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Cognitive Differences Accounting for Cross-cultural Variation in Perceptions of Healthy Eating

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Abstract

What counts as healthy eating varies both within and across cultures. While people often focus on specific foods and nutrients, the timing and style of eating (eating context) can also be an important consideration, and one that appears to vary across cultures. One possible explanation for this variation is differences in basic cognition, with holistic thinking in collectivist cultures favouring contextual factors. We assess this hypothesis by examining perceptions between two cultural groups that vary in collectivism. In study 1, we investigate whether residents of Ukraine place more importance on considerations of eating context than residents of the USA. In study 2, we test whether this between-country difference is due to the mediating effect of individual differences in collectivism. Ukrainian participants consistently placed more importance on context (Cohen's $d = 0.71$ – 0.84 ; $p < 0.01$) and were more collectivist (Cohen's $d = 0.95$, $p < 0.001$). A mediation analysis shows that collectivism significantly mediates the effect of nationality on context endorsement, and renders the effect of nationality non-significant ($p > 0.05$). These results suggest that the holistic pattern of attention might extend to the domain of nutrition and may account for some cross-cultural differences in perceptions of healthy eating. We briefly discuss the benefits of perception focused on the context of eating, such as decreased burden of self-regulation in a food-rich environment.

Keywords

collectivism – eating context – food perceptions – holistic cognition

1 Introduction

What counts as healthy eating can vary within and across cultures (Povey et al., 1998). While healthy eating is mostly interpreted by Americans in terms of the foods and nutrients eaten (Povey et al., 1998; Croll et al., 2001; Lake et al., 2007), there are other factors that can influence people's perceptions of healthiness. Specifically, there is evidence that in other cultures people also dietary have a strong focus on non-food aspects of the diet in addition to concerns about the specifics of foods. Martinez-Gonzalez et al. (2000) show that Spanish respondents focused on the concept of "balance and variety" more than respondents in other traditional Mediterranean countries (Greece, Italy and Portugal). The authors propose that lower prevalence of the "balance and variety" definitions may be due to lower nutrition education in these other countries. Akamatsu et al. (2005) report that Japanese respondents' models of healthy eating include two factors: "food and nutrition" and "eating styles and habits". The latter factor includes such considerations as timing and regularity of food intake. These authors suggest that, in comparison to many European and American countries where healthy eating perceptions focus on foods, the Japanese emphasis on eating styles is influenced by culturally unique beliefs related to how food is eaten (in addition to what foods should be consumed).

We group these considerations of "how" one eats (ways of eating or habits) into a separate domain of "eating context". It contrasts the "content" domain, which is concerned with the intrinsic qualities of foods — nutrients, additives, caloric content. We thus have two ways of perceiving healthy eating: a context view that takes into consideration the whole diet and how we eat, and a content view that centres on the specific foods and their qualities (Ronteltap et al., 2012). Focusing on context can influence people's perceptions and, possibly, might influence their eating behaviours. For example Ronteltap et al. (2012) show that individuals who focus more on context judge unhealthy (chips) and ambiguous (chocolate) products to be healthier. De Ridder et al. (2013) also propose that norms about the context of eating — how much, when and where it is appropriate to eat (termed eating appropriateness standards or EAS) — can be important for weight management. The authors suggest that a lack of clear EAS can compromise self-regulation in a food-rich (or obesogenic) environment, leading to overconsumption.

Although there appear to be differences in the degree to which individuals across cultures endorse eating context as an important consideration of a healthy diet, to the author's knowledge no work has examined the factors that make one more likely to focus on context in terms of healthy eating. One

possible explanation for differences in one's focus on context is based on the cognitive differences related to collectivism- a well-studied dimension of cultural variation. As one of the most recurring distinctions in social science research, this dimension describes the perceived relationship between the self and others in society. Members of societies where individuals tend to be more collectivist are more likely to value group membership and respect group processes and decisions (Triandis, 1995). This distinction also maps onto deeper cognitive differences, whereby individuals in more collectivist societies tend to perceive situations more holistically and attend to features of context, rather than focusing on specific items in a situation (Nisbett et al., 2001).

