous study (Suh, Diener, Oishi, & Triandis, 1998): Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, Chile, China, Colombia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Ghana, Greece, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, Japan, Korea, Mexico, Latvia, Lithuania, the Netherlands, Nigeria, Norway, Pakistan, Peru, Poland, Portugal, Romania, Russia, South Africa, Singapore, Slovenia, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, the United Kingdom, and the United States.

Database used in the present research was obtained from the myPersonality project (www.mypersonality.org). Specifically, our sample was a subset of Facebook users in the project who

opted in to provide their Facebook profiles including social networks on Facebook. Respondents' cultural backgrounds were determined based on their country of origin (see Appendix B for the number of respondents for each country and their basic demographics).

Measures of Network Characteristics

The present research investigated social networks and, in particular, ego networks on Facebook. An ego network is defined as a network including a single actor (ego), the actors who are directly connected to the ego (first-order neighborhoods), and all the links among them (Everett & Borgatti, 2005). That is to say, we looked at how one's friends on Facebook are connected both to the person and to his or her other friends. Our hypothesis was that social networks on Facebook would be more ego-centric in individualistic cultures (e.g., Americans) than in collectivistic cultures (e.g., East Asians). In other words, Facebook users in individualistic cultures would have social networks with relatively fewer connections between friends, resulting in the increased importance of the ego's position in the network.

To test the hypothesis, we included four different measures of network characteristics, *ego betweenness*, *brokerage*, *density*, and *transitivity*. Ego Betweenness reflects the extent to which an ego lies on the shortest path between any given two members of one's network (Freeman, 1978). Ego Betweenness is high when many pairs of the network are connected only via the ego. In this study, we estimated Ego Betweenness following Everett and Borgatti (2005). Brokerage is defined as the number of pairs on the network that are not directly connected. As in the previous literature (Burt, Kilduff, & Tasselli, 2013), we normalized both Ego Betweenness and Brokerage using all possible connections among friends in one's network, as they are sensitive to network size. Network density indicates the number of connections in one's network with respect to the maximum possible connections. It was computed by dividing the number of connections by the maximum number of possible connections. Transitivity reflects the "closedness" of the triad (i.e., whether a friend of my friend is also my friend). For example, a triad is transitive if three actors are linked with each other, and it is intransitive if one of the links is missing. Our measure of transitivity was the number of transitive triads divided by the total number of possible triads in one's social network. An ego-centric network is indexed in high Ego Betweenness high Brokerage, low Density, and low Transitivity. In addition to these four measures of ego-centric networks, we also looked at network size which is simply the number of members in one's social network (i.e., the number of Facebook friends).

Data Transformation

The measures of network characteristics were not normally distributed. First, Ego Betweenness and Brokerage were negatively skewed, and thus, they were log transformed using the following formula: $\log(1 + \text{Maximum value of } x - x)$, where x was a variable being transformed. Second, density, transitivity, and network size were positively skewed, and so, they were log transformed using the following formula: $\log(x)$. Finally, four log-transformed measures of ego-centrality were inversed by multiplying minus one for more intuitive interpretation. Thus, higher values in these measures reflect more ego-centrality. The national means of raw data as well as log-transformed data were reported in Appendix A.¹

Pathogen Prevalence

Data on pathogen prevalence were from the previous study (Fincher et al., 2008). They reported the prevalence data for the nations included in the present research, except for Iceland, Lithuania, and Latvia. Thus, these three nations were excluded from the analyses regarding pathogen prevalence.

Table 1. Correlations of Measures of Ego-Centrality Among 49 Nations, East Asians (EA), and Americans (US).

	Ego Betweenness	Brokerage	Density	Transitivity
All				
Ego Betweenness				
Brokerage	.80***			
Density	.88***	.78***		
Transitivity	.86***	.77***	.85***	
EA				
Ego Betweenness				
Brokerage	.76***			
Density	.88***	.76***		
Transitivity	.83***	.55***	.83***	
US				
Ego Betweenness				
Brokerage	.76***			
Density	.80***	.70***		
Transitivity	.86***	.51***	.76***	

Note. All variables were transformed so as to be in the same direction.

*** $p < .001$.

Cultural Orientations

For nation-level indices of cultural orientations, we used the Individualism–Collectivism Index (INDCOL) from Suh and colleagues (1998). This index is a combination of Hofstede's (1980) ratings and Triandis's (1996) ratings and, thus, believed to integrate the strengths of each rating system. Moreover, it has been shown to be significantly associated with theoretically relevant outcome variables (e.g., Fincher et al., 2008). Higher scores in the index reflect more individualism and less collectivism in a given culture.

Control Variables

The following were included as control variables: the number of respondents for each country, the mean age of respondents, the percent of female respondents, gross domestic product (GDP) per capita, and Gini Index.

Results

First, four measures of ego-centrality correlated strongly with one another, all $r_s > .77$, all $p_s < .001$ (see the top portion of Table 1). Thus, they were standardized and averaged to form an index of ego-centrality, and this index was used for the main analyses.

Pathogen Prevalence

Pathogen prevalence was not significantly associated with the index of ego-centrality or any of four individual measures of ego-centrality (Table 2) although the associations were in the expected direction, namely, high pathogen prevalence resulted in less ego-centric and tighter network.

