ONLINE READINGS IN PSYCHOLOGY AND CULTURE
International Association for Cross-Cultural Psychology

Volume 2 *Theoretical and Methodological Issues*
Issue 1 *Conceptual Issues in Psychology and Culture*

Article 15

7-2023

Cultural Orientations of Northerners and Southerners

Evert Van de Vliert
University of Groningen, e.van.de.vliert@rug.nl

Recommended Citation
Van de Vliert, E. (2023). Cultural Orientations of Northerners and Southerners. *Online Readings in Psychology and Culture, 2*(1). https://doi.org/10.9707/2307-0919.1189

Abstract

A growing group of psychologists recognizes that many collective mindsets and practices are functionally linked to natural habitats, which predominantly differ from north to south. Notably, cultural collectivism, power distance and aggression increase from the South Pole toward the Equator but decrease from the Equator toward the North Pole; conversely, cultural creativity, gender equality and life satisfaction decrease from the South Pole toward the Equator but increase from the Equator toward the North Pole. None of these cultural orientations varies considerably in east-west direction. Both theoretically and empirically, the most plausible explanation is that societies at higher latitudes adopt greater internal flexibility in response to greater habitat variability, consisting of daylength variability, climatic variability (cold, heat, dryness, wetness) and biotic variability in plants and animals. This variability explanation has deep historical roots as evidenced by the predictability of current geographical differences in culture on the basis of north-south differences in vertical collectivism and gender equality across mutually isolated pre-industrial societies.

A Mysterious Discovery

More than a century ago, members of the so-called geographical school started to investigate the extent to which humans collectively and individually adapt their natural habits to their natural habitat (for overviews, see Dewey, 1922; Feldman, 1975; Sorokin, 1928). Further into the 20th century, many psychological forerunners (e.g., Barker, 1968; Berry, 1979; Bronfenbrenner, 1977; Lewin, 1939) came to believe that habitual mindsets and cultural practices cannot be accurately understood without distinguishing between immediate, intermediate, and remote environments. In that vein, somewhere in the 1970s, the Dutch social scientist Geert Hofstede discovered a mysterious latitude-related dimension of culture. People living at lower latitudes, such as Guatemalans and Malaysians, are more collectivistic and accept larger power distances. By contrast, people living closer to the North and South Poles, such as Danes and New Zealanders, are more individualistic and reject larger power distances. What on Earth is going on?

Confronted with this puzzling finding, Hofstede (1980, 2001) made a decision that would unintentionally lead generations of cross-cultural psychologists astray. The unearthed latitudinal gradient of culture was split up into two dimensions: collectivism versus individualism (more or less differentiation between familiars and strangers) and power distance (more or less differentiation between higher-ups and lower-downs). Hofstede continued to advocate the existence of two separate dimensions when others called his unsplit dimension "vertical collectivism versus horizontal individualism" (Triandis, 1989, 1995) and "tight versus loose culture" (Gelfand, 2018; Gelfand et al., 2011). Now, about five decades later, cross-cultural psychology is beginning to appreciate not only the uniqueness and wholeness of the unsplit dimension of social differentiation (Van de Vliert, 2020), but also Hofstede's seminal discovery of latitudinal distributions of cultural orientations.

Going beyond Hofstede's cross-cultural dimension of social differentiation, latitudinal psychology is guided by the observations that the Earth (a) has North and South Poles but no "East and West Poles;" (b) creates opposite north-south gradients of livability conditions in the opposite Northern and Southern Hemispheres; (c) causes all plants and animals to cope with these conditions—notably night-day variations, cold-heat variations, and dry-wet variations; and (d) requires especially humans, who feed on plants and animals, to adapt to the variability in daylength, temperature, and precipitation (Richerson & Boyd, 2008; Van de Vliert & Van Lange, 2019). This perspective motivates a growing group of psychologists to investigate worldwide differences in cultural orientations—locally shared mindsets and practices. Following are brief overviews of geographical descriptions, description-based ecological explanations, and explanation-based temporal predictions of these cultural orientations across short and long time scales.

Geographical Descriptions

A scientific description is better to the extent that it anticipates an explanation of what is being described. Therefore, descriptions of cultural differences between northerners, southerners, easterners, and westerners should ideally be anchored to the geographical coordinates of the Northern or Southern Hemisphere, or both. For example, although it is important to know that both collectivism and power distance decrease at higher latitudes (Hofstede, 1980, 2001), it provides more information and makes more sense to know that Hofstede's unsplit dimension of differentiation between familiars and strangers as well as higher-ups and lower-downs increases from the South Pole toward the Equator, decreases from the Equator toward the North Pole, and varies negligibly along longitude (see Figure 1). This more detailed description and visualization does indeed anticipate ecological explanations of pitting "us" against "them" in terms of oppositely sloping north-south gradients of night-day variability, cold-heat variability, and wet-dry variability.