The purpose of our work is to test whether collectivism can account for individual differences in the importance of eating context (see Figure 1). The United States is consistently ranked as one of the least collectivist countries in the world (Triandis, 1995), while a number of studies demonstrate that central and eastern Europeans have more collectivist values (Kolman et al., 2003). Some researchers have proposed that a history of communism may have played a role in these differences in collectivism (Varnum et al., 2008a). As expected from the known cognitive influences of collectivism, eastern Europeans are more holistic in their thinking than western Europeans: Russians tend to have a more holistic pattern of attention (Kuhnen et al., 2001), categorize more thematically, and make more situational attributions for behaviour than Americans (Grossmann, 2008). As Ukraine has been influenced by both western and eastern Europe (Varnum et al., 2008b), globally it fits in the middle of the analytic-holistic continuum with West Europeans and North Americans being most analytic and East Asians being most holistic (Varnum et al., 2008b).

We hypothesize that Ukrainian participants will place higher importance on statements about the context of eating due to a stronger collectivism orientation than American respondents. We do not have expectations about cross-country differences in perceived importance of content, as our context and content dimensions do not necessarily form a single dimension whereby higher importance on context would decrease the importance of content. However, we include content based views of healthiness as well as an additional scale based on the importance of naturalness as a check on differences in acquiescence bias between the USA and Ukraine (Smith, 2004). In study 1 we conduct in-person interviews to collect statements that reflect both the content and context of a diet. We then measure perceived importance of these statements for weight loss. In study 2 we additionally measure individual collectivism levels and test for mediation to assess if collectivism predicts perceived importance of context above differences in nationality.

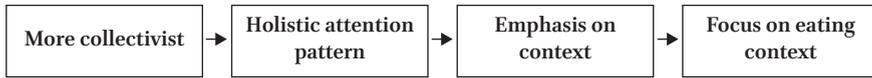


FIGURE 1 *Hypothesis: Individuals who score higher on collectivism also have a more holistic pattern of attention, characterized by emphasizing the context of a given situation; they thus place more importance on the context of eating.*

2 Study 1

2.1 Sampling

U.S. survey participants ($n=50$) were recruited by disseminating study information via online interest groups (e.g. outdoor activity, music, local food on Facebook.com and Meetup.com) and providing the survey link to graduate and undergraduate students across a number of departments (linguistics, kinesiology, music) at Indiana University and Arizona State University. Ukrainian respondents ($n=41$) were recruited at local small businesses and stores (respondents included both owners and employees) in eastern Russian-speaking Ukraine (Dnepropetrovsk, Kharkiv and Odessa). The mean age for the U.S. sample was 32 ($SD=11.9$; 60% female) and 34.2 for Ukraine ($SD=12.9$; 64% female).

All participants received an information letter with study details; agreeing to the interview or completing the survey constituted informed consent. The study was approved by the Arizona State University IRB (No. 1304009147).

2.2 Procedure and Materials

2.2.1 Surveys

Surveys were collected during June-July 2013 in both the U.S. and Ukraine and collected demographic information (age, self-reported weight and height, family income and education levels) in addition to the main measures discussed further. After piloting the surveys on several American and Ukrainian respondents, the final version was translated (and reverse-translated) into Russian for the Ukrainian sample (Russian is the dominant language in eastern Ukraine).

