Baby Boomers of Different Nations:

Identifying Horizontal International Segments Based on Self-Perceived Age

Purpose

This study investigates self-perceived age among Baby Boomers in the UK, Germany, Japan, and Hungary, and identifies two horizontal segments based on the way consumers view their age

Design/methodology/approach

Questionnaires were used to sample 880 Baby Boomers. Structural equation modeling is used to investigate multi-national measurement invariance of the cognitive age scale.

Findings

Two distinct segments are identified, providing support for a young at heart consumer culture in all nations in the study. Results also find cognitive age to exhibit partial measurement invariance, which is expected given the disparate nations under study.

Research limitations/implications

This research contributes to cross-cultural global age research which is still in an early pioneering stage. The study builds on a small number of previous studies that validate cognitive age, extends current knowledge of the measurement properties of cognitive age, and identifies two distinct international segments of Baby Boomers. Further research needs to delve into the antecedents of self-perceived age, particularly in the ways in which different life experiences and cultures may impact age identities.

Practical implications

The study has implications for marketing mangers wishing to target the increasingly important young at heart Baby Boomer.

Originality/value

The study uses 4 non-American countries, uses samples matched for chronological age, and does not use convenience samples, which make it unique in the cognitive age literature. The study has value for marketing managers, global age researchers, and consumer culture researchers.

The extreme view of globalization as a force shrinking the world that will result in a global civil society (Douglas and Craig, 1997, 2006; Levitt, 1983; Ohmae, 1995) is now tempered to a more balanced acknowledgement of interconnectedness of people and interdependence among countries, while simultaneously recognizing the persistence of national cultures (Morrison, 2011; Steenkamp, 2001). Nevertheless, national cultures are impacted by globalization (Craig et al., 2009), and researchers have started to proclaim and debate the emergence of a global consumer culture (see Merz, et al., 2008, for a review and analysis). A global consumer culture should provide organizations with new opportunities, because successful segmentation relies on similarities among groups of people rather than differences between them. Thus, global phenomena that can be applied to international segmentation and targeting decisions provide organizations with opportunities for economies of scale across a range of marketing activities. One such global phenomenon receiving increasing attention from marketing academics is the concept of self-perceived or subjective age. Self-perceived age may be more useful than chronological age when studying older adults because ageing does not occur in the same way for all individuals (Bell, 1972; Jarvik, 1975), so homogeneity in individual lifestyles and conditions among people of the same age cannot be assumed. In other words, the number of years lived is a poor indicator of a person's attitudes and behavior. Yet, chronological age is still widely used in

consumer research. Self-perceived age may be a far more important psychological influence on the way a person behaves in the marketplace (Barak and Gould, 1987; Chua et al., 1990). This is a particularly important concept because population aging is currently experienced by most nations in the developed world (UN, 2010), so researchers and businesses alike will likely pay more attention to aging consumers.

This paper investigates two types of self-perceived age among Baby Boomers of different nations. The first type is called age identity, and reflects the way in which a person classifies themselves in terms of feeling young, middle-aged, or old. The second is called cognitive age (Barak and Schiffman, 1981), which is a multi-dimensional quantifiable measure of self-perceived age. Cognitive age has been gaining increasing attention in the marketing literature, and has been used in many studies in different countries and cultures. Most studies find similar patterns in how people view their age. This consensus has led to tentative suggestions that there is a global consumer culture emerging based on being 'young at heart' (Barak, 2009). However, over twenty years ago, Van Auken et al. (1993) noted that despite its crucial importance to marketing, most of the published research on cognitive age "denotes an assumption of validity and reliability" (p. 84) that suggests cognitive age has been determined intuitively rather than scientifically. Over two decades later, and numerous further studies utilizing cognitive age across different cultures and nations, this situation has not changed much in that the measurement properties of cognitive age have not been fully investigated. Thus, before cognitive age is considered to be truly universal its measurement properties need further examination, and the cognitive age scale needs to be validated in more countries and cultures. This study presented here therefore investigates the cognitive age scale, attempts to validate it across four disparate nations, and examines its usefulness for international segmentation.

The paper begins with an outline of global population aging and evaluates the importance of older consumers to businesses. It then explains the theoretical underpinning to cognitive age, and synthesizes marketing studies that utilize the concept to better understand consumer behavior among older adults. The paper then details a four-nation (UK, Germany, Hungary, and Japan) investigation into the validity of the cognitive age scale, and presents the discovery of two distinct segments of Baby Boomers that can be found in all four

countries. Despite being the same chronological age, the two segments are shown to differ significantly across a range of consumer attitudes and behaviors. The first segment comprises the cognitively young, and this finding therefore adds to the growing evidence to suggest there is indeed a global consumer culture that is the young at heart. A second smaller segment, comprising those who have old age identities, also emerges. The study also finds that despite its clear psychological influence on consumer behavior in a cross-national context, the cognitive age scale itself may not be entirely culture free. Implications for theory and marketing practice are discussed.

Aging consumers

The UN (2010) describes population aging as the most profound demographic change in history. A pervasive and truly global phenomenon without precedent or parallel means the previous young populations are unlikely to reoccur. Globally, life expectancy has increased by almost 20 years over five decades, and as the UN (2010) points out, the profundity of this demographic change impacts economic growth, labor markets, pensions, health care, housing, migration, politics, and of course consumption. Projections of the importance of older people to business are not limited to increasing numbers. Spending patterns across North America, Japan, and Europe suggest that older consumers are an increasingly important segment for a range of goods and services including vacations and leisure, cars, healthcare, and beauty products (Eurostat, 2012; ONS, 2011; Reuters, 2013) with Baby Boomers enjoying an annual spending power of $3.4 trillion (CBS News, 2011).

The Baby Boomers are a unique cohort from a cultural and marketing perspective. In contrast to the "silent generation" who preceded them (Lifecourse Associates, 2012), Boomers have experienced a life-course emphasizing choice, autonomy, self-expression, and pleasure (Jones *et al.,* 2008). The ad men of Madison Avenue created a youth culture as a reaction to the Depression, shifting the focus from class differences to age-related life-style differences. The cultural shift took slightly longer in Western Europe, but nevertheless it came. By the 1960s, for the first time ever, society's focus was working class teenagers and this is where the origins of mass consumption are found. The situation in America and Europe was mirrored, to a lesser extent, in Japan. Japan's Baby Boomers were also the first

generation to grow up during the age of mass media, and through television and magazines "they connected to a world that was alien to their parents" (Brasor, 2013). Consequently, there is weakened demand for traditions or customs and indications of a diversification of lifestyles and values that suggest Baby Boomers now want to enjoy their own time in their own way, which is in contrast to previous generations (Enomoto, 2011). Subsequently, "socialization into the new lifestyles of consumption has permeated the lives...of the participants of post-war youth culture" (Jones *et al*., 2008, p.39). This situation is mirrored in Japan, where is a remarkable individual propensity to consume, today's Japanese Baby Boomers enjoy a prosperity that previous generations could not have dreamed of and are an important consumer market for cars, appliances, travel, and luxury goods (BBC, 2006; Enomoto, 2011). In a nutshell, Baby Boomers shaped modern marketing (Thompson and Thompson, 2009). Yet, despite the importance of Baby Boomers, marketing's focus on youth and neglect of older adults is well documented (Niemela-Nyrhinen, 2007; Thompson and Thompson, 2009). Even with their relatively large share of spending, Nielsen (2012) estimates that less than 10% of advertising is geared towards them, an assertion supported by advertising content analyses across different media and nations (Kessler *et al.,* 2009; Prieler *et al.,* 2011, 2014; Simcock and Sudbury, 2006).

Empirical research into older consumers is sparse in comparison to younger samples, with older respondents frequently missing from studies of consumer behavior (Lippert, 2011; Sudbury and Simcock, 2011). Yet, a body of evidence from cognitive psychology and cognitive and affective neuroscience supports the contention that older adults have different information processing strategies than their younger counterparts (Gutchess, 2010). Consequently, older consumers have different decision making-processes (Peters, 2010), all of which impacts their attitudes towards possessions (Folkman et al., 2010), comprehension of marketing communications (Bonifield and Cole, 2010) and brand choice (Lambert- Pandraud and Laurent, 2010). Yet, many marketing theories and concepts have been designed using predominantly younger samples, and thus may not be optimum for use when targeting older segments. Indeed, marketing's knowledge of how to successfully reach the Boomer cohort is high on speculation and conjecture and low on valid and reliable empirical studies that are underpinned by relevant theoretical perspectives. As global

population aging has resulted in recognition of the importance of older consumers, so too is there a growing recognition that marketing research needs more theories and concepts that are appropriate for use with older adults (Sudbury-Riley and Edgar, 2013). Yet, there is a paucity of such appropriate theories and concepts at the current time. One of the few exceptions to this is the concept of cognitive age, which, since its introduction to marketing from gerontology over 30 years ago (Barak and Schiffman, 1981), has been utilized in studies across the globe to advance understanding of the consumer behavior of older adults.