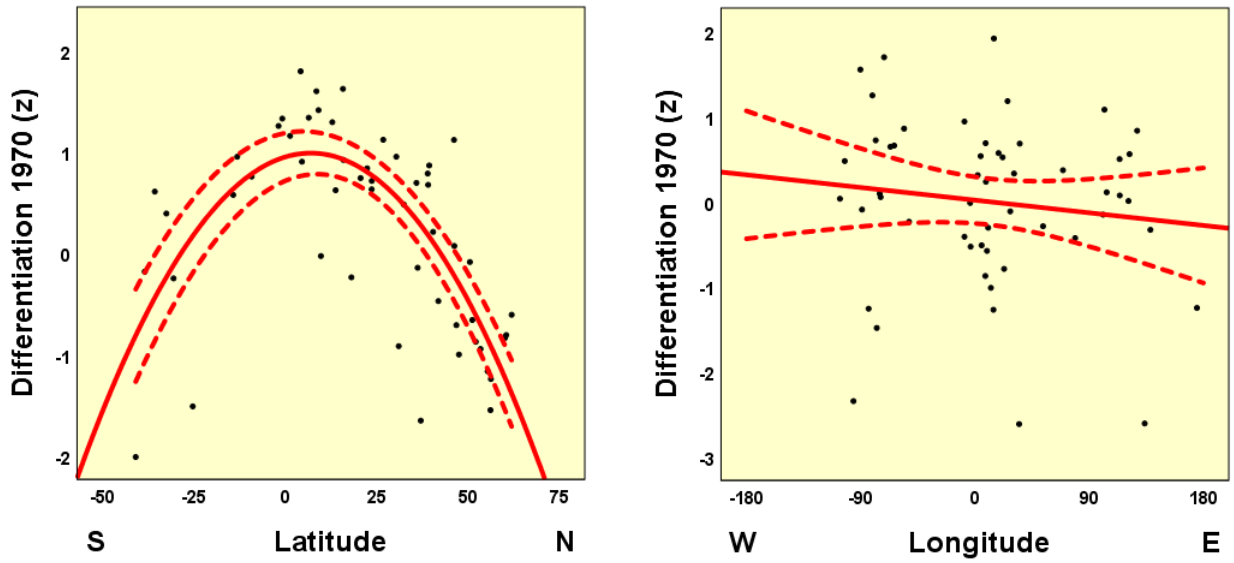

Figure 1. Scatter plots with best-fitting lines for Hofstede's geography of culture in the 1970s (taken from Van de Vliert, 2020, p. 273). Left: significant bell-shaped distribution along latitude of differentiation between familiars and strangers (collectivism) as well as higher-ups and lower-downs (power distance). Right: non-significant linear distribution of differentiation between "us" and "them" along longitude. The dashed curves represent 95% confidence intervals. S = south, N = north, W = west, E = east.

Bell-shaped culture distributions between the North and South Poles, contrasting with flat culture distributions from east to west, have been documented not only for collectivism and power distance (Figure 1), but also for aggression (Van de Vliert & Daan, 2017; Van de Vliert & Van Lange, 2019) and mental depression (Van de Vliert & Rentfrow, 2021). Even on a smaller spatial scale, within the United States, collectivism (Fincher & Thornhill, 2012) and

legal discrimination (Conway et al., 2017) decrease from the Mexican to the Canadian border and vary negligibly from the East Coast to the West Coast (Van de Vliert, 2020). The common denominator of collectivism, power distance, aggression, and depression seems to be something like constraints to free thinking and acting. It raises the possibility that opportunities to freely choose goals, means, and actions have inverted bell-shaped (U-shaped) distributions between the North and South Poles. A growing body of research shows this to be the case.