2.2.2 Eating Context and Content Scales

The Eating Context Scale was developed with information derived from open-ended interviews on healthy eating perceptions in the USA and Ukraine. Interviews were conducted during May 2013 (Phoenix, AZ, USA) and June 2013 (Dnepropetrovsk, Ukraine) on American ($n=5$) and Ukrainian ($n=5$) respondents. MV interviewed the respondents in their native languages (English and

Russian). The semi-structured interviews included questions on healthy eating topics, such as “what does healthy eating mean to you” and “what and how should one eat to stay in good health”. The specific goal of the interviews was to elicit statements about eating context or the ways one eats (in addition to what one eats) that may lead to poor health. These statements were used to construct the “content” and “context” categories for the surveys, in addition to the statements collected by Fisher and Dubé (2011) on American eating norms (Table 1). Fisher and Dubé created a list of 18 norms of what Americans typically believe were appropriate or desirable when eating. Based on the interviews and the Fisher and Dube items, 13 context statements comprised the final Context Scale (Cronbach’s alpha = 0.77) and eleven intrinsic food statements comprised the Content Scale (Cronbach’s alpha = 0.74).

Respondents were asked to rate how important each practice described in the statements was in contributing to weight loss (from not important at all to very important). We chose weight loss as the outcome because other health-related issues (e.g., chronic conditions such as cancer or diabetes) appeared hard for respondents to elaborate on.

TABLE 1 *Statements comprising the context and content scales*

Context	Intrinsic
Avoid snacking between meals*	Reduce foods high in sugar
Always eat breakfast*	Reduce foods high in fat
Not eat more than others around you*	Include more vegetables
Not eat in front of the TV	Reduce meat consumption
Chew food slowly*	Avoid food high in sodium
Avoid combining meat and grains	Avoid foods with a long shelf life
Avoid eating protein late in the day	Eat more fish
Eat small meals often through the day	Include more dairy
Have set times for meals	Avoid GMO foods
Avoid foods fried in oil	Keep away from fast food places
Eat all foods but in moderation*	Replace sugary beverages with water
Eat sweets only in 1st half of the day	
Eat at home rather than at a restaurant*	

* From Fisher and Dubé (2011).

2.3 Analysis

For all analysis in this work we used SPSS Version 22. To assess the inter-item reliability of the two scales we used Cronbach's alpha. For assessing the difference between perceived importance of context statements for Ukrainian and American respondents, we conducted a Student *t*-test. To assess the effect of age and gender on context scores, we ran a linear regression with nationality, gender and age as predictors. We used an alpha of 0.05 as the cut-off for statistical significance and Cohen's *d* as a measure of effect size.

2.4 Results

Ukrainian means for context and content were $M=2.73$ ($SD= 0.56$) and 3.07 ($SD= 0.56$), respectively. American means were $M=2.31$ ($SD= 0.55$) for context and 2.94 ($SD= 0.51$) for content (Fig. 2). There was a significant correlation between content and context ($r = 0.65, p < 0.05$) which indicates that content concerns and context concerns are not opposite poles of a single dimension. There was a statistically significant difference and a strong effect size between the context means for the two countries ($p < 0.001$; Cohen's $d = 0.84$), while no significant difference between content means was observed ($p > 0.05$), suggesting that the national differences in context concerns is not simply due to acquiescence bias. In the full sample, neither age nor gender were a significant predictor for context scores, and did not eliminate the effect of country on the importance of context statements.

As hypothesized, Ukrainians gave more importance to context statements in our question on the significance of eating practices for weight loss. This

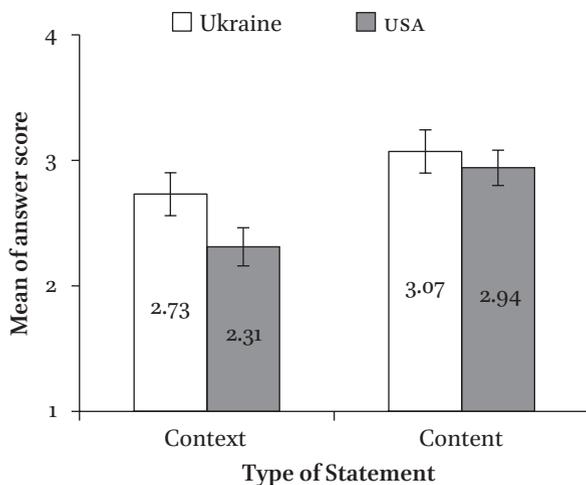


FIGURE 2
Mean importance scores for each scale between Ukrainian and American sample (Study 1). Bars indicate 95% confidence intervals.