Self-Perceived Age

The importance of self-perceived age has long been recognized in gerontology (Burke and Tully, 1977), and due to the aging of the world's population and the increasing importance of older consumers, marketers must also pay more attention to the concept. As people age they become increasingly dissimilar with respect to lifestyles, needs, and consumption habits (Moschis, 1996) which of course renders chronological age even more useless in terms of targeting Baby Boomers. The implications of the cliché that a person is as young, or as old, as they feel may be more useful in understanding the behavior of older people. In other words, self-perceived age is more reflective of an older consumer's attitudes and behavior than is chronological age because it contributes more to understanding how older adults view themselves (Wilkes, 1992). Indeed, not only does self-perceived age give a better insight into consumer behavior than chronological age alone, but it also renders invalid those segmentation studies which rely on chronological age. Indeed, marketers who fail to consider self-perceived age "may be missing the true psychological make-up of these consumers" (Van Auken et al., 1993, p. 82). Van Auken et al. (1993) go on to warn that strategies to target mature consumers that do not consider self-perceived age may lead to failure due to ineffective targeting, promotional, and positioning strategies. Examples of such expensive and embarrassing marketing mistakes include Affinity Shampoo for older hair, Heinz Senior Foods, and Silver Pages telephone directory (Moody and Sood, 2010).

Embedded in every culture, age categories define the life course and range from minimal distinctions of young, adult, and old, to intricate systems with ten or more grades (Keith, 1985). Known as age identity measures, such self-perceived age classification schemes are the standard and most popular technique among gerontologists for measuring self-perceived age (Barak, 1987), and are a useful indication into how a person defines themselves in relation to their life-course (Goody, 1976). Alternatively, age can be measured by functionality (Keith, 1985). Even in modern societies, people associate factors such as loss of health, diminished mobility, and low activity levels as being markers of old age (Bultena and Powers, 1978). Functional definitions of age may involve an assessment of health or appearance (physical), or allude to a change in mental attitude or aptitude (psychological), or reference to a change in role such as retirement or social habits (social), or even involve all three. Indeed, aging is multidimensional and no single component can be understood without reference to the others (Riley, 1985).

Self-perceived age falls under the rubric of identity theory (Burke and Tully, 1977), and in response to the acceptance that aging is multidimensional and drawing on self-perceived age research from psychology (Cleveland and Shore, 1992), sociology (Keith, 1990), and gerontology (Guptill, 1969), Kastenbaum et al. (1972) developed 'The Ages of Me' instrument, designed to measure "how old a person seems to himself" (p.197). The instrument comprises a set of four functional age questions that requests respondents to specify an absolute age in response to the following:

I feel as though I were about age…

I look as though I were about age…

I do most things as though I were about age…

My interests are mostly those of a person about age…

Kastenbaum et al. (1972) therefore successfully introduced the concept of self-perceived *ages* based on how old a person feels (psychological and biological), looks (biological), acts (psychological and social) and is reflective of their interests (psychological and social). Barak and Schiffman (1981) later adapted the 'Ages of Me' instrument in several ways. First, they altered the questions to read:

I feel as though I am in my….

I look as though I am in my…

I do most things as though I were in my….

My interests are mostly those of a person in his/her…

Second, instead of respondents giving an absolute age in response to the four items, Barak and Schiffman (1981) simplified the instrument by asking respondents to check an age decade for each question. Third, they suggested that an overall composite score - or cognitive age - could be derived by averaging the midpoint values for the four dimensions. The averaging of the individual dimensions into a cognitive age composite is standard practice (Van Auken et al., 2006). For example, somebody who feels in their 40s, looks in their 60s, does things as though they were in their 50s and has interests mainly of someone in their 40s has a cognitive age of 52.5 years (45 + 65 + 55 + 45/4). Methodologically, the cognitive age scale is superior to other methods of ascertaining self-perceived age because it has simplified data collection, understanding and measurement (Stephens, 1991). At the same time, cognitive age is based on sound theoretical principles developed across disciplines, and is multidimensional which is important because there has long been consensus among philosophers concerning the existential stances of the human condition, namely knowing, feeling, and acting (Bengston et al., 1985). Applying these concepts to marketing, biological ageing is likely to alter consumer needs and ability to function in the marketplace; psychological ageing has implications for a wide variety of consumer information processing and problem solving abilities (Moschis, 1994), while the social aspects of age and ageing are important because society has expectations from people of different ages, as society is age graded (Birren and Cunningham, 1985). Cognitive age incorporates all dimensions of ageing, in that feel age is likely to reflect psychological and biological factors, look age is affected by biological factors, do age and interests age both reflect how a person acts and will be impacted by psychological and social factors, and may also reflect biological factors such as poor health.

Cognitive Age and Consumer Behavior

Since its introduction, studies have found cognitive age influences consumer behavior throughout the decision making process. At the most fundamental level, cognitive age is

associated with consumer values (Kohlbacher and Chéron, 2012; Sudbury and Simcock, 2009) which have hierarchical primacy over attitudes (Kahle et al., 1992) and can therefore help in understanding consumer motivations (Kahle, 1996). Cognitive age influences consumer behavior in a variety of social, cultural, and leisure activities (Chua et al., 1990; Clark et al., 1999; Gonzàlez et al., 2009; Mathur and Moschis, 2005; Ward, 2006; Wilkes, 1992). In comparison to chronological age, cognitive age is a much more accurate measure of self-image among older consumers (Ward, 2006) and affects fashion consciousness and 'defensive aging consumption' such as purchasing skin care products, health supplements, organic and high-anti-oxidant food, and anti-aging treatments (Eastman and Iyer, 2012; Ong et al., 2008) as well as the adoption and diffusion of other products and innovations (Gwinner and Stephens, 2001; Hong et al., 2013; Mathur et al., 2011; Sherman et al., 1988; Stephens, 1991; Wei, 2005). Finally, cognitive age impacts attitudes towards different media, brands, and various forms of marketing communications (Barak, 1998; Barak and Rahtz, 1990; Dolinsky et al., 1998; Gwinner and Stephens 2001; Hsu, 1993; Iyer et al., 2008; McMellon et al., 1997; Smith and Moschis, 1984; Teller et al., 2013; Uncles and Lee, 2006; Wei et al., 2013; Wray and Hodges, 2008). Clearly, therefore, cognitive age is a proven concept for better understanding consumer behavior across a range of products, sectors, and media. Indeed, it can be argued that no other concept specifically designed for use with older consumers has had such impact on consumer behavior theory than has cognitive age.

Cognitive Age and International Segmentation
While it has been suggested that cognitive age could be a useful segmentation variable (Barak, 2009; Kohlbacher and Cheron, 2012; Wei, 2005), only one previous empirical study (Sudbury and Simcock, 2009b) has utilized cognitive age in developing a segmentation model. Based solely on UK data, Sudbury and Simcock (2009) identified five distinct segments among senior consumers that differ in terms of a range of psychographic variables, including cognitive age. Used in conjunction with demographics, psychographic variables are particularly useful in segmenting international markets (Cleveland et al., 2011), yet, to date, no study has attempted to segment older consumers internationally using cognitive age.

International segmentation has long been acknowledged to be as important as domestic segmentation (Wind and Douglas, 1972). Choosing an international segmentation strategy is a vital and complex task of great magnitude that is related to competitive advantage; yet the area is vastly under-researched (Cleveland et al., 2011; Papadopoulos and Martín Martín, 2011). Particularly noteworthy is the absence of studies that focus on the individual consumer; Cleveland et al. (2011) note that, "for various reasons, including the relative ease of acquisition of secondary data, extant research on international market segmentation (IMS) is primarily based on published sources (e.g. UN publications, Hofstede's indices). Very few IMS studies draw upon responses from actual individual consumers" (p. 245). Perhaps as a consequence of this situation, many international segmentation decisions are made at the country level, yet as Papadopoulos and Martín Martín (2011) point out, using the consumer as the focal point makes great theoretical sense, as there is no good reason why 'country' should always be the right choice. In a global environment marked by increasing complexity, firms need to not only examine the macro-level forces at country level, but also need to examine specific consumption situations, which not only provides insights into product design, but also gives marketing managers information on how to position and promote products and services appropriately. Consequently, data which relates to consumption contexts and factors which influence behavior and vary both across and within countries is increasingly important (Douglas and Craig, 2011). Clearly, from a practical perspective, transnational firms need cross-national, cross-cultural approaches to marketing segmentation because global trends have increased the heterogeneity of attitudes and behaviors of consumers within countries and, at the same time, increased commonalities across countries (Agarwal et al., 2010).