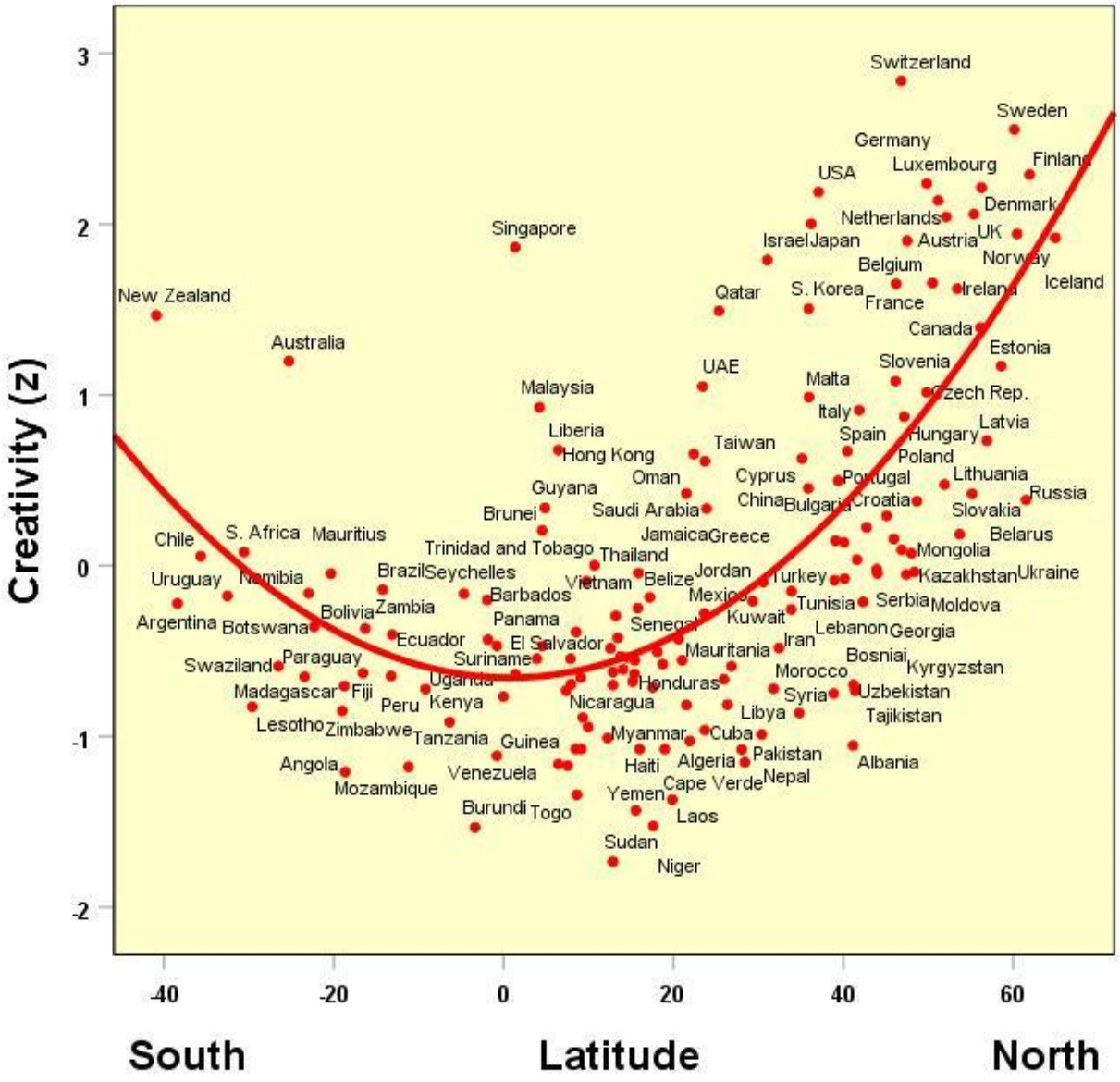

Figure 2. U-shaped distribution of creativity between the North and South Poles (taken from Van de Vliert & Van Lange, 2019, p. 868). Scatter plot and best-fitting line show the relationship between a country's midrange latitude and the inhabitants' creativity.

Illustrated in Figure 2 is the U-shaped pole-to-pole distribution of a 155-country index of creativity (Murray, 2014; Van de Vliert & Van Lange, 2019). Visualized are the reliably combined scores of the World Economic Forum's assessment of perceived creative capacity, the technology achievement index of the United Nations, Cornell University's global innovation index, the rate of patent applications per country reported by the World Intellectual Property Organization, and the Nobel Prize laureates per capita by country of birth. Figure 2 shows a clear pattern with Singapore as the only outlier. Compared with southerners, northerners tend to be more inventive and innovative in the Northern Hemisphere but less inventive and innovative in the Southern Hemisphere. By contrast, easterners are not more or less creative than westerners, regardless of whether they reside east or west of the Greenwich meridian (Van de Vliert & Van Lange, 2019).

U-shapes like the one in Figure 2 have also been documented for cultural orientations that reflect greater and more equal access of a country's inhabitants to resources, practices, and payoffs. Indeed, governance quality (Van de Vliert & Conway, 2022), population literacy (Conway et al., 2022), gender equality (Van de Vliert & Kluwer, 2023), and life satisfaction or happiness (Van de Vliert & Van Lange, 2019), all decrease from the South Pole toward the Equator, increase from the Equator toward the North Pole, and vary negligibly from east to west. There is also intriguing evidence that North Americans and North Europeans have clock-time cultures that rely heavily on time schedules and sequentially organized activities, whereas most Africans and Latin Americans have event-time cultures that go with the natural flow of social events unfolding in parallel (Brislin & Kim, 2003; Levine, 2006). Toward the North and South Poles, time is money; toward the Equator, time is life.

Taken together, the discussed geographical descriptions allow the conclusions that (a) cultural orientations such as vertical collectivism, aggression, creativity, and life satisfaction vary from north to south rather than from east to west, (b) northerners in the Northern Hemisphere share cultural orientations with southerners in the Southern Hemisphere, and (c) northerners in the Southern Hemisphere share cultural orientations with southerners in the Northern Hemisphere.

Ecological Explanations

North-south geographies of locally shared mindsets and practices, such as those in Figures 1 and 2, do little to promote genetic and socio-economic explanations of culture. Rather, such pictures radiate the message that genetic and socio-economic factors mediate and modify rather than generate cultural orientations. Indeed, opposite north-south gradients of culture in the Northern and Southern Hemispheres ultimately require ecological explanations in terms of opposite north-south gradients of livability conditions in the Northern and Southern Hemispheres. Importantly, north-south gradients of average levels of livability conditions (e.g., lower temperature levels at higher latitudes) are confounded with north-south gradients of deviations from the average levels of livability conditions (e.g., greater temperature variations at higher latitudes).

While ignoring this confounding information, north-south gradients of culture are usually explained in terms of average levels of livability conditions. For example, stronger vertical collectivism has been variously explained in terms of the greater need for intergroup differentiation at warmer latitudes with higher levels of rice growing (Talhelm et al., 2014) and parasitic diseases (Fincher & Thornhill, 2012). Similarly, larger gaps between gender roles have been traced to poorer cognitive and economic performance at warmer latitudes with more ultraviolet radiation (León, 2023). Conversely, greater female emancipation has been traced to weaker fertility pressures in latitudes with colder temperatures and better accessibility of fresh water (Silva et al., 2023). However, all such north-south explanations of culture violate the axiom that warm-blooded humans—with basic needs for thermal comfort, nutrition, and health—are essentially and primarily sensitive to divergence from moderate levels of temperature and precipitation (Van de Vliert & Van Lange, 2019).

