



**Reaching the Heart or the Mind? Test of two Theory-Based Training Programs to Improve Interactions Between Age-Diverse Coworkers**

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**Reaching the Heart or the Mind? Test of two Theory-Based Training Programs to  
Improve Interactions Between Age-Diverse Coworkers**

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**ABSTRACT**

Due to demographic change, age diversity is increasing in many organizations. We aimed to understand how organizations can use age diversity training to overcome the challenges and realize the benefits of an age-diverse workforce. We built on the two predominant theoretical perspectives in the diversity literature—social identity theory and the information/decision-making perspective—to advance a dual pathway model and to develop two age diversity training programs: An identity-oriented training that helps organizations to overcome the challenges of age diversity by “speaking to the heart” of age-diverse coworkers and a knowledge-oriented training that helps organizations to realize the benefits of age diversity by “speaking to the mind” of age-diverse coworkers. We tested both training programs in a randomized controlled field experiment with age-diverse coworker dyads. We found that the identity-oriented training facilitated contact quality as a socioemotional outcome through increased levels of coworker’s perceived similarity and also reduced stereotype threat. The knowledge-oriented training increased knowledge transfer as a sociocognitive outcome through increased levels of coworker’s perceived knowledge utility and transactive memory. In a pilot training integration study, we made a first attempt to develop and test an integrated training program. Our findings advance research on the evidence-based management of age diversity.

**Keywords:**

Age diversity training; diversity management; information/decision-making perspective; social identity theory; randomized controlled field experiment

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How can organizations improve interactions among age-diverse coworkers?

Answering this question is important as interactions among employees from different age groups can be challenging. Research reported tensions and lower quality interactions among age-diverse coworkers (Finkelstein, Ryan, & King, 2013; King & Bryant, 2017; North & Fiske, 2015), which in turn can result in decreased performance (Kunze, Boehm, & Bruch, 2011) and increased turnover (Schneid, Isidor, Steinmetz, & Kabst, 2016). Furthermore, although age-diverse employees possess unique knowledge due to differences in socialization, education, and on-the-job experiences, they do not automatically exchange this valuable knowledge with each other (Gerpott, Lehmann-Willenbrock, & Voelpel, 2017a). This is unfortunate since knowledge exchange is crucial to realize the potential performance-related benefits of the non-redundant knowledge pools of age-diverse employees (Li et al., in press).

Age diversity training (i.e., discrete instructional programs that aim to enhance the motivation, attitudes, knowledge, and skills required for interacting with age-dissimilar others) is one practice that organizations adopt to manage age-diverse workforces (Bezrukova, Jehn, & Spell, 2012; Gerpott et al., 2017a). While diversity training is one of the most popular diversity management practices (Kalev, Dobbin, & Kelly, 2006), research on age diversity training is scarce (Schloegel, Stegmann, Maedche, & van Dick, 2016). Existing age diversity training programs typically build on social identity theory (Tajfel, 1982; Tajfel & Turner, 1986; Turner, 1987), to examine how the challenges of age-based categorization processes can be addressed (Reynolds, 2010; Schloegel et al., 2016; Wegge et al., 2012). However, based on the information/decision-making perspective (Van Knippenberg, Dreu, & Homan, 2004; Williams & O'Reilly, 1998) and empirical findings about the positive effects of age diversity (Li et al., in press; Pitt-Catsouphes, Mirvis, & Berzin, 2013), it seems equally valuable to adopt a knowledge-based perspective and focus on the possible benefits of age diversity.

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Further, research on diversity training programs often fails to specify a program theory (which links intervention activities via processes to desired outcomes; Astbury & Leeuw, 2010) to provide insights into the mechanisms through which training programs elicit their effects (Kalinowski, Steele-Johnson, Peyton, Leas, Steinke, & Bowling, 2013; Kulik & Roberson, 2008). This has led researchers to call for process-based perspectives that clarify the mechanisms through which age diversity training programs yield their benefits (Li et al., in press; Roberson, Holmes, & Perry, 2017). While conceptual research suggests that diversity can spark both identity- and knowledge-related processes (Carter & Phillips, 2017; Van Knippenberg et al., 2004), empirical research has yet to delineate the different pathways through which interactions of age-diverse coworkers can be managed (Kulik & Roberson, 2008).

To advance our understanding of the management of age-diverse workforces, we develop and test a dual pathway model that deciphers different mechanisms and outcomes triggered by two forms of age diversity training. We focus on interactions of age-diverse dyads consisting of one younger and one older colleague with a minimum age difference of 15 years because scholars have found that this age gap is often used to capture one generation (Rudolph, Rauvola, & Zacher, 2018). This age difference might thus relate to unique knowledge and perspectives due to the nestedness of educational and socialization experiences in time (Joshi, Dencker, Franz, & Martocchio, 2010). On the one hand, to help organizations overcome the challenges of age diversity by “speaking to the heart” of age-diverse coworkers, we designed an identity-oriented age diversity training based on social identity theory (Tajfel, 1982; Tajfel & Turner, 1986; Turner, 1987) aiming to improve contact quality (i.e., pleasant, natural, and cooperative social interactions; Iweins, Desmette, Yzerbyt, & Stinglhamber, 2013) as a socioemotional outcome. On the other hand, to enable organizations to realize the benefits of age diversity by “speaking to the mind” of age-diverse coworkers, we designed a knowledge-oriented age diversity training based on the information/decision-making

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perspective (Williams & O'Reilly, 1998) aiming to improve knowledge transfer (i.e., exchange and reception of knowledge from another employee; Burmeister, Fasbender, & Deller, 2018) as a sociocognitive outcome. Contact quality and knowledge transfer have been established as predictors of relevant employee outcomes such as organizational commitment and job performance (Ehrhardt & Ragins, 2019; Reich & Hershcovis, 2011; Rhee & Choi, 2017; Tran, Nguyen, Dang, & Ton, 2018; Zhu, Chiu, & Holguin-Veras, 2018), and thus represent relevant proximal outcomes of our two age diversity training programs.

We aim to extend the literature on the management of age-diverse workforces in three main ways. First, we translate the bi-theoretical arguments about the operation of diversity (Meyer, 2017; Williams & O'Reilly, 1998) into a dual pathway model. We examine the effects of our two age diversity training programs from the identity-based social categorization perspective and the knowledge-based information/decision-making perspective, to simultaneously depict challenges and opportunities of age diversity in line with the conceptualization of diversity as a "double-edged sword" (Milliken & Martins, 1996: 403). Empirically, we test for the possibility of interacting pathways in the form of cross-over effects from the knowledge-oriented training to the socioemotional mechanisms and outcome and from the identity-oriented training to the sociocognitive mechanisms and outcome. Ruling out cross-over effects increases the confidence in our program theory, namely that the intervention activities exert their socioemotional or sociocognitive effects through the specified process variables and not others. In doing so, our dual pathway model provides nuance to the bi-theoretical diversity literature by distinguishing the different identity- and knowledge-related processes and the socioemotional and sociocognitive outcomes triggered by our two age diversity training programs.