Differentiating between countries and consumer behavior variables as the focus of the segmentation process has important implications for international marketing. Vertical marketing segments emerge when the analysis is conducted cross-nationally, thus exist within nations or countries. On the other hand, horizontal marketing segments are identified as a result of discovering behavioral homogeneity and heterogeneity between consumers of different countries and cultures. Globalization impacts phenomena across many different countries and cultures, re-shaping individual and group beliefs, attitudes, and sub-cultures (Agarwal et al., 2010). Recently, the efficiency of typical market

segmentation categorizations has been called into question on the basis that while globalization forces result in more similarities than ever before, increasingly sophisticated technology allows for increased consumer choice and life experiences, resulting in consumers that are complex and multidimensional (Amine and Smith, 2009). The identification of a global phenomenon which allows for the identification of horizontal international segments of older consumers would therefore be of major benefit to both marketing theory and practice. Given that cognitive-age has been shown to be an important concept theoretically, while methodologically it is easy to use and understand, the question of its usefulness for international marketing segmentation is an important one that is worthy of investigation. Before cognitive-age can be examined in terms of its usefulness for international horizontal segmentation, however, its measurement properties and the validity of the scale need further examination.

Cognitive Age: International Use and Validity Tests

While the majority of studies into cognitive age were conducted in North America (Barak, 2009), the cognitive age scale has been used in single-nation studies in Belgium (Weijters and Geuens, 2006), France (Guiot, 2001), Hong Kong (Hong *et al.,* 2013), Japan (Kohlbacher and Cheron, 2012; Van Auken and Barry, 2009; Van Auken *et al.,* 2006), Malaysia (Ong *et al.,* 2008), The Netherlands (Dorscheidt, 2001), Spain (Gonzàlez *et al.,* 2009), Switzerland (Teuscher, 2009), Taiwan (Wei, 2005), and the UK (Szmigin and Carrigan, 2000; Sudbury, 2006). This body of international research shows a strong consensus in that:

- Cognitive and chronological age differ, although the two correlate positively.
- There is a strong youth bias (average cognitive age is younger than chronological age).
- Look age is closest to actual age than any other cognitive age dimension.

A growing body of international cognitive age research focuses on identifying its antecedents and impact on behavior, but only a few have considered the factorial validity of the construct. Yet, Gerbing and Anderson (1998) stress the need for confirmatory factor analysis to assess the unidimensionality of a scale. Those few studies that have attempted to test for factorial validity have met with mixed results. Wilkes' (1992) American and Guiot's

(2001) French study both used convenience samples of females and both dropped the look age dimension due to its low reliability. Three further studies (Mathur and Moschis, 2005; Mathur *et al.,* 2011; Van Auken and Barry, 1995) have used structural equation modeling and found the measurement model of cognitive age with the four dimensions to have an overall good fit.

The scale has also been used in a small number of multi-national studies (Barak *et al.,* 2001, 2003; Barnes-Farrell and Rumery, 2000; Kohlbacher *et al.,* 2011a) where no cross-national comparisons of cognitive age were made. Importantly, however, cognitive age has been utilized in several studies that have made country comparisons without examination of the scale's properties. Wei and Talpade (2009) compared Chinese and American seniors and claimed that Chinese adults have older cognitive ages than their American counterparts, though as their Chinese sample were chronologically older this result needs to be interpreted with some caution. Barnes-Farrell *et al.* (2002) published a follow-up study of their 5-nation study in which direct comparisons between nations were made using MANCOVAs with chronological age as a covariate. Kohlbacher *et al.* (2011b) reported ANOVA results across their 4-nation study, while Chua *et al.* (1990) used language (English and Chinese) as a proxy for culture in their Singapore study and found that youth bias (i.e., the difference between chronological and cognitive age) is greater among English-speaking respondents in comparison to Chinese-speaking respondents. Crucially, none of these comparative studies considered the issue of measurement invariance, which is essential if theory is to be tested successfully in different cultural settings (Mathur *et al.,* 2001). Indeed, without evidence of invariance, findings "are at best ambiguous and at worst erroneous" (Steenkamp and Baumgartner, 1998, p. 78).

Steenkamp and Baumgartner (1998) contend that multigroup confirmatory factor analysis (CFA) is the most powerful and versatile approach to testing for cross-national invariance in consumer research and offer a sequential testing procedure for doing so. The first measure is configural invariance, which tests the pattern of salient (non-zero) and nonsalient (zero or near zero) loadings and defines the structure of the measurement instrument. The second is metric invariance, where factor loadings are constrained equally across nations, which means researchers can have confidence in observed item differences being indicative of

cross-national differences in the underlying construct, though it has been acknowledged that metric invariance is often difficult to achieve (Chen and Tang, 2006). Finally, studies that wish to make direct comparisons of means scores across nations need to ensure that the scale exhibits scalar invariance, which tests whether, in addition to the factor loadings, the intercepts are the also the same which implies that cross-national differences in the means of the observed items are due to differences in the means of the underlying constructs (Hu and Cheung, 2008).

Despite the many previous investigations using cognitive age, only two previous multinational studies have ever attempted to establish measurement invariance. In the first, Barak and his colleagues (Barak, 2009, 2011; Mathur et al., 2001) used Steenkamp and Baumgartner's (1998) procedure and established configural and partial metric invariance across India, China, and Korea, though the first published paper to emerge from this study was unable to attempt scalar invariance as the samples were not matched for chronological age. Adding data from France to their data set, these researchers later managed to achieve full invariance with sub-samples aged 30-59. Using a different technique, Van Auken et al. (2006) found the same factor pattern to apply for both Japanese and Americans, and attained partial invariance, but were unable to establish full measurement equivalence of the cognitive age scale. Several issues pertaining to the Van Auken et al. (2006) study should be noted. First, the American data used in the Van Auken et al. (2006) study had been collected a decade earlier for a different study (Van Auken and Barry, 1995), so it is possible that time and/or cohort effects may have impacted results. Second, both the Japanese and the US samples comprised University alumni, suggesting that both samples are likely to be of higher socio-economic status than would be found in the general population. This is an important issue, because the self-perceived age literature is consistent with regards to socio-economic status (SES), in that persons with younger self-perceived ages tend to be of higher SES. Specifically, several studies have found that higher levels of education are associated with younger self-perceived ages (Back, 1963; Bultena and Powers, 1978; Gwinner and Stephens, 2001; Markides, 1980, 1983; Miller et al., 1980; Underhill and Cadwell, 1983), while the vast majority of self-perceived age studies that take income into consideration have found that those on higher incomes perceive themselves to be younger than their financially worse-off counterparts (Barak and Rahtz, 1990; Baum and Boxley,

1983; George et al., 1980; Miller et al., 1980; Gwinner and Stephens, 2001; Mutran and Reitzes, 1981; Stephens 1991; Underhill and Cadwell, 1983; Wilkes, 1992). Third, Van Auken et al.'s (2006) samples both comprise adults age 55+, with the US sample ranging from 56-87 years and the Japanese sample ranging from 55-93 years., making both samples considerably older than the Baby Boomer consumers on which the current study focuses.

