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Knowledge Retention From Older and Retiring Workers: What Do We Know, and Where Do We Go From Here?

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ABSTRACT

The aging and shrinking of skilled workforces already has been, and will continue to be, a major challenge for organizations, particularly in highly developed economies. In light of the massive wave of retirements of members of the baby boomer generation, the retention of valuable organizational knowledge from older and retiring workers has been identified as an urgent need. Surprisingly, research on this specific area of knowledge transfers in organizations is scarce, the nature and antecedents of the knowledge retention process are not yet well understood, and an integrated conceptual framework is missing. As a first step to address these limitations, we conducted a systematic literature review. We summarized the existing literature on knowledge retention according to the 4 main antecedents of knowledge transfers: knowledge, individual, relationship, and contextual characteristics. Furthermore, we examined the nature of the knowledge retention process and identified theories that can explain the proposed relationships. We developed a conceptual framework of knowledge retention that specifies the most relevant antecedents, clarifies how this process unfolds, and summarizes the theoretical foundations. Finally, we utilized the conceptual framework to propose research questions, to identify avenues for future research, and to derive implications for practitioners.

Demographic changes have lead to the aging of the human population in most parts of the world (United Nations, 2013). The two simultaneously operating trends that have been identified are a dramatic increase in life expectancy and an equally dramatic decline in fertility rates (Kulik, Ryan, Harper, & George, 2014). As a result, the relative share of individuals older than 59 is expected to increase from 9.2% in 1990 to 21.1% in 2050. In addition, this age group is projected to outgrow the younger adult age groups within a decade from now (United Nations, 2013).

This aging of the population also effects organizations and new managerial challenges are arising (Hedge, Borman, & Lammlein, 2006; Leibold & Voelpel, 2006; Streb, Voelpel, & Leibold, 2008). These challenges include managing health (Kovner, 2002), managing the effectiveness of an age-diverse workforce with different mindsets and work values (Thrasher, Zabel, Wynne, & Baltes, 2016), adjusting human resource practices, such as training, to also address the needs of older workers (D. Kooij, 2015) as part of inclusive practices for all age groups (Boehm, Kunze, & Bruch, 2014), managing extended working lives and careers (Pundt, Wöhrmann, Deller, & Shultz, 2015), and, finally, managing the retention of critical knowledge from highly skilled and retiring workers (Ropes, 2014).

Researchers have argued that knowledge retention from older and retiring workers becomes a key element of ensuring continued organizational success (Beazley, Boenisch, & Harden, 2002). This is based on the understanding that the availability of critical knowledge is one of the most important success factors for organizations to achieve competitive advantages in today's knowledge-driven economies (Argote, 2013). In addition, researchers have argued that teams with different levels and types of experiences can facilitate organizational learning through novel combinations of their knowledge (March, 1991; Tempest, 2003). Beazley and colleagues (2002) highlighted the irony that on the one hand, knowledge has become more critical, while on the other hand, knowledge loss has become more likely due to the massive wave of retirements of members of the baby boomer generation. Unfortunately, extracting knowledge from one individual, to make it available to others within the organization, is not an automatic process (Calo, 2008). In contrast, knowledge transfer has been described as difficult and *sticky* (Szulanski, 1996) since several variables such as knowledge characteristics (Zander & Kogut, 1995), individual characteristics (Chang, Gong, & Peng, 2012), relationship characteristics (Szulanski, Cappetta, & Jensen, 2004), and contextual characteristics (Kostova, 1999) can affect the success of knowledge transfer.

Thus, in the light of the massive wave of retirements of members of the baby boomer generation, organizations need to develop

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mechanisms to facilitate the retention of valuable organizational knowledge from older and retiring workers to prevent irrevocable knowledge loss (De Long, 2004; Leibold & Voelpel, 2006). Researchers have even argued that intergenerational knowledge transfer is a matter of survival to prevent *corporate amnesia* (Harvey, 2012). Beazley and colleagues (2002) stated that in the United States, the *baby boomer exodus* has already begun in 2005, and will continue for the next two decades. However, research on this topic is still scarce and an understanding of the antecedents and consequences of successful knowledge retention from older and retiring workers, as well as the nature of the transfer process itself, is currently still missing. Consequently, this systematic literature review aims to fill this gap and contribute to a more detailed understanding of knowledge retention from older and retiring workers.

This article is structured as follows: First, the research methodology is described, and the scope of the systematic literature review is clarified. Second, the key actors in the knowledge retention process are identified. Third, the results of the literature review are presented. The structure of the presentation is based on the categorization of the literature on general knowledge transfer that distinguishes among the following four antecedents of knowledge transfer success: knowledge, individual, relationship, and contextual characteristics (Szulanski, 1996). Szulanski (1996) had argued that the internal stickiness of intraorganizational knowledge transfers (i.e., their difficulty) is based on these four characteristics. This categorization is widely accepted and used in the literature on knowledge transfers (e.g., Riusala & Suutari, 2004; Santosh & Muthiah, 2012). Furthermore, the nature of the knowledge transfer process is examined. We enriched this review of the extant literature on knowledge retention from older and retiring workers by integrating the perspective of lifespan development theories (Baltes, 1987), and more specifically socio-emotional selectivity theory (e.g., Carstensen, 2006), and theory of psychosocial development (Erikson, 1963). We think that this theoretical expansion (a) clarifies the specific characteristics of knowledge retention processes from older and retiring workers compared to other knowledge transfer processes, and (b) helps to overcome the lack of theoretical foundation of existing research. Finally, avenues for future research and implications for practitioners are discussed.

METHODS
Identification of Papers and Selection Criteria
We decided to conduct a systematic review of the literature in order to accumulate a relatively complete census of relevant research findings (Webster & Watson, 2002). The approach explained below, increases the quality, transparency, and reproducibility of the results (Crossan & Apaydin, 2010). First, articles were identified through a keyword search in the databases Ebsco, PsychInfo, and Web of Science. Two main search terms were used: aging workforce and knowledge retention. The search terms were elaborated by a combination of similar words and synonyms (Crossan & Apaydin, 2010; Fink, 2014). In addition to aging workforce, age-diverse workforce and intergenerational workforce were used as synonyms. Knowledge retention was elaborated by the terms cross-generational knowledge flows (Liebowitz, Nirmala, Hang, Deborah, & James, 2007), intergenerational learning (Baily, 2009), intergenerational knowledge transfer (Kuyken, Ebrahimi, & Saives, 2009), and organizational memory (A. H. Dunham & Burt,

2011). The synonyms were connected with the coordinating conjunction "or." Second, the snowballing sample technique was used in order to identify additional relevant studies. This meant searching the reference lists of already identified publications (Greenhalgh, Potts, Wong, Bark, & Swinglehurst, 2009). As a result of this search process, 74 publications were identified.

Publications that were included in the literature review had to meet the following selection criteria. First, the scope of this literature review was limited to studies that investigated knowledge retention from older and retiring workers at the workplace (Ropes, 2013). Thus, studies with a sociological or educational background were not included (e.g., Gray, 2015; Sime & Pietka-Nykaza, 2015), due to their limited relevance for interactions in an organizational context. Second, only publications in English were included. Third, the period of the literature review was limited to publications between 2000 and June 2015. As a result, Table 1 consists of 28 publications that met the selection criteria.