Second, depicting the processes through which our age diversity training programs elicit their effects helps opening up the "black box" of diversity training effects (Kulik & Roberson, 2008), and responds to calls for more integrative, process-based perspectives (Li et

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3 al., in press; Roberson et al., 2017). Linking these processes to their respective socioemotional  
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5 (i.e., contact quality) and sociocognitive (i.e., knowledge transfer) outcomes further provides  
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7 a more balanced account of the consequences of interactions between age-diverse coworkers.  
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9 This is especially important to overcome the dominant view about age diversity as a  
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11 challenge, which has been adopted by the majority of extant studies (see Shore et al., 2009 for  
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13 a review), despite the fact that meta-analyses do not support this negative perspective (Bell,  
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15 Villado, Lukasik, Belau, & Briggs, 2011; Schneid et al., 2016).  
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20 Third, we offer actionable and robust insights for managing increasingly age-diverse  
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22 workforces. As we conducted a randomized controlled field experiment which represents a  
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24 methodological “gold standard” (Gloor, Gazdag, & Reinwald, in press; King, Hebl, Botsford  
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26 Morgan, & Ahmad, 2013), we are able to contribute to the advancement of evidence-based  
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28 training and development practices (Antonakis, Fenley, & Liechti, 2011; Bezrukova et al.,  
29  
30 2012). Our test of causal relationships in a field setting allowed us to examine whether the  
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32 relationships proposed in conceptual research “hold up in the presence of other social and  
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34 situational factors” (Paluck & Cialdini, 2014: 85). Our findings thus enable organizations to  
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36 adopt and implement training programs to effectively manage their age-diverse workforces,  
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38 which are both theory-driven and evaluated for effectiveness.  
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### 42 **REVIEW OF AGE DIVERSITY TRAINING RESEARCH**

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44  
45 The literature on age diversity training is nascent. Overall, we identified nine studies  
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47 (published between 2000 and 2020) in which the effectiveness of a training that was solely  
48  
49 focused on age diversity was evaluated using an experimental design (see Tables 1a and 1b).  
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51 For a more comprehensive review of diversity training research, we direct the interested  
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53 reader to the existing reviews and meta-analyses (Bezrukova et al., 2012; Bezrukova, Spell,  
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55 Perry, & Jehn, 2016; Kalinoski et al., 2013). Two insights stand out when systematically  
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57 assessing the foci and pattern of results of previous work on age diversity training.  
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Please insert Tables 1a and 1b about here  
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7 First, most studies demonstrated that the age diversity training programs are effective  
8 in reducing negative age stereotypes. Accordingly, age diversity training programs are  
9 effective in reducing negative age stereotypes and in increasing positive intergenerational  
10 attitudes and comfort in interacting with other age groups (Beyer, Wolff, Freiberger, &  
11 Wurm, 2019; Kulik, Perry, & Bourhis, 2000; Levy, Pilver, Chung, & Slade, 2014; Sun, Lou,  
12 Dai, To, & Wong, 2019). In addition, studies conducted in the work context showed that  
13 participation in the age diversity training programs had effects on relevant work attitudes and  
14 behavior, including reduction in conflicts and increases in job satisfaction, organizational  
15 commitment, person-organization fit, and job performance (Egan & Song, 2008; Jungmann,  
16 Wegge, Liebermann, Ries, & Schmidt, 2020; Reynolds, 2010; Schloegel et al., 2016).  
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30 Second, the overview of theory and key constructs (Table 1a) indicates that most age  
31 diversity training studies focused on identity-related constructs (e.g., age perceptions, age  
32 stereotypes, attitudes towards aging) in terms of theoretical framing, manipulated variables,  
33 and outcomes. This is in line with our argument that the literature has predominantly focused  
34 on identity-related challenges and associated outcomes, which has also been documented by  
35 reviews of the general diversity training literature (Bezrukova et al., 2012; Bezrukova et al.,  
36 2016; Kalinoski et al., 2013). In addition, the overview shows that extant age diversity  
37 training studies have collectively ignored the examination of mediating mechanisms, which is  
38 aligned with multiple calls for research into the mechanisms through which diversity training  
39 programs elicit their effects (Kalinowski et al., 2013; Kulik & Roberson, 2008).  
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### 53 THEORETICAL BACKGROUND

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55 “Central to much of the theorizing about diversity and diversity training is a discussion  
56 of two perspectives: a social categorization perspective and an information-processing/  
57 decision-making perspective” (Kalinowski et al., 2013: 1077). This bi-theoretical approach to  
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diversity research is grounded in the literature review by Williams and O'Reilly (1998).

Based on this review of more than 40 years of research on diversity, researchers have argued that effects of diversity can be understood from two main theoretical perspectives that arrive at opposing predictions: The identity-based social categorization perspective has mainly been associated with challenges and the knowledge-based information/decision-making perspective has mainly been associated with benefits of diversity (Boehm, Baumgaertner, Dwertmann, & Kunze, 2011; Kalinoski et al., 2013; Kearney & Gebert, 2009; Meyer, 2017; van Dijk, Meyer, van Engen, & Loyd, 2017; Van Knippenberg et al., 2004; Williams & O'Reilly, 1998).

### **Age Diversity as a Challenge: Social Identity Theory**

According to social identity theory (Tajfel, 1982; Tajfel & Turner, 1986; Turner, 1987), individuals use easily detectable personal attributes, such as age, to categorize the self and others into groups, leading to categorizations into members of one's own ingroup and members of outgroups. In line with the similarity-attraction paradigm (Byrne, 1971), social identity theory argues that people favor similar members of ingroups over dissimilar members of outgroups (Tajfel & Turner, 1986), mainly because interactions with similar others who reinforce one's identity provide a source of affirmation. As a result of social categorization processes, employees engage in stereotyping and experience intergroup anxiety, which impairs interpersonal interactions among dissimilar employees (Turner, West, & Christie, 2013; Williams & O'Reilly, 1998). In sum, social identity theory points to the identity-based challenges inherent in interactions of age-diverse coworkers that need to be overcome to enable effective interactions in age-diverse workforces.