Greater climatic deviations from average levels of livability at higher latitudes are appraised as more stressful and requiring more adjustment. The climato-economic explanation of culture (Van de Vliert, 2011, 2013) proposes three types of psychobehavioral adaptations. Poorer people appraise greater climatic problems as more threatening, place more emphasis on existence needs, and tend to embrace vertical collectivism. By contrast, richer people appraise the same greater climatic problems as more challenging, place more emphasis on growth needs, and tend to embrace horizontal individualism. In the absence of climatic problems, poor and rich people alike develop comfort appraisals, place more emphasis on social needs, and tend to embrace intermediate levels of vertical collectivism versus horizontal individualism. The psychological core idea is that unmet existence needs tend to proliferate into frustration of both social needs and growth needs (Alderfer, 1972; Herzberg, 1966; Kenrick et al., 2020; Maslow, 1943).

Viewed more broadly, deviations from constant daylength, clement temperature levels, stable wet and dry seasons, and stationary levels of plant and animal life are indeed the most plausible drivers of our daily functioning. Figure 3 places these ecological conditions of livability in a sequential causal order: daylength variability drives climatic variability in annual temperatures and daily precipitation, which then drives biotic variability in plants and animals, which finally drives flexibility in cultural habits (Van de Vliert, Conway, & Van Lange, 2023). The theoretical foundation for the effect of habitat variability on cultural orientations lies in the understanding that inflexible and routine responses are more effective in stable environments whereas flexible and creative adjustments are more effective in dynamic environments (Giuliano & Nunn, 2021; Mintzberg, 1979; Schill et al., 2019). This basic insight is pointedly formulated in the systems law of requisite variety (Ashby, 1958; Heylighen, 1992): in order to survive and thrive any system adjusts its internal flexibility to the variability of its external environment.

Viewed from the funnel perspective in Figure 3, Hofstede's (1980, 2001) mysterious discovery loses its mystery. In order to adjust to their more variable natural habitat, inhabitants of higher latitudes are bound to adopt more flexible habits including less prejudiced mindsets and discriminatory practices against groups of outsiders. Other people

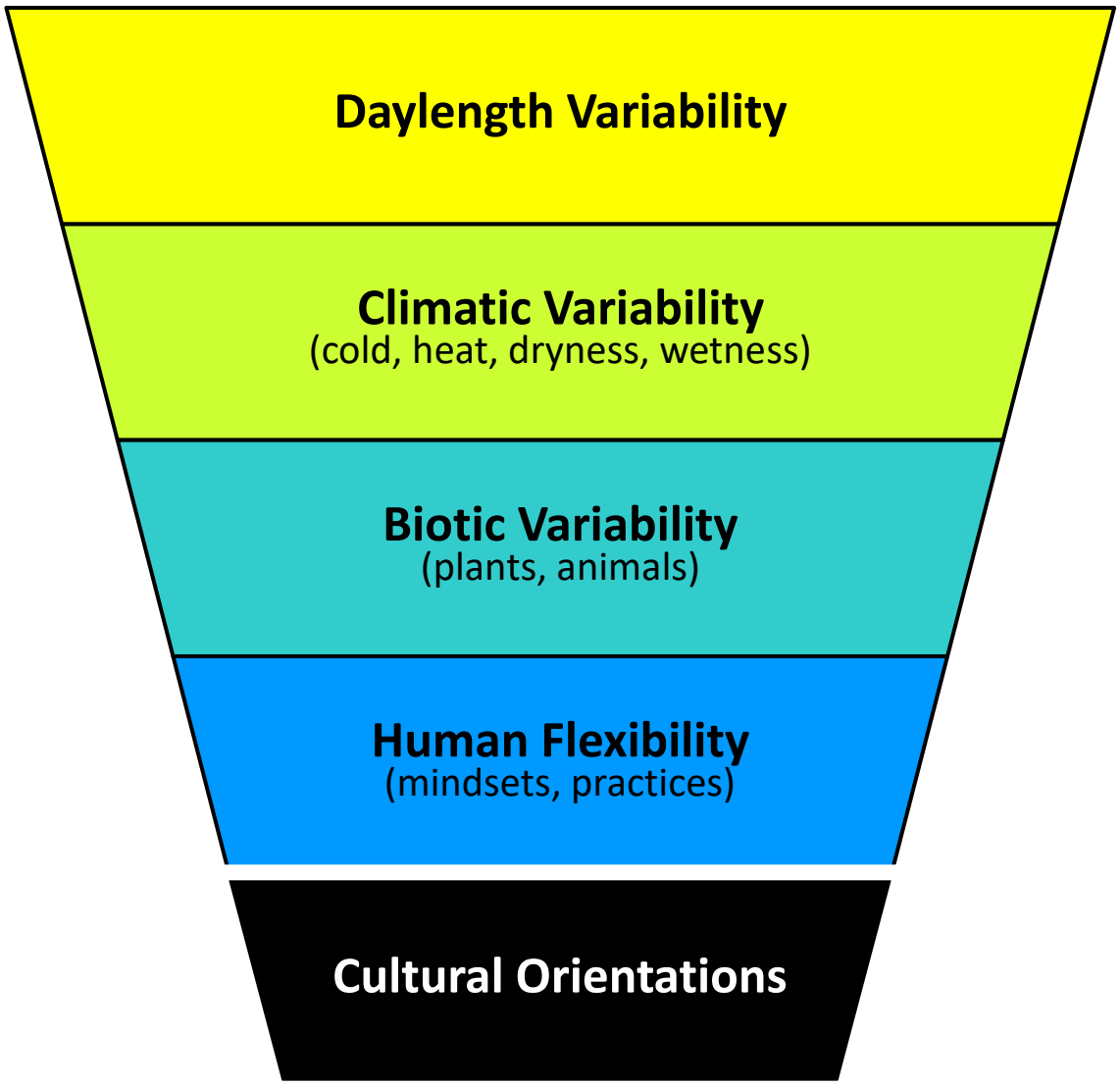

Figure 3. Ecological Explanations of Cultural Orientations
Note: Locally shared mindsets and practices are more flexible to the extent that they are embedded in causally ordered layers of natural variability of the natural habitat.

are seen and treated as free individuals rather than members of either familiar ingroups or unfamiliar outgroups, resulting in less vertical collectivism and more horizontal individualism. The funnel perspective in Figure 3 can also explain the opposite north-south gradients of creativity in the Northern and Southern Hemispheres (Figure 2) as more flexible mindsets and practices in more variable habitats are conducive to both inventive idea generation and innovative idea implementation. The connection with Hofstede's seminal discovery is that creativity is minimal among vertical collectivists in stable habitats and maximal among horizontal individualists in variable habitats (Van de Vliert & Murray, 2018).

