



Towards the use of chronological age in research – A cautionary comment



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ARTICLE INFO

Article history:

Received 21 January 2016

Received in revised form

6 May 2016

Accepted 11 May 2016

Keywords:

Chronological age

Cognitive age

Future time perspective

ABSTRACT

In recent years, this journal published several articles that used chronological age in their models to distinguish customer behavior between younger and older people. While all these articles are in line with the growing importance of age-related research, chronological age is not discriminant when behavior and motivations enter the fray. By taking two recent articles in this journal as examples, this short note calls for a cautious application of chronological age and highlights other age-related constructs for research. The note ends with practical implications and avenues for further research in age-related projects.

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1. Introduction

In 2000, worldwide, one in nine people above the age of 60 was 80 or older. By 2050, this ratio is expected to increase to approximately one in five (United Nations, 2008). Due to declining birth rates and increasing life expectancies, this “silver tsunami closing in” (Sunday Times, 2010) is already prevalent in more developed regions of the world, in which the proportion of older people already exceeds that of children (United Nations, 2008).

Marketing research is slowly recognizing these growing numbers of older consumers and research on older consumers' behavior is rising. Several important and insightful articles in this journal either directly focused on older consumers and explained their behavior based on their age group (e.g., Kohijoki, 2011) or used chronological age as a moderator in their studies to contrast older consumers' behavior with other age groups (e.g., Kirk et al., 2012; Kohijoki and Marjanen, 2013; Loureiro and Roschk, 2014; Massicotte et al., 2011; Roschk et al., 2013; San-Martín et al., 2015; Tsarenko and Strizhakova, 2015). Table 1 provides an overview of age-related articles that appeared in this journal.

Although all these articles are in line with the increasing importance of older consumers, they may cause researchers and practitioners to misinterpret the true value of their results, because chronological age is not discriminant when behavior or motivations enter the fray (Kuppelwieser et al., 2014). This note therefore calls for a cautious application of chronological age as a correlate or as the main focus in research studies. It discusses the use of age along examples of recent articles in this journal, namely

San-Martín et al. (2015) and Tsarenko and Strizhakova (2015), but the discussion is applicable to all age-related papers.

2. Shortcomings of chronological age

Granted, chronological age has been found to explain a number of possible changes that occur in people's psychological, social, and societal functioning in their life cycle. A lot of this research accounts for the common belief that there is a normative, chronological age-related decline in extrinsic and intrinsic motivation and individuals' behavior (e.g., Homburg and Giering, 2001; Kohijoki, 2011; Kohijoki and Marjanen, 2013; Kooij et al., 2011; Lambert-Pandraud et al., 2005; Mägi, 2003).

In the meantime, several scholars have suggested that chronological age may only serve as a proxy for age-related processes. In that sense, Griffiths (1997, p. 208) notes that “we should stop accepting chronological age as a factor ...” and Heckhausen et al. (2010, p. 37) argue that “chronological age itself does not automatically propel progression through the timetable of development tasks.” Indeed, the general process of aging consists of several dimensions, of which chronological aging is only one (Carstensen et al., 1999; Cleveland and McFarlane Shore, 1992; Settersten and Mayer, 1997). Recent research has found that individuals differ in their biological age, even if they are of the same chronological age (Belsky et al., 2015). These differences impact physical and cognitive abilities, brain aging, and health. Consequently, individuals with the same chronological age may differ in all other dimensions, such as health, family status, or income. The concept of age may thus have a subjective meaning for them (Cleveland and McFarlane Shore, 1992; Settersten and Mayer,

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Table 1
Overview of age-related papers in JRCs.

