

Generations in context: The development of a new approach using Twitter and a survey

Abstract

Millennials (born between 1982-1999) and their work-related values have received significant attention in recent years, but empirical evidence of Millennials' characteristics is inconclusive. One possible reason behind these mixed results is the tendency to apply generational groupings universally and ignore the potential impact of the broader context, such as national culture. This study develops a contextual perspective on generational differences and proposes a new, hybrid approach to generations. First, we conducted an exploratory study using data mining of big data from Twitter, to test hypotheses regarding differences between age cohorts in four different countries (USA, Russia, India, Argentina). Second, we conducted a follow-up study to further investigate the between-countries differences found in the first study, using survey data from the same four countries. The results highlight the importance of both global and local influences when considering generational differences, supporting a new hybrid theoretical approach to understanding generational differences. Millennials were shown to be different from Generation X (born 1965-1981) across countries in relation to the behavioral aspect of writing style on social media. In contrast, in relation to work values, generational groupings were not universal, as the distinction between the work values of Millennials and Generation X was only found in the individualistic culture of the USA, and not in other, more collectivistic, cultures.

Keywords: Millennials, Work-values, Data mining, national context

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The existence of multiple generations in the workplace (Dries, Lyons, Schweitzer & Ng 2015; Pepermans & De Kerpel, 2008) has led to considerable interest in the attitudes and preferences of different age groups (Ng & Parry 2016). Commentators from both academia (e.g. Culpin, Miller & Peters 2015; Thompson & Gregory 2012; Twenge & Campbell 2008) and practice (e.g. Wright, 2018) have emphasized the importance of managers understanding generational differences in work values in order to increase employees' motivation, innovation and productivity. Most of this focus in recent years has been on Generation Y or Millennials (born 1982-1999), probably because they now represent the largest proportion of the North American labor market (Ng & McGlinnis Johnson 2015). Many organizations have adapted their practices to the suggested work values of Millennials such as high self-esteem, desire for meaningful work, a strong desire to succeed and valuing leisure more than other generations (Alsop, 2008; Ng & Parry 2016). These practices have included adding services focusing on leisure or relaxation (Gloeckler, 2008) such as the in-house massage rooms offered at Google or meditation rooms at eBay (Fortune 100 Best, 2008).

Despite the growth of such practices built on the perceived work values and aspirations of Millennials, the evidence base for generational differences remains problematic (Costanza & Finklestein 2015; Ng & Parry, 2016; Parry & Urwin, 2011, 2017, 2021). Scholars have commented that research relies on cross-sectional studies (Parry & Urwin 2011, 2017), that effect sizes are small (Becton, Walker & Jones-Farmer 2014; Costanza et al 2012) and that studies have produced mixed and inconsistent results (Parry & Urwin 2011).

Indeed, some studies have not found any differences between generations while others have found differences that are not consistent and contradict the common stereotypes of the different generations (Parry and Urwin, 2011; Parry 2014). For example, Appelbaum, Serena, & Shapiro (2005) found that employees, regardless of generation, ranked a high salary and a stable and secure future as the most

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important motivational work factors. In their investigation of differences in work values and work attitudes among three generations (Baby Boomers, Generation X and Millennials), Cennamo and Gardner (2011) found that although Millennials prioritized status- and freedom-related values, no significant differences were found between Generation X (born 1965-1981) and Millennials in either intrinsic (cognitive) or extrinsic (instrumental) work values. Recent articles by Cappelli (2019) and King et al (2019) have therefore cautioned both researchers and practitioners against drawing strong conclusions about generational differences in work values, suggesting that more research is needed.

These inconclusive findings in relation to generational differences in work values suggest that generational differences might be influenced by factors outside of the individual and therefore that there is potential for the effects of contextual moderators. In particular it is possible that differences between Generation X and Millennials may be contingent on contextual norms such as national culture (e.g. a set of norms, beliefs, behaviors, and values shared by individuals within a nation; Peretz & Knappert, 2021). Indeed, research has noted that heterogeneity within generational groups might be greater than that across groupings (Parry and Urwin, 2011). This is important for our discussion and is consistent with the diversity literature, which suggests that differences between groups can be driven not only by generation but also by other wider contextual influences, such as national context and culture (Peretz, Levi and Fried, 2015, Peretz and Fried, 2012).

We suggest here that this failure to consider other contextual influences outside of year of birth has contributed to the confusion around the characteristics of generational groups and might also be leading practitioners to make decisions based upon invalid notions of generational differences in contexts outside of the USA. In this paper, we present theoretical arguments for this position before testing it empirically using data mining and a survey. Obtaining a more precise understanding of the work values in different generations, contingent on national culture, will help employers to more effectively attract and

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retain different segments of the workforce by tailoring practices to their values thus potentially increasing positive employee attitudes and productivity (Twenge and Campbell, 2008; 2010).

CONCEPTUAL BACKGROUND

Work values

Values at the individual level define what people believe to be fundamentally right or wrong (Schwartz, 1992). Applying this definition of right or wrong to the work setting, work values have a more specific meaning than general values (Smola & Sutton, 2002) and can be defined as “evaluative standards relating to work or the work environment by which individuals discern what is right or assess the importance of preferences” (Dose 1997 pp. 227–228). Values (including those relating to work) have been shown to be stable from early adolescence to early adulthood (Low, Yoon, Roberts, & Rounds, 2005) and are therefore “likely to have effects on the paths people follow over the life course” (p. 727). We select work values rather than broader values or other characteristics as scholars have suggested that these are important in promoting positive employee attitudes such as job satisfaction and organizational commitment (e.g. Knoop 1993; Kidron 1978), while inconsistency between individuals’ work values and workplace practices is likely to reduce productivity (e.g., Mitra, Jenkins, & Gupta., 1992). Work values are therefore important in understanding organizational attitudes and behavior.

When considering different types of work values at the individual level, we use Lyons et al’s (2010) categories. Using principal component analysis (PCA) of items from three popular work values measures (Minnesota Importance Questionnaire, Rounds et al, 1981; Super's Work Values Inventory, Super, 1970; and Manhardt's Work Values Inventory, Manhardt, 1972), Lyons et al (2010) identified the domains of work values that were shared among measures and provided some broad categories of values plus examples of the more specific values that fall within each category. The categories are cognitive (e.g. creativity, challenge, advancement), societal (e.g. fairness), instrumental (either job focus-instrumental values such as work-life balance, or individual-instrumental focus such as salary) and social (e.g.

friendship). Lyons work values constructs have been commonly used and validated in the generations literature (for example, Rani, & Samuel, 2016; Jalalkamali, Ali, Hyun, & Nikbin, 2016 and Papavasileiou & Lyons, 2015, used the Lyons Work Value constructs across generations in different country-contexts).

Generational differences in work values

A 'generation' has commonly been defined as "an identifiable group that shares birth years, age, location and significant life events at critical developmental stages" (Kupperschmidt 2000, p. 66). The theoretical basis for generations suggests that those who were born at the same time share a common "social space" (Mannheim 1952), which means that they share common experiences and collective memories that lead to the development of common values within a generational cohort (e.g. Schuman & Scott, 1989). Values that are formed within a generational cohort as a result of the context within which that cohort grew up can be presumed to remain stable over time, rather than changing as an individual age. As the external context changes over time therefore, the formative experiences of those growing up in one period will not be the same as those growing up in another, meaning that, based upon this notion alone, we expect to see differences between different generational cohorts that will be sustained over the life course. In this study therefore we focus conceptually on the impact of generational grouping on work values, rather than of chronological age.

Despite the fact that dividing people into groups based upon a continuous variable such as age is somewhat arbitrary, generations in the workplace have popularly been divided into five groups: Veterans (also known as the Silent Generation (born 1925-1945), Baby Boomers (Boomers; born 1946-1964), Generation X (GenX; born 1965-1981), Generation Y (GenY, Millennials and iGen; born 1982-1999) and Generation Z (or the net generation: born after 1999) (Bencsik, Horváth-Csikós, & Juhász, 2016).

Several studies have suggested that Generation Xers are more focused on instrumental work values (extrinsic rewards) as they are likely to leave an employer for a higher salary or better benefits (e.g., Loomis, 2000). Additionally, scholars have suggested that Millennials prioritize cognitive work values

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(intrinsic rewards) and seek interesting jobs that provide more personal meaning (e.g. Ng, Schweitzer & Lyons, 2010). There is some evidence that supports these differences, for example, in a study comparing work values of 800 employees, Rani & Samuel (2016) found that Millennials scored significantly higher on intrinsic work values (e.g. challenge, recognition and opportunity to use one's abilities), compared to Generation X and Baby Boomers. Other studies, however, did not support those work values differences between generations (e.g. Appelbaum, et. Al, 2005; Cennamo & Gardner, 2011).