Clearly, projects focusing on the structure and measurement properties of cognitive age lag far behind those comprising its antecedents and relationships with different consumer behaviors. Too many previous cognitive age studies rely on convenience samples. Some studies that have tested for factorial validity had to remove one of the four dimensions before a satisfactory measurement model was found. The one study that did achieve full equivalence (Barak *et al.*, 2011) comprised consumers aged 30-59 only. Moreover, there is a paucity of countries from which these multi-national studies have selected samples, leading Barak (2001, 2009) to call for more research to be conducted in nations that differ in terms of cultural, economic, political, and social factors, yet produces data that can be used in comparative studies. The current study therefore answers that call by analyzing the self-perceived ages – both cognitive and identity – of older consumers of Baby Boomer age across four disparate nations. In so doing, it will be only the third known study to attempt to test for factorial validity and measurement invariance across countries. Recently, the importance of replication studies has been brought to the forefront of marketing research. The Journal of Business research, for example, recently ran a special edition on replication (Easley and Madden, 2013). Replication studies are important in order to validate the findings of previous studies (Mathur and Moschis, 2005) and determine facts (Hunter 2001). Replications and extensions play a valuable role in ensuring the integrity of a discipline's empirical results, and they are considered to be important for the advancement of science (Easley, Madden, and Dunn 2000; Hubbard and Armstrong 1994). In fact, replication-with-extension research lends itself particularly well as the vehicle for discovering empirical generalizations (Hubbard and Lindsay 2002) and building a solid body of knowledge. As Newton's famous quote reminds, "if I have seen further, it is by standing upon the shoulders of giants" (BBC, 2014).

It is upon the shoulders of Barak and his colleagues (Barak, 2009, 2011; Mathur et al., 2001) and Van Auken et al. (2006) that the current study stands. Indeed, as Jasny et al. (2011) state, "replication - the confirmation of results and conclusions from one study obtained independently in another - is considered the scientific gold standard" (p. 1225). The motivation, therefore, to conduct a replication investigation into measurement invariance of the cognitive age scale is threefold. First, only one previous multinational study, using samples aged 30-59 has established full measurement invariance of the cognitive age scale, yet many published studies have used the scale in previous research across different and diverse cultures and nations. Second, no previous international research has ever established invariance using a Baby Boomer sample, despite the increasing importance of Boomers across so many nations and to such a wide range of organizations. The study conducted by Barak and his colleagues (Barak, 2009, 2011; Mathur et al., 2001) utilizes respondents aged 30-59 years, and is therefore younger than Baby Boomers, and the study conducted by Van Auken and his colleagues (Van Auken and Barry, 1995; Van Auken et al. 2006) comprises samples that are overall older than the Baby Boomer samples utilized in the current study. Given than chronological age impacts cognitive age (Barak, 1998; Barak and Rahtz, 1990; Barnes-Farrell and Piotrowski, 1989; Henderson, Goldsmith and Flynn, 1995; Hubley and Hultsch, 1994; Sudbury, 2004; Wilkes, 1992), this too is an important consideration. Third, attempts to establish measurement invariance of the cognitive age scale have never been attempted in three of the four countries that are included in the current study. As Van Auken et al., (2006) note, if the construct is to reach its full potential, its validity in other countries must be investigated. Overall, then, there are clear reasons to replicate attempts to establish measurement invariance using samples that are a) matched for chronological age, b) comprise respondents of Baby Boomer age, and c) comprise samples drawn from nations that have not been considered in relation to measurement invariance before. Equally importantly, the current study also extends previous knowledge by considering cognitive age and age identity in relation to a variety of values, attitudes, and consumer behaviors. Finally, the study's greatest contribution is its investigation into the usefulness of self-perceived age for international segmentation of Baby Boomers.

Method

Samples

Ebbinghaus (2005) contends that nation-state formation, international co-operation, and data availability results in some countries being over represented in many analyses. Consequently, research conducted in one country (usually the US) is often assumed to be relevant to other countries, irrespective of differences in cultural and social forces. Inclusion of disparate nations in the current study is therefore an important contribution to knowledge. The UK was chosen because it has been severely criticized for its negative attitudes towards aging (Bytheway *et al.,* 2007). Indeed in contrast to some other European countries Britain still has age discrimination built into the fabric of its society, and ageing is often portrayed in negative ways in the media (Joseph Rowntree Foundation 2004; Williams et al. 2010). Additionally, the UK is often condemned as being 'Eurosceptic' and having more in common with the US than the rest of Europe (Economist, 2012). Consequently Germany, which is increasingly important in terms of senior consumers (Eitner *et al.,* 2011), is the largest economy in continental Europe, and is a country without Anglo-Saxon roots and therefore more representative of Western Europe, was selected. Few previous studies of cognitive age include countries from the 'new Europe' and because it already has the oldest population in Eastern Europe (UN, 2010), Hungary was selected for inclusion. Finally, while several previous studies have considered the cognitive ages of Japanese seniors (Kohlbacher and Chèron, 2012; Kohlbacher *et al.,* 2011a, 2011b; Van Auken *et al.,* 2005; Van Auken and Barry, 2009), Japan is the country most severely affected by the demographic shift (Kohlbacher, 2011, 2013) and therefore gives an important comparison point to the European nations under study.

In the UK, a list of randomly-selected names and addresses which in part contained 2500 consumers of Baby Boomer age was purchased from a commercial organization. In Germany, the research was conducted in collaboration with the German Senior Citizens' League (DSL), which is a not-for-profit association for older people, similar to AARP in the US. A random list of 6000 people aged 50+ was purchased from their master sample. In Japan, the Japanese social research institute Central Research Services (Chūō Chōsa Sha), which is one of the biggest and most-well known Japanese social research institutes, was contracted to conduct the survey. Often used by the Japanese government, its master

sampling was used as the sampling frame and the questionnaire sent to 1044 adults of Baby Boomer age [1].   A list, representative in terms of gender, region, work status, income, and age was purchased from the Hungarian Central Statistic Büro.

Postal surveys were used in the UK, Germany, and Japan. A postal survey was used for several reasons. First, in addition to questions about age, the survey contained measures of ethics, thus social desirability bias was deemed to be a major consideration. Social desirability bias tends to be higher when respondents talk to researchers directly, so a postal survey was deemed preferable to interviews or a telephone survey. Second, it was felt that nonresponse bias may be higher in interviews or telephone surveys due again for reasons pertaining to the ethical questions. Third, an online survey was rejected on the basis that there is a question regarding anonymity, and also the fact that online panels are not always suitable for studying older cohorts, thus there is a possibility of strong selection bias. Fourth, while the current study focuses solely on a sub-sample of older adults of Baby Boomer age and is thus limited to those aged 50-70, the data were gathered for a larger study into the consumer behavior of seniors, and therefore questionnaires were sent out to some very old people. It was felt that an on-line questionnaire may not be well-received by persons of very advanced age. Finally, postal lists of randomly selected names and addresses were available in the countries. Sweepstake incentives, comprising the chance to win shopping vouchers in the UK and a Blu-ray player in Germany, were offered. In Japan, every respondent received a JPY 500 (approximately 5 USD) book voucher. However, piloting in Hungary found difficulties of self-completion among rural Hungarians, and consequently the data collection method was adjusted. The sample list, which is representative in terms of gender, region, work status, income, and age, was purchased from the Hungarian Central Statistic Büro, and a professional market research company was employed to conduct interviews face to face. Of the Hungarian respondents, 38% were drawn from Budapest, a further 44% from other cities, and 37% from rural villages.

Response rates were 9.2% in UK, 3.8% in Germany, and 42% in Japan. Despite the use of incentives, some of these response rates are lower than many attained in other consumer behavior studies, but surveys comprising older adults tend to be lower than average, in part

because some older people are afraid of scams and junk-mail (Sudbury and Simcock, 2010) while survey response rates are declining overall (Tourangeau, 2004). Moreover, the survey also contained questions of a personal and ethical nature, thus low response rates were expected. Research shows that surveys with relatively low response rates can be just as accurate as surveys with high response rates (Cook et al., 2000). Reminders were sent out, and comparisons made of early versus late respondents (i.e., before and after reminder letter). Armstrong and Overton's (1977) classic review of methods to measure non-response bias include a review of extrapolation methods which are based on the assumption that respondents who answer later or only after prodding are more like non-respondents. Analysis of the socio-demographic profiles of early (before reminder letters) and later (after reminder) respondents revealed differences in terms of education and work status. In common with many postal surveys (Armstrong and Overton, 1977) better educated respondents tended to reply early. For this reason, education and work status were not included in any further data analysis.