Table 2. Standardized Coefficients From Regression Analyses for Pathogen Prevalence.

	Ego centrality	Ego Betweenness	Brokerage	Density	Transitivity	Network size
Pathogen	-.21	-.23	-.23	-.11	-.24	-.01
Gini	.11	.07	.12	.12	.10	.13
GDP	-.21	-.28	-.18	-.07	-.28	.12
Age	.28 [†]	.20	.31	.17	.37*	-.04
Gender	-.17	-.20	.05	-.22	-.26 [†]	-.20
Respondents	-.03	.03	-.03	-.03	-.06	.02
R ²	.11	.10	.10	.08	.21	.06
F(6, 39)	0.79	0.68	0.69	0.58	1.69	0.39

[†] $p < .10$. * $p < .05$.

Table 3. Standardized Coefficients From Regression Analyses for the Individualism–Collectivism.

	Ego centrality	Ego betweenness	Brokerage	Density	Transitivity	Network size
Model 1						
INDCOL	.48*	.56*	.53*	.30	.39 [†]	.12
Gini	.18	.15	.17	.19	.15	.18
GDP	-.35	-.45*	-.34	-.15	-.36 [†]	.09
Age	.14	.03	.19	.10	.12	-.02
Gender	-.18	-.23	.00	-.21	-.24	-.03
Respondents	-.16	-.15	-.17	-.12	-.17	-.19
Model 2						
INDCOL	.48 [†]	.57*	.52*	.31	.39 [†]	.12
Gini	.17	.14	.19	.16	.15	.14
GDP	-.36	-.46 [†]	-.34	-.16	-.40 [†]	.08
Age	.19	.09	.20	.11	.30 [†]	-.02
Gender	-.20	-.25	.01	-.24	-.28 [†]	-.07
Respondents	-.16	-.16	-.17	-.12	-.17	-.21
Pathogen	-.04	-.01	.03	.01	-.10	.03

Note. INDCOL = Individualism–Collectivism Index.

[†] $p < .10$. * $p < .05$.

Individualism–Collectivism (INDCOL)

Our main hypothesis was that ego-centric networks would be closely associated with the individualism–collectivism at the nation level. To test this hypothesis, a series of regression analyses was conducted with controlling for GDP, Gini, age, gender, and the number of respondents. First, as shown in Model 1 of Table 3, INDCOL showed significant and positive association with the index of ego-centrality, $\beta = .48$, $p = .04$. One may suspect that Facebook users in collectivistic cultures have tight-knit networks mainly because they have relatively a small number of friends in their networks. However, INDCOL was not associated with the size of network. Thus, confirming the main hypothesis, we found predicted cultural differences in the ego-centrality of networks on Facebook.

In addition, (marginally) significant associations were also observed for individual measures, Ego Betweenness ($\beta = .56$, $p = .02$), Brokerage ($\beta = .53$, $p = .03$), and Transitivity ($\beta = .39$, $p = .09$), except for Density ($\beta = .30$, ns) which was in the predicted direction. Also, control variables were not significantly associated with network characteristics except that GDP showed some trends, especially for Ego Betweenness (higher GDP \rightarrow more ego-centric network). However,

Table 4. Means and Standard Deviations of the Network Characteristics for East Asians and Americans.

	Log-transformed data		Raw data	
	East Asians	Americans	East Asians	Americans
Ego betweenness	$M = -1.86; SD = 1.14$	$M = -1.50; SD = 0.98$	$M = 87.25; SD = 21.86$	$M = 92.13; SD = 17.17$
Brokerage	$M = -0.03; SD = 0.06$	$M = -0.02; SD = 0.05$	$M = 0.47; SD = 0.07$	$M = 0.48; SD = 0.05$
Density	$M = 3.39; SD = 1.24$	$M = 3.63; SD = 1.09$	$M = 0.08; SD = 0.15$	$M = 0.05; SD = 0.11$
Transitivity	$M = 2.28; SD = 1.36$	$M = 2.74; SD = 1.34$	$M = 0.20; SD = 0.22$	$M = 0.13; SD = 0.16$
Network size	$M = 5.27; SD = 1.06$	$M = 5.30; SD = 1.02$	$M = 310.80; SD = 293.56$	$M = 322.17; SD = 327.99$

compared with INDCOL, the effect was notably weaker. Moreover, as shown in Model 2 in Table 3, the significant effects of INDCOL remained (at least marginally) significant even after controlling for pathogen prevalence. It is also noteworthy that the effect of pathogen prevalence became negligible once INDCOL was entered into regression analyses. In other words, cultural orientations such as INDCOL may stem from ecological factors such as pathogen prevalence, and yet, once established, their influences may be stronger than ecological factors that give rise to them.