Generational differences and national context

As suggested above, a major concern in relation to the current operationalization of generational differences is the fact that the extant literature has largely ignored national context. It makes little sense that those born and raised in vastly different national contexts would be homogenous in relation to work values. For instance, Parry and Urwin (2011:11) indicated that "the US literature has suggested that the generations have formed in response to events such as Kennedy's assassination and the Vietnam War – events that are unlikely to have had as great an impact outside the USA. Therefore, research on the experiences of generations in the USA cannot simply be mapped onto experiences in other countries". Indeed, Mannheim (1952) explicitly states that, whilst members of a generation are partly defined by common location in the historical dimension of the social process (date of birth), they must also participate in common experiences, in order to create "an identity of responses, a certain affinity in the way in which all move with and are formed by their common experiences" (p. 306). This would suggest that individuals who have different experiences due to their location, or other aspects of their social environment, will have potentially differing values and attitudes, despite being born at the same time (Parry & Urwin 2021). This supports the notion that the generational structure in different countries may differ, contingent on the context and dominant historical events of each country.

A small amount of research, mostly conducted in Confucian cultures such as China and Japan, has supported this view by suggesting that generational characteristics in Eastern countries are not the same

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as in the West (Murphy et al, 2004; Unite, Shen, Parry, Demel and Briscoe 2014; Egri and Ralston, 2004). For example, Murphy *et al.* (2004) examined cross-cultural age and generational differences in values in the US and Japan through a survey and found cross-cultural differences for 26/36 values and cross-cultural generational differences for 23/36 values. Egri and Ralston (2004) conducted a study comparing generational cohorts in the USA and China. Rather than using the same definition of generations in each country, Egri and Ralston hypothesized that there would be four generations in Chinese society based upon political and historical events in the country – these were the Social Reform, Republican, Consolidation and Cultural Revolution generations – and three generations in the USA – Veterans, Baby Boomers and Generation X. Using the Schwartz Values Scale, Egri and Ralston (2004) found clear differences between the US generational cohorts for openness to change, conservation and self-enhancement, but no differences for self-transcendence and clear Chinese generational cohort differences for all four values. More importantly, they found significant differences between each of the US and Chinese cohorts supporting the importance of the national context in the development of generational cohorts and supporting the notion that generational characteristics are specific to a national setting rather than being globally applicable. More recently, Papavasileiou and Lyons (2015), also using the Schwartz value scale, concluded that Millennials in Greece held a unique work value profile when compared to published studies in other countries.

The idea of differences between countries has also been taken up in the marketing literature, most notably by Schewe and Meredith (2004) who focused on the differences in generational cohorts in the countries of USA, Brazil and Russia. They proposed that some events are not similarly significant in the USA and other countries, suggesting that age cohorts are formulated differently in those countries. While Schewe and Meredith did not provide empirical support for these age cohorts, their paper is beneficial in showing the potential of generational differences in values across different nations.

National culture and generational differences

The above studies (Schewe & Meredith, 2004; Papavasileiou & Lyons, 2015; Egri & Ralston, 2004) might imply that individuals' values are affected by the cultural norms in which they grow up. Culture can be defined as the "patterned ways of thinking, feeling and reacting, acquired and transmitted mainly by symbols, constituting the distinctive achievements of human groups, including their embodiments in artifacts; the essential core of culture consists of traditional ideas and especially their attached values" (Kroeber & Kluckhohn, 1952, p. 181). Furthermore, culture is "shared understanding made manifest in act and artifact" (House, Hanges, Javidan, Dorfman, & Gupta, 2004, p. xv). Culture in this manner is a collective system of values (Peretz & Knappert, 2021). The impact of national culture on generational characteristics has been largely ignored in the literature on generations. We know however, from previous research, that national culture, as an important element of national context, has a significant impact on both work values and behavior (e.g. Adler, 2008; Mead, 1994). With regard to values at work, Smola and Sutton (2002) defined work values as the evaluative standards relating to the "work environment by which individuals discern what is right or wrong and the outcomes they feel they should attain through work" (p. 366), suggesting that individuals from different cultural backgrounds might foster varied work values. Based upon this, national context – in the form of culture - is expected to have a significant effect on generational differences.

To conceptualize national culture in this study, we draw on House et al's (2002) GLOBE model of culture. The GLOBE model offers a comprehensive nine-dimension framework to explain cultural similarities and differences (e.g., institutional collectivism, in-group collectivism, power distance, uncertainty avoidance, gender egalitarianism, humane orientation, performance orientation and assertiveness). The primary goal of GLOBE is "to develop an empirically-based theory to describe, understand, and predict the impact of cultural variables on leadership and organizational processes and the effectiveness of these processes" (House et al, 2002, p. 4). This culture framework "presents the most

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current data on cultural dimensions and it does so for a large number of cultures" (Peretz & Knappert, 2021, p. 31).

The global perspective on generational differences

We have argued above for differences in generational diversity in work values relating to national context. However, we note that a small number of authors have argued explicitly that national context is becoming less important in relation to generational diversity and also consider this in our first study. This literature suggests that many events are now experienced globally, due to the growth in media and communications technology such as television and the Internet. Authors argue that this trend has enabled the development of global generations, (e.g., Edmunds & Turner, 2005). Edmunds and Turner (2005) suggested that events such as the September 11 attacks in New York were experienced in a similar way across the world and that these similar experiences of events have resulted in the development of a global generation. The financial crisis in 2007-2008 and the recent COVID-19 global pandemic are additional events with potential implications for a global generation. This perspective has not been empirically researched in depth in extant literature and can be criticized for its failure to recognize that sharing an experience via social media is not the same as experiencing that event first hand. Indeed, even global events are likely to be experienced in different ways at a national or even local level. However, there is some evidence that some broad trends might be experienced in similar ways across most countries. Corsten (2011), for example, suggested that technological transformations in media have had an impact on the formation of a global generation. Similarly, Volkmer (2006) developed an international study of media memories through generations called Global Media Generations. This compared the media and news-related memories of three different generations in nine different countries to find out whether the formation of their life world had been similarly affected by communication technologies and the international news flow. Despite the historical gaps in the media system development between some of the nine countries and the very different social and cultural contexts, Volkmer concluded that media and

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the increasing technological transformations created very similar generational experiences in the nine countries involved (Volkmer, 2006). In addition, qualitative research by Unite et al (2014) across 11 countries provided some support for Edmunds and Turner's (2005) suggestion that younger generations would be more homogenous across countries compared to the older generations.

Hybrid perspective to generations

Given the two contradictory perspectives (generation's global identity versus generation's local identity), we suggest in this paper a new approach: the hybrid approach to generations (see figure 1).

Insert Figure 1 about here

Our hybrid perspective suggests a two-layered model in relation to generational differences. The first layer, the global layer, is associated with the idea of global generations (Edmunds & Turner, 2005). The second layer, the local layer, is associated with the contextual perspective and, in this case, with national culture.

In developing this two-layered model we draw on our third theoretical framework, that of Schein's theoretical components of artifacts and deep culture (Schein, 1984). Artifacts are the visible elements of values, such as clothing, logos and writing patterns. Deep values are the core assumptions within a culture (Schein, 1984). Note that Schein (1984) focuses on artifacts and deep values in the organization. We, however, extrapolate from Schein's perspective on organizational culture to our developed perspective on national culture. This can be justified because organizational culture tends to be nested in national culture (House et al., 2004). Hence, the first layer of the hybrid model relates to artifacts while the second layer concerns deep values. We suggest that individuals' artifacts are based on generational differences so that Millennials will show some similarity in artifacts regardless of national context. Specifically, through the process of interacting through technology and global social media, Millennials are likely to show similarities in observed elements such as dress code and writing patterns. Thus, as a result of interacting

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with others in their age cohort globally on social media, we might expect those in a single generation, such as Millennials, to share superficial characteristics (artifacts) that are reflective of their interaction with this wider, global group. Indeed, as Rosenthal and McKeown (2011) conclude in their study on generations and social media, Millennials share similar and unique writing characteristics such as wording and style. The same is not true however of individuals' deep values with regard to work (intrinsic work values such as challenge and recognition or extrinsic work values such as salary and job security). These are contingent on a more developed notion of "social space" in which individuals grew up and are thus influenced by a combination of aspects of national context.

The hybrid approach can also be discussed in light of Erez and Gati's (2004) multi-level model of culture. The multilevel model comprises two dimensions: structural and dynamic. The "structural dimension" symbolizes the nested configuration of culture going from global culture through national, organizational, team and individual cultures. The "dynamic dimension" of culture expresses the processes in which one cultural level causes changes in other levels of culture (top-down–bottom-up processes). According to several studies on cultural identity (e.g. Shokef & Erez, 2008, Erez et al, 2013) a person can hold multiple identities, reflecting his/her belonging to multiple groups. As a result, global and local identities can coexist, as each becomes salient in a different social context. The global identity becomes significant in a global context (for example, while using the internet and social media), enabling individuals to adapt to their global group. In comparison, the local identity becomes salient in the local cultural context (for example the workplace), enabling individuals to engage in their local community. The hybrid approach to generations suggests that individuals might indeed experience two cultural identities: global and local, and that those two identities are dynamic. The global generation represents the global identity. On the other hand, deep assumptions and core values are affected by the local identity, which is (national) context based.