difference might be due to more collectivist cognition in the Ukrainian sample as studies have shown that collectivist cultures possess a more holistic pattern of attention (Kuhnen et al., 2001). However, since individual levels of collectivism were not measured in this study, it is not possible to determine if these differences are due to variation in collectivism or other factors. Study 2 addresses this concern by assessing individual-level collectivism.

3 Study 2

3.1 Sampling

Ukrainian participants ($n=35$) were recruited via convenience sampling at various businesses in Dnepropetrovsk, Ukraine (grocery stores, small business firms, factories). American participants ($n=42$) were obtained via Amazon Mechanical Turk (MTurk), a crowd sourcing system where tasks are given to anonymous “workers” for a small completion fee (\$0.45 for the present survey). MTurk data has been shown to have comparable reliability and apparent validity to data collected with traditional recruitment methods (Buhrmester et al., 2011). Surveys on MTurk included a test question that indicated which online survey takers did not pay attention to survey instructions. Sample characteristics are summarized in Table 2. Ukrainian and U.S. respondents did not have significant differences in education levels, BMI, age and gender distribution.

The study was approved by the Arizona State University IRB (No. 1304009147). All participants received an information letter with study details; agreeing to the interview or completing the survey constituted informed consent.

TABLE 2 Sample descriptives for studies 1 and 2

Descriptive	Summer 2013		Autumn 2014	
	Ukraine	USA	Ukraine	USA
<i>N</i>	41	50	35	42
Age (mean)	34.2	32	40.1	42.4
SD	12.9	11.95	16	12
Females	64%	60%	54.3%	66.7%
BMI (all)	23.5	26.5	25.1	27.3
Male	25.4	27.2	25.8	27.3
Female	22.4	26.1	24.5	27.3

3.2 *Procedure and Materials*

Survey data collection took place during October 2014. The survey contained identical context and content scales from Study 1; it also measured naturalness- one's preference for natural foods, as an additional check on whether acquiescence bias can account for the cross-cultural differences.

Collectivism level was assessed via the Culture Orientation Scale (Triandis and Gelfand, 1998) measuring two dimensions of collectivism (vertical and horizontal). The scale consists of 16 items and respondents are asked to indicate how well each statement describes them with 1 being "never/definitely no" to 9 being "always/definitely yes". The Triandis method allows for differentiation between subtypes of collectivism- horizontal (HC) and vertical (VC). Vertical collectivists accept more inequality while horizontal perceive all members of the group as equal. However, a single scale including items from both scales had a higher reliability than either scale individually (HC: Cronbach's alpha =0.71; VC: Cronbach's alpha =0.59; Full scale: Cronbach's alpha =0.74). Thus, we used a single scale based on all 16 items.

3.3 *Analysis*

We assessed national differences in the main outcome, scores on the context scale, the key predictor, collectivism, as well as the content and naturalness scales using Student *t*-tests. To assess the inter-item reliability of scales we used Cronbach's alpha. For assessing the degree of collectivism on the individual level, we use the mean score for the cultural orientation scale. To test whether Ukrainian participants endorse context more due to higher levels of collectivism, we use a formal bootstrap mediation analysis (using PROCESS in SPSS; Hayes 2013) with Ukraine as predictor, collectivism as mediator, and the context scale as outcome. To assess whether the effect of collectivism was uniform across Ukrainian and American samples, we tested an interaction between nationality and collectivism. To assess whether the relationship between collectivism and context is confounded by other covariates, we run a linear regression including age, gender, and BMI as independent variables in the regression to test whether collectivism remains a significant predictor after controlling for these factors. Finally, to assess whether the mediation by collectivism is not due to increased acquiescence bias, we test whether two other scales which would suffer from similar acquiescence bias (content and naturalness) mediate the relationship between nationality and context (Smith, 2004). We used an alpha of 0.05 as the cut-off for statistical significance and Cohen's *d* as a measure of effect size.