Data Analysis
Because the number of quantitative research was limited and because the goal of this review was to provide a conceptual rather than an empirical overview, the findings were summarized in narrative, rather than statistical form (Crossan & Apaydin, 2010). Thereby, we aimed to synthesize the extant literature on knowledge retention into an integrated conceptual framework that provides guidelines for future research (M. Wang, 2015).

RESULTS
As already outlined above, the categorization of antecedents of the literature on general knowledge transfer into knowledge, individual, relationship, and contextual characteristics was used to systematize the presentation of the results. In addition, the nature of the knowledge retention process was examined. The list of the publications that have been analyzed for this literature review can be found in Table 1. In addition, Figure 1 depicts an integrated framework of the antecedents of the knowledge retention process, and the nature of the process itself. To start with, the key actors of the knowledge retention process are identified.

Key Actors in the Knowledge Retention Process
The existing literature has acknowledged that knowledge retention is dependent on the successful transfer of knowledge between individuals, namely knowledge senders and knowledge recipients (Ropes, 2013). Several different terms have been used to identify these actors. These terms distinguish between the two groups based on either their (1) chronological age, (2) generational affiliation, (3) experience, or (4) career status. For example, the following expressions have been used to identify knowledge senders:

1. Age: aging workers (Ebrahimi, Saives, & Holford, 2008), older workers (Ashworth, 2006; Beck, 2014; Joe, Yoong, & Patel, 2013; Kuhn & Hetze, 2007; Ropes, 2014), senior workers (Ebrahimi et al., 2008).
2. Generation: baby boomers (Baily, 2009; Leiter, Jackson, & Shaughnessy, 2009; Liebowitz et al., 2007; McNichols, 2010).

Table 1. List of Publications on Knowledge Retention

No.	Year	Authors	Method	Outlet	Term	Main Findings
1	2002	Beazley et al.	Conceptual	Continuity management[a]	Knowledge loss from baby-boomers	The authors investigate how corporate knowledge and productivity can be secured, while downsizing, baby-boomer retirement, and high turnover threaten continuity
2	2003	Tempest	Qualitative ($n = 32$, United Kingdom)	Management Learning	(Reciprocal) Inter-generational knowledge transfer	Building on social constructionist theory, the author develops an egalitarian and fluid approach to organizational learning. She found that intergenerational teams enabled reciprocal knowledge transfer, and that less experienced workers functioned as catalysts in unlocking the knowledge base of experienced workers.
3	2004	De Long	Conceptual	Lost Knowledge[a]	Retaining critical know-how as veteran workers leave	The author analyses the threat of an unprecedented number of highly skilled employees leaving the workforce over the next years, due to the retirement of the baby boomer generation. The book focuses on the cost of losing intellectual capital, evaluates knowledge retention strategies, and discusses the implementation of such knowledge retention strategies.
4	2005	Lahaie	Qualitative ($n = 12$, Canada)	Leadership in Health Services	Corporate memory loss	Based on a description of the key tasks and competences of senior executives, the impact of corporate memory loss was investigated. For example, mentoring and succession planning were identified as effective mechanisms to preserve knowledge.
5	2006	Ashworth	Quantitative ($n = 65$, United States)	Int. J. of Human Resource Management	Knowledge loss due to aging-related turnover	The author found that addressing the consequences of an aging workforce is the number one HR concern. Existing theoretical approaches, such as organization learning theory and socio-technical systems theory are discussed.
6	2007	Kuhn and Hetze	Conceptual	Rostock Center for the Study of Demographic Change—Discussion paper[a]	Transfer of know-how by older and retiring workers	Analysis of the private and social incentives for older and retiring workers to transfer knowledge to younger workers and provide training under the condition of a shrinking workforce. The authors found that the total incidence of training is reduced if the workforce is shrinking because the competition for younger/unskilled partners becomes tougher.
7	2007	Liebowitz et al.	Quantitative ($n = 50$, United States)	Industrial Management & Data Systems	Cross-generational knowledge flows	The authors researched cross-generational knowledge flows in 4–5 member teams of John Hopkins University, which they consider an example of an edge-like organization. They presented a model in which cross-generational biases impact the degree of tacit knowledge transfer.

Table 1. *Continued*

No.	Year	Authors	Method	Outlet	Term	Main Findings
8	2008	Calo	Conceptual	Public Personnel Management	Transfer of older and retiring workers' knowledge to others	The author argued that knowledge transfer is a talent management strategy and a specific responsibility of HR professionals. Thus, HR professionals need to make sure that they analyze the demographic profile of their workforce, develop a knowledge risk profile, assess their policies, rethink the job and career design for older and retiring workers, and finally ensure that the HR function has the right competencies to deliver these changes.
9	2008	Ebrahimi et al.	Qualitative ($n = 8$, Canada)	Journal of Knowledge Management	Inter-generational aspects of knowledge management	The authors argued that companies need to evaluate their managerial style, their knowledge strategy, their information management systems and knowledge transfer processes, their places of socialization, their relational and communicational know-how, and the activation of organizational and HR networks in order to facilitate intergenerational aspects of knowledge management.
10	2008	Strack et al.	Conceptual	Harvard Business Review	Knowledge transfer of key knowledge holders	The authors argued that managers need to address two types of demographic risks today, namely capability risk and productivity risk. Introduction of effective measures to mitigate the demographic risks need to be based on a detailed analysis of the workforce demand and supply on the level of job groups, job families, and job functions.
11	2009	Arif et al.	Conceptual/ Case study (United Arabic Emirates)	Engineering, Construction and Architectural Management	Knowledge retention of employees that leave the organization	The authors presented a four-stage model of explicit knowledge retention within organizations. The model consists of the following phases: Personalization/socialization, codification/ externalization, combination/ renewation, and internalization.
12	2009	Baily	Conceptual	AI & Society	(Reverse) Inter-generational learning	The author introduced the current generations at work (e.g., traditionalists, generation Y). She argued that reverse intergenerational learning should be seen as a more general approach to bridge the gaps between generations. However, a supportive organizational culture and training programs for younger and older workers need to be in place to facilitate this learning process.
13	2009	Kuyken et al.	Qualitative ($n = 16$, Germany/ Canada)	ASAC 2009, conference proceedings[a]	Inter-generational knowledge transfer (IGKT)	The authors analyzed the impact of cultural differences in Germany and Quebec on the management of IGKT. They found that educational systems, management styles, and the individual status of aged and younger workers in the two countries affected IGKT.