Therefore, we hypothesize that:

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H1: Generational differences in artifacts exist across countries, resulting in similar differences between generational cohorts regardless of national context.

H2: Individuals' deep (work) values are dependent on national context, resulting in differences between national contexts over and above differences in generations.

METHODOLOGY

Exploratory study: data mining of a social network (Twitter)

Data mining is "the analysis of large observational data sets to find unsuspected relationships and to summarize the data in novel ways that are both understandable and useful to the data owner" (Hand, Mannila & Smyth, 2001, p. 5). Web mining is the use of data mining techniques to obtain knowledge from websites, including online social networking websites (Tonidandel, King, & Cortina, 2015; 2016). An online social networking service (also known as a social networking site or SNS) is a computerized platform helping to build and maintain social relations between people who share backgrounds, interests, activities, or real-life connections (Boyd & Ellison, 2007). A SNS consists of a profile representation of a user with social links. Social network websites enable individuals to connect to other individuals within the system (Kwak, Lee, Park, & Moon, 2010). As of January 2018, the three most popular social networking sites were Facebook (2,010,000 estimated unique monthly visitors), Instagram (880,000,000 estimated unique monthly visitors) and Twitter (690,000,000 estimated unique monthly visitors).

Zafarani, Abbasi, & Liu (2014) discussed the use of social media to examine both individual and collective behaviors. Zafarani et al (2014) showed that computational methods can be used to analyse behaviors and identify patterns in this behavior. In addition, past research has used text mining to enable the identification of personal preferences, attitudes and values. For example, Sobowicz, Kaschesky & Bouchard (2012) used social media data mining to examine political attitudes in the US – via opinion detection (extraction of opinions from text on social media) and sentiment analysis (identifying emotions about particular things). Sobowicz et al (2012) suggested that this was a cheaper way of obtaining

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information from a large number of people compared to traditional survey techniques. Tumasjan, Sprenger, Sandner, & Welpe (2010) used Twitter analysis to predict the German federal election. Tumasjan et al (2010) analyzed over 100,000 tweets containing a reference to either a politician or a political party in the relevant timeframe. Using text analysis, the researchers determined the rate at which certain emotions and cognitions were present in each tweet and found that the sentiment profiles of political parties and politicians reflected many nuances of the actual election campaign. In addition, Tumasjan et al (2010) found that the mere number of tweets reflected the election result in a similar way to traditional election polls. Similarly, Bollen, Mao and Zeng (2011) investigated whether stock market performance can be predicted via collections of daily Twitter posts (public sentiment). Bollen et al (2011) analyzed 9,853,498 tweets published in a year and took into account only tweets that contained explicit statements of their author's mood states. In the next step they created an index of collective daily mood based on the tweets and correlated it with the value of the daily Dow Jones index. Bollen et al (2011) found that changes in the public mood (as reflected by Twitter) matched shifts in the Dow Jones values.

Unlike traditional surveys that naturally are limited by number of participants and hence can be biased, data mining of the big data available via social networks enabled us to extract insights from billions of public social conversations and posts on online social networks (while protecting the identity of individuals by aggregating and anonymizing results). As a result, the insights received should be much more reliable (Tonidandel et al, 2015; 2018).

Two main approaches exist in relation to analyzing social media data. First, "closed-vocabulary" approaches start with predefined categories of words and examine their prevalence within a sample of text (Schwartz et al 2013; Park et al 2015). This approach has been previously used in applied psychology studies (e.g. Hickman et al, 2020; Hickman et al, 2021; Tay et al, 2020). Alternatively, "open-vocabulary" approaches do not rely on a priori lists of words, but instead provide a rich analysis of text by identifying

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the characteristics of a section of text in a more bottom-up manner. In this study we used a closed-vocabulary approach for the sake of simplicity in making direct comparisons between the four countries included. A closed vocabulary approach is appropriate in this case as lists of words relating to work exist that have been developed based on content analysis (van Zoonen, Verhoven & Vliegenhart 2016). Previous studies have suggested that the result of closed-vocabulary language analysis is largely congruent to that of open-vocabulary approaches (Eichstaedt et al 2020), albeit with a restricted list of words.

Sample

For the purpose of this study, we concentrated on four countries that are culturally distinct according to GLOBE's clustering approach (Gupta et al, 2002) in relation to national culture: *USA (representative of the Anglo-culture); Russia (representative of the Eastern Europe-culture); India (representative of the South Asia-culture) and; Argentina (representative of the Latin America-culture)*. We note that our funding enabled us to study only four countries. The criteria for selecting those four countries were the following: (a) high usage of Twitter; must be part of the top 20 countries with Twitter accounts. (SemioCast, 2012), (b) representing maximum variation in relation to national culture; and (c) availability of language translators. A total of 1,860,000 tweets were analyzed in this study (see specification of number of tweets for each country below).

Procedure

Using Mobasher, Cooley, & Srivastava's (2000) recommended process of web mining, four main steps were taken to conduct the Twitter data analysis:

Step 1- gathering and extracting data. To gather and extract data from Twitter we used Tweepy (Roesslein, 2015). Tweepy is a software package that enables communication with the Twitter platform and uses an application programming interface (API) that enables developers to access specific data using Python (a programming language). For the purpose of this study, we gathered information from seven months (February-August 2016) in four countries (a total of 24 million tweets).

Step 2- determining a list of work-related words and filtering the data. Because this study focused on data related to work, we needed to filter our dataset to contain only work-related tweets (about 92% of the 24 million tweets was not work related). To do so, using van Zoonen, Verhoeven, & Vliegenthart's (2016) typology of work-related tweets, we first created a list of work-related words in each of the relevant languages (English, Spanish and Russian). Van Zoonen et al (2016) provide a typology of work-related tweets based on a large-scale content analysis across a diverse sample of employees' tweets. The list of words in English included: work, job, employer, supervisor, team, department, employment, organization, company, firm, business, institution, labor, office, boss, career and all relevant synonyms (for example, employees, corporate, manager, vocation). Using Brislin's (1970) recommended translation-back translation procedure, these words were also translated to the other languages, with their specific synonyms and slang. The second step was to filter the data based on this list. At the end of the process we had a total of 1,860,000 work-related tweets 310,000 tweets from Russia (6% of all tweets from Russia), 450,000 tweets from India (7% of all tweets from India), 8% 440,000 tweets from Argentina (8% of all tweets from Argentina) and 660,000 tweets from the USA (10% of all tweets from the USA).

Step 3- creating age groups in each country. To see how the data were grouped in each country, we first conducted cluster analysis based on the tweets' structure (N-Grams; see below). At the end of the process we ended up with two clusters in each country. To examine whether the style of Tweets differed based on generation, we used N-grams. N-grams of texts are often used in text mining tasks. N-grams are contiguous sequences of words within a given sample of text; when computing the n-grams you typically move one word. For example, regarding the sentence "The child jumped over the fence", if N=2 (known as bigrams), then the N-grams would be: the child; child jump; jump over; over the; the fence- meaning we have 5 N-grams in this case. The basic point of N-grams is that they capture the language structure of a specific text (Damashek, 1995). In recent years, N-gram models have become a viable technique in

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Twitter mining studies (e.g. Pak, & Paroubek, 2010; Kouloumpis, Wilson, & Moore, 2011). We calculated the N-grams distribution inside the two clusters in each country.

Step 4- Analyzing the data in each generation and country. Using Lyons et al's (2010) work values framework, we categorized each tweet for the value it was related to (see vocabulary in table 1)

Insert Table 1 about here

Finally, we analyzed the distribution of each value in each cluster and conducted a t-test analysis to determine whether the values' distribution between clusters differed significantly.

RESULTS

The results of the data mining exploratory study are presented following the steps described above:

Generational groups in each country:

A N-gram analysis showed that in each country the N-grams distribution was smaller in one group, meaning the language used in one of the groups in each country was shorter and simpler compared to the second group. For example, Figure 1 presents the N-grams distribution for the two groups in the USA.