The foregoing analyses confirmed the predicted association between INDCOL and social networks on Facebook. However, the number of respondents substantially varied across nations as shown in the Appendix B. Moreover, several nations might not have enough respondents. Although the number of respondents was statistically controlled, such variations might be an issue. Therefore, we conducted additional analyses that could speak to this issue. In these analyses, we compared the same number of East Asian and American users. East Asians and Americans were selected because they are often considered as a representative example of collectivistic and individualistic cultures, respectively (Markus & Kitayama, 1991; Triandis, 1989). Respondents were classified as East Asians if their home country was China, Hong Kong, Japan, South Korea, or Taiwan. In this way, we identified 252 East Asians (70 Chinese, 44 Hong Kong Chinese, 48 Japanese, 53 South Koreans, and 37 Taiwanese), and 83 (out of 252) East Asians lived in North America (the United States or Canada). Then, 252 American respondents were selected in the following ways: (a) 56 Americans living in Asia were included to examine the effect of experiencing Asian cultures, and (b) the remaining 196 were randomly selected. The resulting sample of East Asians and Americans was comparable, East Asians: $M_{\text{age}} = 24.38$ years and % of female = 51% and Americans: $M_{\text{age}} = 27.06$ years and % of female = 44%. We also note that the following results did not change when unselected American respondents were included.

If our prediction is correct, American users would have more ego-centric networks on Facebook than East Asian users, who would have tight-knit networks. First of all, four measures of network characteristics were well correlated with each other (see Table 1). Thus, cultural differences in ego-centrality were examined with a multivariate analysis of variance (MANOVA). Using Wilks's lambda as the test of significance, we found the predicted cultural differences, $F(4, 499) = 5.15, p < .001, \eta_p^2 = .040$. Furthermore, significant differences were found for each measure of ego-centrality, Ego Betweenness: $F(1, 502) = 14.80, p < .001, \eta_p^2 = .029$; Brokerage: $F(1, 502) = 6.10, p = .014, \eta_p^2 = .012$; Density: $F(1, 502) = 5.48, p = .020, \eta_p^2 = .011$; Transitivity: $F(1, 502) = 14.78, p < .001, \eta_p^2 = .029$. Thus, as predicted, Ego Betweenness and Brokerage were higher for Americans than for East Asians, whereas the opposite was the case for Density and Transitivity. We also note that there was no significant difference in the network size, $t < 1, ns$, which indicates that the differences between Americans and East Asians were not due to the corresponding differences in the network size. Pertinent means and standard deviations were summarized in Table 4.

We further reasoned that living in an individualistic or a collectivistic culture would have significant impact above and beyond the user's culture of origin. For example, it is likely that American users in Asian regions would have less ego-centric networks than their counterparts in the United

Table 5. Means and Standard Deviations on Network Characteristics for Additional Analyses.

	East Asians		Americans	
	East Asia (N = 35)	North America (N = 83)	Asia (N = 56)	United States (N = 130)
Ego betweenness				
Transformed	-2.09 (1.27)	-1.73 (0.86)	-1.70 (1.01)	-1.41 (0.89)
Raw	82.69 (26.12)	91.66 (15.57)	89.46 (21.85)	94.20 (11.22)
Brokerage				
Transformed	-0.04 (0.08)	-0.02 (0.05)	-0.03 (0.06)	-0.02 (0.02)
Raw	0.45 (0.09)	0.48 (0.05)	0.47 (0.07)	0.49 (0.03)
Density				
Transformed	3.30 (1.48)	3.62 (1.01)	3.45 (1.06)	3.71 (0.99)
Raw	0.11 (0.19)	0.05 (0.11)	0.07 (0.14)	0.04 (0.06)
Transitivity				
Transformed	2.07 (1.24)	2.36 (1.18)	2.38 (1.06)	2.87 (1.37)
Raw	0.23 (0.23)	0.16 (0.16)	0.16 (0.18)	0.11 (0.13)
Network size				
Transformed	5.26 (1.28)	5.49 (0.97)	5.24 (0.98)	5.32 (0.96)
Raw	369.71 (392.09)	356.01 (288.99)	281.34 (247.80)	311.42 (299.93)

Note. SDs are in parentheses.

States due to (a) their habitual exposures to Asian cultures and (b) self-selection processes (i.e., more collectivistic Americans would go to Asia). Likewise, compared with East Asians in East Asia, East Asians in North America (the United States or Canada) would have more ego-centric social networks. To test this idea, we ran additional analyses. First, a MANOVA comparing Americans in the United States and Americans in Asian regions (East Asia and South Asia) found the marginally significant differences, $F(4, 181) = 2.21, p = .070, \eta_p^2 = .047$.² Moreover, the predicted differences were at least marginally significant for each measure, Ego Betweenness: $F(1, 184) = 3.81, p = .05, \eta_p^2 = .020$; Brokerage: $F(1, 184) = 4.39, p = .04, \eta_p^2 = .023$; Transitivity: $F(1, 184) = 5.64, p = .02, \eta_p^2 = .030$; and Density: $F(1, 184) = 2.72, p = .10, \eta_p^2 = .015$. Second, a similar MANOVA was conducted to compare East Asians in East Asia and those in North America (the United States and Canada). The overall effect of MANOVA was not significant, $F(4, 113) = 1.16, ns$, although they were in the expected direction (Table 5). Looking at each measure, the predicted differences were marginally significant for Ego Betweenness, $F(1, 116) = 3.23, p = .075, \eta_p^2 = .027$; and significant for Brokerage, $F(1, 116) = 3.95, p = .049, \eta_p^2 = .033$. We suspect that Asians in the United States could easily find their cultural communities (e.g., Asian towns), which may make it easy for them to maintain their cultural traditions and also limit their exposure to American cultures. This may explain the relatively small differences between Asians in Asia and Asians in the United States, compared with the differences between Americans in the United States and Americans in Asia. Finally, network size did not show any significant difference (Table 5).