Table 1. *Continued*

No.	Year	Authors	Method	Outlet	Term	Main Findings
14	2009	Leiter et al.	Quantitative (*n* = 418, Canada)	Journal of Nursing Management	Knowledge sharing between baby boomers and Generation X	The authors found that Generation X nurses experienced their work settings as less consistent with their personal values than baby boomer nurses, and that they are less inclined to knowledge sharing than baby boomer nurses. In addition, they highlighted a lack of standard measures for knowledge sharing.
15	2010	McNichols	Qualitative/ Delphi method (*n* = 24, United States)	Journal of Knowledge Management	Inter-generational knowledge transfer (IGKT)	The authors found that the quality of the relationship between individuals and the environmental conditions were important for IGKT. The main barriers for IGKT were heavy workload, lack of standard KM practices, lack of time, lack of budget, and lack of trust. The most effective management strategies for IGKT included pairing, mentoring, teamwork, communication, technology, geographical proximity, mutual trust and respect, and management involvement.
16	2011	Dunham and Burt	Quantitative (*n* = 134, United States)	Journal of Knowledge Management	Knowledge sharing by experienced employees	The authors developed an organizational memory empowerment model, and investigated the antecedents and consequences of organizational memory. They found that people go to older and retiring workers for knowledge sharing due to positive age stereotypes. In addition, being recognized as repositories of organizational memory can have positive outcomes for older and retiring workers' psychological empowerment, organizational regard and recognition, sense of worth, and self-esteem.
17	2011	Lefter et al.	Quantitative (*n* = 237, Romania)	Amfiteatru Economic	Inter-generational knowledge transfer (IGKT)	The authors analyzed whether academics prefer attitudes of cooperation, competition, or innovation for knowledge transfer. Their results indicated that academics give priority to IGKT through cooperation, especially for the activity for working together on research grants.
18	2011	Levy	Case study (Israel)	Journal of Knowledge Management	(Vertical) Knowledge transfer in the context of retiring employees	The author focused on knowledge retention in the context of expert knowledge workers about to leave the firm due to their retirement. The literature review revealed effective strategies for IGKT (e.g., shadowing, mentoring/ coaching, training) and key success factors (e.g., leadership style, trust, organizational learning culture). A model of four knowledge retention stages was introduced, consisting of initiation, scope, transfer, and integration.
19	2012	Harvey	Case study (Canada)	Journal of Knowledge Management	Inter-generational knowledge transfer (IGKT)	The author investigated the recently introduced IGKT strategy at a health care organization in Canada. The results show that IGKT led to higher performance of younger nurses and greater willingness to collaborate. In addition, he emphasized that the mutual exchange model, rather than the source-recipient model is appropriate to frame this context of tacit and explicit IGKT.

Table 1. *Continued*

No.	Year	Authors	Method	Outlet	Term	Main Findings
20	2012	Kuyken	Conceptual	VINE	Inter-generational knowledge transfer (IGKT)	The author described the three generations at work: baby boomers, Generation X, and Generation Y, and the types of knowledge they posses. She introduced the concept of "communities of knowledge" (e.g., function, type of knowledge) as a new perspective that acknowledges differences within generations and enables a more tailored approach to KM in general and IGKT in particular.
21	2012	Martins and Meyer	Quantitative |(*n* = 455, South Africa)	Journal of Knowledge Management	Knowledge retention	The authors aimed to identify and explore organizational and behavioral factors that influence knowledge retention in organizations and introduced a theoretical model. The model compromises external forces of change, the influence of who carries what type of knowledge, and behavioral factors on the individual, group, and organizational level.
22	2013	Joe et al.	Case study (New Zealand)	Journal of Knowledge Management	Knowledge loss when older experts leave	The authors aimed to identify the different types of knowledge that can be lost when older experts leave the firm. They identified five types of knowledge: subject matter expertise, knowledge about business relationships and social networks, organizational knowledge and institutional memory, knowledge of business systems, processes and value chains, and knowledge of governance mechanisms.
23	2013	Ropes	Literature review	European Journal of Training and Development	Inter-generational learning (IGL)	The author emphasized the socially embedded nature of the IGL process, and outlined the organizational mechanisms and outcomes of IGL. He also provided future research directions including work that focuses on organizations (i.e., workplaces), empirical work to be able to underpin the existing practical reports, and research about the outcomes of IGL for individuals and organizations.
24	2014	Beck	Qualitative (*n* = 39, United Kingdom)	Management Learning	Making learning and experience available to younger colleagues	The author found that the training offered to older and retiring workers is mostly less, shorter, and of lower quality compared to training offered to younger workers. However, employers seem to expect that older and retiring workers take on mentor and trainer roles to transfer their knowledge to younger colleagues. She concludes that employers need to rethink the role of older and retiring workers in their workforce to capitalize on their productivity and knowledge.

Table 1. *Continued*

No.	Year	Authors	Method	Outlet	Term	Main Findings
25	2014	Dunham and Burt	Quantitative ($n1 = 143$, $n2 = 288$, New Zealand)	The Learning Organization	Loss of organizational memory when experienced employees leave	The authors aimed to develop a reliable and valid self-report measure for organizational memory. The resulting measurement instrument has 21 items and the following subscales: socio-political knowledge, job knowledge, external network, industry knowledge, and history. Test–retest, EFA, and CFA results provided support for the reliability and validity of the scale.
26	2014	Ropes	Conceptual	Development and Learning in Organizations	Inter-generational learning	The author argued that companies need to increase managerial awareness, have an open and learning-oriented culture, and support learning processes via training. Mentoring and age-diverse teams were identified as effective mechanisms for intergenerational learning. As a result, intergenerational learning can address older workers' need for self-actualization and increase their motivation.
27	2015	Pollack and Pollack	Case study (Australia)	Systemic Practice and Action Research	Knowledge retention	The authors used a company that introduced a knowledge management program focusing on the interpersonal aspects of knowledge retention as an example to test the applicability of Kotter's eight stage process to manage organisational change. They found that the process model is applicable, even though the use of the process was more complex in reality.
28	2015	Burmeister and Rooney	Literature review	Encyclopedia of Gero-psychology[a]	Inter-generational knowledge transfer	The authors define knowledge retention as "management practices and processes designed to preserve older workers' valuable organizational knowledge before they enter retirement." They also discuss the knowledge retention process and outline future research directions.

Note. CFA = confirmatory factor analysis; EFA = exploratory factor analysis; HR = human resources; KM = knowledge management.
[a]Not peer-reviewed.

3. Experience: experienced workers (A. H. Dunham & Burt, 2011; Tempest, 2003), expert knowledge workers (Levy, 2011), senior executives (Lahaie, 2005).
4. Career status: late-career workers (Harvey, 2012), leaving employees or incumbents (Beazley et al., 2002), potential older and retiring workers (Calo, 2008), older and retiring workers (Ashworth, 2006), retiring employees (Strack, Baier, & Fahlander, 2008).

In sum, the current literature is ambiguous with regard to the terms that are used to identify the actors that are involved in the knowledge retention process. In addition, the multiplicity of terms suggests the difficulty of finding a concise but inclusive expression. Moreover, recent research has questioned the theoretical grounding and empirical usefulness of the concepts of chronological age (D. T. Kooij, De Lange, Jansen, & Dikkers, 2013; Schwall, 2012) and generational

affiliation (Baily, 2009; Costanza, Badger, Fraser, Severt, & Gade, 2012; Costanza & Finkelstein, 2015; Kuyken, 2012). First, chronological age, even though easy to interpret in the context of human life spans, is only a proxy variable and ignores the inter-individual variability with regards to nonbiological and nonenvironmental aspects of human development (Schwall, 2012). Second, the generational concept (Mannheim, 1928) has been criticized because the assumption of generationally based differences is theoretically and empirically largely unsupported (Costanza et al., 2012; Costanza & Finkelstein, 2015).