Instrument

Questionnaires were developed in English and then translated and back-translated into German, Japanese, and Hungarian. The study detailed here is part of a larger study into the consumer behavior of older adults. Consequently, in addition to a battery of socio-demographic questions (chronological age in years, gender, education, income, work status), the questionnaire contained several further attitudinal and behavioral scales, which are detailed in Appendix 1. As well as containing the cognitive age scale (Barak and Schiffman, 1981) the Age Identity scale (Cavan et al., 1949) was included, which is the oldest and most established self- perceived age scale, and reflects the fact that society is age graded. The age identity scale is used extensively by gerontologists. Values, in the form of Kahle's (1983) List of Values (LOV), were included. The decision to include values was taken because values take hierarchical primacy over attitudes (Kahle et al., 1992), influence a range of consumer behaviors (Batra et al., 2001; Beatty et al., 1988), and are of crucial importance in international research (Craig and Douglas, 2006). Kahle's (1983) scale was selected over other alternatives due to its relative parsimony and ease of administration. The Ethically Mindful Consumer Behavior Scale (EMCB) (Sudbury-Riley et al., 2012a) was

included because ethical and environmentally friendly purchasing is of growing importance and yet in comparison to younger consumers, little is known about the ethical beliefs of older consumers (Carrigan et al., 2004; Sudbury-Riley et al., 2012b). The EMBC scale was chosen over available alternatives because it provides a measure of actual behavior as opposed to attitudes, and past research has found that attitudes towards ethical issues are not necessarily reflected in actual purchases (Cowe and Williams, 2000; d'Astous and Legendre, 2008). Ethical purchasing and cognitive age have never before been considered together. Finally, a measure of Social Desirability Bias (Strahan and Gerbasi, 1972) was included because of the sensitive nature (age, ethics) of some of the questions contained in the questionnaire.

Results

Preliminary Analysis

One-way ANOVA revealed there to be no significant differences in the chronological ages of the samples ($F_{(3, 876)}$ = 2.550, p = .055). This is a major advantage many previous investigations which have comprised sample not matched for chronological age. Table 1 profiles respondents by nation.

Table 1 here

Table 2 presents the findings of the age identity scale. As the table shows, the vast majority of older adults, regardless of nationality, identify with middle-age. Nevertheless, 9.2% of UK Baby Boomers - compared to less than 3% of Hungarian and German Boomers - still feel young. Noteworthy is while Germany and Hungary are similar in terms of the percentage feeling young, those adopting an old age identity differ considerably, with far greater numbers of Hungarians having already adopted an old age identity. Indeed, over one-quarter of the Hungarian Boomers surveyed already feel old, compared to less than 10% of Germans and only 3.5% of British Baby Boomers. Despite no significant differences in the chronological ages of the samples, a Chi-square test for independence found a significant association between nationality and age identity (χ^2= 66.997, df = 6, p < .001), with fewer

than expected British and Germans, and greater than expected numbers of Japanese and Hungarians, admitting to an old age identity.

Table 2 here

Table 3 details the dimensions of cognitive age by nation. Across the UK, Germany, and Japan, look age is older than the other dimensions, though this pattern fails to emerge in Hungary where look age is marginally younger than feel age. The youngest dimension in the UK is do age, while it is interests age in Germany, Hungary, and Japan.

Table 3 here

Mirroring previous self-perceived age studies (Hubley and Hultsch, 1994; Terpstra et al., 1989; Uotinen, 1998) a youth bias, i.e. the difference between chronological and self-perceived age, for each dimension of cognitive age was computed. Table 4 shows the results, where it can first be seen that across every dimension and every nation, the youth bias is positive. In other words, the vast majority of Baby Boomers across all nations perceive themselves to feel, look, do most things, and have interests that are younger than their chronological age. The magnitude of the youth bias, however, differs between cognitive age dimensions in that in the UK, Germany, and Japan, people report look ages that are much closer to their chronological age, while across all nations, do age and interests age show the greatest magnitude in terms of youth bias. Finally, striking differences emerge across nations, with the magnitude of the youth bias being much smaller in Hungary than in the other nations. In Hungary, the youth bias falls between 2.5 years and does not reach 6 years; in Japan the bias increases in magnitude to between 4.3 and 7.8 years, while in the UK and Germany several dimensions find a youth bias of over 10 years.

Table 4 here

Reliability analyses on the 4 dimensions of cognitive age using Chronbach's Alpha were found to be acceptable for each country (UK = .791, Germany = .873, Hungary = .898, Japan = .847). Consequently, an overall cognitive age was computed for each nation. Table 5 presents the results. It can be seen that despite these samples being the same age

chronologically, the youth bias is less than 4 years in Hungary, and is almost 6 years in Japan. This youth bias increases to 8.5 years in German and is over 9 years in the UK. Clearly, chronological and cognitive age are different constructs, and this is confirmed with a paired samples t-test which confirmed them to be significantly different in each nation (UK: $t_{(230)}$ = 21.68, p < .001; Germany: $t_{(164)}$ = 17.31, p < .001; Japan: $t_{(306)}$ = 19.98; Hungary: $t_{(176)}$ = 7.79, p < .001).

Table 5 here

Although chronological and cognitive ages are significantly different, correlation analyses showed the two to be positively correlated across all nations (UK: r=.456, n = 231, p < .001; Germany: r=.632, n= 165, p < .001; Hungary: r= .549, n=177, p < .001; Japan: r=.725, n=307, p < .001). Finally, a pattern emerged between the two types of self-perceived age. As table 6 shows, the youth bias is greater for those who feel young and less for those who feel old. Indeed, those who admit to feeling old have cognitive ages that are much closer to their chronological age, and these differences are significant for each nation (UK: $F_{(2, 218)}$ = 16.084, p < .0.1; Germany: $F_{(2, 155)}$ = 8.410, p < .0.1; Hungary: $F_{(2, 174)}$ = 26.154, p < .0.1; Japan: $F_{(2, 301)}$ = 9.731, p < .0.1).

Table 6 here

Invariance Testing

In order to further check the psychometric properties of the cognitive age scale, a series of confirmatory factor analyses (CFA) using AMOS 20 were conducted. Following the procedure recommended by Cheung (1999), a CFA for each country was conducted. Results revealed adequate fit in Germany ($\chi2$ = 2.914, df = 2, p = .233, RMSEA = .053) and Hungary ($\chi2$ = 4.043, df = 1, p = .131, RMSEA = .076), but modification indices indicated the need for correlated error terms between look age and do age in the UK and between look age and interest age in Japan[2]. By amending the models accordingly in these two countries, adequate fit was achieved (UK: ($\chi2$ = 0.093, df = 1, p = .761, RMSEA = .000; Japan: ($\chi2$ = 1.000, df = 1, p = .317, RMSEA = .001). Table 7 shows the results of the final CFAs for each country.

Table 7 here

Analysis then proceeded to multi-group CFAs in order to test for measurement invariance at three levels, namely configural, metric, and scalar (Steenkamp and Baumgartner, 1998; Mathur *et al.,* 2001). Analyses revealed that a model with correlated error terms between look age and do age worked well for the multi-group analysis involving all 4 countries. Table 8 shows the results of the measurement invariance tests. Model 1) tested for configural invariance. Based on the RMSEA (.058) and CFI (.992) results the model fit was deemed acceptable, leading to the conclusion that configural invariance holds across the four nations under study. Model 2) tested for metric invariance. The Δ in CFI of 0.014 is slightly above the 0.01 threshold recommended by Cheung and Rensvold (2002). While there is precedent of this figure being rounded (Byrne, 2010), in which case full metric invariance could be claimed, the chi-square difference test is statistically significant ($\chi 2 = 46.890$, df = 13, p = .000) and thus erring on the side of caution full metric invariance is not claimed here. In a similar vein, testing of model 3) reveals that scalar invariance does not hold, either ($\chi 2 = 139.581$, df = 25, p = .000; RMSEA = .072; Δ in CFI = .051). Analysis therefore proceeded to testing for partial measurement invariance.

Table 8 here

Care was taken to select the most invariant item as the marker item (Cheung and Rensvold, 1999). Based on a systematic search for the invariant item to set free in order to achieve partial measurement invariance, feel age was selected as the marker item and do age was identified as the invariant item. Therefore in testing for partial metric invariance (model 2a) the factor loading of do age was set free and in testing for partial scalar invariance (model 2b) the intercept of do age was also set free. Based on the chi-square differences test and the ΔCFI of 0.002, it is concluded that partial metric invariance holds across the four countries ($\chi 2 = 19.769$, df = 10, p = .032; RMSEA = .033; Δ in CFI = .002). However, both tests indicate that partial scalar invariance cannot be established ($\chi 2 = 81.667$, df = 19, p = .000; RMSEA = .061; Δ in CFI = .034). In other words, the intercepts of the 4 dimensions of cognitive age are different across countries. Indeed, even a cursory glance at table 3

suggests national differences, and ANOVAs confirmed this for each dimension (feel age: $F_{(3,879)}$ = 14.986, p < .001; look age: $F_{(3,879)}$ = 3.521, p < .05; do age: $F_{(3,879)}$ = 18.800, p < .001; and interests age $F_{(3,879)}$ = 6.238, p < .001).