The emphasis of the current literature on the negative effects of age diversity and relevant theoretical mechanisms might partly be driven by the prevalence of age stereotypes and age discrimination in contemporary organizations (Posthuma & Campion, 2009; Santora & Seaton, 2008). To illustrate, regardless of empirical counter-evidence (Ng & Feldman, 2012), common stereotypes depicting older employees as less motivated and less competent

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3 or more resistant and less willing to change are persistent in several countries (North & Fiske,  
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5 2015). Similarly, younger workers are often assumed to possess less knowledge and wisdom  
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7 than their older counterparts (Tempest, 2003) and are presumed to be inexperienced and often  
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9 lazy (Finkelstein et al., 2013). These age stereotypes lead to discrimination, for example, in  
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11 hiring decisions (Fasbender & Wang, 2017; Karpinska, Henkens, & Schippers, 2013), and  
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13 over the years, can become self-fulfilling prophecies through stereotype embodiment (Levy,  
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15 2009). Further, the presence of age stereotypes can negatively affect the interactions among  
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17 age-diverse employees. For example, Liebermann, Wegge, Jungmann, and Schmidt (2013)  
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19 found that younger employees' health was negatively affected when they worked in age-  
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21 diverse teams, but only when the younger employees held negative stereotypical beliefs about  
22  
23 older people. Consequently, addressing age stereotypes is a major challenge for the  
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25 management of age diversity in organizations (Hertel, van der Heijden, De Lange, & Deller,  
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27 2013).

**Age Diversity as an Opportunity: Information/Decision-Making Perspective**

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33 The information/decision-making perspective (Williams & O'Reilly, 1998) posits that  
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35 demographically diverse employees possess non-redundant knowledge, skills, and abilities,  
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37 which can yield benefits as long as the different knowledge reservoirs are combined and  
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39 integrated. In addition, diversity challenges individuals to reconcile conflicting perspectives by  
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41 processing available information more thoroughly (Van Knippenberg et al., 2004; Van  
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43 Knippenberg & Schippers, 2007). This deeper level of information processing that is necessary  
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45 to generate shared understanding can have positive effects on the effectiveness of interactions  
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47 among diverse coworkers (Joshi & Roh, 2009). In sum, the information/decision-making  
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49 perspective points to the knowledge-based opportunities of age diversity that need to be  
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51 leveraged to enable effective interactions in age-diverse workforces.  
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58 In line with these arguments, research has shown that age diversity can be associated  
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60 with opportunities because age-diverse employees can contribute their non-redundant

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3 knowledge, skills, and abilities (Backes-Gellner & Veen, 2013; Williams & O'Reilly, 1998).  
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5 For example, younger workers can benefit from older workers' company-specific knowledge  
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7 and older workers can benefit from younger workers' technological and scientific knowledge  
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9 (Gerpott et al., 2017a). In addition, performance in age-diverse top management teams can be  
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11 facilitated because they can draw from their complementary experiences when making  
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13 decisions (Kilduff, Angelmar, & Mehra, 2000). Building on this idea of complementarity  
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15 between younger and older employees, Li et al. (in press) adopted an intellectual capital  
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17 perspective and showed that age diversity can facilitate organizational performance via human  
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19 and social capital as two knowledge-based resources. Consequently, to realize the benefits of  
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21 age diversity, organizations need to emphasize the value inherent in diverse knowledge and  
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23 make employees aware of the diverse knowledge around them to foster knowledge exchange  
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25 between older and younger employees (Burmeister & Deller, 2016; Gerpott, Lehmann-  
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27 Willenbrock, & Voelpel, 2017b).

### 32 **Dual Pathway Model: Engaging the Heart and Mind of an Age-Diverse Workforce**

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35 We introduce a dual pathway model (Figure 1) in which two different age diversity  
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37 training programs influence either the pathway of social identity theory or the pathway of the  
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39 information/decision-making perspective. With regard to the identity-oriented pathway, we  
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41 propose that our identity-oriented age diversity training improves contact quality among age-  
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43 diverse coworkers as a socioemotional outcome via increased levels of coworkers' perceived  
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45 similarity (i.e., the extent to which the dyad partner is perceived as alike in outlook,  
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47 perspectives, and values; Turban & Jones, 1988) and reduced stereotype threat (i.e., anxiety  
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49 about fulfilling a negative stereotype; Kang & Chasteen, 2009). With regard to the  
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51 knowledge-oriented pathway, we propose that our knowledge-oriented age diversity training  
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53 improves knowledge transfer among age-diverse coworkers as a sociocognitive outcome via  
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55 increased levels of coworkers' perceived knowledge utility (i.e., positive evaluation of the  
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57 value of coworker's knowledge; Borgatti & Cross, 2003) and transactive memory (i.e., shared  
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conceptualization about the specialized and distributed knowledge within a certain unit, such as a dyad; Hollingshead, 2001).

In doing so, we propose a dual pathway model in which both pathways lead to distinct positive outcomes (i.e., contact quality, knowledge transfer) because our two age diversity training programs alter the underlying identity- and knowledge-related mechanisms in a productive way (e.g., reducing stereotype threat, increasing coworker's perceived knowledge utility). Overall, we thus specify a program theory that clarifies through which processes the intervention activities of our age diversity training programs are linked to desired outcomes (Astbury & Leeuw, 2010).

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Please insert Figure 1 about here  
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## HYPOTHESES DEVELOPMENT

### **Engaging the Heart: An Identity-Oriented Age Diversity Training**

First, we hypothesize that our identity-oriented age diversity training increases perceived similarity among age-diverse coworkers. Increasing perceived similarity through training is relevant because "initial perceptions of similarity are based on salient social category diversity" (Zellmer-Bruhn, Maloney, Bhappu, & Salvador, 2008: 43). Accordingly, automatically occurring social categorization processes (Carter & Phillips, 2017) lead to maximizing perceived differences between groups (Tajfel & Turner, 1986). For example, individuals from different groups are less likely to assume that they have similar values or past experiences (Elsass & Graves, 1997). To overcome these categorical beliefs about differences, individuals from different groups need to be encouraged to establish commonalities to increase the psychological overlap between the groups (see Gaertner, Dovidio, Anastasio, Bachman, & Rust, 1993). Accordingly, employees from different age groups require opportunities for cooperative interactions to get to know each other and to identify common ground (Iweins et al., 2013; King & Bryant, 2017). In our identity-oriented