Insert Figure 2 about here

The diagram indicates that short sentences and words were more common in the second group, revealing the possibility that the second group represented the users commonly referred to as Millennials. Millennials have been characterized as having a smaller vocabulary and shorter words, especially when using written text (see Djamasbi, Rochford, DaBoll-Lavoie, Greff, Lally, & McAvoy, 2016). Because only eight percent of users provided age (either directly or by providing pictures that can reveal age, based on age recognition tools such as openBR), we looked at the N-grams distributions of those eight percent of users who do provide age, and statistically compared the N-grams distributions of Generation X (age 32-50) and Millennials (age 18-31) to the N-grams distributions of the entire sample (group 1 and group

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2 in each country; see description of Step 3 of the Procedure above) (the percentage of Baby Boomers using Twitter is less than five per cent). The results demonstrated a high correlation between the distribution of Generation X users who provided their age and group 1 ($r=.71$ $p=.02$) and between the distribution of Millennials users who provided their age and group 2 ($r=.77$ $p=.01$) and confirmed our assumption that group 1 was Generation X (age 32-50) while group 2 was the Millennial generation (age 18-31). The results of the N-grams analysis confirmed that Millennials' writing style was similar in all four countries and differed from Generation X's writing style, such that the writing style of Millennials is shorter, confirming hypothesis 1.

Distribution of values in each generation in each country

Distribution of all work values (% of frequencies of all 38 work values) for each generation (Millennials and Generation X) within the four countries appears in table 2.

Insert Table 2 about here

We compared the Generation X distribution to the Millennials distribution of work values in each country, using a T-test analysis.

USA

The distribution of work values for the sample in the USA appears in Figure 3

Insert Figure 3 about here

The results indicated that for the Millennials the most frequently mentioned values were cognitive values (advancement (17.1%), change (16.3%) and achievement (6.8%)). For the Generation X group, the most frequently mentioned values were instrumental-job focused values, specifically, balance (26.3%), stability (17.6%) and honesty (15.2%). The T-test analysis demonstrated significant differences between the work values distributions of the two generations ($t=3.9$; $p<.01$).

Russia

The distribution of work values of Generation X and Millennials in Russia appears in Figure 4

Insert Figure 4 about here

The results indicated that for both generations, the most frequently mentioned values were instrumental- individualistic focused values. Specifically, salary (16.6% for Millennials and 15.8% for Gen X), benefits (9.0% for Millennials and 9.4% for Gen X, hours (10.1% for Millennials and 11.6% for Gen X) and competence (7.7% for Millennials and 7.6% for Generation X). The T-test analysis found no significant differences between the work values' distributions of the two generations ($t=.06$; $p>.05$)

India

The distribution of work values of Generation X and Millennials in India appears in Figure 5

Insert Figure 5 about here

The results indicated that in both generations, the most frequently mentioned values were societal values: fairness (16.1% for Millennials and 16.3% for Generation X), society (14.5% for Millennials and 13.2% for Generation X), supportiveness (13.9% for Millennials and 13.8% for Generation X) and loyalty (7.3% for Millennials and 9.8% for Generation X). The T-test analysis found no significant differences between the distribution of the two generations ($t=.03$; $p>.05$)

Argentina

The distribution of work values of Generation X and Millennials' in Argentina appears in Figure

6.

Insert Figure 6 about here

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The results indicated that for both generations, the most frequently mentioned work values were social values. Specifically, team (19.5% for Millennials and 18.8% for Generation X), friendship (15.5% for Millennials and 16.3% for Generation X) and interaction (9.6% for Millennials and 8.8% for Generation X). The T-test analysis found no significant differences between the two work values distributions ($t=.04$; $p>.05$).

Finally, using a MANOVA analysis, we compared work values distributions between countries. The results indicated a significant difference between the countries ($F=2.937$; $p<.01$).

Summary of data mining results

In sum, the analysis of the Twitter network (a total of 1,860,000 Tweets from four different countries with each country representing a different culture) led to two main conclusions. First, the N gram analysis indicated that in all four countries there were two separate age cohorts in relation to writing style. The age group that equates to the Millennial generation on average used shorter words and a smaller vocabulary (e.g. "I kno Mboss doesn't care foreal") compared to that equating to Generation X (e.g. " I like to complain about my job but I work with some great people. Thank you to everyone out there who makes my job fun"). However, the work values of the two age cohorts were different only in the USA. Thus, while the results supported differences in values between Generation X and Millennials in the USA, these differences were not found in the other three countries. In these other countries (Russia, India and Argentina), we did not find significant differences between the two groups. The core work values that were important to Millennials in the USA were advancement, change and achievement while the core work values that were important to Generation X in the USA were balance, stability and honesty. In the other three countries (Russia, India and Argentina), we did not find significant differences between the age groups relating to Millennials and Generation X. We therefore found differences in work values when compared to other countries but not between age cohorts. In general, the core work values that were important in Russia were salary, benefits, hours and competence; the core work values that were important

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in India were fairness, society and supportiveness; and the core work values that were important in Argentina were team, friendship and interaction.

Follow-up study

The data mining study above suggests that generational differences in work values are dependent on national context, supporting our suggestion that individuals' work values are affected not only by generation but also by national culture. In order to further investigate *how* national culture affects individuals' work values we conducted a survey-based study. In this study we examined national values dimensions as moderators of the relationship between generation and work values. Specifically, we focus on the dimensions of GLOBE national values: institutional collectivism, in-group collectivism, uncertainty avoidance, power distance, gender egalitarianism, future orientation, assertiveness, humane orientation and performance orientation (House et al, 2004), as measures of these are available across the countries studied. These national values dimensions also have theoretical relevance to individuals' values (e.g. Parboteeah, K. P., Bronson, J. W., & Cullen, 2005; Waldman et al, 2006). Specifically, we explored which one of the GLOBE cultural dimensions explained the between-country differences found in our data mining study.

METHODOLOGY

Follow-up study: survey-based analysis of work values and national culture values

Sample

Data were collected online via internet panels in each country (USA, India, Argentina, Russia). The internet panels used for this study were working under ESOMAR (European Society for Opinion and Market Research), hence they were obligated to the ESOMAR code of research and data collection and analysis (see ESOMAR, 2016). Originally, the survey was developed in English by the researchers of this study and was translated from English to Russian and Spanish using Brislin's (1970) recommended translation-back translation procedure. In each country, the specific-language survey was distributed to

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individuals from the relevant age cohorts. The final sample included a total of 484 participants (113 from USA, 158 from Russia, 102 from India and 111 from Argentina). 46 per cent of respondents were born between 1965-1981 (Generation X) and 54 per cent between 1982-1999 (Generation Y).

Measurement

Work values were measured using the shorter 31-item version of Papavasileiou & Lyons (2015), adapted from the Lyons Work Values Survey (LWVS; Lyons et al., 2010). Each item was measured on a 1 to 5 Likert scale. The survey contains five scales that assess five sets of values (Lyons et al., 2010; Papavasileiou & Lyons, 2015): cognitive values (e.g. creativity, challenge); instrumental- job focus values (e.g. balance, security); instrumental- individualistic focus values (e.g. salary, benefits); societal values (e.g. fairness); and social values (e.g. friendship, interaction). As previously mentioned, this scale has been used in a variety of contexts (e.g. Rani, & Samuel, 2016; Jalalkamali et al, 2016; Papavasileiou & Lyons, 2015). In addition, each participant indicated his/her age, gender, country of residency, country of origin (if different from country of residency) and how many years s/he had been a resident of this country (if different from country of origin). Only participants that had been residents in a specific country for more than ten years were included in the final sample.

National culture values were obtained from the GLOBE (Global Leadership and Organizational Behavior Effectiveness) database (House et al., 2004). (For more information about the GLOBE dataset, please see House et al., 2004, Chapter 6- research design). Survey items measured seven national cultural values: institutional collectivism, in-group collectivism, uncertainty avoidance, power distance, gender egalitarianism, future orientation, assertiveness, humane orientation and performance orientation, on a 1 (low) to 7 (high) scale. An example of a collectivism cultural value was “I believe that the economic system in this society should be designed to maximize...” The corresponding cultural practice item was “The economic system in this society is designed to maximize...” each participant in our survey assigned the cultural values scores of his/her countries.

Control variables. Twenge & Campbell (2008) argued that age and generation are difficult to separate, while Parry & Urwin, (2011) indicated that this difficulty challenges all generational research. Egri & Ralston (2004) argued that including age as a covariate is inappropriate due to its high correlation with generational cohort. Thus, to address the potential confounding effect of age, we used a technique offered by Becton, Walker and Jones-Farmer (2014). Specifically, we included a control variable labeled “relative age”. We calculated *relative age* by measuring the distance from the real age of an individual to the average age of his/her generation in our study. Thus, an individual with a “relative age” of 3 is three years older than the average for his/her generation. Including relative age as a control variable enabled us to reduce the potential age confounding effect. In addition, to overcome potential confound and to rule out an exogenous effect of socio-economic differences, we held the country GDP per capita (World Bank, 2017) as a control variable.