Discussion

The present research confirmed the predicted cultural differences in social networks on Facebook, not only by means of a comparison between prototypical members of individualistic and collectivistic cultures but also by a multicultural comparison based on the nation-level indices. In addition, independent of cultural backgrounds (i.e., their culture of origin), the present research demonstrated the importance of current cultural contexts. Americans in Asia had less ego-centric networks than Americans in the United States, whereas East Asian users in North America had more ego-centric

networks than East Asians in East Asia, although the latter effects were weak (i.e., one marginal and one significant difference out of four measures). Furthermore, we showed that the individualism–collectivism was a stronger predictor of the ego-centrality than ecological factors such as pathogen prevalence. These findings have various theoretical as well as practical implications.

First, it is important that our research confirmed the predicted cultural differences in social networks on Facebook, as social networks can have various impacts on information flow and interaction (Borgatti, Mehra, Brass, & Labianca, 2009). Furthermore, this finding suggests that when a new tool is introduced in different cultural contexts, preexisting cultural practices, rather than the tool itself, are likely to determine its usage. The result is also in line with the literature about human behaviors on the Internet and social network services (e.g., Toma & Hancock, 2013). This emerging literature suggests that one's behaviors on the Internet reflects not only his or her psychological characteristics such as personality traits (Vazire & Gosling, 2004) but also social processes such as peer influence (Lewis, Gonzalez, & Kaufman, 2012). What our findings can add to this general literature is that one's behaviors on the Internet are heavily influenced by their cultural backgrounds. As such, these findings all together suggest that newly developed technologies such as Facebook may be eventually integrated into the existing cultural repertoires of behaviors.

It is also noteworthy that the evidence we gathered from our multicultural analysis was convergent with the two-culture comparison between the most representative cultures (i.e., East Asians and Americans). As most cultural studies have been done between East Asians and Americans, investigating these two-cultural groups allows the results to be readily integrated to the existing literature. It is also possible to test more nuanced ideas by focusing on a small number of cultures, such as the effects of living in the opposite cultures in this study. Despite these strengths, it may be problematic to solely rely on a two-culture comparison, as factors other than the variable of interest (i.e., the individualism–collectivism) can differ between the two cultures. Thus, it has been encouraged to seek converging evidence from a multicultural investigation because it can increase the confidence in interpreting the results (Cohen, 2007).

Moreover, the individualism–collectivism showed stronger effects than pathogen prevalence. This suggests that pathogen prevalence may have weaker effects on social relations that do not require physical contacts. Moreover, Fincher and colleagues (2008) argue that the individualism–collectivism has evolved as a defensive system in high pathogen regions. In this case, our results show that cultural values/practices, once established, may exert stronger influences than ecological factors that gave rise to them. We think that this tendency of cultural influences to self-perpetuate will be an important area for future research.

In addition, the current findings could have implications for the literature on social networks. This literature has demonstrated that occupying a certain position in a social network has advantages for accumulating social capital and, consequently, increases performance in diverse competitive settings (Burt, 1992; Coleman, 1988). The most telling example of this sort is the effects of structural holes, defined as the absence of connection between pairs in social networks (Burt, 1992). Numerous studies have shown that an individual with structural holes (i.e., one who bridges two or more otherwise disconnected individuals) has an advantage over other individuals who do not hold such a “brokering” position because he or she is in a position to be exposed to more information (i.e., information should flow through the individual) and can control the flow of information (Burt, 1992, 1997). To the extent that one has a more ego-central network (i.e., members are connected via the ego), the person's network will have more structural holes. Thus, the association between the ego-centrality of networks and positive outcomes is expected. However, our findings suggest that social networks in collectivistic cultures might not allow many structural holes among in-group members due to the direct connection of network members. In other words, only out-group members can have many structural holes in a given network. Furthermore, collectivistic cultures make a sharp distinction between in-groups and out-groups (Triandis & Gelfand, 2012). Combining these strands of evidence, it is expected that the effects of ego-central networks (or having many structural holes) would be diminished in collectivistic cultures. In collectivistic cultures, it is difficult for a person to have many structural holes, and even if

he or she has many, the person may be perceived as part of an out-group, which would seriously reduce his or her trustworthiness (Yamagishi & Yamagishi, 1994). We think that such interaction effects between ego-central networks and culture is a fruitful area for future research.

Limitations

Before closing, it is warranted to discuss one important limitation of the current sample. It cannot be said that Facebook users in the present research are representative of their respective country. First, the number of respondents is too small in some countries (e.g., $N = 5$ in Ghana). We included the number of respondents as a control variable in main analyses and, furthermore, found that network characteristics were not systematically associated with the number. However, we admit that this issue was not completely resolved. Second and more important, our sample was not randomly recruited. Thus, self-selection could be an issue. For example, respondents of the myPersonality project might spread “virally” on Facebook. That is, respondents might learn about the project from previous respondents. This indicates that our sample might not be independent and also that there might be much overlap in social networks among respondents. This issue could be especially problematic for countries with small number of respondents.