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3 training, we thus encourage age-diverse employees to find similarities with each other rather  
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5 than focus on differences, which has been shown to ease interactions among dissimilar  
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7 individuals (Martin & Phillips, 2017). We expect that employees who can experience positive  
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9 attributes of their age-diverse counterpart during the training are more likely to look beyond  
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11 categorical differences and perceive each other as similar.  
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15 *Hypothesis 1a: The identity-oriented age diversity training has a positive effect on*  
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17 *perceived similarity in age-diverse coworker dyads.*  
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20 Second, we propose that our identity-oriented age diversity training reduces stereotype  
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22 threat among age-diverse coworkers. When interacting with age-diverse coworkers, negative  
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24 stereotypes about one's own age group can become more salient (Finkelstein et al., 2013;  
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26 Kulik, Perera, & Cregan, 2016), and one's anxiety about fulfilling these negative stereotypes  
27  
28 can be increased. Age-based stereotype threat can have several detrimental effects (Kulik et  
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30 al., 2016; Lamont, Swift, & Abrams, 2015), and addressing stereotype threat is of central  
31  
32 importance for the management of diversity (Casad & Bryant, 2016). To reduce stereotype  
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34 threat and the anxiety to be evaluated in line with negative stereotypes, employees can be  
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36 encouraged to focus on similarities in interactions with diverse others and identify  
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38 commonalities (Martin & Phillips, 2017; Rosenthal & Crisp, 2006). In addition, explaining  
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40 the phenomenon of stereotype threat and thereby offering stereotype threat as an alternative  
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42 explanation for potential anxieties has been shown to yield positive results (Roberson &  
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44 Kulik, 2007). In our identity-oriented training, we thus explain the basic operation of social  
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46 categorization and stereotypes, ask the age-diverse coworkers to reflect upon their own age  
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48 stereotypes, and to discuss their positive perceptions of the other age group with an age-  
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50 diverse coworker. We expect that these activities enable age-diverse employees to generate a  
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52 more positive perspective on how the other age group views them, which should reduce their  
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54 anxiety to behave in line with negative stereotypes.  
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*Hypothesis 1b: The identity-oriented age diversity training has a negative effect on stereotype threat in age-diverse coworker dyads.*

Based on the arguments presented above, we hypothesize that our identity-oriented age diversity training facilitates contact quality via increased perceived similarity and reduced stereotype threat. Research has demonstrated that stereotype threat can harm socioemotional outcomes by increasing aggression and out-group avoidance (Inzlicht & Kang, 2010; Macinnis & Hodson, 2012). To contrast, perceived coworker similarity can facilitate interaction quality (Avery, McKay, & Wilson, 2007; West, Magee, Gordon, & Gullett, 2014). Further providing support for the proposed identity-based mediation process, perceived similarity mediated the relation between diversity and interaction quality between diverse coworkers (Harrison, Price, Gavin, & Florey, 2002).

*Hypothesis 2: The positive effect of the identity-oriented age diversity training on contact quality of age-diverse coworker dyads is mediated by (a) increased perceived similarity with the coworker and (b) reduced stereotype threat.*

### **Engaging the Mind: A Knowledge-Oriented Age Diversity Training**

First, we expect that our knowledge-oriented age diversity training increases coworkers' perceived knowledge utility. Increasing perceived knowledge utility is relevant because employees make deliberate decisions from whom to accept knowledge at work based on the usefulness of the available knowledge (Andrews & Delahaye, 2000). To make the utility of coworkers' knowledge visible, employees need to become aware of what the other person knows and how this connects to their own knowledge (Okhuysen & Eisenhardt, 2002). For example, an older employee might experience the creation of infographics as a cumbersome part of their job. Learning that a younger coworker knows how to use a sophisticated illustrator software and reflecting on the impact of this knowledge on one's own work will likely increase the perceived utility of the younger coworker's knowledge. In line with this notion, scholars showed that providing age-diverse coworkers with the opportunity to

learn about each other's areas of expertise, and reflect on the usefulness of this knowledge for their own work, makes them more likely to appreciate the utility of the knowledge of their age-diverse coworkers (Gerpott et al., 2017a). Similarly, in research on teams, knowledge-based interventions have been used to encourage employees to reflect on the teams' knowledge to improve the perception and utilization of the available knowledge (Gurtner, Tschan, Semmer, & Nägele, 2007; Sikorski, Johnson, & Ruscher, 2012). A knowledge-oriented training that includes the visualization and discussion of the available knowledge within the age-diverse dyad should thus be a useful approach to increase the perceived utility of each other's knowledge.

*Hypothesis 3a: The knowledge-oriented age diversity training has a positive effect on coworker's perceived knowledge utility in age-diverse coworker dyads.*

Second, we propose that our knowledge-oriented age diversity training increases transactive memory, that is, the age-diverse dyad members' shared understanding of what each of them knows (Hollingshead, 2001). Reflecting about who knows what is essential to build a shared understanding of the available knowledge within a team or dyad (Gurtner et al., 2007; Sikorski et al., 2012). In research on teams, scholars have shown that knowledge-oriented training programs can help individuals within groups to develop a shared understanding of which factual and procedural knowledge is held by whom (Marks, Zaccaro, & Mathieu, 2000). Being trained together rather than individually is thereby an important success factor for the development of transactive memory (Moreland & Myaskovsky, 2000; Ren & Argote, 2011). Accordingly, we expect that a knowledge-oriented training that asks age-diverse coworker dyads to visualize and reflect upon their knowledge helps to develop transactive memory by making both dyad members aware which knowledge each of them possesses.

*Hypothesis 3b: The knowledge-oriented age diversity training has a positive effect on transactive memory in age-diverse coworker dyads.*

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3 In combination, we hypothesize that the knowledge-oriented age diversity training  
4 increases knowledge transfer via increasing coworker's perceived knowledge utility and  
5 transactive memory. In line with the proposed knowledge-based mediation process, research  
6 showed that perceived knowledge utility and the awareness about each other's knowledge  
7 determine the extent to which employees engage in knowledge transfer (Hsu, Ju, Yen, &  
8 Chang, 2007). In contrast, when individuals perceive each other's knowledge as not useful or  
9 when they lack an understanding of each other's expertise, knowledge transfer is less likely  
10 (Andrews & Delahaye, 2000; Borgatti & Cross, 2003; Hertel et al., 2013). Our knowledge-  
11 oriented age diversity training should thus facilitate knowledge transfer because it increases  
12 coworker's perceived knowledge utility and transactive memory.  
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26 *Hypothesis 4: The positive effect of the knowledge-oriented age diversity training on*  
27 *knowledge transfer of age-diverse coworker dyads is mediated by (a) increased*  
28 *coworker's perceived knowledge utility and (b) transactive memory.*  
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## 33 METHOD

### 34 Procedure

35 We collected data from employees working for two internationally operating  
36 production companies in the German-speaking part of Switzerland that each employ more  
37 than 20,000 employees. We gained access to the two companies after introducing the  
38 intervention study to their human resources (HR) managers. The HR managers assisted us in  
39 identifying age-diverse coworker dyads that met the following two criteria. First, they had to  
40 consist of one younger and one older colleague with a minimum age difference of 15 years.  
41 We chose this gap because research centers around this cut-off value to define an age cohort  
42 (Rudolph et al., 2018), and because this age difference is used in dyadic age diversity research  
43 (e.g., Burmeister, Wang, & Hirschi, 2020). Second, age-diverse coworkers could not be in a  
44 formal hierarchical relationship, such as supervisor-subordinate or formal mentor-mentee  
45 relationships. We adopted this criterion because supervisor-subordinate or mentor-mentee  
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## AGE DIVERSITY TRAINING

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relationships are characterized by formalized power and status differences (Ragins, 1997; Yukl & Falbe, 1991), opening up the possibility that perceptions of these differences rather than the proposed mechanisms influence the effects of our age diversity training programs.