In contrast, researchers have argued that experience and career status can be meaningful categories to identify the actors in knowledge retention processes (A. H. Dunham & Burt, 2011; Harvey, 2012; Kuyken et al., 2009; Tempest, 2003). First, Kuyken and colleagues (2009) used the expression *deep smarts* (Leonard & Swap, 2004) to refer to employees, who have acquired highly contextual, complex, and tacit knowledge by formal education and experience. In addition, A. H.
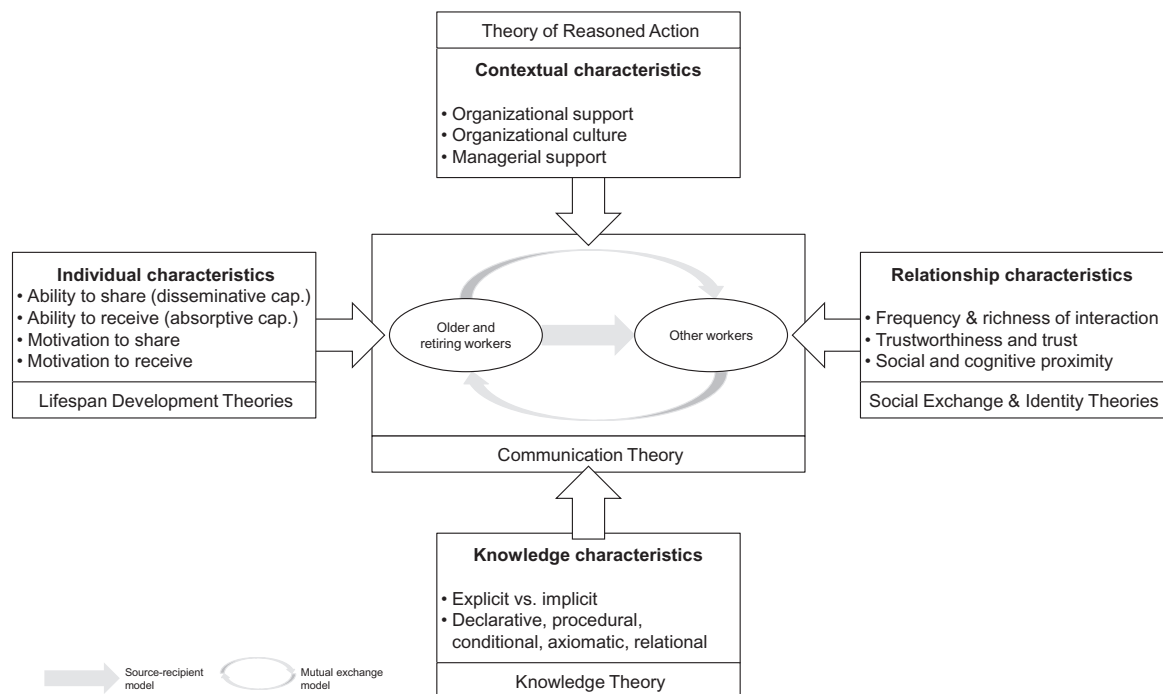
Figure 1. Knowledge retention framework.

Dunham and Burt (2011) argued that the perceived value of employees' knowledge and expertise is more relevant for the knowledge retention process than their age. Second, employees' career status is highly relevant, as knowledge retention is a specific knowledge transfer process in which organizations attempt to safeguard the knowledge of employees nearing retirement (Ashworth, 2006; Beazley et al., 2002; Calo, 2008; Harvey, 2012; Strack et al., 2008). However, not all retiring employees might have relevant knowledge to share, as pointed out by A. H. Dunham and Burt (2011).

Consequently, we define those employees whose knowledge organizations attempt to safeguard through knowledge retention processes as older and retiring workers. Currently, these employees often belong to the so-called baby boomer generation (Joe et al., 2013). In contrast, knowledge recipients are employees who remain within the organization, and whose jobs require them to draw on the knowledge of older and retiring workers. Oftentimes, these employees are less experienced (Tempest, 2003), and they can be the successors of the older and retiring workers (Beazley et al., 2002; Lahaie, 2005). However, we decided for two main reasons, not to employ the term intergenerational knowledge transfer that has been used by some other researchers (e.g., Harvey, 2012; Kuyken et al., 2009; Lefter, Brătianu, Agapie, Agoston, & Orzea, 2011). First, the generational concept has its inherent limitations, as pointed out above (Costanza et al., 2012; Costanza & Finkelstein, 2015). Second, research has shown that retirement processes are becoming much less standardized, and while some employees might enter early retirement, others extend their working lives beyond their legal retirement age (Pundt et al., 2015; Schwall, 2012). Therefore, knowledge retention processes might also take place between individuals who would be argued to belong to the same "generation," and in some rare instances older and retiring workers might even be younger than employees who acquire their knowledge.

The Nature of the Knowledge Retention Process

Knowledge retention is the result of successful knowledge transfer between older and retiring workers and those employees who remain within the organization (Ropes, 2013). Successful knowledge transfer is defined by the acquisition and application of the shared knowledge in new contexts by knowledge recipients (Beazley et al., 2002; Ropes, 2013). The existing literature has questioned whether these knowledge transfer processes can best be described with the source-recipient model, which stipulates that older and retiring workers are knowledge senders only, or the mutual exchange model, which proposes that older and retiring workers can be both knowledge senders and recipients (Arif, Egbu, Alom, & Khalfan, 2009; Baily, 2009; Beazley et al., 2002; Calo, 2008; Harvey, 2012; McNichols, 2010; Ropes, 2013; Tempest, 2003).

The classical source-recipient model (Shannon & Weaver, 1949) depicts communication processes as a linear series of steps in which messages are transmitted from a source to a recipient (Bowman & Targowski, 1987). Researchers have argued that retiring workers are predestined for sharing knowledge with others because they have accumulated relevant organizational knowledge over several years (Voelpel, Sauer, & Biemann, 2012). Moreover, the results by A. H. Dunham and Burt (2011) indicated that employees are more likely to approach older employees with requests for knowledge sharing, regardless of their tenure. Based on Hummert, Garstka, Ryan, and Bonneson (2004), they argued that this behavior reflected positive age stereotypes.

However, it has been questioned whether the source-recipient model accurately depicts all knowledge retention processes (Baily, 2009; Harvey, 2012; Tempest, 2003). For example, the results of the case study by Harvey (2012) indicated that mentoring sessions and storytelling group meetings generated mutual exchanges rather than

unidirectional transfers. Accordingly, knowledge retention has also been described as a reciprocal process in which knowledge is co-developed. Less experienced workers can function as catalysts for unlocking the knowledge base of retiring employees (Baily, 2009; Harvey, 2012; Tempest, 2003), and retiring employees can benefit from the up-to-date scientific and technical knowledge of younger colleagues (Ebrahimi et al., 2008). While mutual exchanges can take place, researchers have also shown that retiring workers might be skeptical when having to learn new knowledge from much younger colleagues (Baily, 2009). In addition, less experienced workers might also lack the teaching skills that are necessary to transfer knowledge to others (Baily, 2009).

Consequently, based on the preliminary understanding of the knowledge retention process, several research questions have yet to be answered:

1a. How does the knowledge retention process unfold? Can subsequent phases be identified?

1b. Which is a more accurate representation of the knowledge retention process: the source-recipient model or the mutual exchange model?

1c. Under which conditions is each of the models more accurate?

Antecedents of Knowledge Retention

Knowledge transfer researchers agree that the following four main groups of antecedents affect knowledge transfer processes (Argote, 2013; Szulanski, 1996); knowledge (Zander & Kogut, 1995), individual (Chang et al., 2012), relationship (Szulanski et al., 2004), and contextual (Kostova, 1999) characteristics. In the following, these categories will be used to summarize the results of the systematic literature review.