Explanations of cultural orientations in terms of ecological variability may complement and enrich explanations in terms of average levels of ecological conditions of livability. For

example, the rice-wheat theory (Talhelm, 2020, 2022; Talhelm et al., 2014) accounts for collectivistic ingroup-outgroup differentiation by arguing that rice production at warmer latitudes historically had more intense and more reciprocal labor exchanges than wheat production at colder latitudes. To manage irrigation networks, rice communities had to coordinate water use and shared infrastructure, which created strong interdependent ties in vertical and horizontal networks. As a long-term consequence, the differentiation between ingroups (familiar, near, trusted, favored) and outgroups (strange, distant, mistrusted, disfavored) became stronger in rice regions than in wheat regions. The funnel perspective in Figure 3 suggests the complementary ecological explanation that rice habitats are less variable than wheat habitats, with more ingroup-outgroup differentiation as a likely result.

Similarly, the parasite-stress theory (Fincher et al., 2008; Fincher & Thornhill, 2012) accounts for collectivistic ingroup-outgroup differentiation by arguing that a greater burden of human-to-human transmitted diseases at warmer latitudes promotes cultural collectivism, xenophobia, ethnocentrism, and the like. The idea is that in warmer areas with higher levels of parasitic diseases, a stronger ingroup orientation helps people avoid infection through fewer contacts and interactions with potentially disease-carrying outsiders and strangers. The funnel perspective in Figure 3 suggests the complementary ecological explanation that the co-occurring higher levels of pathogen prevalence and habitat stability can both lead to more ingroup-outgroup differentiation and discrimination. A common weakness of the rice-wheat and parasite-stress theories thus seems to be that habitat variability provides a more compelling and more integrative explanation because warm-blooded humans respond primarily to deviations from the stationary levels of life in plants such as rice crops and animals such as parasites.

Nowhere has the struggle between ecological-level and ecological-variability explanations of cultural orientations been more evident than in the explanation of the bell-shaped distribution of aggression and violence between the North and South Poles. Highlighting the confounded nature of lower temperature levels and greater temperature variability, proponents of the CLimate, Aggression, and Self-control in Humans (CLASH) model (Van Lange et al., 2017) argue that greater temperature variability calls for more year-round planning at colder latitudes, which increases future orientation and key aspects of self-control in the short run. In the longer run, this adjusted mindset reduces aggressive and violent practices. In agreement with the CLASH model, business costs of aggressive crime and violence, domestic hostilities, press repression, political oppression, and legal discrimination all peak in relatively stable habitats near the Equator and taper off in increasingly more variable habitats toward the Poles (Van de Vliert & Conway, 2019, 2022; Van de Vliert & Daan, 2017; Van de Vliert & Van Lange, 2019).

Taken together, the ecological explanations of north-south differences in mindsets and practices suggest that cultural orientations (a) can be related to average levels of environmental livability, but (b) are more meaningfully related to causally ordered layers of daylength variability, climatic variability and biotic variability of the natural habitat, because (c) human populations are forced to function increasingly flexibly in increasingly variable natural habitats.

Temporal Predictions

Explanations of cultural orientations of northerners and southerners are no exception to the rule that an explanation is better to the extent that it cannot only account for the present but can also forecast the future. Think again of Hofstede's (1980, 2001) north-south distributions of differentiation between familiars and strangers (collectivism) as well as higher-ups and lower-downs (power distance). The above variability explanation of this latitudinal gradient of culture appears to have been foreshadowed in the historical reality of pre-industrial societies, where cultural orientations already ranged from tight vertical collectivism (for example, Ganda, Azande, Fon, Hausa, Amhara and Aztec) to loose horizontal individualism (for example, Yahgan, Aweikoma, Slave and Copper Eskimo) (see also Jackson et al., 2020). Both pre-industrial collectivism and pre-industrial hierarchism increased from the South Pole toward the Equator, decreased from the Equator toward the North Pole, and varied negligibly from east to west (Van de Vliert, 2020).

So systematic and persistent are these culture distributions around the Earth, that they allow reliable predictions of locally shared intergroup orientations across time. Distinct forecasts of intergroup discrimination were based on regression equations for (a) the prevalence of collectivism and hierarchism along latitude and longitude in pre-industrial times and around 1970, (b) the prevalence of intergroup discrimination along latitude and longitude around 2010, (c) the inverse association between intergroup differentiation around 1970 and variability in annual temperatures, daily precipitation, pathogen prevalence and subsistence activities, and (d) the inverse association between intergroup discrimination around 2010 and the same habitat variabilities (Van de Vliert, 2020). The six forecasts are almost identical (Cronbach's $\alpha = .91$), creating a firm prophecy about the future. The resulting worldwide index predicts future discrimination between groups to be maximal in Nigeria, Yemen and Somalia, and minimal in Greenland, Canada, and on the Falkland Islands. It should perhaps not come as a surprise if this cultural habit of pitting of "us" against "them" were to generalize to the gender categories of women and men, with gender inequality as a consequence.