Based on these criteria, the HR managers informed line managers and employees via personal contact and the company's intranet about the opportunity to participate in a training on age diversity. Employees were told that they had the opportunity to participate in an age diversity training together with an age-diverse coworker if they fulfilled the two criteria outlined above (i.e., age difference of 15 years, no formal hierarchical relationship). They were also informed that the training was going to be conducted by an external research partner. Age-diverse coworker dyads who wanted to participate in the age diversity training discussed their training participation with their line manager and reported their names and email addresses to the HR manager. The research team received the list of age-diverse coworker dyads that had signed up for the study. Participation in the study was voluntary and participants were not reimbursed.

We conducted the study over 12 weeks. At the start of the study, all participants received the link to the pre-training baseline questionnaire (Time 0). In this pre-training baseline questionnaire, we collected data on socio-demographic variables and all study variables. In weeks 3 to 6, we implemented the training programs at the location of the companies during work hours. Each training session lasted four hours, and we offered four training sessions in total, two at each company site, to accommodate all participating dyads. Up to 12 age-diverse coworker dyads participated in a training session. The trainer for all training sessions was a part-time PhD student in work and organizational psychology with prior consulting experience. The trainer was blind to the hypotheses of the study and was hired solely for the purpose of training implementation. The training programs were delivered in German. To reduce possible contamination, the trainer explicitly asked participants at the

1  
2  
3 end of the training programs to not discuss training contents with coworkers other than their  
4  
5 age-diverse training partner.  
6

7  
8 Directly after the training, all participants received the link to the first post-training  
9  
10 questionnaire (Time 1). At Time 1, we collected data on all four proposed mechanisms:  
11  
12 perceived similarity, stereotype threat, coworker's perceived knowledge utility, and transactive  
13  
14 memory. Three weeks after the training, the trainer and the first two authors called the  
15  
16 participants to collect their feedback on the training and to discuss the implementation of the  
17  
18 action plan that the dyads developed during the training. The purpose of the follow-up calls was  
19  
20 to create accountability among participants for implementing the planned activities, to  
21  
22 consolidate what has been learned, and to increase training transfer (e.g., Kraiger, Ford, &  
23  
24 Salas, 1993; Martin, 2010). We conducted these follow-up phone calls with individual  
25  
26 participants rather than dyads to encourage critical reflection and the discussion of possible  
27  
28 problems within the dyad. We were able to schedule follow-up calls with 93% of all  
29  
30 participants. To ensure comparability, the interviewers used a guideline for the phone calls and  
31  
32 made notes during the call to document participants' responses. The guideline included  
33  
34 questions about the action plans and their implementation. One month after the training, all  
35  
36 participants received the link to the second post-training questionnaire (Time 2), in which we  
37  
38 collected data on the outcomes (i.e., contact quality, knowledge transfer).  
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43

#### 44 **Participants**

45  
46 In total, 116 individuals, who formed 58 age-diverse coworker dyads, signed up for  
47  
48 the study. We randomly assigned the age-diverse coworker dyads to either the identity-  
49  
50 oriented intervention group ( $n = 38$  individuals), the knowledge-oriented intervention group  
51  
52 ( $n = 38$  individuals), or the waiting control group ( $n = 40$  individuals). The waiting control  
53  
54 group received one of the training programs (at the discretion of HR managers) after the data  
55  
56 collection was finalized (please see Figure 2 for details on sample randomization and  
57  
58 attrition). A total number of 108 individuals, nested in 54 dyads, filled in the baseline  
59  
60

questionnaire ( $n = 32$  identity-oriented intervention group,  $n = 38$  knowledge-oriented training group,  $n = 38$  control group).

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Please insert Figure 2 about here  
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Of the participants, 35% were female, which is reflective of the lower number of female employees in production companies. In addition, 65% were same-gender dyads. Educational backgrounds were diverse: 10% held a PhD or MBA, 28% had a bachelor's or master's degree, 56% had completed an apprenticeship, and 6% had a high school degree. The average age of participants was 41.16 years ( $SD = 13.85$ ), and the average age difference between dyad members was 24.90 years ( $SD = 6.00$ ). Participants' average organizational tenure was 13.89 ( $SD = 11.26$ ), and dyad members knew each other, on average, for 3.53 years ( $SD = 2.75$ ). We provide a more detailed description of demographics per experimental group in the Appendix (Table A1).

### Age Diversity Training Programs

Both age diversity training programs combined lectures from the trainer, group discussions, and specific exercises that age-diverse dyads engaged in. We kept the structure of both age diversity training programs constant, but the contents differed in alignment with either social identity theory or the information/decision-making perspective (see Figure 3). At the start of both workshops, the trainer invited participants to introduce themselves and share their expectations for the session. In both training groups, participants were then introduced to the topic of age diversity in organizations as a result of demographic change.

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Please insert Figure 3 about here  
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We developed the modules in the *identity-oriented age diversity training* based on social identity theory (Tajfel & Turner, 1986; Turner, 1982) to overcome the possible challenges of age diversity. The sequence of modules was as follows. First, the participants