Knowledge Characteristics

In terms of the type of knowledge that older and retiring workers possess, both explicit and tacit knowledge dimensions have been identified. However, scholars have emphasized the importance of the tacit knowledge that older and retiring workers possess because this knowledge can be particularly valuable for organizations (Joe et al., 2013; Kuyken, 2012; Martins & Meyer, 2012). While explicit knowledge is less complex, and easier to codify and to teach, tacit knowledge is described as complex, personalized, context-dependent, and difficult to codify and to teach (Polanyi, 1967; Zander & Kogut, 1995). While diverse types of knowledge have been identified, we followed the suggestion of Joe and colleagues (2013), and structured the knowledge types according to Berthoin Antal's (2000) framework that is based on the work of Sackmann (1992). These five knowledge types are: know-what (declarative), know-how (procedural), know-when (conditional), know-why (axiomatic), and know-whom (relational).

First, declarative knowledge has been introduced as the technical and job-specific knowledge of older and retiring workers (A. Dunham & Burt, 2014; Joe et al., 2013; Martins & Meyer, 2012). This mainly includes knowledge about the industry, customers, and products and services. Second, procedural knowledge encompasses the tacit knowledge that is needed to perform well at a given task, such as problem-solving skills, as well as social and communicative competencies

(Beazley et al., 2002; Ebrahimi et al., 2008; Kuhn & Hetze, 2007). In addition, researchers highlighted the importance of the knowledge of older and retiring workers about the organizational culture, organizational politics, and the general functioning of the organization (Joe et al., 2013; Kuyken, 2012; Lahaie, 2005; Martins & Meyer, 2012). This knowledge about norms and values can be both procedural (i.e., knowing what [not] to do) and conditional (i.e., knowing when [not] to do something). Fourth, axiomatic knowledge refers to the knowledge about the development of and reasoning behind organizational processes and systems (Lahaie, 2005; Martins & Meyer, 2012). In this context, the majority of scholars have used the term corporate, institutional, or organizational memory (Walsh & Ungson, 1991) to refer to the capacity of organizations to learn from past experiences. This capacity is based on the sum of aging workers' explicit and tacit knowledge about the evolution of the organization (Arif et al., 2009; Ashworth, 2006; Beazley et al., 2002; Calo, 2008; A. H. Dunham & Burt, 2011; A. Dunham & Burt, 2014; Ebrahimi et al., 2008; Harvey, 2012; Joe et al., 2013; Lahaie, 2005; Martins & Meyer, 2012; Tempest, 2003). Fifth, relational knowledge encompasses the internal and external social networks of older and retiring workers (A. Dunham & Burt, 2014; Ebrahimi et al., 2008; Joe et al., 2013; Kuyken, 2012). Researchers have argued that older and retiring workers can act as boundary spanners, who connect and coordinate different knowledge reservoirs (Ashworth, 2006; Ebrahimi et al., 2008). This knowledge about who knows what has been examined by scholars drawing on transactive memory theory (Lewis, 2003; Wegner, 1987). Transactive memory exists in the mind of an individual, and it "is influenced by knowledge about the memory system of another person" (Lewis, 2003, p. 588). As the retrieval of information that is stored in someone else's memory is triggered by interpersonal communication and interaction, and older and retiring workers have often engaged in these interactions for years and decades, they might be in a particularly suitable position to connect different knowledge sources within an organization.

Finally, scholars have not only described the knowledge of older and retiring workers, but also defined the value of the knowledge of less experienced employees. These employees are more likely to possess the latest and up-to-date scientific and technical knowledge, abstract and conceptual knowledge, and knowledge about how to cope with insecurity, changing environments, and diversity at the workplace (Ebrahimi et al., 2008; Kuyken, 2012). These existing conceptualizations regarding the characteristics of the knowledge involved in knowledge retention processes have still to be tested in rigorous empirical research in the future. Therefore, we propose the following research questions:

2a. Which knowledge characteristics are most relevant for knowledge retention from older and retiring workers?

2b. Do older and retiring workers and other employees possess different kinds of knowledge?

2c. Do different knowledge characteristics influence how knowledge is transferred between older and retiring workers and other employees?

Individual Characteristics

Two of the most frequently used variables on the individual level in knowledge transfer research are motivation and ability to share and

receive knowledge (Argote, McEvily, & Reagans, 2003; Minbaeva, Pedersen, Bjoerkman, Fey, & Jeong, 2003; Szulanski, 1996). Theoretically, the relevance of these variables can be traced back to theories of work performance, which argue that any performance in the work context is a function of individual ability and motivation to perform (Kanfer & Ackerman, 1989; Vroom, 1964). Ability is defined as ones skills or knowledge base that is needed to act, whereas the term motivation designates the willingness of an individual to act (Chang et al., 2012; Siemsen, Roth, & Balasubramanian, 2008).

In the context of knowledge transfers, ability to share knowledge refers to the ability to frame, articulate, and communicate knowledge to others (Mu, Tang, & MacLachlan, 2010; Reagans & McEvily, 2003). Some researchers have also used the term disseminative capacity to describe the ability to share knowledge (Martin & Salomon, 2003; Minbaeva & Michailova, 2004; Mu et al., 2010). In addition, the motivation to share knowledge can be understood as the willingness of the knowledge source to disseminate knowledge to others (Huang, Chiu, & Lu, 2013). With regard to the ability of knowledge recipients to recognize, assimilate, and apply new knowledge in different contexts, the concept of absorptive capacity (Cohen & Levinthal, 1990; Zahra & George, 2002) has been used in the interpersonal knowledge transfer literature (Minbaeva, Pedersen, Bjoerkman, & Fey, 2014; Minbaeva et al., 2003). Finally, knowledge recipients need to be willing to acquire new knowledge from others (Gupta & Govindarajan, 2000).

Knowledge retention researchers have argued that the factors that motivate knowledge-sharing behavior change over employees' lifetime (Calo, 2008; Ropes, 2014). Lifespan development theories in general and socio-emotional selectivity theory and the theory of psychosocial development in particular provide useful lenses to explain these changes in individual motivation over one's lifespan. Lifespan development theories (Baltes, 1987) argue that individual development should be seen as a lifelong process in which growth and decline take place simultaneously. Socio-emotional selectivity theory (Carstensen, 1991, 2006) focuses on age-induced changes and proposes that subjective perceptions of remaining time have an influence on the choice of personal goals. As a result, individuals who perceive their remaining time as limited tend to prioritize social values and emotional goals, whose benefits can be realized in the present (Carstensen, Isaacowitz, & Charles, 1999). For older and retiring workers, this perception could manifest in increased motivation to share information with others (e.g., Deller, Liedtke, & Maxin, 2009) and engage in mentoring behaviors to build emotionally satisfying relationships (Beehr & Bennett, 2015). In contrast, individuals who perceive time as unlimited tend to focus on knowledge-related goals that will pay off in the future. These knowledge-related goals include, for example, the development of new social relationships, career planning, and the acquisition of new knowledge (Carstensen et al., 1999). The employees who remain in the workforce and receive knowledge are often considerably younger than retiring workers. Their motivation to receive knowledge from older and retiring workers could be influenced by these knowledge-related goals. These differences in individual motivation to share and receive knowledge are in line with the theory of psychosocial development by Erikson (1963). Accordingly, age is positively related to generativity values (i.e., "the concern in establishing and guiding the next generation"; Erikson, 1963, p. 267) and negatively related to intrinsic and extrinsic growth values (e.g., advancing one's career; Hertel et al., 2013; Kanfer, Beier, & Ackerman, 2013; D. Kooij & Van De Voorde,

2011). In the context of knowledge retention, increased generativity over their lifespan might motivate older and retiring workers to transfer their knowledge to those workers who remain in the workforce. To date, the literature on knowledge retention has not yet used lifespan development theories to explain individual knowledge transfer behavior of the actors in knowledge retention processes.