Procedure

The analysis was conducted in two steps. In the first step, we examined the effect of generation (Millennials/ Generation X) and country (USA/Russia/India/Argentina) on work values. Because of the nested structure of the data (individuals nested within countries), we conducted a multilevel analysis using Mplus 8 (Muthén & Muthén, 2017). We specified the Level 1 (i.e. individual level) generation, work values and individual level control slopes to be random. At Level 2 (i.e., country level), we specified cultural values and country level control. We should note that because of the low number of level 2 variables (countries) we followed McNeish & Stapleton’s (2016) recommendation and used the Kenward-Roger correction. McNeish & Stapleton (2016) showed that a Kenward-Roger correction can provide appropriate standard errors well into the single digits for a fairly simple model.

In the second step of the survey analysis, in order to fully understand the effects of national culture (in contrast to specific country), we added to the dataset the nine GLOBE indices of cultural values (House et al., 2002; 2004) and examined whether these national cultural values predicted differences in work

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values between generations. In order to do so, gap indices of the work values (the absolute deviation between Generation X and Generation Y in each one of the five work values categories) were created. Then, in order to see if national cultural values predicted work values differences between generations a series of multilevel regressions was conducted using Mplus 8 (Muthén & Muthén, 2017). At level 1 (individual level) we specify the gap between Millennials and Generation X values (e.g. gap between the two groups on cognitive values, instrumental- job focus values, instrumental- individualistic focus values, societal values and social values). At level 2 (country level) we specified the GLOBE cultural values.

RESULTS

Study 2

First, in order to confirm the validity of the adapted work values measure, we conducted both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). EFA identified a five-factor structure, supporting Lyons et al's (2010) five sets of work values: cognitive values, instrumental- job focus values, instrumental- individualistic focus values, societal values and social values. Confirmatory factor analyses (CFAs) indicated that the five-factor model of work values fit the data well ($\chi^2=28.5$ $p<.01$, NFI=.97, GFI=.95, TLI= .92, RMSEA=.03) and significantly better than alternative models (for example a single factor model: $\chi^2=115.97$ $p<.01$, NFI=.81, GFI=.58, TLI= .78, RMSEA=.10).

Due to the fact that the individuals in our sample were nested within countries, we first analyzed a null model for the dependent variables (no predictors model) in order to examine whether the dependent variables clustered within countries. We calculated the Intraclass Correlation Coefficient (ICC) for each of the dependent variables (cognitive values, instrumental- job focus values, instrumental- individualistic focus values, societal values and social values) using the formula $\tau_{00}/\tau_{00} + \sigma^2$. ICC represents the percentage of variance between groups (see Raudenbush & Bryk, 2002). τ_{00} represents the variance of level 2 variables and σ^2 represents the variance of level 1 variables. Null ICC of above 0.05 is an

indication of clustering within level 2 (Heck et al., 2013). The results indicated that for the examined dependent variables (cognitive values, instrumental- job focus values, instrumental- individualistic focus values, societal values and social values), the null ICC was above 0.05 (.19, .17, .20, .21 and .17 respectively), suggesting that data is clustering within countries.

Before the analysis, it was necessary to address whether the measurements of work values corresponded to the same constructs across countries (i.e., if measurement equivalence holds; Cheung et al., 2006). Measurement equivalence for cognitive values, instrumental- job focus values, instrumental- individualistic focus values, societal values and social values were tested using meta-analytic structural equation modelling (see Cheung et al., 2006). The results (TLI =.91,.93,.91, .92, .92 CFI =.93,.92,.91,.93, .92 respectively) indicated no measurement invariance issues (Vandenberg & Lance, 2000).

Next, multilevel analysis was conducted. The results appear in table 3.

Insert Table 3 about here

The results indicated a main effect of country on all five categories of values: cognitive values, instrumental- job focus values, instrumental- individualistic focus values, societal values and social values ($\gamma=.19$, $SE=.08$, $p<.01$; $.15$, $SE=.07$, $p<.01$; $\gamma=-.25$, $SE=.12$, $p<.01$; $\gamma=-.27$, $SE=.13$, $p<.01$; $\gamma=.23$, $SE=.11$, $p<.01$, correspondently). A generational main effect was not found to be significant (see table 3). Regarding interaction effects, the results indicated a significant interaction effect between country and generation only on cognitive values ($\gamma=.31$, $SE=.12$, $p<.01$) and instrumental job focus value ($\gamma=.24$, $SE=.10$, $p<.01$). Finally, ICC of the conditional models (e.g. models with the explained variables) were smaller than the ICC of the null models (see table 3) meaning that the specific Level 2 variables added in the conditional models explain the clustering effect (see Raudenbush & Bryk, 2002).

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To more systematically examine the direction of the interactions, we displayed the results graphically (see figures 7 and 8). These graphs indicated that cognitive and instrumental job focus values differences between Generation X and Millennials are contingent on country

Insert Figures 7 and 8 about here

Post hoc analysis, conducted separately for each country, indicated that generational differences were found only in the USA: cognitive values were significantly higher ($t=1.24$, $p<.01$) among Millennials ($M= 4.12$, $SD=.07$) compared to Generation X ($M= 3.90$, $SD=.10$) and instrumental job focus values were significantly higher ($t=1.13<.01$) among Generation X ($M= 4.37$, $SD=.08$) compared to Millennials ($M=4.08$, $SD=.09$).

In the second step of the analysis, we examined the effect of GLOBE cultural values on the work values gaps. As indicated, nine GLOBE cultural values were examined: institutional collectivism, in-group collectivism, uncertainty avoidance, power distance, gender egalitarianism, future orientation, assertiveness, humane orientation and performance orientation. The results indicated that institutional collectivism and in-group collectivism predicted cognitive values ($\gamma=-.31$, $SE=.13$, $p<.01$ and $\gamma=-.29$, $SE=.11$, $p<.01$): the lower the collectivism (the higher the individualism) the higher the gap between Generation X and Millennials in cognitive values (creativity, advancement, challenge). None of the other GLOBE cultural dimensions were related to the gap between these generations. These results support those of the data mining analysis in which value differences were found between Generation X and Millennials only in the individualistic society of the USA.

Summary of study 1 and study 2

To summarize, Twitter data mining analysis of 1.86 million tweets of individuals from four different countries suggested that the writing style (aka artifacts) of Millennials is similar in all countries and differs from Generation X, hence supporting hypothesis 1. In addition, the work values of Millennials

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were different from Generation X work values only in the USA but not in the other countries, supporting hypothesis 2. Survey-based analysis conducted on 484 participants from the same four countries for which the web-mining analysis was conducted (USA, Russia, India and Argentina) confirmed the web-mining Twitter analysis of work values distribution and indicated that generational differences appeared only in the USA but not in the other three countries. In the USA, cognitive values (creativity, advancement, challenge) were highest among Millennial participants and instrumental-job focus values (work-life balance, security) were the highest among Generation X participants. In addition, when adding national cultural values to the equation, only collectivism was found to have an effect on cognitive values: the lower the collectivism level (the higher the individualism) the higher the differences between generations in cognitive values.

DISCUSSION

In this study we aimed to enhance our understanding of the factors affecting differences in work values and particularly the role of generation and national culture in driving these. So far, the literature has indicated mixed results in relation to the nature of generational differences (Parry and Urwin, 2011; Parry 2014). The differences that are found are inconsistent and sometimes contradict the popular stereotypes of generations such as Millennials (e.g. Murphy, Gordon, & Anderson, 2004).

Previous studies have promoted two different perspectives in relation to generational differences. Several studies argue that differences between generational groups can be driven not only by generational differences, but also by wider contextual influences (e.g. Murphy et al, 2004; Unite, et al 2014; Schewe and Meredith, 2004), while a smaller group of studies suggests that because of technology such as the Internet, global events are experienced similarly across the world, resulting in the emergence of a global generation (Edmunds & Turner, 2005). Based on this idea, Edmunds and Turner (2005) suggested that younger age cohorts will be more homogenous across countries. We used two methodologies to examine

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whether generational differences in work values differ across different national contexts and to explore a new approach to exploring generational differences- the hybrid approach

The first study, based on data mining of 1,860,000 Tweets from four different countries, revealed two main patterns. First, on a global level, in all four countries, Millennials' behaviour in relation to the way they write was similar regardless of location and language. Millennials tended to use significantly shorter words and less complex vocabulary compared to Generation X. Second, the results indicated differences in work values between the age groups equating to Generation X and Millennials only in the USA but not in the other three countries (India, Argentina and Russia), thus suggesting a local effect of context. The second study, based on a work values survey comparing individuals from Generation X and Millennials from the same four countries, supported these latter findings in relation to work values.

The results of the two studies support the new theoretical approach to generational differences, which we called the hybrid approach (see figure 1). The hybrid approach suggests that individuals experience two cultural identities: global and local. Our results suggest that generational differences in artifacts do exist across countries, resulting in similar behaviors in relation to writing style within a generational group regardless of national context (the global layer). These differences are driven by cohort effects in the way that individuals interact on social media – differences that are experienced globally rather than on a national or contextual level. Further research should examine whether generational differences in other artifacts also exist and should also investigate the reasons behind such differences in more detail.