## AGE DIVERSITY TRAINING

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1  
2  
3 engaged in an intergroup attribution exercise (Pendry, Driscoll, & Field, 2007) that we had  
4  
5 adapted to the age-diverse context by forming age-homogenous sub-groups and asking these  
6  
7 groups to identify reasons for negative work behaviors (e.g., being late for a meeting) of  
8  
9 members from either their in-group (i.e., same age) or their out-group (i.e., older or younger).  
10  
11 The results were subsequently shared and discussed in the plenary. The purpose of this  
12  
13 exercise was to make employees aware of the content and consequences of age-based  
14  
15 categorization processes. Second, the participants reflected on their perception of the other  
16  
17 age group and on the views of the other age group regarding their own age group, guided by  
18  
19 adjective lists of individual characteristics used to describe different age groups (Finkelstein  
20  
21 et al., 2013). The purpose of this exercise was to increase participants' awareness about how  
22  
23 their own views of the other age group are often simplistic and how they may also be held  
24  
25 back by implicit beliefs about what the other age group thinks about their own group.  
26  
27 Through the integration of all participants' perspectives, the trainer then facilitated the insight  
28  
29 that members from the other age group often hold very positive beliefs about one's own age  
30  
31 group (e.g., younger employees are tech-savvy, older employees are wise). Overall, this  
32  
33 exercise should contribute to reducing stereotype threat (Rosenthal & Crisp, 2006). Third, the  
34  
35 trainer provided scientific input on social identity theory, self-categorization, and in-group  
36  
37 bias, and provided examples of their relevance in age-diverse contexts, to integrate the  
38  
39 previous discussions. Fourth, age-diverse dyad members got together to identify similarities  
40  
41 with their age-diverse coworker, while also discussing perceptions of each other's age groups.  
42  
43 The purpose of this exercise was to overcome the challenges of separate identities associated  
44  
45 with one's in-group and blur intergroup boundaries, which reduces stereotype threat and  
46  
47 contributes to the formation of an overarching identity (González & Brown, 2006; Rosenthal  
48  
49 & Crisp, 2006; van Dijk et al., 2017). In our data analysis, identity-oriented training was  
50  
51 coded as a dummy variable (1 = "received identity-oriented training" vs. 0 = "did not receive  
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53 identity-oriented training").  
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We developed the *knowledge-oriented age diversity training* based on the information/decision-making perspective (Williams & O'Reilly, 1998) to realize the possible benefits of age diversity. The sequence of training modules was as follows. First, the trainer provided scientific input on the information/decision-making perspective and work-related knowledge types (e.g., task-related knowledge, social knowledge, political knowledge, etc.), and offered examples of how these insights are related to age diversity. The purpose of this training module was to set the stage and equip participants with the necessary knowledge for the subsequent exercises. Second, the trainer asked participants to reflect on and write down their own work-related knowledge as well as their age-diverse dyad partner's work-related knowledge based on the knowledge types that the trainer introduced before. The purpose of this exercise was to increase the awareness of the available knowledge within the dyad. Third, age-diverse dyad members got together to create a joint knowledge tree that captured both partners' knowledge in work-related areas (Wilke, 2004), including similarities and differences in knowledge. The purpose of this exercise was to create a visualization of the available knowledge within the dyad and identify knowledge that one has in the perception of others that is unknown to the self. In doing so, participants should become more aware of the utility of their own and the colleague's unique knowledge for conducting their work. In our data analysis, knowledge-oriented training was coded as a dummy variable (1 = "received knowledge-oriented training" vs. 0 = "did not receive knowledge-oriented training").

Finally, in both interventions, the trainer asked age-diverse dyad members to create a joint action plan for the next month, specifying how they are going to implement the training contents in their day-to-day work. The purpose of this exercise was to facilitate training transfer (Kraiger et al., 1993). Specifically, we asked age-diverse coworker dyads to define at least three activities that they aimed to implement including deadlines for their implementation within the next months and to set up a meeting to reflect jointly on the learnings obtained from the training. Note that both trainings addressed skills *and* knowledge,

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2  
3 albeit in different domains. The identity-related training addressed skills (e.g., identifying  
4 similarities in life) and knowledge (e.g., about stereotype effects and categorization processes)  
5  
6 in the socioemotional domain, whereas the knowledge-related training addressed skills (e.g.,  
7 identifying similarities in knowledge) and knowledge (e.g., about knowledge types and  
8 knowledge utility) in the sociocognitive domain. The difference thus lies in the domain in  
9  
10 which skills and knowledge are addressed.  
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### 16 17 **Measures**

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19 We measured the proposed mechanisms (i.e., perceived similarity with coworker,  
20 stereotype threat, coworker's perceived knowledge utility, and transactive memory) at  
21 baseline (Time 0) and directly after the training (Time 1). The outcomes (i.e., contact quality,  
22 knowledge transfer) were assessed at baseline (Time 0) and one month after the training  
23 (Time 2). We asked participants to refer to the time since filling in the last questionnaire in  
24 answering the items (if applicable). All variables were measured on 7-point scales ( $1 =$   
25 *strongly disagree*,  $7 =$  *strongly agree*).  
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### 35 **Contact Quality**

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37 Contact quality was measured with the 5-item scale by Iweins et al. (2013).  
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39 Participants indicated to which extent their contact with their age-diverse partner had been  
40 "natural", "positive", "pleasant", "cooperative", and "voluntary" since filling in the last  
41 questionnaire. Cronbach's alpha was .89.  
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### 47 **Perceived Similarity with Coworker**

48  
49 Perceived similarity with coworker was measured with the 3-item scale by Turban and  
50 Jones (1988). A sample item is "My colleague and I are alike in a number of areas."  
51  
52 Cronbach's alpha was .93.  
53  
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### 56 **Stereotype Threat**

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58 Stereotype threat was measured with the 3-item scale by Kang and Chasteen (2009). A  
59 sample item is "My colleague thinks less of me because of my age." Cronbach's alpha was .85.  
60

### ***Knowledge Transfer***

Knowledge transfer from coworker was measured with the 4-item scale by Wilkesmann, Wilkesmann, and Virgillito (2009). A sample item is “I have turned to my colleague for advice regarding special procedures so that I learn them.” Cronbach’s alpha was .83.

### ***Coworker’s Perceived Knowledge Utility***

Coworker’s perceived knowledge utility was measured with 4 items based on Borgatti and Cross (2003). A sample item is “My colleague has expertise in areas that are important for the kind of work I do.” Cronbach’s alpha was .93.

### ***Transactive Memory***

Transactive memory was measured with the 15-item scale by Lewis (2003). A sample item is “I have knowledge about an aspect of our work that my colleague does not have.” Cronbach’s alpha was .82.

### ***Control Variables***

First, we controlled for company affiliation as we conducted the training programs in two companies and contextual differences might influence our results (0 = “Company 1” vs. 1 = “Company 2”). Second, we controlled for dyadic gender difference (0 = “no dyadic gender difference” vs. 1 = “dyadic gender difference”) because our analysis of pre-training differences revealed significant differences between the training/control groups on this demographic characteristic (see below). Third, we controlled for pre-training baseline levels of our focal variables (i.e., perceived similarity with coworker, stereotype threat, coworker’s perceived knowledge utility, transactive memory, contact quality, and knowledge transfer; Cronbach’s alpha ranged from .76 to .92). Thus, regression coefficients can be interpreted as changes in the dependent variables.

### ***Data Analysis***

Before conducting our hypotheses tests, we examined the missingness of our data. We found that 87.76% of the participants had provided complete item-level data. Overall, 5.22%

of values were missing. In line with recommendations on handling missing data, we adopted multiple imputation as a technique that creates unbiased parameter estimates and accurate standard errors (Little & Rubin, 2002; Newman, 2014). Rather than replacing missing values with a single value (i.e., single imputation), multiple imputation replaces missing values with a set of plausible values that reflect the uncertainty about the right value to impute. Specifically, we used the *mice* package (“Multiple Imputation by Chained Equations”) in *R* with predictive mean matching to create ten imputed datasets on which we ran repeated analyses and then pooled our results (see van Buuren & Groothuis-Oudshoorn, 2011).