Another issue of self-selected sample is that there could be many other factors than the individualism–collectivism that potentially contribute to the reported cultural differences in social networks on Facebook. Several countries (especially non-English-speaking countries) have indigenous SNSs (e.g., Renren in China or KaKaoStory in Korea), and some of them are more popular than Facebook. Similarly, the Internet may be difficult to access in some cultures. Then, in a certain culture, a highly selected group of people may use Facebook, which may inflate the likelihood that Facebook users in that culture are friends with each other. In fact, approximately 53% of Americans are using Facebook, whereas less than 1% of Chinese are doing so (www.internetworldstats.com). In addition, the number of Facebook users itself may be related to cultural differences in the ego-centrality of social networks on Facebook. For example, if the pool of Facebook users that one can choose Facebook friends from is small in a given country, one’s social network on Facebook in the country could be tight (or less ego-centric) by chance alone. However, the number of Facebook users (also available at <http://www.internetworldstats.com/stats2.htm>) was not significantly associated with each index of network characteristics in our data, $-.02 < \text{all } r_s < .04$, all $p_s > .79$. In addition, the association between the number of Facebook users and the individualism–collectivism was not significant, $r = .19$, $p = .19$, and also, the association became negligible after controlling for control variables used in the main analysis (i.e., GDP, Gini, etc.), $\beta = .09$, $p = .61$. Nevertheless, all the issues mentioned in this section should be addressed in future research using well-controlled experiments with random samples. However, we also note that correlational research with archive data like ours can be an important first step.³

Coda

In his book, *Republic.com*, Cass Sunstein (2001) convincingly shows that the world of the Internet is also segregated. For example, research conducted on 60 political websites found that the proportion of including links to websites with opposing views was only 15%, compared with 60% which was the proportion of including links to like-minded websites. Sadly enough, social or political isolation is true on the Internet world although the Internet itself is a technology that allows for easy interaction between people with diverse backgrounds. Likewise, the Internet including Social Network Services can easily bridge different cultures due to their potential for intercultural contacts. However, as demonstrated in the present research, the way we use these new tools is likely to conform to cultural traditions. If so, these tools may contribute to maintaining and even strengthening the existing cultural differences rather than closing the gap between cultures. Then, what the present works essentially show may be the resilience of cultural influences and the role of a new technology in such processes.

Appendix A

	M of raw data										M of transformed data														
	Ego betweenness					Density					Transitivity					Network size					Pathogen				
	Ego betweenness	Brokerage	Density	Transitivity	Network size	Ego betweenness	Brokerage	Density	Transitivity	Network size	Ego betweenness	Brokerage	Density	Transitivity	Network size	INDCOL	Pathogen								
Argentina	98.33	0.5	0.02	0.05	469.44	-0.8152	-0.0046	4.1629	3.6056	5.5594	4.8	37													
Australia	93.64	0.48	0.05	0.13	311.17	-1.5037	-0.0165	3.6705	2.6307	5.4017	9	27													
Austria	97.95	0.49	0.03	0.07	576.5	-0.9259	-0.0076	4.3012	3.4076	5.7314	6.75	26													
Belgium	95.95	0.49	0.04	0.11	303.57	-1.6741	-0.0107	3.5081	2.7124	5.0509	7.25	27													
Brazil	94.32	0.49	0.04	0.11	240.03	-1.4125	-0.012	3.639	3.0845	5.0478	3.9	45													
Bulgaria	95.51	0.49	0.03	0.08	270.55	-1.3359	-0.0067	3.7801	3.2605	5.189	5	30													
Chile	97.31	0.49	0.03	0.08	260.33	-1.184	-0.0066	3.801	3.0753	5.3168	4.15	29													
China	79.49	0.45	0.13	0.31	46	-3.0686	-0.0444	2.044	1.1575	3.8286	2	37													
Colombia	96.23	0.49	0.02	0.08	384.4	-1.0257	-0.0071	4.1455	3.3564	5.6895	2.15	43													
Czech Republic	98.21	0.49	0.02	0.05	205.5	-0.8161	-0.0051	4.0971	4.0954	5.2861	7	27													
Denmark	95.53	0.49	0.03	0.14	337.94	-1.7794	-0.0098	3.6463	2.2941	5.4914	7.7	25													
Estonia	95.65	0.49	0.03	0.09	278.33	-1.4477	-0.0087	3.9048	3.383	5.3239	4	25													
Finland	92.52	0.48	0.05	0.11	277.44	-1.3497	-0.0168	3.7985	3.0204	5.3144	7.15	25													
France	89.31	0.47	0.07	0.15	238.55	-1.6168	-0.0249	3.435	2.649	5.0289	7.05	29													
Germany	98	0.5	0.02	0.05	246.55	-0.9736	-0.0049	4.048	3.5709	5.3187	7.35	24													
Ghana	85.97	0.47	0.08	0.22	308	-1.9567	-0.0289	3.5337	2.4885	4.9733	3	40													
Greece	98.74	0.5	0.02	0.04	424.47	-0.7523	-0.0038	4.1372	3.6278	5.3784	5.25	30													
Hong Kong	96.88	0.49	0.02	0.1	722.13	-1.1245	-0.007	4.3652	2.8261	6.2527	4.75	25													
Hungary	97.43	0.49	0.03	0.07	324.44	-1.1716	-0.006	4.0442	3.2534	5.5074	6	28													
Iceland	95.46	0.49	0.03	0.11	201.25	-1.5548	-0.009	3.4921	2.6465	5.1801	7	28													
India	91.65	0.48	0.06	0.16	251.3	-1.6514	-0.0213	3.4496	2.6157	5.1205	4.4	39													
Indonesia	93.68	0.49	0.04	0.09	568.27	-1.1842	-0.0138	4.3601	3.3864	5.8917	2.2	37													
Ireland	90.89	0.48	0.06	0.14	294.66	-1.5865	-0.0196	3.6054	2.8211	5.2752	6	25													
Italy	97.12	0.49	0.02	0.06	301.55	-1.0202	-0.0059	4.057	3.6212	5.4035	6.8	26													
Japan	75.79	0.46	0.12	0.23	183.43	-2.7452	-0.0425	2.7278	1.933	4.3541	4.3	28													
Latvia	92.04	0.47	0.08	0.18	136.29	-1.6209	-0.0258	3.1479	2.5357	4.6866	4	28													