3.4 Results

The key findings from Study 1 were replicated. The context and content, as well as the naturalness scales were moderately reliable — Cronbach's alpha was 0.77, 0.74 and 0.82, respectively. Again, there was a significant correlation between content and context ($r = 0.68, p < 0.05$) as well as naturalness with content ($r = 0.31, p < 0.05$) and with context ($r = 0.24, p < 0.05$). As before, Ukrainians placed more importance on context statements ($M = 2.96; SD = 0.57$) than Americans ($M = 2.61; SD = 0.37$) (Fig. 3). There was a statistically significant difference and a strong effect size between the context means for the two countries (Cohen's $d = 0.71; p < 0.005$). There was no significant national difference between content or naturalness means ($p > 0.05$).

Ukrainian respondents also scored higher on collectivism (Cohen's $d = 0.95; p < 0.001$). Higher scores on collectivism accounted for 18% ($R^2 = 0.18, p < 0.001$) of the variance in scores on the context scale. The interaction between country and collectivism was not significant ($p > 0.10$) which indicates the effect of collectivism is uniform in both societies, and the effect of collectivism on context remained significant when controlling for BMI, age and gender in a regression model.

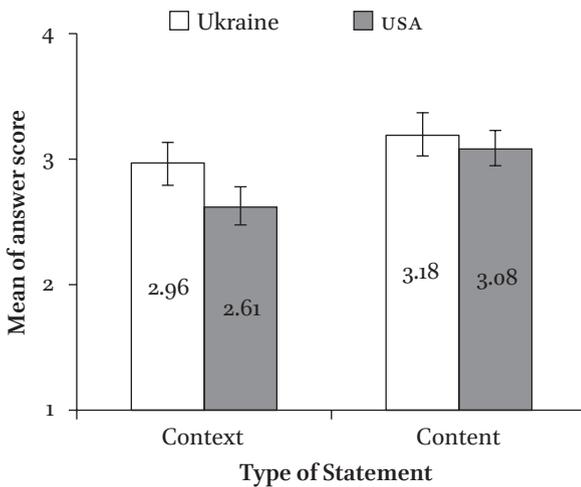


FIGURE 3 Mean importance scores for each scale between Ukrainian and American sample (Study 2). Bars indicate 95% confidence intervals.

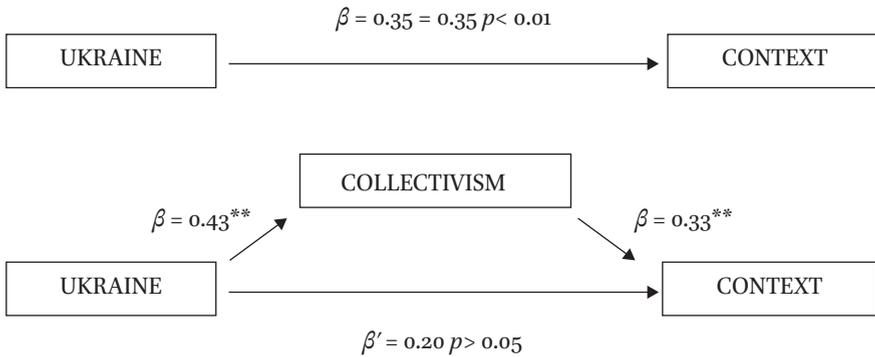


FIGURE 4 Mediation analysis. β , Direct effect of nationality on context scores; β' , Direct effect of nationality on context after controlling for collectivism.