Table 9 Here

An inspection of the factor loadings revealed do age to have the strongest impact on cognitive age for all nations except for Japan. This difference seems to be the reason why do age ends up being an invariant item which has to be set free in order to establish partial metric invariance, a finding that is mirrored in its higher F value. Japan was then removed from further analyses and results of the measurement invariance tests with the remaining three countries (Table 9) reveals that full metric invariance holds ($\chi 2$ = 15.694, df = 9, p = .074; RMSEA = .036; Δ in CFI = .006). However, as Table 9 shows it was still not possible to establish scalar invariance ($\chi 2$ = 85.717, df = 17, p = .000; RMSEA = .084; Δ in CFI = .061) even or even partial scalar invariance ($\chi 2$ = 74.000, df = 15, p = .000; RMSEA = .083; Δ in CFI = .051) which is unsurprising given that the ANOVA results reported above reveal significant differences across the countries for every cognitive age dimension. Conversely, post hoc tests confirmed Hungary to differ significantly from Germany and the UK on all dimensions except look age, where Germans were significantly different than Hungarians and Britons.

Due to the fact that scalar invariance was not achieved, the remaining analyses do not make direct comparisons of mean scores across nations. The establishment of partial metric invariance, however, greatly increases confidence in the validity of the following analyses.

International Segments

In each country, respondents were split into 2 segments: the young-at-heart (those whose cognitive age is younger than their chronological age) and the old-identifiers (those whose cognitive age is older than their chronological age). Table 10 details the chronological and cognitive ages of each segment and shows the youth bias. The young-at-heart segment range from a youth bias of just over 7 years for Hungary and Japan to over 9 years in

Germany and over 10 years in the UK. In contrast, the old-identifies range from feeling just over 1 year older than their actual age in Germany and Japan, to almost 2 years in the UK and almost 3 years in Hungary. Importantly, independent t-tests found no significant differences between the chronological ages of each group across the UK (t= -1.445, df = 222, p. =.150), Germany (t= -3.98, df = 1.59, p. =.691), or Hungary (t= -1.153, df = 175, p. =.251), and it was only in Japan that significant differences emerged (t = - 3.185, df = 303, p < .01), with the older-identifiers being chronologically younger (mean age 60.5 years) than the young at heart (57.5 years).

Table 10 Here

Slight income differences were found in Hungary (t= - 2.182, df = 131.768, p < .05) with the young-at-heart segment enjoying slightly higher incomes than the old identifiers, though no income differences were found between the two segments in the UK (t= - 1.883, df = 202, p =.061), Germany (t= - 1.035, df = 152, p =.302), or Japan (t= - 0.052, df = 303, p =.958). Chi-square tests for independence (with Yates Continuity Correction) indicated no gender differences in the segments in any nation (UK: χ2 (1, n=221) =.031, p =.86; Germany: χ2 (1, n=159) =.74, p =.39; Japan: χ2 (1, n=305) =.023, p =.88; Hungary: χ2 (1, n=177) =.53, p =.47). The two segments were then profiled in terms of the consumer behavior variables. First, the List of Values (LOV) can be seen in table 11. While there are clearly national/cultural differences, what is important is that within each nation there are differences in the rankings of the values between the two segments. In the UK, while both segments rank self-respect and security as the top values, the young-at-heart place greater importance on self-fulfillment, being well-respected, and accomplishment than do the old-identifiers. These values are more individualistic, while the old-identifiers place greater importance on group values such as a sense of belonging and warm relations with others. There are a number of differences between the segments in Germany, too, with the young-at-heart placing more emphasis on fun and enjoyment and self-respect, and the old-identifiers ranking self-fulfillment, accomplishment, and security comparatively higher. Both segments in Hungary

agree on their most important values (security and a sense of belonging) and indeed their least important (fun and enjoyment), but differ in terms of the relative importance they place on all others. Finally, the segments in Japan have fewer differences between them, but the Japanese young-at-heart place relatively greater importance on warm relations with others, while the old-identifiers rank security as their top value.

Reliability analyses on the Environmentally Friendly Consumer Behavior (EFCB) scale were found to be acceptable for each country (Alpha in UK = .91, Germany = .91, Hungary = .93, Japan = .84). Across all four nations, the young-at-heart demonstrated higher levels of environmentally friendly consumer behavior, and independent t-tests revealed these differences to be significant in the UK ($t = -2.856$, $df = 216$, $p < .01$), Germany ($t = -1.902$, $df = 2159$, $p < .05$), and Hungary ($t = -2.348$, $df = 175$, $p < .05$). The Japanese young-at-heart also had higher EFCB scores than the old-identifiers (mean scores = 35.06 and 34.63 respectively), though these differences did not reach statistical significance ($t = -.474$, $df = 303$, $p = .636$).

Finally, given the sensitive nature of the questions pertaining to cognitive age and environmentally friendly consumer behavior, two simple regression analyses were conducted for each country, using the social-desirability scores as the predictor variable, and using cognitive age and then the EFCB scores as the outcome variable. Cognitive age is not affected by social desirability in any of the nations, while its effects on EFCB were very small, and accounted for only 2.8% of the variance in the British Sample, 3.7% in the German sample, 6.7% in the Japanese sample and 7.7% in the Hungarian sample. This is despite the face-to-face administration in Hungary, which would theoretically be expected to be higher given the administration method used.

Discussion
Clearly, the 'young at heart' philosophy holds true for many older consumers in all four nations. The majority of Boomers feels middle-aged, does not feel old, and has cognitive-age identities that are significantly younger than their chronological age. Many of the patterns

are similar to American research in that there is little agreement between cognitive and chronological age, with a strong youth bias. Likewise, the expectation that the look age dimension would be closest to actual age than any other emerged in all the samples except Hungary. These youthful identities are despite the fact that many are retired when, arguably, society deems a person to be old.

The tendency for older people to report younger self-perceived ages has been viewed as a form of denial in the US, where youth is valued over old age (Guy et al., 1994). This ideology is not limited to American culture: in the UK old age is associated with negative characteristics; indeed in contrast to some other European countries Britain still has age discrimination built into the fabric of its society, and aging is often portrayed in negative ways in the media (Joseph Rowntree Foundation, 2004; Williams et al., 2010). Chua et al. (1990) interpreted their finding that in comparison to their English-speaking counterparts the age-bias was less pronounced among Chinese speaking respondents as a result of cultural influences because age is more respected in Eastern as opposed to Western cultures. In a similar vein, Catterall and Maclaran (2001) argue that the underpinning assumptions inherent in the concept of cognitive age reflect a Western preoccupation with youthfulness. However, given that the youth bias also exists in non-western nations, this view is challenged. While the UK and German samples demonstrate similarities to American studies which typically report an age bias of between 8 and 12 years (Barak, 1998; Sherman et al., 2001), a number of studies conducted outside the US show the bias to be less pronounced. For example, older Finnish adults have a greater acceptance of their actual age than do older Americans (Uotinen, 1998).

This is not to say that cognitive age is not a useful concept for marketing to Baby Boomers. On the contrary, the young at heart philosophy holds true for all nations studied here. However, the results of the CFA demonstrate that there are differences in the way cognitive age is viewed. This is perhaps unsurprising, given the very different nations selected for inclusion in the study. Wahl and Kruse (2003) argue that research into older adults should be designed and interpreted with a consideration of the social and cultural contexts in which these adults live. Thus, particularly in view of the significance of the European Union, it would seem that more research is needed across European nations before Baby Boomers are targeted with a pan-European marketing strategy. A recent meta-analysis, using data from 598 studies conducted over 30 years, found that cultural values were more strongly related to older adults in comparison to younger people (Taras et al., 2010). Clearly, then, the life-experiences of individual nations needs to be considered. The nations selected here are very different with regards to life-experiences. Germans have experienced re-unification (and before that separation), migration of younger adults from Eastern to Western Germany which has affected older people's social networks and integration, their parents suffered war guilt and a lack of focus on war veterans that is in stark contrast to the UK and US, and different social welfare arrangements which produce continuity of income in old age (Wahl and Kruse, 2003). Language is an important part of culture, and interestingly the Hungarian language belongs to the Finno-Ugric family and is one of the few languages spoken within the EU that is not of Indo-European origin. Moreover, older Hungarians have lived through the collapse of communism and the transition to a market economy, and a large study into the formulation of a consumer society and on the development of local identities in Central Europe found that a special type of consumer society came into being into these countries,

with Hungary being one of them (Wessely, 2000). From a consumer values perspective, the socialist system in Hungary which emphasized altruism and concern for the community has been replaced with more materialistic values, but there are still major generational differences (Hofmeister Toth and Neulinger, 2009). Finally, older Japanese seniors have – just like their German counterparts – experienced the post-war efforts to rebuild their country and finding a new national identity. Globalization as well as American occupation during the post-war years has led to an acculturation process that strongly impacts Japanese values and consumer behavior (cf. also Francks, 2009). It is therefore of little surprise to find the List of Values to be ranked differently between the nations.