Individuals' deep values however are dependent on national context, specifically culture, as well as the time period in which they grow up. Our results suggest that only in cultures high in individualism are the deep values of Millennials different from Generation X, while in cultures high in collectivism, Millennials share the same dominant values as Generation X, values that are unique to that particular country (the local identity). The new hybrid approach, confirmed by the result of this study, provides

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additional support to Schein's (1984) theoretical framework of artifacts and deep values, and supports the idea of extrapolating those components from the organizational to the national level. The study demonstrates the importance of considering both artifacts (visible elements such as writing style) and deep values (e.g. core assumption within a culture; Schein, 1984; 2010) while examining generational differences.

The results of the studies suggest the cultural dimension of individualism/collectivism (but not other cultural dimensions) as a potentially key dimension that contributes to the value differences between generations X and Y in the USA (individualistic country), but not in the other three countries (collectivistic countries). More specifically, according to GLOBE (House et al, 2004), the USA scores the lowest on collectivism (4.21) (highest on individualism), while the other three countries, Argentina, India and Russia, are all relatively low on individualism (high on collectivism), with similar scores (5.83, 5.81, 5.51, respectively). Thus, these findings can be explained in relation to the wider characteristics of collectivistic and individualistic societies. The importance of individualism/collectivism was confirmed by adding all of the GLOBE nine national cultural values to the equation. This revealed that only collectivism has an effect on generational differences in work values.

We suggest that individualism/collectivism is particularly relevant to the question of generational differences because it promotes either freedom of choice and association (individualism) that contributes to generational differences, or the subordination of the individual to societal norms (collectivism), that promotes homogeneity in values and behaviors and thus reduces the likelihood of generational differences. More specifically, in collectivistic societies, people view the self as interdependent with the group to which they belong. On the other hand, in individualistic societies, people see themselves as independent, separate from other people and as holding a unique set of traits (Markus & Kitayama, 1994). One of the most significant results of these opposite views of the self is the degree of conformity that is observed in social settings. A meta-analysis of studies suggested that individuals in collectivistic societies

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demonstrated a stronger tendency to conform than individuals in individualistic societies (Bond & Smith, 1996). In societies high on collectivism, the culture emphasizes subordination of the individual to the group and society at large. Therefore, people across generations are more likely to adhere to the same societal values in these cultures rather than developing distinct generational values. Individualistic national cultures, on the other hand, emphasize individuality and individual rights and choices and therefore give latitude for individuals with similar life experiences (same generation) to develop and adopt values that fit their joint generational background and aspirations. Thus, individuals in these cultures have the legitimacy to develop and adhere to values that are similar to those people in their own age cohort, rather than to the collective (country) as a whole. This, in turn, would result in different generational work values. Based on our findings, Generation X in the USA emphasizes balance and stability and Generation Y values advancement, change and achievement. In this kind of individualistic society, members assume that they are largely independent, the society's economic system tends to maximize the interests of individuals and the pursuit of individual goals is encouraged. In Generation X (characterized by family and life obligations), personal goals will be balanced between all obligations and maintaining work stability, which could be associated with financial stability. On the other hand, Generation Y's personal goals will be to maximize their own personal benefits, which could be associated with a rapid change and quick advancement in the workplace.

Both the data mining and survey studies provide support for the cultural-based contingency approach by showing that deep values differ between generations only in the individualistic society of the US (e.g. Rousseau & Fried, 2001). Consistent with the data mining results, the survey-based analysis also supported the notion that collectivism has an effect on cognitive values: the lower the collectivism (the higher the individualism), the higher the differences between generations in cognitive values. Because cognitive values (e.g. advancement, challenge) represent Millennials in the USA, the assumption that the

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differences found between generations in the USA (as opposed to the other three countries) is due to the American dominant culture, characterized as highly individualistic, can be supported.

Finally, our research also supports broader research regarding cultural values within countries. Although the writing style of all tweets within each generation were similar regardless of country, representing global identity, the core work values in each country were different, representing local (national) identity. Russian core work values were salary, hours, benefits and competence. From a national values perspective, this could be explained by the fact that Russia is defined as a high-power distance society (GLOBE score is 5.61). Power distance is "the degree in which community accepts and endorses authority, power differences and status privileges" (House et al, 2004, p. 513). High power distance societies implement strict hierarchy systems in which privileges distributed unequally. In this society employees will strive to gain more power, which will translate into higher salaries and better work conditions (working hours and benefits). Regarding India, we found that the core work values were fairness, society and supportiveness. This could be explained by the fact that India is defined as a high humane orientation society (GLOBE score is 5.2). Humane orientation refers to the extent to which societies emphasize the values of fairness, altruism, caring, kindness and generosity. Societies high in humane orientation will be more likely to encourage acceptance and tolerance of people with diverse backgrounds. Consequently, employees in this society appreciate a work environment that emphasizes fairness and supportiveness. Argentinian core work values based on our study were team, friendship and interactions. This could be related to the fact that Argentina is a low performance orientation society (GLOBE score is 3.63). Performance orientation refers to "the extent to which a community encourages and rewards innovation, high standards, excellence and performance improvement" (House et al, 2004, p. 239). Societies high in performance orientation value competitiveness. In contrast, societies low in performance orientation put emphasis on social relationships, value harmony with the environment and view formal feedback as judgmental. As a result, employees in Argentina value a workplace that

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emphasizes friendship and informal interactions. However, it is important to emphasize that the dominant values in each of these countries covered both generations X and Y.

The focus on context might help to explain the inconsistencies within the wider generations literature by explaining why some studies found differences between generations X and Y (e.g. Twenge et al, 2010) while others did not (e.g. Cucina, Byle, Martin, Peyton, & Gast, 2018). We have shown here that specific generational groupings and indeed characteristics of those groupings, only exist within particular national contexts. It might be that other contextual variables (e.g. within-country location, social class) also affect the existence and nature of generations in that the experience of events is dependent on these environmental factors. For example, Griffin (2004) found regional differences in his study of collective memories of the civil rights movement in the USA.

Practically, the study provides support for the suggestion that, although Millennials demonstrated uniformity in their social media appearance as reflected by their writing style, employers should not use the western notion of generations outside of the USA when addressing their needs as reflected by their work values. Managers should not necessarily accept the validity of the commonly held work preferences, characteristics and values of different generations, as they may vary by contextual variables such as cultural context. Generational differences appear to be more pronounced in individualistic countries where individual's choice and self-expression and are more legitimate. As a result, managers should consider whether the work values of different generations are sufficiently distinct before adopting alternative recruitment, selection and retention policies presumably aligned with these preferences. Additionally, our results can help managers with responsibility for global operations in multinational companies to more effectively decide which values to adhere to and which related practices to implement in organizations that operate in different national cultures. In a country high on individualism, organizations might benefit from adjusting their practices to the specific values of Generations X and Y (for example a program that highlights job rotations or a structured career development plan for

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Millennials and programs that allow work-life balance while protecting the stability for Generation X employees). On the other hand, in a country high on collectivism, similar practices across generations appear to be more appropriate and beneficial to the organization. However, it is also worth noting that generational differences such as those reported in our study do not necessarily apply to all individuals in the different age groups. Some individuals may adhere to similar work values regardless of their age cohort. Employers should therefore be cautious when adopting human resource practices based on generational cohorts. For instance, employers might use the group level information of employees' preferences as a basis for practices, but at the same time also take into account individual desires that may differ from others in the age cohort.

Limitations and future research

This study enabled us to establish the effectiveness of a novel analysis technique (social media data mining) in studying generational differences. However, there are some potential limitations of data gathered from social networks. For example, Hargittai (2018) examined the potential bias of this data and concluded that several socio-demographic factors such as higher socioeconomic status and internet skills were related to high usage of social media sites, resulting in sampling biases. Additionally, Mislove, et al (2011) in their study addressing the question how representative of the overall population USA Twitter users are, concluded that the Twitter US population is a non-uniform sample of the population. Nonetheless, McCormick et al (2017) argued that this does not negate the use of Twitter to examine social questions. In fact, "the overrepresentation of African Americans and young adults on Twitter can be used to better understand populations that are often underrepresented in most surveys" (McCormick et al, 2017, p.398). Future research should be encouraged to pursue further exploration of the new theoretical approach introduced in this study, for example, by collecting data from more countries from each of these cultural clusters. This would enable researchers to conclude with higher confidence what the impact of societal culture rather than country is on generational differences. For example, if we find similar generational

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differences in both USA and another individualistic Anglo-Saxon country (e.g., UK), it would support the importance of culture if no such differences are found in other cultural contexts. Moreover, future research would benefit from collecting data over longer time periods and from different regions within countries, to explore the generalizability of generational differences also within countries.