However, researchers have started to empirically examine the impact of individual ability and motivation of older and retiring workers and other employees on knowledge retention (A. H. Dunham & Burt, 2011; Ebrahimi et al., 2008; Kuhn & Hetze, 2007; Liebowitz et al., 2007; Martins & Meyer, 2012; McNichols, 2010). For example, Martin and Salomon (2003) found that individual motivation and individual ability to communicate and retain knowledge were the two highest ranked success factors for knowledge retention, as mentioned by senior managers. Focusing on the individual characteristics of older and retiring workers, A. H. Dunham and Burt (2011) emphasized that those employees differ in their ability to be potential mentors, and to train other employees in order to retain critical knowledge. Therefore, some older and retiring workers seem to be *go-to* people in organizations, while others are approached less often. In addition, A. H. Dunham and Burt (2011) found that the motivation to transfer knowledge can increase knowledge flows. With regard to the characteristics of employees who receive knowledge from older and retiring workers, Kuhn and Hetze (2007) argued that they are heterogeneous in terms of their trainability, which they conceptualized as a combination of individual ability and motivation. Thus, employees with higher trainability can be trained at lower costs. In sum, even though empirical research that focused on individual differences is scarce, initial findings support the relevance of individual motivation and ability of older and retiring workers and employees receiving knowledge for knowledge retention. These findings lead to the following research questions:

3a. Which individual characteristics are the most relevant for knowledge retention from older and retiring workers, including variables other than ability and motivation (e.g., personality)?

3a. Which factors explain the inter-individual variability of individual ability and motivation to share and receive knowledge?

3c. Are all of the four variables – ability to share, motivation to share, ability to receive, motivation to receive – equally important for knowledge retention from older and retiring workers?

Relationship Characteristics

Several characteristics of the relationship between knowledge senders and recipients have been highlighted as important success factors for knowledge transfers. On the one hand, these refer to the frequency and richness of interactions between knowledge senders and recipients (Argote et al., 2003; Kang, Rhee, & Kang, 2010). On the other hand, relationship characteristics also refer to more subtle and qualitative elements of the relationship, including perceived trustworthiness (Joshi, Sarker, & Sarker, 2006), mutual trust (Ipe, 2003; Oddou et al., 2013), social similarity (Argote, 2013; D. Wang, 2015), and cognitive similarity (Hansen, 1999; Kwan & Cheung, 2006). In general, Szulanski (1996) found that an arduous relationship was one of three most relevant barriers to knowledge transfer success.

From a theoretical perspective, the influence of the variables mentioned above on knowledge transfer success has been explained both with findings from social exchange theory (Blau, 1964; Cook, Cheshire, Rice, & Nakagawa, 2013), as well as self-categorization theory, which is part of social identity theories (Tajfel, 1974; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). First, social exchange theory argues that individuals regulate their interactions with others based on a self-interested analysis of costs and benefits. Thereby, exchanges such as knowledge transfers, are facilitated when some benefit is expected in the future (Blau, 1964). Positive assessments of others' trustworthiness that result in mutual trust (Mayer, Davis, & Schoorman, 1995) appear to be one approach to reduce the vulnerability to actions of others and ensure that one will be reciprocated in the future. Second, social identity theory is concerned with how identities are formed in social interaction and within social contexts and how individuals attach meaning to their roles in social structures, their roles within different groups, and unique perceptions of themselves (Stets & Burke, 2000). Moreover, self-categorization refers to the social categorization of self and others into ingroup and outgroup, a process that results in depersonalization because targets are seen as embodiments of the relevant prototype rather than as individuals (Turner et al., 1987). As a result, similarities within and differences between groups are maximized in order to create positive self-identity, which is motivated by the need for positive self-esteem (Hogg, 2000; Hogg & Terry, 2000).

In the context of knowledge retention, researchers have begun to acknowledge the influence of relationship characteristics on knowledge retention. First, Beazley and colleagues (2002) emphasized the importance of opportunities for exchange through meetings and overlap in schedules and tasks. Second, the majority of studies highlighted the relevance of perceived trustworthiness and mutual trust for knowledge retention (Arif et al., 2009; Harvey, 2012; Liebowitz et al., 2007; Martins & Meyer, 2012; McNichols, 2010). For example, Harvey (2012) argued that social and cognitive proximity can positively influence the perceived trustworthiness of actors, and, as a result, facilitate knowledge sharing behavior. Researchers also highlighted the relevance of face-to-face communication in order to build more trusting relationships that in turn, can facilitate knowledge retention (Arif et al., 2009; Harvey, 2012). In sum, the limited number of empirical studies that investigated the influence of relationship characteristics on knowledge retention are in line with the findings of the knowledge transfer literature, even though more research is needed to provide conclusive evidence. Therefore, we propose the following research questions:

4a. Which relationship characteristics are the most relevant for knowledge retention from older and retiring workers?

4b. What kind of interaction opportunities are needed to facilitate the formation of relationships between older and retiring workers and other employees?

4c. How do potential age differences between older and retiring workers and other employees influence relationship characteristics? Do age differences facilitate stereotyping?

Contextual Characteristics

Research on knowledge transfer has identified the influence of contextual factors, such as organizational-level variables, and assessed their respective influence on knowledge transfer (Kostova, 1999; Santosh & Muthiah, 2012). Barren organizational contexts (i.e., contexts "that

hinders the gestation and evolution of transfers") have been identified as one of the main barriers to knowledge transfer (Szulanski, 1996, p. 32). Organizational-level variables that have been shown to have an influence on knowledge transfer are organizational support (Huang et al., 2013), organizational culture (Santosh & Muthiah, 2012), and managerial support or leadership style (Oddou et al., 2013).

From a theoretical standpoint, knowledge transfer researchers (e.g., Cabrera & Cabrera, 2005) have explained the relationship between organizational-level variables and knowledge transfer success by drawing on the theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). This theory posits that individual behavioral intention depends on the attitude and subjective norms of an individual with regard to that behavior. In addition, behavioral intention is likely to influence actual behavior (Fishbein & Ajzen, 1975). A more recent perspective that can also be useful in this context is research by Iweins, Desmette, Yzerbyt, and Stinglhamber (2013) on the creation of favorable intergenerational contexts at work. They proposed that, for example, high-quality intergenerational contact and the adoption of a multi-age perspective can be used to influence age-norms and reduce ageism at work.

These theoretical propositions have been used by knowledge transfer researchers to argue that extrinsic motivators such as organizational support, organizational culture, and leadership behavior can shape the dominant norms in an organization and the attitudes of organizational members towards knowledge sharing. This, in turn, can influence individuals' intention to engage in knowledge transfer behavior (Bock, Zmud, Kim, & Lee, 2005; Cabrera & Cabrera, 2005).

In the context of knowledge retention, researchers have provided initial evidence for the influence of organizational-level variables on knowledge retention. First, human resources practices that are aligned with the objectives of knowledge retention, for example selection, training and development, and compensation systems that reward participation in knowledge transfer behavior, have been highlighted as potential facilitators of the process (Beazley et al., 2002; Calo, 2008; Martins & Meyer, 2012; Ropes, 2014). Furthermore, Henry, Zacher, and Desmette (2015) argued that the provision of resources that fulfill age-related needs, for example older workers' generativity needs, can have positive effects on the quality of intergenerational contact between older and younger workers. In turn, age biases and prejudices might be reduced, and this can facilitate intergenerational knowledge transfers. Knowledge retention from older and retiring workers can also be viewed as an element of succession planning (Beazley et al., 2002; De Long, 2004). Succession planning refers to "strategies aimed at reducing or eliminating existing or anticipated human capital gaps" (Crumpacker & Crumpacker, 2007, p. 349). These strategies can include mechanisms that enable knowledge transfer among workers to safeguard valuable organizational knowledge. For example, assessments of the criticality of the knowledge that is at risk when employees leave can be combined with information on projected retirement dates to develop detailed succession plans for those employees who are particularly valuable to the organization (De Long & Davenport, 2013).