Our data was hierarchically structured because one younger and one older coworker were nested within an age-diverse coworker dyad. To generate unbiased standard errors and coefficient estimates (Bliese & Hanges, 2004; Klein & Kozlowski, 2000; Raudenbush & Bryk, 2002), we accounted for this non-independence by denoting the dyad as the grouping variable in our hierarchical regression analyses. All analyses were performed in *R* (R Core Team, 2017). We used the package *lme4* to conduct the hierarchical regression analyses with maximum likelihood estimation.

Our regression-based approach is in line with the standard methodological procedures recommended to test effects of interventions and their mediating mechanisms (e.g., Campos et al., 2017; Kooij, van Woerkom, Wilkenloh, Dorenbosch, & Denissen, 2017). This approach allowed us to not only control for pre-training baseline differences but also compare the training of interest to both the passive waiting control group as well as the other active training group, which constitutes a highly robust test of the proposed relations. To test the indirect effects of the two interventions as proposed in Hypotheses 2 and 4, we used the Monte Carlo method to construct 95 percent confidence intervals (CI) around the point estimates of the indirect effects (Preacher & Selig, 2012; Selig & Preacher, 2008). If zero is not included in the CI, significance of the indirect effect can be assumed. We generated the estimates for the *a*-paths of the indirect effects by regressing each of the four proposed



mechanisms (Time 1) on the two dummy-coded training variables while controlling for their baseline levels (Time 0; in line with the tests for Hypotheses 1 and 3). To generate the estimates for the *b*-paths of the indirect effects, we regressed each of the two outcomes (Time 2) on the two dummy-coded training variables, while controlling for their baseline levels (Time 0), and both of the respective mediators (i.e., Hypothesis 2: perceived similarity and stereotype threat; Hypothesis 4: coworker's perceived knowledge utility and transactive memory).

## RESULTS

Table 2 reports the means, standard deviations, and intercorrelations of the study variables.

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Please insert Table 2 about here  
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### Pre-Training Baseline Differences

To rule out the possibility that our randomization was unsuccessful in creating experimental groups with comparable characteristics, we checked for several pre-training baseline differences between the two training groups and the control group using one-way ANOVA. First, we checked for group differences on our focal variables. We found no significant differences on perceived similarity with coworker,  $F(1,103) = 0.37, p = .55$ ; stereotype threat,  $F(1,103) = 1.00, p = .32$ ; coworker's perceived knowledge utility,  $F(1,102) = 0.29, p = .59$ ; transactive memory,  $F(1,102) = 0.90, p = .35$ ; contact quality,  $F(1,101) = 0.83, p = .36$ ; and knowledge transfer,  $F(1,101) = 2.28, p = .14$ . Second, we checked for group differences on relevant relational variables and demographic characteristics. We found no significant differences on dyad tenure,  $F(1,103) = 0.13, p = .72$ ; and their frequency of interaction,  $F(1,103) = 0.09, p = .35$ . In addition, we found no significant differences on age,  $F(1,103) = 0.07, p = .79$ ; gender,  $F(1,103) = 0.05, p = .82$ ; education (1 = primary school, 2 = secondary school, 3 = vocational education, 4 = bachelor/master degree, 5 = PhD/MBA),

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2  
3  $F(1,103) = 0.69, p = .41$ ; dyadic age difference,  $F(1,103) = 0.72, p = .40$ ; and dyadic  
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5 education difference (0 = “no dyadic education difference” vs. 1 = “dyadic education  
6  
7 difference”),  $F(1,100) = 0.52, p = .47$ . However, groups differed on dyadic gender difference  
8  
9 (0 = “no dyadic gender difference” vs. 1 = “dyadic gender difference”),  $F(1,100) = 10.17, p =$   
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1002), which is why we included dyadic gender difference as a control variable in our  
hypotheses tests.

### Hypotheses Tests

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Please insert Tables 3 and 4 about here  
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The results for the identity-oriented age diversity training program are presented in Table 3. In line with Hypotheses 1a and 1b, we found that the identity-oriented training led to (a) increased levels of perceived similarity ( $B = .49, SE = .20, p = .014$ ) and (b) reduced levels of stereotype threat ( $B = -.41, SE = .17, p = .021$ ). The effects on (a) perceived similarity ( $B = .27, SE = .18, p = .138$ ) and (b) stereotype threat ( $B = -.19, SE = .16, p = .245$ ) were non-significant for the knowledge-oriented training group. Hypothesis 2 predicted that the effect of the identity-oriented training on contact quality is transmitted via (a) increased perceived similarity and (b) reduced stereotype threat. We found support for Hypothesis 2a (*indirect effect* = .06, CI [.008, .140]), but not for Hypothesis 2b (*indirect effect* = .04, CI [-.010, .105]).

The results for the knowledge-oriented age diversity training program are presented in Table 4. We found support for the effects of the knowledge-oriented training proposed in Hypothesis 3a and 3b, as the effects on (a) coworker’s perceived knowledge utility ( $B = .58, SE = .23, p = .013$ ) and (b) transactive memory ( $B = .27, SE = .11, p = .014$ ) were significant. The effects on (a) coworker’s perceived knowledge utility ( $B = -.02, SE = .25, p = .925$ ) and (b) transactive memory ( $B = .20, SE = .12, p = .096$ ) were non-significant for the identity-oriented training group. Hypothesis 4 stated that the effect of the knowledge-oriented training on knowledge transfer is transmitted via increased (a) coworker’s perceived knowledge utility

and (b) transactive memory. We found support for both Hypothesis 4a (*indirect effect* = .10, CI [.006, .235]) and Hypothesis 4b (*indirect effect* = .12, CI [.019, .255]).

### Robustness Checks

We performed two robustness checks. First, we calculated our regression models using listwise deletion instead of multiple imputation and found that the interpretation of our results remained the same. Second, we calculated repeated measures ANOVAs with time (pre-training, post-training) as within-subjects factor and training group (control group, identity-training group, knowledge-training group) as between-subjects factor. Again, the interpretation of results remained the same. We found significant time x group interaction effects for perceived similarity ( $F(2) = 4.04, p = .021$ ), stereotype threat ( $F(2) = 4.59, p = .012$ ), perceived knowledge utility ( $F(2) = 5.44, p = .006$ ), and transactive memory ( $F(2) = 3.25, p = .043$ ).

### Supplemental Analysis

#### *Direct training effects*

Even though not hypothesized, we also tested the direct effects of the training programs on contact quality and knowledge transfer, respectively. We found that participants in the identity-oriented training reported increased levels of contact quality ( $B = .35, SE = .11, p = .002$ ), while this effect was non-significant for the knowledge-oriented training group ( $B = .11, SE = .10, p = .257$ ). Further, we found that the increase in knowledge transfer by participants in the knowledge-oriented training group was not significant ( $B = .33, SE = .19, p = .092$ ), even though the effect was more pronounced than the effect for the identity-oriented training group ( $B = .09, SE = .21, p = .671$ ).