Additionally, our decision to use a closed-vocabulary approach to examining the text on Twitter allowed us some simplicity in our analysis but meant that we might have missed words or phrases that would also have been relevant to work values. Future research could undertake more in-depth open-vocabulary approaches to address this. In addition, in relation to the identification of writing style as an artifact, we did not verify this using non-social media data. It is possible therefore that this generational difference exists only on social media – i.e. it is made salient by the social media context as individuals mimic the style of those around them. It is also important to note that these differences, while significant, accounted for only around half of the variance, suggesting some heterogeneity within generations in relation to writing style. However, this finding does support previous research that suggests that Millennials have a different writing style than previous generations (Rosenthal & McKeown 2011). This finding might be useful to employers who should check whether employees of all ages are able to write at the level of depth and complexity required by the job. Future research should further explore the ramifications of the writing style differences between Millennials and Generation X. For example, are Millennials able to express deep thoughts and ideas despite their tendency to write in a shorter way? Or, does Millennials writing style provide them an advantage in communication in the changing work environment relative to Generation X's writing style? And if so how?

The assignment of generational categories is arbitrary given that they are based upon the continuous variable of age. Therefore, while the groups might differ on average, it is likely that those individuals on the boundaries of each generational group (such as those born in 1981 and 1982 for example) are less likely to show significant differences. Future research might want to omit these

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individuals in order to highlight categorical changes over time, or to examine changes in attitudes as ongoing trends rather than as categories at all. It is also important to note that cultural norms will vary within a national group, due to the presence of recent immigrants. Therefore, anything said about cultural groups, in the same way as anything said about age groups or generations, is likely to be an over-generalisation. Future research could focus on identifying other drivers of heterogeneity within cultural or generational groups in order to provide further understanding of the factors influencing work-related values.

Conclusions

This study examined how generational differences in work values differ across different national contexts, based on the results of two studies. This research offers a new theoretical approach to the study of generational differences: a hybrid approach between the global and local layers and an emphasis on context when studying deep level values. This new approach may help to address the inconsistency of results in the generational literature and the failure of much of the current literature to consider national context. The hybrid approach offers a new way to examine generational differences at work from a two-layered – global and local- perspective. We offer this to the community of scholars working in the area of generational diversity so that they can further examine this approach by expanding on both sample and context.

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Table 1: vocabulary of values in English

Values	Related words
1. Fair	Just, equity, fairness, unfair, unjust, bias
2. Supportive	Unsupportive, support, helpful, caring
3. Training	Development, train, develop, learning, learn, grow, growth
4. Feedback	Criticize
5. Hours	Workload
6. Competent	Incompetent, skilled, unskilled, competence, skills, experience, Knowledgeable, expert, talent
7. Balance	Family, wife, husband, child, kids, baby, work-life, work-family, flexibility, flexible,
8. Stable	Stability, job security, secure, security, safe, steady
9. Recognition	Praise, valued, appreciate, appreciation, respect, complement, kudos, honor, credit, respects, respectful, professional
10. Salary	Pay, money, wages, wage, cash, income
11. Independence	Independent, self-reliant, entrepreneurial, entrepreneur, freedom, free
12. Autonomy	Autonomous
13. Creativity	Creative, innovative, original
14. Stimulating	Stimulate, inspire, inspiring, motivate, encourage, inspirational
15. Interesting	Interest, curiosity, curious
16. Variety	Range, mixture, varied, mixed, selection, diverse
17. Challenge	Challenged, challenging
18. Advancement	Promotion, advance, promote, progress, progression, opportunities, opportunity, pay rise, pay increase, career, fast track
19. Benefits	Rewards, compensation, perks, paybacks
20. Society	People, the world, the public
21. Help	Make a difference, altruistic, worthwhile, self-sacrifice, selfish
22. Fun	Enjoy, enjoyment, pleasure, cool, boring, chillin, chilling
23. Exciting	Excite, thrill, thrilling, thrilled, excited,
24. Engaging	Engagement, engage, involve, take part

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25.	Moral	Ethos, ethical, corporate social responsibility, environment, environmental, environmentally,
26.	Influence	Impact, effect
27.	Interaction	Communicate, communication, collaboration, collaborate, network
28.	Prestigious	Status
29.	Authority	Power, rule, rules, hierarchy, hierarchical, control
30.	Friendship	Friends, mates, camaraderie, pals, relationship(s), bro (s),
31.	Workaholic	Hard work; conscientious, busy,
32.	Achievement	Achieve, succeed, success, , go-getting, ambition, results, fulfillment
33.	Loyalty	Loyal, commitment, committed, trust, dedicated, dedication, devoted, keen
34.	Change (as in jobs)	New (job), job seeking
35.	Diversity	Diverse, equality, inclusion
36.	Technology	Innovation, innovative
37.	Team	Group, teamwork, collaboration, collaborative, network, networked, social
38.	Honesty	Openness, open, honest

Figure 2: Distribution (in %) of work values in each age group in each country

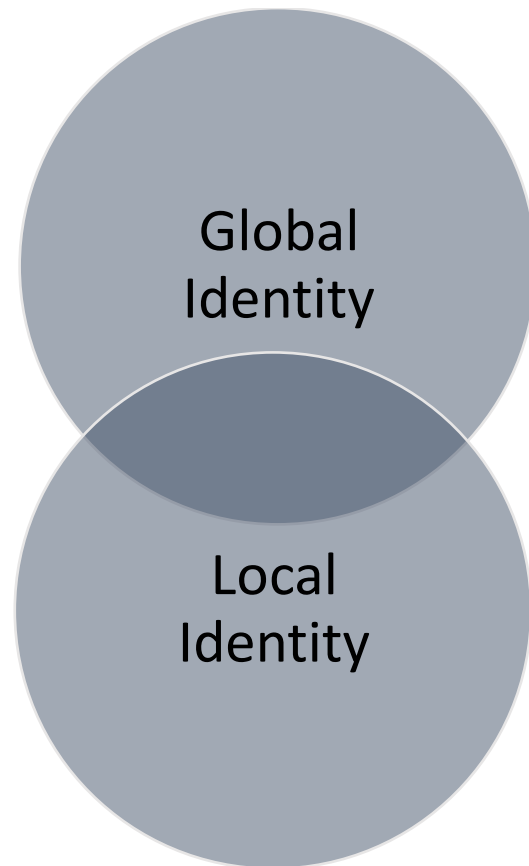
	U.S.A		Russia		India		Argentina	
	Millennials	Gen X	Millennials	Gen X	Millennials	Gen X	Millennials	Gen X
Fairness	2.3	1.6	1.3	1.3	16.1	16.3	2.4	2.9
Supportive	2.5	1.1	1.2	2.1	13.9	13.8	5.4	6.6
Training	0.9	8.7	3.9	3.4	1.3	1.1	2.5	2.8
Feedback	0.0	0.0	2.7	2.6	0.8	0.4	0.0	0.0
Hours	1.3	1.3	10.1	11.6	0.4	0.3	3.2	3.1
Competent	1.5	0.8	7.7	7.6	1.5	1.5	1.7	1.1
Balance	0.5	26.3	3.4	3.0	2.5	1.1	3.1	5.4
Stable	0.1	17.6	0.6	0.7	1.1	1.2	1.9	3.5
Recognition	1.4	5.1	2.5	2.3	2	2.4	0.8	0.9
Salary	2.4	0.9	16.6	15.8	1.5	1.4	3.2	3.1
Independence	2.2	0.5	2.2	1.8	4.6	4.4	2.2	3.1
Autonomy	2.8	0.0	0.2	0.2	0.02	0	0.0	0.0
Creativity	4.1	0.3	0.7	0.5	0.3	0.2	0.3	0.0
Stimulating	0.7	0.1	0.1	0.1	0.3	0.9	0.1	0.6
Interesting	2.0	2.1	1.8	2.0	0.5	0.8	1.9	1.5
Variety	0.8	0.2	1.9	0.9	0.7	0.3	0.5	0.3
Challenge	1.6	0.0	0.6	0.6	3.2	2.5	0.8	0.4
Advancement	17.1	2.1	1.2	1.3	1.9	1.9	1.1	0.9
Benefits	1.5	0.4	9.0	9.4	0.2	1.9	0.9	0.8
Society	2.3	0.5	3.5	3.5	14.5	13.2	6.0	4.5
Help	1.5	0.3	2.8	2.9	5.6	4.6	0.7	0.8
Fun	2.4	1.0	1.6	1.7	2.8	2.5	1.1	0.9
Exciting	6.4	0.3	0.1	0.1	0.4	0.7	5.0	0.3
Engaging	0.4	0.1	2.8	2.3	0.4	0.1	0.8	0.3
Moral	1.4	0.1	0.1	0.1	0.5	0.3	1.4	1.1
Influence	0.5	0.1	0.5	0.3	0.6	0.3	0.0	0.0
Interaction	0.5	0.2	1.7	1.5	0.5	0.3	9.6	8.8
Prestigious	0.4	0.3	0.3	0.2	0.1	0.1	0.0	0.0
Authority	2.1	0.3	3.4	3.3	0.9	0.8	1.1	2.0
Friendship	2.7	0.3	1.9	2.2	0.6	1	15.5	16.3
Workaholic	0.7	0.3	0.6	0.6	1.3	1.3	1.3	0.9
Achievement	6.8	0.5	1.5	1.4	1.3	1.5	0.8	0.9
Loyalty	1.1	5.2	0.8	0.5	7.3	9.8	0.8	0.8
Change	16.3	0.9	4.1	5.3	1.1	0.1	2.9	3.8
Diversity	1.3	0.5	0.3	0.4	0.1	0.5	0.3	0.9
Technology	1.9	3.4	0.0	0.3	0.5	0.2	0.3	1.1
Team	2.4	1.4	5.9	5.9	3.5	2.7	19.5	18.8
Honesty	3.3	15.2	1.1	0.9	5.2	7.8	0.9	0.8