Authors	Focus of research	Key findings
Kirk et al. (2012)	Distinguishes two age groups (born before and after 1980); age as a moderator.	Age moderates satisfaction with interactivity, with older participants being more satisfied by static e-books and younger participants by interactive e-books. The less useful consumers find print products, the more likely they are to adopt interactive digital books; age moderates this effect.
Kohijoki (2011)	Describes behavior of the elderly based on panel data.	Aging consumers demand high-quality products and services and are willing to make an effort to satisfy their needs. Aging increases difficulty in coping with shopping in the store environment.
Kohijoki and Marjanen (2013)	Effect of chronological age on shopping behavior of aging consumers and whether their behavior is different to that of younger 18–54 years old) consumer cohorts.	Different consumer types form the aging market, which is rather similar to that found among younger age cohorts.
Loureiro and Roschk (2014)	Effect of the atmospheric cues graphics and information design on positive emotions and loyalty intentions. Model compares offline and online stores and regards consumers' age as moderator.	In the offline context, positive emotions predict loyalty among younger customers, but not among older ones. In the online context, the effect of graphic design on loyalty is stronger for younger customers than older ones.
Massicotte et al. (2011)	What is the effect of mall atmosphere in mall evaluation? Is this effect mediated by self-congruity and functional congruity? Does the effect of mall atmosphere on mall evaluation differ between adult and teenage shoppers? If so, how?	Mall atmosphere positively affects functional congruity for adults as well as teenage shoppers. The impact of atmosphere on self-congruity is only significant for teenagers. Self-congruity and functional congruity positively affect mall evaluation for both age groups.
Meneely et al. (2009)	Determines behavior and experience of older consumers in Northern Ireland (aged 60+) during the food procurement process. Recommendations to minimize older consumer detriment.	Identified shopping patterns and motivations fuel purchase decisions. Older people face a range of positive and negative experiences when accessing food.
Roschk et al. (2013)	Examines how age moderates the impact of justice perception (e.g., distributive, procedural, and interactional justice) on post-complaint satisfaction.	Identifies four developmental stages of adulthood, separated by five-year transition periods. Impact of distributive justice on satisfaction peaks in middle adulthood and the effect of procedural justice in early adulthood. Effect of interactional justice dips in early adulthood.
San-Martín et al. (2015)	Moderates the role of age in the influence of entertainment and subjective norms on m-shopper satisfaction and WOM. Identifies relevant differences in behavior in a mobile shopping context according to age, considering people younger than 25 years and older than that.	Perceived entertainment has a higher importance for young adults and the subjective norms are crucial for adults. Satisfaction is a relevant determinant of WOM in both m-buyer groups.
Tsarenko and Strizhakova (2015)	Models female purchase behavior in order to gain a better understanding of factors that influence and direct the purchase behavior of intimate apparel. Assesses the effect of consumer age on this relationship.	Mediation of hedonic consumption is more pronounced in the younger segment, while interaction with store personnel is more apparent among the older segment of consumers.

1997) and the concept of age loses its stability assumption.

These findings have important implications for Tsarenko and Strizhakova's (2015) and San-Martín, et al.'s (2015) studies: If the relationship between chronological age and any form of subjective age is non-linear, we can expect different results when other forms of age measurement are used as a moderator, rather than chronological age. For example, Kuppelwieser and Sarstedt (2014b) have shown that even the formation of satisfaction and ultimately loyalty changes when another age measure is applied. They finally state that "satisfaction formation shifts between emotion and function under different time perspectives" (Kuppelwieser and Sarstedt, 2014b, p. 2625).

3. An alternative concept: cognitive age

Feeling younger (as assumed by many researchers) has important implications for marketing (Schiffman and Sherman, 1991; Tepper, 1994). Cognitive age is an individual perception of how old one feels (Barak and Schiffman, 1981; Sudbury and Simcock, 2009b).

Research has found several reasons why this dominant affective dimension propelled age-related research. Peters (1971) mentions that the age people perceive themselves to be and therefore identify with obstructs recognition of changes and the perception of attitudes towards them. From this perspective, cognitive age provides a deeper notion into customer behavior than chronological age alone (Barak and Schiffman, 1981; Cleaver and Muller, 2002; Schiffman and Sherman, 1991; Stephens, 1991).

More specifically, Yoon, et al.'s (2005) call to include affective and cognitive dimensions in age-related research resulted in a

body of research which ostensibly underlines the usefulness of cognitive age. For example, Gwinner and Stephens (2001) find that cognitive age can be more effective in capturing older people's lifestyles, predicting their purchases, and explaining their choices than other commonly used variables.

Most of this research relies on the concept of youth age (Barak, 1987), which refers to the difference between chronological and cognitive age (e.g., Stephens, 1991; Szmigin and Carrigan, 2000). More specifically, Barak and Schiffman (1981), Barak (1987) developed a scale to measure subjective age (Table 2). This scale asks respondents to rate their self-perceived age status by identifying an age most closely matching the way they feel, look, act, and think. The resulting cognitive age represents a mean of these four dimensions and can then be compared to the respondent's chronological age.

4. Another alternative concept: Socioemotional selectivity theory (SST)

Socioemotional selectivity theory (SST) has recently gained much attention in psychology (Carstensen, 2006; Drolet et al., 2010; Fung and Carstensen, 2003; Hicks et al., 2012) and marketing fields (Jahn et al., 2012; Kuppelwieser and Sarstedt, 2014a, 2014b; McKay-Nesbitt et al., 2011; Pyone and Isen, 2011; Wei et al., 2013; Yoon et al., 2005). In SST, behavior and motivations are no longer due to their physical or chronological age, but they are due to changes in their future time perspective (FTP). As such, FTP focuses on the time individuals believe they have left in their life cycle (Cate and John, 2007) and embraces individual and subjective time experiences (Husman and Shell, 2008; Lang and

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