Second, the majority of researchers have acknowledged the positive influence of organizational cultures that are conducive to knowledge sharing, on knowledge retention (Baily, 2009; Beazley et al., 2002; Calo, 2008; Joe et al., 2013; Levy, 2011; Liebowitz et al., 2007; Martins & Meyer, 2012; McNichols, 2010; Ropes, 2013, 2014). For example, Calo (2008) emphasized that organizational values and

norms are particularly important since the transfer of critical knowledge can be seen as an altruistic act that mostly benefits other organizational members. Therefore, an organizational culture that promotes openness and positive attitudes to change can have a positive impact on knowledge retention (Baily, 2009).

Third, the influence of managerial support and leadership style on knowledge retention has been emphasized (Harvey, 2012; Levy, 2011; Martins & Meyer, 2012; McNichols, 2010; Ropes, 2013, 2014). For example, McNichols (2010) highlighted the need for managerial sensitivity to age diversity for the facilitation of knowledge retention. Moreover, Harvey (2012) argued that managers can act as bridge builders when connecting different employees with different knowledge reservoirs and learning needs. While there is an emergent consensus regarding the relevance of contextual characteristics for knowledge retention, several questions still need to be examined in more detail:

5a. Which contextual characteristics are the most relevant for knowledge retention from older and retiring workers?
5b. How do contextual characteristics influence the knowledge retention from older and retiring workers?
5c. Do older and retiring workers and other employees differ with regard to the organizational support that facilitates their engagement in knowledge retention behavior?

DISCUSSION

This article presented the results of a systematic literature review of the conceptual and empirical research on knowledge retention from older and retiring workers. We summarized our findings in a conceptual framework of knowledge retention that identifies antecedents, clarifies how the knowledge retention process unfolds, and summarizes theoretical foundations. We found that knowledge retention from older and retiring workers is affected by knowledge, individual, relationship, and contextual factors. Regarding the analysis of the nature of the knowledge retention process, we found that the classical source-recipient model might not be applicable in all contexts. Conversely, in some instances, knowledge retention processes are better understood in terms of a mutual exchanges between older and retiring workers and other employees (Baily, 2009; Harvey, 2012; Tempest, 2003). By discussing knowledge retention in the context of lifespan development theories, such as socio-emotional selectivity theory (e.g., Carstensen, 2006) and theory of psychosocial development (Erikson, 1963), we clarified the special characteristics of knowledge retention processes from older and retiring workers compared to other knowledge transfer processes.

Implications for Future Research

At this point, the literature on knowledge retention is, as indicated in the introduction, scarce, and evidence is often anecdotal. Our goal in this article was to describe the current discourse on knowledge retention in general and its lacunae in particular. Based on the results of this literature review, we proposed research questions that, if answered conclusively, may contribute to a more detailed understanding of knowledge retention from older and retiring workers. Moreover, these questions help researchers to evaluate if and how knowledge retention from older and retiring workers differs from general knowledge transfer processes. Currently, researchers have made conceptual arguments and presented primarily anecdotal empirical evidence that suggests that knowledge

retention processes have unique attributes. For example, researchers have proposed that leaders might have to demonstrate sensitivity to age diversity to facilitate knowledge retention (McNichols, 2010). In addition, motivational changes over the course of a human life might affect the implicit and explicit motives of older and retiring workers and of employees receiving knowledge to engage in knowledge transfer (Calo, 2008). Socio-emotional selectivity theory (e.g., Carstensen, 2006) and theory of psychosocial development (Erikson, 1963) can guide researchers as they begin to test these relationships in empirical studies in the future.

First, scholars can use the conceptual framework of knowledge retention (Figure 1) and the research questions that we posed (Table 2), to begin a systematic empirical analysis of the antecedents of knowledge retention. Thereby, it will be necessary to assess the impact of the four different groups of antecedents (e.g., knowledge, individual, relationship, context) simultaneously to establish the relative contribution of each predictor. Furthermore, more complex interactions among the four groups of antecedents can be examined. For example, contextual and individual characteristics might interact to influence knowledge retention, such that different situational cues influence the activation of certain personality traits (Tett & Burnett, 2003). In addition, the strength of the situation (Mischel, 1977) might affect the relevance of individual attributes for knowledge retention. Another line of research that has not yet been considered is the question how knowledge management systems and digital technologies influence the knowledge retention process.

Second, the quantitative investigation of these relationships will require the application of psychometrically sound measurement instruments to generate reliable and valid empirical results (Aiken & Groth-Marnat, 2006; DeVellis, 2012; Schriesheim, Powers, Scandura, Gardiner, & Lankau, 1993). Several knowledge retention researchers either did not provide sufficient information regarding their measures or they used a combination of commonly used and self-made scales for the purpose of their current research interest (A. H. Dunham & Burt, 2011; Leiter et al., 2009; Liebowitz et al., 2007; Martins & Meyer, 2012). Thus, the interpretability of new research results depends on the use of reliable and valid measurement instruments.

Third, research on knowledge retention has yet to investigate the potential interdependence between the responses of older and retiring workers and employees receiving knowledge. For example, while Leiter and colleagues (2009) used data from both the baby boomer generation and generation X, dyadic interdependence of the data was ignored. In the future, researchers could use the actor-partner interdependence model (APIM) by Kenny (1996), to treat the nonindependence of error terms as a systematic component, and test intrapersonal (i.e., actor) and interpersonal (i.e., partner) effects simultaneously (Gonzalez & Griffin, 2008; Kashy & Kenny, 2000; Kenny, Kashy, & Cook, 2006). As a result, a more detailed understanding about the interactions between older and retiring workers and employees receiving knowledge can be generated.

Fourth, longitudinal research has not been conducted yet, and, therefore, cause-and-effect relationships have yet to be substantiated empirically. Future research needs to apply longitudinal research designs in order to fill this gap, and to understand whether and how the impact of different antecedents changes during the course of the knowledge retention process. Longitudinal designs would be necessary to examine knowledge retention from a process perspective (e.g.,

Table 2. Implications for Future Research: List of Research Questions

Antecedents	Research Questions
Knowledge retention process	1a. How does the knowledge retention process unfold? Can subsequent phases be identified?
	1b. What is a more accurate representation of the knowledge retention process: The source-recipient model or the mutual exchange model?
	1c. Under which conditions is each of the models prevalent?
Knowledge characteristics	2a. Which knowledge characteristics are the most relevant for knowledge retention form older and retiring workers?
	2b. Do older and retiring workers and other employees possess different kinds of knowledge?
	2c. Do different knowledge characteristics have an impact on how knowledge is transferred between older and retiring workers and other employees?
Individual characteristics	3a. Which individual characteristics are the most relevant for knowledge retention from older and retiring workers, including variables other than ability and motivation (e.g., personality)?
	3b. Which factors explain the inter-individual variability of individual ability and motivation to share and receive knowledge?
	3c. Are all of the four variables—ability to share, motivation to share, ability to receive, motivation to receive—equally important for knowledge retention from older and retiring workers?
Relationship characteristics	4a. Which relationship characteristics are the most relevant for knowledge retention from older and retiring workers?
	4b. What kind of interaction opportunities are needed to facilitate relationship building between older and retiring workers and other employees?
	4c. How do potential age differences between older and retiring workers and other employees influence relationship characteristics (e.g., social and cognitive similarity)? Do age differences facilitate stereotyping?
Contextual characteristics	5a. Which contextual characteristics are the most relevant for knowledge retention from older and retiring workers?
	5b. How do contextual characteristics influence the knowledge retention from older and retiring workers?
	5c. Do older and retiring workers and other employees differ with regard to the organizational support they require in order to engage in knowledge retention behavior?