Table 3: Analysis of the relationship between country, generation and work values

Variables:	Cognitive values <i>Coef. (SE), P-value</i>	Instrumental- job focus values <i>Coef. (SE), P-value</i>	Instrumental-individualistic focus values <i>Coef. (SE), P-value</i>	Societal values <i>Coef. (SE), P-value</i>	Social values <i>Coef. (SE), P-value</i>
<i>Level 1 main effects:</i>					
Relative age	-.05 (.02), .27	-.06 (.03), .32	.03 (.02), .61	-.02 (.01), .68	-.03 (.01), .54
generation	.06 (.04), .39	.04 (.02), .51	.03 (.02), .37	.05 (.03), .34	.02 (.01), .63
<i>Level 2 main effects:</i>					
GDP	-.03 (.01), .48	.05 (.03), .37	-.04 (.02), .39	.03 (.02), .53	-.06 (.03), .47
Country	.19 (.08), <.01	.15 (.07), <.01	-.25 (.12), <.01	-.27 (.13), <.01	.23 (.11), <.01
<i>Cross-level interaction:</i>					
Country X Generation	.31 (.12), <.01	.24 (.10), <.01	-.05 (.03), .29	-.07 (.04), .28	-.06 (.03), .26
~R ²	.19	.15	.12	.12	.10
ICC (null model)	.19	.17	.20	.21	.17
ICC (conditional model)	.13	.12	.11	.10	.09

ICC= % Variance between = $\tau_{00}/\tau_{00} + \sigma^2$. ~R² (Pseudo R²) estimate the amount of total variance (both level 1 and level 2) in the dependent variables captured by predictors in the model.

Figure 1: Hybrid approach to generations

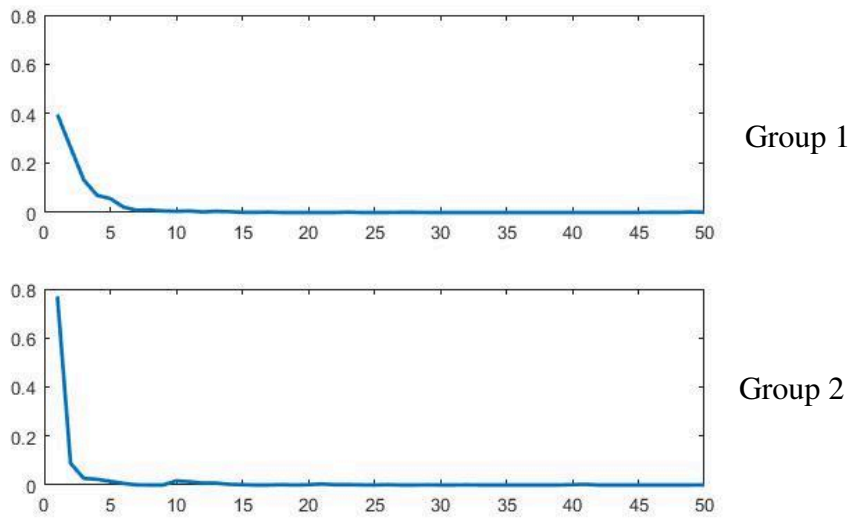


Global identity- shared behavior of age cohort shaped by mobile technology, social networks and the internet.

Local identity- deep values shaped by national context

Are Millennials a global generation?

Figure 2: NGram analysis for USA sample



Are Millennials a global generation?

Figure 3: Distribution of values in each age group- USA

Gen Y:



Gen X:



Are Millennials a global generation?

Figure 4: Distribution of values in each age group- Russia

Gen Y:



Gen X:



Are Millennials a global generation?

Figure 5: Distribution of values in each age group- India

Gen Y:



Gen X:



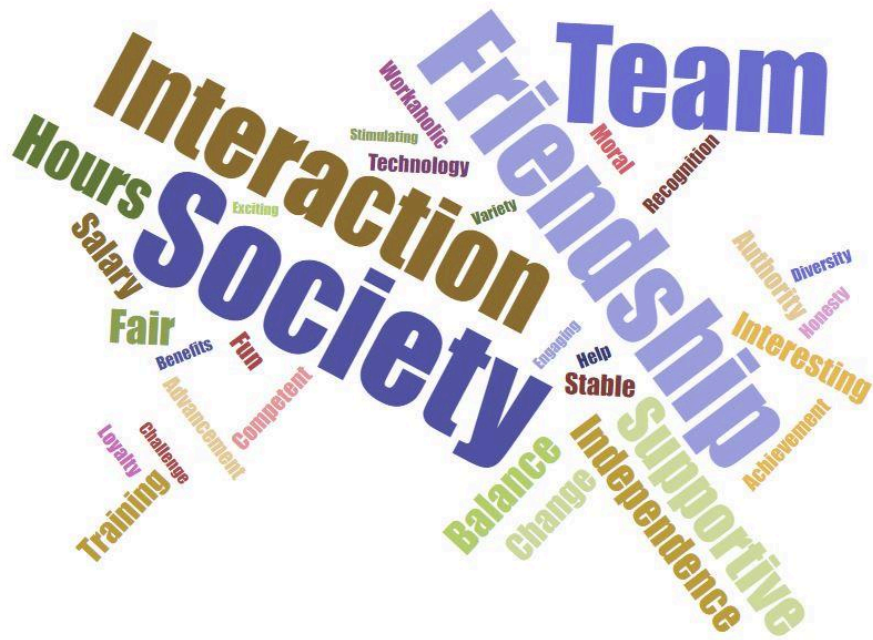
Are Millennials a global generation?

Figure 6: Distribution of values in each age group- Argentina

Gen Y:



Gen X:



Are Millennials a global generation?

Figure 7: interaction effect of country and generation on cognitive values

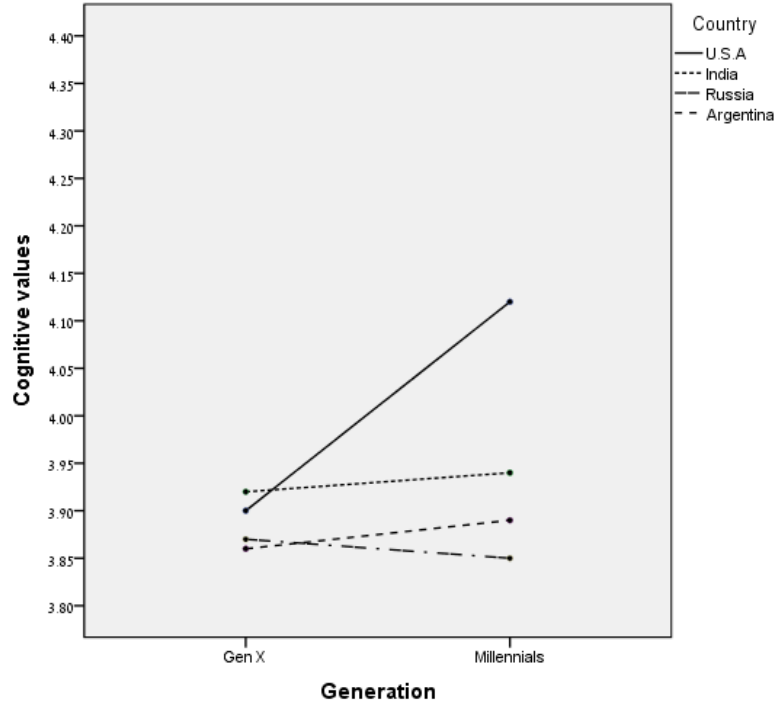


Figure 8: interaction effect of country and generation on instrumental-job values