(continued)

Appendix A (continued)

	M of raw data					M of transformed data					INDCOL	Pathogen
	Ego betweenness	Brokerage	Density	Transitivity	Network size	Ego betweenness	Brokerage	Density	Transitivity	Network size		
Lithuania	98.77	0.5	0.03	0.03	176.17	-0.757	-0.0036	3.7299	3.7258	4.8332	4	4
Mexico	96.89	0.49	0.03	0.08	396.87	-1.1368	-0.007	4.0181	3.2141	5.5587	4	37
The Netherlands	97.38	0.49	0.04	0.07	217.63	-1.2749	-0.0092	3.6128	2.8971	4.9507	8.5	24
Nigeria	98.33	0.5	0.02	0.05	311.94	-0.8155	-0.0047	4.0321	3.551	5.3411	3	47
Norway	90.18	0.47	0.06	0.16	397.93	-1.5589	-0.0237	3.803	2.7241	5.6505	6.95	24
Pakistan	91.85	0.48	0.06	0.14	154.7	-1.8396	-0.0178	3.2003	2.7353	4.6541	2.2	35
Peru	98.91	0.5	0.01	0.03	467.69	-0.6436	-0.003	4.5012	3.8325	5.832	2.8	38
Poland	96.06	0.49	0.04	0.1	193.14	-1.3674	-0.0099	3.4138	2.7813	4.8962	5	27
Portugal	97.5	0.49	0.03	0.05	333.91	-1.016	-0.0052	3.9464	3.5937	5.2783	3.85	29
Romania	95.96	0.49	0.03	0.08	284.85	-1.3036	-0.0091	3.8422	3.2788	5.2656	5	27
Russia	74.34	0.44	0.15	0.27	100.25	-2.3542	-0.0575	2.5405	1.8613	4.3995	6	28
Singapore	93.31	0.49	0.04	0.12	385.24	-1.542	-0.013	3.8901	2.8798	5.5781	3.5	26
Slovenia	95.16	0.49	0.04	0.22	186	-1.7648	-0.0147	3.2169	1.5207	5.2257	5	27
South Africa	96	0.49	0.03	0.1	287.07	-1.3373	-0.009	3.791	3.014	5.3254	5.75	36
South Korea	71.25	0.4	0.22	0.39	243	-2.7403	-0.0897	2.4832	1.2788	4.83	2.4	32
Spain	97.74	0.49	0.02	0.07	393.22	-1.1019	-0.0058	4.0248	2.9478	5.6577	5.55	31
Sweden	95.09	0.49	0.04	0.13	256.86	-1.4476	-0.0119	3.6261	2.7006	5.2939	7.55	25
Switzerland	94.04	0.48	0.05	0.12	266.33	-2.2254	-0.0138	3.5372	3.3449	4.7323	7.9	24
Taiwan	82.6	0.46	0.08	0.18	413.43	-1.8448	-0.0327	3.7936	2.5333	5.7305	3.85	29
Thailand	95.65	0.49	0.02	0.09	536.03	-1.2351	-0.0075	4.368	3.3292	6.0399	3	41
Turkey	90.2	0.48	0.06	0.15	225	-2.2303	-0.0174	3.4579	2.7471	4.9651	3.85	39
United Kingdom	93.96	0.49	0.04	0.13	309.32	-1.5137	-0.0142	3.6593	2.6159	5.388	8.95	26
United States	92.42	0.48	0.05	0.14	321.75	-1.5701	-0.0174	3.6048	2.6152	5.3407	9.55	29

Note: INDCOL = Individualism–Collectivism Index.