In this vein, a two-wave panel study (Van de Vliert & Kluwer, 2023) has developed forecasts of current gender equality on the basis of geographical descriptions and variability explanations of gender equality in pre-industrial times. The descriptive part of the study ascertained that pre-industrial gender equality was lowest around the Equator, higher toward the North and South Poles, and invariant in east-west direction. The explanatory part showed that greater annual variability in daylength, temperature and daily precipitation at higher latitudes was associated with greater flexibility in subsistence-related strategies and greater pre-industrial gender equality in its wake. The final panel part estimated current gender equality by applying the regression equation for the distribution of pre-industrial gender equality along latitude and longitude to the latitudes and longitudes of contemporary countries. The predictions were quite accurate, producing support for the variability explanation and the long-term predictability of gender equality in 139 Northern-Hemisphere countries ($r = .64$, $p < .001$) and 36 Southern-Hemisphere countries ($r = .67$, $p < .001$).

Apparently, inhabitants' cultural habits of flexibility and equality make more variable natural habitats at higher latitudes better places to live for girls and women. It would be interesting to examine whether this variability-livability proposition also holds for gays and lesbians and for other minority groups who are usually stereotyped and met with prejudice and discrimination. Fortunately, this research has already been done (Van de Vliert et al., 2023). More than a million survey responses by inhabitants of 163 countries were used to demonstrate that life is collectively viewed as better for gays and lesbians, racial and ethnic minorities, and foreign immigrants living closer to the North and South Poles, regardless of how far they live east or west of the Greenwich meridian. Again supporting the explanatory perspective from Figure 3, the perceived local livability for minority groups increases in habitats with greater annual variability in daylength, temperature and daily precipitation. Economic affluence reinforces this ecological trend, mediated by quality of governance and psychosocial well-being.

Gallup World Poll data, gathered from 2010 to 2015, enabled these geographical descriptions and variability explanations of local livability for gays and lesbians, racial and ethnic minorities, and foreign immigrants. The regression equation predicting livability for these minority groups along latitude and longitude produced geographical forecasts, whereas the regression equation predicting livability for these minority groups on the basis of habitat variability and national wealth produced ecological forecasts. Both forecasts were tested on Gallup World Poll data gathered at a later period (2016-2020), and both were confirmed in each of the four hemispheres of the Earth. The geographical forecasts based on latitude and longitude accounted for up to 62 percent, whereas the ecological forecasts based on habitat variability by national wealth accounted for up to 75 percent of the extent to which minority groups are judged to be living in a good place.

Taken together, the temporal predictability of geographical and ecological differences in vertical collectivism, gender equality, and livability for minority groups corroborates (a) the principle that cultural orientations vary along latitude rather than longitude, (b) the explanation that cultural orientations are partially driven by the natural variability of the natural habitat, and (c) the observation that cultural persistence has deep historical roots traceable to the north-south axis of the Earth.

Coda

Good science offers description, explanation, and prediction in sequential order (Editors Nature Human Behaviour, 2021; Hofman et al., 2021; Yarkoni & Westfall, 2017). Developments in artificial intelligence and machine learning have revealed that psychologists are nevertheless mesmerized by explanation to the exclusion of what precedes and follows it. I have therefore emphasized description and prediction, also in the Discussion Questions.

References

Alderfer, C. P. (1972). *Existence, relatedness, and growth: Human needs in organizational settings*. New York, NY: Free Press.

Ashby, W. R. (1958). Requisite variety and implications for control of complex systems. *Cybernetica, 1,* 83-99.

Barker, R. (1968). *Ecological psychology: Concepts and methods for studying the environment of human behavior.* Stanford, CA: Stanford University Press.

Berry, J. W. (1979). A cultural ecology of social behaviour. In L. Berkowitz (Ed.), *Advances in experimental social psychology, 12,* 177-206.

Brislin, W. R., & Kim, E. S. (2003). Cultural diversity in people's understanding and use of time. *Applied Psychology: An International Review, 52,* 363–382. http://doi.org/10.1111/1464-0597.00140

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist, 32*(7)*,* 513-531. http://doi.org/10.1037/0003-066X.32.7.513

Conway, L. G., III, Bongard, K., Plaut, V., Gornick, L. J., Dodds, D. P., Giresi, T., Tweed, R. G., Repke, M. A., & Houck, S. C. (2017). Ecological origins of freedom: Pathogens, heat stress, and frontier typography predict more vertical but less horizontal government restriction. *Personality and Social Psychology Bulletin, 43,* 1378-1398. http://doi.org/10.1177/0146167217713192

Conway, L. G., III, Van de Vliert, E., & Chan, L. (2022). The geography of literacy: Understanding poleward increases in literacy rates. *Asian Journal of Social Psychology, 25,* 586-591. http://doi.org/10.1111/ajsp.12520

Dewey, J. (1922). *Human nature and conduct: An introduction to social psychology*. New York, NY: Holt.