Kwan & Cheung, 2006; Szulanski, 2000), and to investigate how the knowledge transfer process between older and retiring workers and other employees unfolds over time.

Fifth, as can be seen from Table 1, the majority of the studies on knowledge retention focused on a limited number of countries, and most empirical studies were conducted in Canada and the United States. While this is a starting point, future research needs to examine knowledge retention in other countries to establish the cross-cultural generalizability of the research results. Asian and European countries could be potential future research contexts because these countries are strongly affected by the consequences of aging populations (United Nations, 2013). Furthermore, cross-cultural research can facilitate the understanding of the influence of societal level variables, such as cultural, economic, and social differences on knowledge retention from older and retiring workers. For example, different regulatory frameworks and policy approaches could have an effect on knowledge retention.

Sixth, knowledge retention researchers have not yet conducted empirical research to analyze the individual, group, and organizational consequences of knowledge retention from older and retiring workers. However, on a conceptual level, researchers have argued that successful knowledge retention can have several positive outcomes, such as improved feelings of older workers' self-worth (A. H. Dunham &

Burt, 2011), reduced stereotypes and more innovative teams (Ropes, 2013, 2014), and improved organizational performance (Daghfous, Belkhodja, & Angell, 2013). Future studies can examine the consequences of successful knowledge retention from a multi-level perspective to acknowledge the different factors on the individual, group, and organizational level.

Implications for Practitioners

The existing literature clearly emphasizes the risks in terms of productivity and capability for organizations that do not address the challenges resulting from an increasing number of highly knowledgeable and retiring employees (Beck, 2014; Strack et al., 2008). Researchers have recommended that managers must act immediately in order to prevent the loss of crucial knowledge that cannot easily be replaced (Beazley et al., 2002; De Long, 2004). At this point, managers can only draw on a very limited body of sound scholarship as they strive for knowledge retention in aging organizations. As a result, practitioners often have to identify practical solutions, even as they lack the information that they would need to make informed decisions. That said, the existing studies on knowledge retention from older and retiring workers can provide a useful starting point, as these studies suggest four important implications for practitioners (Table 3).

Table 3. Implications for Practitioners

Antecedents	Implications
Knowledge characteristics: Identify older and retiring workers and their crucial knowledge	Establish workforce planning to develop demographic profile
	Identify older and retiring workers
	Analyze knowledge of highly knowledge older and retiring workers
Individual characteristics: Develop the ability and motivation to share and receive knowledge	Provide training programs to increase ability to share and receive knowledge
	Provide rewards for engagement in knowledge retention behavior to increase individual motivation to share and receive knowledge
Relationship characteristics: Establish formal and informal opportunities for interaction	Provide formal and informal opportunities for interaction
	Utilize age-diverse teams and create joint projects
	Establish mentoring programs
Contextual characteristics: Create an environment that is conducive to knowledge retention	Align organizational policies and processes with the aim of knowledge retention
	Build organizational culture that values diversity, teamwork, and openness
	Make managers responsible for knowledge retention

First, mechanisms that enable the identification of those older and retiring workers, who possess valuable knowledge that is critical for organizational success, need to be implemented (Calo, 2008; Levy, 2011; Strack et al., 2008). Organizations need to establish effective workforce planning mechanisms (Strack et al., 2008) based on employees' ages and retirement plans. As retirement processes are becoming less standardized, with a growing variance in retirement age of individuals, organizations are advised to not focus on chronological age alone. It seems rather important to closely monitor an individual's decision-making process regarding retirement to identify the best period for instituting formal knowledge transfer processes. Based on analyses of employees' ages and retirement plans, organizations need to develop demographic profiles of their workforces (Calo, 2008). Line managers together with human resources practitioners should be responsible for identifying those older and retiring workers whose knowledge needs to be retained. Once these older and retiring workers are identified, organizations need to analyze and document their knowledge at risk (Levy, 2011), which is a prerequisite for the subsequent implementation of processes that enable the effective safeguarding of this crucial knowledge. Organizations can conduct interviews and surveys in order to arrive at a deeper understanding of the characteristics of the knowledge that older and retiring workers possess (Beazley et al., 2002).

Second, and to address the importance of individual characteristics, organizations need to introduce human resources initiatives that strengthen individual ability and motivation of employees to engage in knowledge retention. On the one hand, older and retiring workers and other employees can benefit from training programs that are aimed at the acquisition of skills that enable them to share and to receive knowledge more effectively (Baily, 2009; Harvey, 2012). Emphasis in training can be placed on developing communication skills, as actors in the knowledge retention process need to be able to listen actively and to convey ideas clearly (Harvey, 2012). On the other hand, knowledge retention behavior should be rewarded to increase the motivation of older and younger workers to exchange knowledge (Beazley et al., 2002; Ropes, 2014). Intangible benefits, such as being valued by others, receiving recognition, building emotionally satisfying relationships with others, and passing on knowledge to the next generation can increase the motivation to share knowledge, particularly for older and retiring workers (Beazley et al., 2002; A. H. Dunham & Burt, 2011).

Younger employees might be more motivated by being given access to valuable organizational knowledge and having opportunities for career development (Carstensen et al., 1999). Therefore, knowledge transfer processes and tools need to take motivational differences of older and younger employees to share and receive knowledge into account.

Third, characteristics of the relationship between older and retiring workers and other employees need to be considered to facilitate knowledge retention. For example, they need formal (e.g., meetings, joint projects) and informal (e.g., social areas) opportunities to interact. These interactions, in particular face-to-face communication, can help to establish trusting relationships, enhance social proximity, and, in turn, facilitate knowledge retention (Arif et al., 2009; Harvey, 2012). The work by Iweins and colleagues (2013) on intergenerational contact supports this view, and shows that high-quality interactions between older and younger workers can improve cooperation between members of these groups. In addition, research on knowledge retention has emphasized that effective mentoring programs, the use of age-diverse teams, and the provision of networking opportunities can contribute to the development of trusting relationships, and, in turn, facilitate knowledge retention (Lahaie, 2005; McNichols, 2010; Ropes, 2014).

Fourth, aging organizations need to create contexts that are conducive to knowledge retention (Ebrahimi et al., 2008). As norms can shape behavioral intention (Fishbein & Ajzen, 1975), organizational policies and processes need to be aligned with the aim of retaining knowledge from older and retiring workers (Calo, 2008). Further, organizations need to establish organizational cultures and leadership styles that value diversity, teamwork, and openness to create organizational contexts that enable and require knowledge sharing behavior from all its organizational members (Baily, 2009; Ebrahimi et al., 2008; McNichols, 2010; Ropes, 2013). Such organizational contexts can facilitate knowledge retention from highly knowledgeable older and retiring workers.

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