Appendix B

	<i>n</i>	Age (<i>M</i>), years	Gender (% of female)
Argentina	52	24.75	56.25
Australia	876	25.07	58.90
Austria	9	24.00	50.00
Belgium	52	28.48	47.15
Brazil	88	28.48	44.83
Bulgaria	231	26.81	59.94
Chile	45	25.15	52.31
China	70	29.00	100.00
Colombia	58	25.44	53.92
Czech Republic	10	26.63	52.17
Denmark	36	26.44	62.50
Estonia	26	22.67	66.67
Finland	52	25.94	61.11
France	62	24.86	59.09
Germany	85	27.55	54.55
Ghana	5	25.86	37.27
Greece	49	28.88	54.17
Hong Kong	44	25.64	49.70
Hungary	22	27.56	55.56
Iceland	10	30.00	25.00
India	1,052	24.36	34.90
Indonesia	335	25.16	51.22
Ireland	260	26.20	59.15
Italy	59	24.60	65.00
Japan	48	22.14	42.86
Latvia	16	23.43	57.14
Lithuania	23	23.33	50.00
Mexico	276	24.44	35.06
The Netherlands	77	26.33	66.67
Nigeria	42	28.50	35.16
Norway	34	29.77	49.20
Pakistan	149	25.01	33.71
Peru	37	24.96	60.72
Poland	64	24.93	50.00
Portugal	78	29.57	47.56
Romania	186	25.88	60.29
Russia	48	22.50	50.00
Singapore	346	20.71	44.66
Slovenia	11	18.00	100.00
South Africa	269	28.96	63.83
South Korea	53	23.22	44.44
Spain	53	27.11	55.56
Sweden	91	28.84	63.64
Switzerland	9	30.24	49.06
Taiwan	37	25.71	28.57
Thailand	93	26.33	56.03
Turkey	11	27.50	100.00
United Kingdom	2,970	26.66	61.39
United States	18,238	26.84	63.85

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Notes

1. We note that the pattern of major results remained the same even when raw scores were used or nonparametric analyses were applied. Also, the way each measure was computed can be found in the following web page: (http://mypersonality.org/wiki/doku.php?id=list_of_variables_available#egocentric_networks_stats).
2. We included Americans in South Asia as well as East Asia to increase *N*. Previous research has shown that South Asians (e.g., Indians) are also more collectivistic than Americans (e.g., Savani, Markus, & Conner, 2008).
3. This paragraph was based on helpful as well as critical comments by anonymous reviewers.

References

- Adams, G., & Plaut, V. C. (2003). The cultural grounding of personal relationship: Friendship in North American and West African worlds. *Personal Relationships, 10*, 333-347.
- Back, M. D., Stopfer, J. M., Vazire, S., Gaddis, S., Schmukle, S. C., Egloff, B., & Gosling, S. D. (2010). Facebook profiles reflect actual personality, not self-idealization. *Psychological Science, 21*, 372-374. doi:10.1177/0956797609360756
- Borgatti, S. P., Mehra, A., Brass, D. J., & Labianca, G. (2009). Network analysis in the social sciences. *Science, 323*, 892-895. doi:10.1126/science.1165821
- Burt, R. S. (1992). *Structural holes: The social structure of competition*. Cambridge, MA: Harvard University Press.
- Burt, R. S. (1997). The contingency of social capital. *Administrative Science Quarterly, 42*, 339-365.
- Burt, R. S., Kilduff, M., & Tasselli, S. (2013). Social network analysis: Foundations and frontiers on advantage. *Annual Review of Psychology, 64*, 527-547. doi:10.1146/annurev-psych-113011-143828
- Castells, M., Tubella, I., Sancho, T., Díaz de la Isla, M. I., & Wellman, B. (2004). Social structure, cultural identity, and personal autonomy in the practice of the internet: The network society in Catalonia. In M. Castells (Ed.), *The network society* (pp. 233 - 248). Northampton, MA: Edward Elgar.
- Cohen, D. (2007). Methods in cultural psychology. In S. Kitayama & D. Cohen (Eds.), *The handbook of cultural psychology* (pp. 196-236). New York, NY: Guilford Press.
- Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*, S95-S120. doi:10.1086/228943
- Duffy, S., Uchida, Y., & Kitayama, S. (2013). *Symbolic self-inflation: A cross-cultural comparison*. Camden, NJ: Rutgers University-Camden.
- Everett, M., & Borgatti, S. P. (2005). Ego network betweenness. *Social Networks, 27*, 31-38. doi:10.1016/j.socnet.2004.11.007
- Faulkner, J., Schaller, M., Park, J. H., & Duncan, L. A. (2004). Evolved disease-avoidance mechanisms and contemporary xenophobic attitudes. *Group Processes & Intergroup Relations, 7*, 333-353. doi:10.1177/1368430204046142
- Fincher, C. L., Thornhill, R., Murray, D. R., & Schaller, M. (2008). Pathogen prevalence predicts human cross-cultural variability in individualism/collectivism. *Proceedings of the Royal Society B: Biological Sciences, 275*, 1279-1285. doi:10.1098/rspb.2008.0094
- Freeman, L. C. (1978). Centrality in social networks conceptual clarification. *Social Networks, 1*, 215-239. doi:10.1016/0378-8733(78)90021-7
- Gibson, J. J. (1979). *The ecological approach to visual perception*. Boston, MA: Houghton Mifflin.
- Himanen, P., & Castells, M. (2004). Institutional models of the network society: Silicon Valley and Finland. In M. Castells (Ed.), *The network society* (pp. 49 - 83). Northampton, MA: Edward Elgar.
- Hofstede, G. (1980). *Culture's consequences: International differences in work-related values*. Beverly Hills, CA: Sage.