A formal mediation analysis shows a statistically significant indirect path of nationality on the context scale via collectivism (coefficient = 0.14, 95% CI = (0.05, 0.28), $p < 0.05$), with 41% of the effect mediated through this path. The same analysis with content and naturalness scales as potential mediators did not show statistically significant indirect paths, suggesting that mediation was not simply the result of acquiescence bias on Likert scales (see Fig. 4).

4 Discussion

Our two studies show that eastern Ukrainian respondents place more emphasis on the context of eating than United States respondents in judgments about reducing weight. This effect of nationality is largely mediated by individual-level differences in collectivism with more collectivist respondents placing more importance on the context of eating. These results are consistent with prior work in other cognitive domains showing that individuals with higher collectivism pay more attention to context. We suggest that holistic thinking pattern associated with collectivism extends to the domain of food, where consideration of the total diet, the timing and “regime” of eating, as well as proper combination of foods become more important for those that think more holistically.

The context statements derived from our interviews and from Fisher and Dubé (2011) are conceptually related to eating norms. As previously mentioned, these norms concerning styles, timing, and place of eating are termed “eating appropriateness standards (EAS) by De Ridder and colleagues (2013), who argue that these standards are a crucial determinant of eating behaviour.

EAS are shaped socially and culturally, are internalized into people's everyday routines, and are influential due to their ingrained nature. The authors present a novel hypothesis that self-regulation of eating in an "obesogenic" environment is compromised by a lack of clear, shared eating appropriateness standards that guide what, how much, where, and when we eat. It is worthwhile to further test whether attention to context might have beneficial outcomes such as a lower BMI. Having a set of context-related ideas about what healthy eating constitutes may also be protective against fluctuations in nutrition information by lessening the burden of self-regulation amidst conflicting dietary advice on specific ingredients and nutrients.

One potential alternative explanation for the lower importance of eating context in the USA is differences in nutrition education between and within cultures — specifically, higher nutritionism among Americans. The ideology of nutritionism is strongly present in the United States and, according to Scrinis (2008), is the nutritionally reductive approach to food that replaces other ways of engaging with it and of contextualizing the relationship between food and body. Scrinis writes that nutritionism has a reductive focus on individual foods, thus particular products are evaluated in isolation from other food items, diets, and contexts. Such view of eating might explain why American respondents see context as less important. However, food content was highly important also for respondents in Ukraine (as evident in high content means for both countries), indicating that Ukrainians emphasize nutrients and individual foods just as much as Americans. In addition, the effect of collectivism on higher context endorsement was consistent in both cultures. It is thus unlikely that higher nutritionism among U.S. respondents is responsible for lower endorsements of context statements.

Limitations of our studies include a small sample size and the non-representativeness of these samples. The lack of dietary measurement is also a constraint- it is unclear if Ukrainians in fact practice the norms they emphasize, thus we cannot make comments about the benefits of focusing on eating context. Lastly, while we assume that individuals who are highly collectivist also hold holistic thinking styles (as suggested in the literature), cognition styles need to be directly measured in future studies.

5 Conclusion

Ample social science research shows that what counts as healthy eating varies both within and across cultures. However, there is little understanding of the reasons underlying such variation. In this paper, we report on two studies that

assess one hypothesis to account for cross-cultural variation in how people make judgments about healthy eating — the attention they give to aspects of the context of eating. Specifically, we examine whether observed differences between Ukrainian and U.S. respondents in the importance of the eating context can be attributed to individual level variation in cognition styles associated with a key dimension of cultural variation — collectivism. Based on a mediation model, our findings suggest that the greater endorsement by Ukrainian respondents of eating context as a factor in weight loss is largely mediated by individual-level variation in collectivism. More generally, these findings suggest that the holistic pattern of attention characteristic of the members of collectivist societies may extend to the domain of nutrition, resulting in a stronger focus on context.

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