Editors Nature Human Behaviour (2021). Description, prediction, explanation. *Nature Human Behaviour, 5,* 1261. http://doi.org/10.1038/s41562-021-01230-5

Feldman, D. A. (1975). The history of the relationship between environment and culture in ethnological thought: An overview. *Journal of the History of the Behavioral Sciences, 11,* 67-81. http://doi.org/10.1002/1520-6696(197501)11:1<67::aid-jhbs2300110114>3.0.co;2-4

Fincher, C. L., & Thornhill, R. (2012). Parasite stress promotes in-group assortative sociality: The cases of strong family ties and heightened religiosity. *Behavioral and Brain Sciences, 35,* 61-79. http://doi.org/10.1017/S0140525X11000021

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, 275,* 1279-1285. http://doi.org/10.1098/rspb.2008.0094

Gelfand, M. J. (2018). *Rule makers, rule breakers: How tight and loose cultures wire our world.* New York, NY: Scribner.

Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. M., Lun, J., Lim, B. C., Duan, L., Almaliach, A., Ang, S., Arnadottir, J., Aycan, Z., Boehnke, K., Boski, P., Cabechinhas, R., Chan, D., Chhokar, J., D'amato, A., Ferrer, M., Fischlmayr, I. C. et al. (2011). Differences

between tight and loose cultures: A 33-nation study. *Science, 332,* 1100-1104 (2011). http://doi.org/10.1126/science.1197754

Giuliano, P., & Nunn, N. (2021). Understanding cultural persistence and change. *The Review of Economic Studies, 88,* 1541-1581. http://doi.org/10.1093/restud/rdaa074

Herzberg, F. (1966). *Work and the nature of man*. Cleveland, OH: World Publishing Company.

Heylighen, F. (1992). Principles of systems and cybernetics: An evolutionary perspective. In R. Trappl (Ed.), *Cybernetics and Systems: Vol. 1* (pp. 3-10). Singapore: World Scientific.

Hofman, J. M., Watts, D. J., Athey, S., Garip, F. Griffiths T. L., Kleinberg, J., Margetts, H., Mullainathan, S., Salganik, M. J., Vazire, S., Vespignani, A., & Yarkoni, T. (2021). Integrating explanation and prediction in computational social science. *Nature, 595,* 181-188. http://doi.org/10.1038/s41586-021-03659-0

Hofstede, G. (1980). *Culture's consequences: International differences in work-related values.* Beverly Hills, CA: Sage.

Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions, and organizations across cultures* (2nd ed.). Thousand Oaks, CA: Sage.

Jackson, J. C., Gelfand, M., & Ember, C. R. (2020). A global analysis of cultural tightness in non-industrial societies. *Proceedings of the Royal Society B*, *287,* 20201036. http://doi.org/10.1098/rspb.2020.1036

Kenrick, D. T., Griskevicius, V., Neuberg, S. L., & Schalór, M. (2010). Renovating the pyramid of needs: Contemporary extensions built upon ancient foundations*., 5,* 292–314. http://doi.org/10.1177/1745691610369469

León, F. R. (2023). Likely electromagnetic foundations of gender inequality. *Cross-Cultural Research, 57.,* xxx-xxx. http://doi.org/10.1177/10693971221143577

Levine, R. V. (2006) *A geography of time: The temporal misadventures of a social psychologist, or how every culture keeps time just a little bit differently*. London, England: Oneworld Publications.

Lewin, K. (1939). Field theory and experiment in social psychology: Concepts and methods. *American Journal of Sociology, 44,* 868-896. http://doi.org/10.1086/218177

Maslow, A. H. (1943). *A theory of human motivation*. *Psychological Review, 50,* 370-396. http://doi.org/10.1037/h0054346

Mintzberg, H. (1979). *The structuring of organizations.* Englewood Cliffs, NJ: Prentice-Hall.

Murray, D. R. (2014). Direct and indirect implications of pathogen prevalence for scientific and technological innovation. *Journal of Cross-Cultural Psychology, 45,* 971-985. https://doi.org/10.1177/0022022114532356

Richerson, P. J., & Boyd, R. (2008). *Not by genes alone: How culture transformed human evolution.* Chicago: University of Chicago Press.

Silva, M. S., Alexander, A. C., Klasen, S, & Welzel, C. (2023). The roots of female emancipation: Initializing role of cool water. *Journal of Comparative Economics, 51,* xxx-xxx. http://doi.org/10.1016/j.jce.2022.11.001

Schill, C., Anderies, J. M., Lindahl, T., Folke, C., Polasky, S., & Cárdenas, Cárdenas, J. C., Crepin, A. S., Janssen, M. A., Norberg, J., & Schluter, M. (2019). A more dynamic

understanding of human behaviour for the Anthropocene. *Nature Sustainability, 2,* 1075-1082. http://doi.org/ 10.1038/s41893-019-0419-7

Sorokin, P. A. (1928). *Contemporary sociological theories.* New York, NY: Harper.

Talhelm, T. (2020). Emerging evidence of cultural differences linked to rice versus wheat agriculture. *Current Opinion in Psychology, 32,* 81-88. http://doi.org/10.1016/j.copsyc.2019.06.031

Talhelm, T. (2022). The rice theory of culture. *Online Readings in Psychology and Culture, 4*(1). http://doi.org/10.9707/2307-0919.1172

Talhelm, T., Zhang, X., Oishi, S. Shimin, C. Duan, D., Lan, X., & Kitayama, S. (2014). Large-scale psychological differences within China explained by rice versus wheat agriculture. *Science, 344,* 603-608. http://doi.org/10.1126/science.1246850

Triandis, H. C. (1989). The self and social behavior in differing cultural contexts. *Psychological Review, 96,* 506-520. http://doi.org/10.1037/0033-295X.96.3.506

Triandis, H. C. (1995). *Individualism and collectivism.* Boulder, CO: Westview.