- Hruschka, D. J., & Henrich, J. (2013). Institutions, parasites and the persistence of in-group preferences. *PLoS ONE*, 8(5), e63642. doi:10.1371/journal.pone.0063642.
- Igarashi, T., Kashima, Y., Kashima, E. S., Farsides, T., Kim, U., Strack, F., . . . Yuki, M. (2008). Culture, trust, and social networks. *Asian Journal of Social Psychology*, 11, 88-101.
- Ishii, K., Reyes, J. A., & Kitayama, S. (2003). Spontaneous attention to word content versus emotional tone: Differences among three cultures. *Psychological Science*, 14, 39-46.
- Kim, H. S., & Markus, H. R. (1999). Deviance or uniqueness, harmony or conformity? A cultural analysis. *Journal of Personality and Social Psychology*, 77, 785-800.
- Kosinski, M., Stillwell, D., & Graepel, T. (2013). Private traits and attributes are predictable from digital records of human behavior. *Proceedings of the National Academy of Sciences of the United States of America*, 110, 5802-5805. doi:10.1073/pnas.1218772110
- Lewis, K., Gonzalez, M., & Kaufman, J. (2012). Social selection and peer influence in an online social network. *Proceedings of the National Academy of Sciences*, 109, 68-72. doi:10.1073/pnas.1109739109
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98, 224-253.
- Markus, H. R., & Kitayama, S. (2010). Cultures and selves: A cycle of mutual constitution. *Perspectives on Psychological Science*, 5, 420-430.
- Miyamoto, Y., & Schwarz, N. (2006). When conveying a message may hurt the relationship: Cultural differences in the difficulty of using an answering machine. *Journal of Experimental Social Psychology*, 42, 540-547.
- Morling, B. (2000). "Taking" an aerobics class in the U.S. and "entering" an aerobics class in Japan: Primary and secondary control in a fitness context. *Asian Journal of Social Psychology*, 3, 73-85.
- Na, J., Grossmann, I., Varnum, M. E. W., Kitayama, S., Gonzalez, R., & Nisbett, R. E. (2010). Cultural differences are not always reducible to individual differences. *Proceedings of the National Academy of Sciences of the United States of America*, 107, 6192-6197.
- Na, J., & Kitayama, S. (2012). Will people work hard on a task they choose? Social-eyes priming in different cultural contexts. *Journal of Experimental Social Psychology*, 48, 284-290.
- Navarrete, C. D., Fessler, D. M. T., & Eng, S. J. (2007). Elevated ethnocentrism in the first trimester of pregnancy. *Evolution & Human Behavior*, 28, 60-65.
- Nisbett, R. E., & Masuda, T. (2003). Culture and point of view. *Proceedings of the National Academy of Sciences of the United States of America*, 100, 11163-11175.
- Qiu, L., Lin, H., & Leung, A. K. y. (2013). Cultural differences and switching of in-group sharing behavior between an American (Facebook) and a Chinese (Renren) social networking site. *Journal of Cross-Cultural Psychology*, 44, 106-121. doi:10.1177/0022022111434597
- Sagiv, L., & Schwartz, S. H. (1995). Value priorities and readiness for out-group social contact. *Journal of Personality and Social Psychology*, 69, 437-448. doi:10.1037/0022-3514.69.3.437
- Savani, K., Markus, H. R., & Conner, A. L. (2008). Let your preference be your guide? Preferences and choices are more tightly linked for North Americans than for Indians. *Journal of Personality and Social Psychology*, 95, 861-876.
- Suh, E., Diener, E., Oishi, S., & Triandis, H. C. (1998). The shifting basis of life satisfaction judgments across cultures: Emotions versus norms. *Journal of Personality and Social Psychology*, 74, 482-493.
- Sunstein, C. R. (2001). *Republic.com*. Princeton, NJ: Princeton University Press.
- Toma, C. L., & Hancock, J. T. (2013). Self-affirmation underlies Facebook use. *Personality and Social Psychology Bulletin*, 39, 321-331. doi:10.1177/0146167212474694
- Triandis, H. C. (1989). The self and social behavior in differing cultural contexts. *Psychological Review*, 96, 269-289.
- Triandis, H. C. (1996). The psychological measurement of cultural syndromes. *American Psychologist*, 51, 407-415.
- Triandis, H. C., & Gelfand, M. J. (2012). A theory of individualism and collectivism. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (Vol. 2, pp. 498-520). Thousand Oaks, CA: Sage.
- Vazire, S., & Gosling, S. D. (2004). e-Perceptions: Personality impressions based on personal websites. *Journal of Personality and Social Psychology*, 87, 123-132. doi:10.1037/0022-3514.87.1.123
- Wheeler, L., Reis, H. T., & Bond, M. H. (1989). Collectivism-individualism in everyday social life: The middle kingdom and the melting pot. *Journal of Personality and Social Psychology*, 57, 79-86.
- Yamagishi, T., & Yamagishi, M. (1994). Trust and commitment in the United States and Japan. *Motivation and Emotion*, 18, 129-166. doi:10.1007/bf02249397