It cannot be claimed that culture is the (sole) explanation for the differences found across these four countries. Other factors on the individual or sample level may be confounding results and further research needs to disentangle cultural effects from those of other correlates. Besides, self-perceived age identity might be a social phenomenon thus its usefulness and applicability could change with changing social attitudes toward age per se (cf. Catterall and Maclaran, 2001). It is hoped that the different sampling methods which were needed due to cultural differences did not impact the results, but it is noted that Hungary, where the administration of the questionnaires was different, emerged as having a much smaller youth bias than the other European nations.

An important contribution of this study is the identification of two distinct segments that are found in each of the countries under study. There are few socio-demographic differences between the segments. However, the first and largest segment, the cognitively young, does add to the growing evidence to suggest there is indeed a global consumer culture that is the young at heart. The study also identifies a smaller segment comprising those who have old age identities, and shows that the two segments differ across a range of values and consumer behaviors. Clearly, the young at heart segment is a key target for environmentally friendly products and services, though these may need to be positioned differently – perhaps using the value rankings – in each country. This segment is also more radical when it comes to environmentalism because it comprises people who are more likely to have taken action (demonstrated, wrote a letter, etc.) about an environmental issue, it contains more people who are members of ethical groups, and this segment is also the more effective target for environmental charities.

This research has also made a contribution to knowledge pertaining to feelings of anomie among older consumers. Irrespective of their age identity, their nationality, or indeed the segment to which they belong, these Baby Boomers have far greater feelings of consumer alienation from the marketplace than have been found in previous studies of young consumers in several different nations (Ning et al., 2013). Given that so few marketers are targeting Baby Boomers (Nielsen, 2012; Thompson and Thompson, 2009) despite their relatively large share of spending, the study uncovers clear evidence of opportunities for those firms who, with insight into the age-identities and values of the different segments, could stand out from the many competitive offerings explicitly tailored for younger consumers.

Conclusions and Recommendations

It is relatively rare to find a multi-national study of cognitive age conducted outside the US. Even rarer is the use of samples matched for chronological age. That the current study uses 4 non-American countries, uses samples matched for chronological age, and does not use convenience samples makes it unique in the cognitive age literature and therefore the findings presented here make an important contribution to knowledge. Indeed, as Dolnicar and Grün (2007) note, results are only as good as the data upon which they are based.

From an international marketing perspective, the study lends support for the usefulness of self-perceived age identities as a way of segmenting and targeting senior consumers across the globe and provides backing for the thesis that universally age identities differ from actual age (Barak et al., 2001). Thus, in the same way as a youth segment represents an example of a global segment (Kjeldgaard and Askegaard, 2006), this study adds to the growing evidence that a 'young at heart' senior global market exists and concurs with Barak (2009) in that age-related identity is superior to chronological age as a basis for segmentation and targeting it. However, the extent of this youth bias differs between nationalities, thus the cognitive age scale cannot be viewed as totally invariant. Equally noteworthy is a segment – existing in each of the countries under study – that comprises old-identifiers. This segment places different importance on values than does its young-at-heart counterpart, and while this segment has been shown to be a less valuable target for environmentally friendly purchasing, its need further investigation for the usefulness of targeting with other products and services. For example, the old identifies may be prime targets for healthcare providers.

This research has answered a recent call for more studies of cross-cultural global age research, which is still in an early pioneering stage (Barak, 2009). Additionally, this study contributes to research on global consumer culture (Merz et al., 2011) which has so far neglected older consumers, and to research on the role of culture in international marketing and consumer behavior (Cleveland et al., 2011; Luna and Gupta, 2001). The study also adds to the small but growing amount of empirical evidence pertaining to the cohort that is known as Baby Boomers in the US and UK. Results lend support for the claim that the concept of cognitive age is reliable and can be used in diverse cultures, and that there is a universal way that human beings perceive and feel about self-perceived age (Barak, 2009; Barak et al., 2001). However, the latter holds only true as far as the general tendency to feel younger than one's actual age is concerned, but not to the degree and magnitude of the youth bias. This is actually not all surprising given the disparate cultures and life-experiences that these Boomers have experienced. Further research needs to delve into the antecedents of the concept of self-perceived age, particularly in the ways in which different life experiences and cultures may impact the way people perceive their ages and the way they are perceived by others. Finally, employing cohort analysis on longitudinal or repeated cross-sectional data may help to shed further light on changing social attitudes towards age and how it impacts a person's age identity. Future research should also examine cultural dimensions and how they impact the different dimensions of cognitive age, which is particularly pertinent given the differences in LOV rankings across the four nations.

Cognitive age is one of the few concepts utilized in marketing to older adults that has historical and important antecedents, notably in a variety of disciplines. Its foundations can be found in sociology, psychology and gerontology and can be traced back over 60 years. All

too often knowledge pertaining to marketing to older adults comprises conjecture and speculation, and in contrast cognitive age is one of the few concepts that has been tested empirically, across a variety of nations and age cohorts, and has been shown to be relatively stable and consistent to a degree. It is therefore unsurprising that lately practitioners have become interested in cognitive age. The BBC recently completed a study of cognitive age identities amongst its media panel and found that cognitive age is extremely useful for program scheduling, content, and intelligence (Edgar and Bunker, 2013) and as a result has commissioned a further study to comprise a number of countries to aid its international program scheduling (Edgar, 2013). If the BBC can replicate the findings found in the few previous multi-national studies of cognitive age, it is likely that the young at heart global segment will become utilized by a range of organizations wishing to target older adults for an assortment of products and services. Settersten and Mayer (1997) argue that the measurement of age has become more problematic in contemporary and ever changing societies, thus the effective empirical measurement of it becomes more pressing and more complicated. The current study adds to the small but increasing amount of literature that attempts to tackle this pressing but complicated phenomenon.

This paper argues that self-perceived age age is an important phenomenon with which to better understand and target this global segment. The paper also makes a unique contribution to the field by identifying two distinct horizontal marketing segments among Baby Boomers in four different nations, lending support to the growing empirical evidence suggesting there is indeed a global consumer culture that is the young at heart.

[1] Strictly speaking, the Baby Booms in each nation under study occurred in different years. However, for consistency the US Baby Boom cohort were used as a benchmark.

[2] The analysis was also repeated using models in which there were no correlated error terms for Germany and Hungary, a correlated error term between look age and do age for the UK and a correlated error term between look age and interest age for Japan. Basically, these findings were replicated. For the sake of simplicity and parsimony, only the results of the multi-group analysis for which the model was exactly the same for all four countries are reported.

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Appendix 1: Scales Used

Self-Perceived Age

Age Identity (Age Identity Scale, Cavan et al., 1949)
Operationalization: Self-perceived age identity, linked theoretically to perspectives of self-concept, requiring the respondent to reflexively examine the self as an object and involving comparisons of counter age-identities" (George et al. 1980).
Actual questions: Do you consider yourself to be Young, Middle-Aged or Old?

Cognitive Age (Cognitive Age Scale, Barak & Schiffman, 1981)
Operationalization: Multidimensional self-perceived age self-concept (Barak et al. 2001)
Actual questions: asks people to identify with age decades using the following 4 questions:
1. I feel as though I am in my…
2. I look as though I am in my…
3. I do most things as though I were in my…
4. My interests are mostly those of a person in his/her…
Respondents reply to all four questions by checking "20s, 30s, 40s, 50s, 60s, 70s, or 80s"

List of Values (LOV) (Kahle, 1983)
Operationalization: Enduring beliefs that individuals hold about specific modes of conduct or end states (Batra, Homer and Kahle, 2001). The 8 values are listed in table 10.