Van de Vliert, E. (2011). Climato-economic origins of variation in ingroup favoritism. *Journal of Cross-Cultural Psychology, 42,* 494-515. http://doi.org/10.1177/0022022110381120

Van de Vliert, E. (2013). Climato-economic habitats support patterns of human needs, stresses, and freedoms. *Behavioral and Brain Sciences, 36,* 465-521. http://doi.org/10.1017/S0140525X12002828

Van de Vliert, E. (2020). The global ecology of differentiation between us and them. *Nature Human Behaviour, 4,* 270-278. http://doi.org/10.1038/s41562-019-0783-3

Van de Vliert, E., & Conway L. G., III (2019). Northerners and Southerners differ in conflict culture. *Negotiation and Conflict Management Review, 12,* 256-277. http://doi.org/10.1111/ncmr.12138

Van de Vliert, E., & Conway, L. G., III (2022). Does perceived governance quality improve toward the North and South Poles for eco-cultural reasons? *Journal of Cross-Cultural Psychology, 53,* 3-20. http://doi.org/10.1177/00220221211051025

Van de Vliert, E., Conway, L. G., III, & Van Lange, P. A. M. (2023). Enriching psychology by zooming out to general mindsets and practices in natural habitats. *Perspectives on Psychological Science, 18,* xxx-xxx. http://doi.org/10.1177/17456916221141657

Van de Vliert, E., & Daan, S. (2017). Hell on earth? Equatorial peaks of heat, poverty, and aggression. *Behavioral and Brain Sciences, 40,* 36-37. http://doi.org/10.1017/S0140525X16001114

Van de Vliert, E., Joshanloo, M., Conway, L. G., III, Kluwer, E. S., & Van Lange, P. A. M. (2023). Life is viewed as better for minorities in places with more variable habitats. Manuscript under review.

Van de Vliert, E., & Kluwer, E. S. (2023). The historical ecology and global geography of current gender equality. Revised manuscript under final review.

Van de Vliert, E., & Murray, D. R. (2018). Climate and creativity: Cold and heat trigger invention and innovation in richer populations. *Creativity Research Journal, 30,* 17-28. http://doi.org/10.1080/10400419.2018.1411571

Van de Vliert, E., & Rentfrow, P. J. (2021). Who is more prone to depression at higher latitudes? Islanders or mainlanders? *Current Research in Ecological and Social Psychology, 2,* 1-8. http://doi.org/10.1016/j.cresp.2021.100012

Van de Vliert, E., & Van Lange, P. A. M. (2019). Latitudinal psychology: An ecological perspective on creativity, aggression, happiness, and beyond. *Perspectives on Psychological Science, 14,* 860-884. http://doi.org/10.1177/1745691619858067

Van Lange, P. A. M., Rinderu, M. I., & Bushman, B. J. (2017). Aggression and violence around the world: A model of Climate, Aggression, and Self-control in Humans (CLASH). *Behavioral and Brain Sciences, 40,* 1-49. http://doi.org/10.1017/S0140525X16000406

Yarkoni, T. & Westfall, J. (2017). Choosing prediction over explanation in psychology: Lessons from machine learning. *Perspectives on Psychological Science, 12,* 1100-1122. http://doi.org/10.1177/1745691617693393

Questions for Discussion

A. Geographical descriptions

Compare Figures 1 and 2. Pay particular attention to the opposite north-south gradients in the opposite hemispheres, and to the Equatorial reversal points (given that the thermal Equator lies 6 degrees north of the geographical Equator).

1. Why are north-south gradients of culture usually steeper in the Northern than in the Southern Hemisphere?
2. Do differences in gradient steepness silently say something about explanations of cultural orientations?
3. What does the Equatorial reversal point of cultural creativity (0□36' N) potentially imply for temperature and daylength explanations of creativity?

B. Ecological explanations

Navigate to link B and download “The Rice Theory of Culture.” Process the two factors that drive tight collectivism, switch back to this paper, and place those drivers of culture into the funnel perspective in Figure 3.

4. What are advantages and disadvantages of proximal and distal explanations of cultural collectivism versus individualism?
5. Does zooming out to climatic explanations weaken or strengthen the common denominator of collectivism, hierarchism, and gender discrimination?
6. Which layers of context would you add to turn Figure 3 into a more representative input-throughput-output perspective on explanations?

C. Temporal predictions

Think of future changes in psychosocial functioning as a result of two huge threats humanity faces today: global warming and local poverty. Navigate to Figure 4 on page 478 of the attached article. Scrutinize the climato-economic forecasts of 104 population-level changes in free functioning between 2012 and 2112. Gains in freedom are above the diagonal, losses are below.

7. Do such ecological forecasts have more or less psychological value than the discussed geographical forecasts?
8. Which northerners and southerners will move up or down on the worldwide ladder of free psychosocial functioning?
9. Do psychologists have a mission to use their explanatory models to forecast and influence the future functioning of the inhabitants of the Earth?

About the Author

Evert Van de Vliert (PhD, Free University Amsterdam, 1973) is a Professor Emeritus of Organizational and Applied Social Psychology at the University of Groningen in the Netherlands, who also worked at the University of St. Andrews in Scotland and at the University of Bergen in Norway. He has published more than 250 journal articles, chapters and books, and received the Lifetime Achievement Award of the International Association for Conflict Management. His current research concentrates on the ecology and geography of cultures, while emphasizing the existence of latitudinal gradients in collectivism, hierarchism, aggression, discrimination, corruption, depression, creativity, and happiness.
Website: www.rug.nl/staff/e.van.de.vliert
Email: e.van.de.vliert@rug.nl; ORCID: 0000-0003-3322-7829