Ethically Mindful Consumer Behavior Scale (EMCB) (Original Scale by Roberts 1996, adapted version used, Sudbury-Riley et al., 2012a)
Operationalization: Environmentally friendly and ethical purchasing.
Actual Questions:
1. I always choose the product that contributes to the least amount of environmental damage
2. I have switched products for environmental reasons
3. If I understand the potential damage to the environment that some products can cause, I do notpurchase those products
4. I do not buy household products that harm the environment
5. Whenever possible, I buy products packaged in reusable or recyclable containers
6. I make every effort to buy paper products (toilet paper, tissues, etc.) made from recycled paper
7. I will not buy a product if I know that the company that sells it is socially irresponsible
8. I do not buy products from companies that I know use sweatshop labor, child labor, or other poor working conditions
9. I have paid more for environmentally friendly products when there is a cheaper alternative
10. I have paid more for socially responsible products when there is a cheaper alternative

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Consumer Alienation Scale (shortened version Singh, 1990)
Operationalization: Overall negative feelings of a consumer toward the market and business entities
in it (Allison, 1978).
Actual Questions:
1. Most companies care nothing at all about the consumer.
2. Shopping is usually an unpleasant experience.
3. Consumers are unable to determine what products will be sold in the stores.

4. In general, companies are plain dishonest in their dealings with the consumer.
5. Business firms stand behind their products and guarantees.
6. The consumer is usually the least important consideration to most companies.
7. As soon as they make a sale, most businesses forget about the buyer

Social Desirability Bias (shortened version of the Marlowe-Crowne Scale, Strahan and Gerbasi, 1972)
Operationalization: One of the most common sources of bias self-deception and other-deception (Nederhof, 1985)
Actual Questions:
1. I'm always willing to admit when I make a mistake
2. I always try to practice what I preach
3. I never resent being asked to return a favour
4. I am never annoyed when people express ideas very different from my own
5. I never deliberately say something to hurt someone's feelings
6. I like to gossip at times
7. There are occasions when I take advantage of someone
8. I sometimes try to get even rather than forgive and forget
9. At times I insist on having things my own way
10. There are occasions when I feel like smashing things

Table 1. Profile of Respondents

		UK	Germany	Hungary	Japan	Total
	N =	231	165	177	307	880
Chronological Age	Mean (years)	61.13	60.34	59.72	60.14	60.35
	SD	4.34	6.07	5.11	5.94	5.44
Gender (%)	Male	43.0	59.5	41.7	45.6	45.6
	Female	57.0	40.5	58.3	54.4	54.4
Work Status (%)	Working	41.6	47.6	55.1	35.6	46.2
	Housewife/unemployed	2.3	9.1	20.6	5.6	10.6
	Retired	56.1	43.3	24.3	58.8	43.2
SES (%)	AB	9.0	7.7	29.7	24.4	18.8
	C1	20.8	21.0	29.7	64.4	33.3
	C2	32.5	56.6	22.1	12.6	28.9
	DE	37.7	14.7	18.5	0.6	19.0

Table 2. Age Identity by Nation (per cent)

Age Identity (%)	UK	Germany	Hungary	Japan	Total
Young	9.2	2.5	2.3	7.8	6.1
Middle-Aged	87.3	88.3	69.5	73.9	79.2
Old	3.5	9.3	28.2	18.3	14.8

Table 3. Dimensions of Cognitive Age (mean age in years).

	UK	Germany	Hungary	Japan	Total Sample
Feel Age	51.36	51.97	57.20	54.41	53.72
Look Age	56.52	54.64	57.09	55.81	56.03
Do Age	49.63	50.64	55.56	54.19	52.60
Interests Age	50.50	49.85	53.81	52.33	51.68

Table 4. Youth Bias by Dimension of Cognitive Age in years.

	UK		Germany		Hungary		Japan		Total Sample	
	Years	s.d.	Years	s.d.	Years	s.d.	Years	s.d.	Years	s.d.
Feel Age	9.78	8.9	8.7	8.2	2.5	8.1	5.7	7.8	6.6	8.6
Look Age	4.6	6.1	5.7	6.2	2.6	6.1	4.3	5.3	4.3	5.9
Do Age	11.5	9.5	9.7	8.2	4.2	8.7	6.0	6.7	7.8	8.7
Interests Age	10.7	9.2	10.4	9.4	5.9	7.8	7.8	8.9	8.6	9.0

Youth bias is the difference between chronological and self-perceived age.

Table 5. Overall Cognitive and Youth Age by Nation

	UK	Germany	Hungary	Japan	Total
Mean Cognitive Age	52.00	51.77	55.92	54.19	53.51
Mean Chronological Age	61.13	60.34	59.72	60.14	60.35
Mean Youth Bias	9.13	8.57	3.80	5.95	6.84

Table 6. Mean Youth Age (in years) by Age Identity.

	UK	Germany	Hungary	Japan

Young	14.5	16.8	13.0	9.3
Middle-aged	9.1	8.8	5.4	6.0
Old	0.6	3.9	-0.8	4.0

Table 7. Cognitive Age CFA by Nation

Nation	N	X_2	df	p	RMSEA	P close	CFI
UK	231	0.093	1	.761	.000	.819	1.000
Germany	165	2.914	2	233	.053	.364	.997
Japan	177	4.043	1	.131	.076	.249	.995
Hungary	307	1.000	1	317	.001	.481	1.000

Table 8. Measurement Invariance of Cognitive Age across UK, Germany, Hungary and Japan

Model	X_2	df	p	RMSEA	P Close	Δ X_2	Δ df	Sig.	CFI	Δ CFI
1) Configural invariance	15.950	4	.003	.058	.276	---	---	---	.992	---
2) Metric invariance	46.890	13	.000	.055	.301	30.94	9	.000	.978	.014
3) Scalar invariance	139.581	25	.000	072	.001	92.691	12	.000	.927	.051
2a) Metric invariance (partial)	19.769	10	.032	.033	.890	3.819	6	.701	.994	.002
2b) Scalar invariance (partial)	81.677	19	.000	.061	.079	61.908	9	.000	.960	.034

Table 9. Measurement Invariance of Cognitive Age across UK, Germany and Hungary

Model	χ_2	df	p	RMSEA	P Close	Δ χ_2	Δ df	Sig.	CFI	Δ CFI
1) Configural invariance	3.445	3	.328	.016	.276	---	---	---	1.000	---
2) Metric invariance	15.694	9	.074	.036	.301	12.249	6	.057	.994	.006
3) Scalar invariance	85.717	17	.000	072	.084	70.023	8	.000	.993	.061
3b) Scalar invariance (partial)	74.000	15	.000	.061	.083	58.306	6	.000	.943	.051

Table 10. Ages and Youth Bias by Segment and Nation (years)

	UK		Germany		Hungary		Japan	
	Young at heart	Old Identifiers	Young at heart	Old Identifiers	Young at heart	Old Identifiers	Young at heart	Old Identifiers
Chronological Age	61.25	59.87	60.39	59.69	60.03	59.10	60.53	57.47
Cognitive Age	50.78	61.85	51.03	60.96	52.80	62.00	53.43	58.90
Youth Bias	10.47	-1.98	9.37	-1.27	7.24	-2.90	7.10	-1.43

ANOVA by Cognitive Age Dimension (UK, Germany, Hugary)

	ANOVA		Post Hoc Tests
	F	*P*	
Feel Age	21.423	.000	Hungary differs from UK and Germany
Look Age	5.119	.006	Germany differs from UK and Hungary
Do Age	20.091	.000	Hungary differs from UK and Germany
Interests Age	8.933	.000	Hungary differs from UK and Germany

Table 10. Values by Rank

		Sense of belonging	Warm relations	Self-fulfilment	Well respected	Fun & enjoyment	Security	Self-respect	Accomplishment
UK	Young-at-heart	8	4	6	7	5	2	1	3
	Old-identifiers	6	3	8	8	5	2	1	4
Germany	Young-at-heart	6	4	8	7	2	3	1	5
	Old-identifiers	6	4	8	5	6	1	2	3
Hungary	Young-at-heart	2	3	5	6	8	1	4	7
	Old-identifiers	2	4	7	5	8	1	3	6
Japan	Young-at-heart	8	1	4	7	3	2	6	5
	Old-identifiers	8	2	4	7	3	1	6	5