#### *Action plans*

Furthermore, the content of the action plans developed by the dyads may also contain interesting behavioral information on potential differences in the planned activities of the age-diverse coworkers depending on whether they participated in the identity-oriented or the

## AGE DIVERSITY TRAINING

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3 knowledge-oriented age diversity training program, respectively.<sup>1</sup> As we encouraged  
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5 participants to take their action plans back to work to foster the implementation of their action  
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7 plans (Martin, 2010), we could not make use of the original documents. However, we were  
8  
9 able to explore the content of the action plans by relying on the information that participants  
10  
11 could remember in the follow-up calls. Specifically, a research assistant blind to the study  
12  
13 conditions, coded the action plan activities that participants reported in the follow-up calls.  
14  
15 Seven categories emerged from the data, namely [1] structural activities to increase  
16  
17 knowledge transfer (e.g., implementation of knowledge data bank; institutionalized  
18  
19 knowledge transfer process related to successions; change of work design to foster knowledge  
20  
21 exchange), [2] (knowledge-focused) meetings, [3] feedback sessions, [4] social events  
22  
23 between dyad members such as joint breakfasts / lunch / coffee / drinks as well as sports, [5]  
24  
25 teambuilding events, [6] support-oriented activities, and [7] a miscellaneous category that  
26  
27 could not be linked to identity- or knowledge-oriented activities (e.g., searching for external  
28  
29 sparring partners outside the dyad). The first three categories can be classified as action points  
30  
31 relating to the information/decision-making perspective, whereas the categories [4] to [6] fit  
32  
33 the scope of social identity theory.  
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40 Participants were able to retrieve in total 147 action points in the follow-up calls. Dyad  
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42 members of the identity-oriented training reported 56.94% of their activities in the identity-  
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44 oriented categories, 29.17% knowledge-related activities, and 13.89% action points that could  
45  
46 neither clearly be identified as identity- or knowledge-oriented. The majority (68.29%) of  
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48 activities within the identity-oriented categories focused on social events between dyad  
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50 members such as joint breakfasts / lunch / coffee / drinks as well as sports. Participants of the  
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52 knowledge-oriented training reported 61.33% knowledge-related activities, 34.67% of their  
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54 activities in the identity-oriented categories, and 4.00% action points that could neither clearly  
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<sup>1</sup> We thank an anonymous reviewer for this suggestion.

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3 be identified as identity- or knowledge-oriented. Most activities (63.04%) within the  
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5 knowledge-oriented categories focused on scheduling (knowledge-focused) meetings. These  
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7 results provide further qualitative support for our argument that the two age diversity training  
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9 programs trigger behavioral intentions that reflect the purpose of the respective program.  
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## 12 **DISCUSSION**

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14 Due to demographic change, organizations need to manage increasingly age-diverse  
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16 workforces. In this study, we advanced a dual pathway model based on social identity theory  
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18 and the information/decision-making perspective to test the distinct mechanisms and  
19  
20 outcomes of two types of age-diversity training: An identity-oriented age diversity training  
21  
22 aimed at addressing the heart of age-diverse coworkers and a knowledge-oriented age  
23  
24 diversity training aimed at addressing the mind of age-diverse coworkers. Using a randomized  
25  
26 controlled field experiment, we found that, in comparison to the control group and the other  
27  
28 training group, the identity-oriented training increased perceived similarity among age-diverse  
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30 dyad members and reduced stereotype threat, and indirectly facilitated contact quality via  
31  
32 perceived similarity. In contrast, the knowledge-oriented training facilitated knowledge  
33  
34 transfer via increasing coworkers' perceived knowledge utility and transactive memory. With  
35  
36 our findings, we aim to make theory-driven and effectiveness-tested tools available to  
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38 organizations to help them address the challenges and utilize the benefits of age-diverse  
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40 workforces.  
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### 46 **Theoretical Implications**

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48 Our study makes three contributions to the literature on diversity theory and age  
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50 diversity management. First, we advance diversity theory by adopting a bi-theoretical  
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52 approach and using social identity theory (Tajfel, 1982; Tajfel & Turner, 1986) and the  
53  
54 information/decision-making perspective (Williams & O'Reilly, 1998) to advance a dual  
55  
56 pathway model. Dual pathway models per se are not new in conceptual research on diversity  
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58 (Carter & Phillips, 2017; Van Knippenberg et al., 2004). Contemporary theories about team  
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3 diversity allude to the possibility of interactive effects by stating that stereotype threat  
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5 undermines knowledge exchanges (Van Knippenberg et al., 2004) or counteracts the positive  
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7 effects of similarity-attraction on knowledge exchange (Carter & Phillips, 2017). We take a  
8  
9 different approach with our dual pathway model and demonstrate that each pathway can be  
10  
11 triggered by a specific age diversity training, leading to either socioemotional or  
12  
13 sociocognitive benefits (i.e., contact quality, knowledge transfer) via theoretically aligned  
14  
15 mechanisms. Our dual pathway model thus positions identity- and knowledge-oriented  
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17 processes as two parallel roads to effective interactions among age-diverse coworkers that can  
18  
19 be initiated by age diversity training. In doing so, we contribute to theory development by  
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21 showing unique and dissociable effects of our two age diversity training programs.  
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26 Second, we advance diversity training research by adopting a process-based  
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28 perspective (Li et al., in press; Roberson et al., 2017) and specifying a program theory  
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30 (Astbury & Leeuw, 2010), to clarify the socioemotional and sociocognitive mechanisms  
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32 through which our two age diversity training programs facilitate effective interactions among  
33  
34 age-diverse coworkers. Such a process-based perspective has been missing from diversity  
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36 training research in general (Kulik & Roberson, 2008) and age diversity training research in  
37  
38 particular (see Table 1). Most importantly, we provide novel insights into the realization of  
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40 the sociocognitive benefits of diversity. Diversity theory suggests that the sociocognitive  
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42 benefits of diversity, such as knowledge transfer, are realized automatically when negative  
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44 social identity-related processes, such as bias activation, are absent (Carter & Phillips, 2017;  
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46 Van Knippenberg et al., 2004). However, our findings suggest that reducing identity-related  
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48 barriers does not suffice to increase knowledge transfer among age-diverse coworkers. In  
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50 contrast, specific processes (i.e., perceived knowledge utility and transactive memory) need to  
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52 be triggered through a knowledge-oriented age diversity training to reap the sociocognitive  
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54 benefits of age diversity. This focus on the active management of the sociocognitive processes  
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3 associated with age diversity also broadens the possible ways in which age diversity can be  
4 managed.  
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8 Interestingly, we did not find support for our assumption that stereotype threat would  
9 mediate the effect of the identity-oriented training on contact quality because the link between  
10 stereotype threat and contact quality was non-significant (after including pre-training  
11 stereotype threat and perceived similarity in the regression model). First, we think that part of  
12 the explanation is our sample size that limits our ability to detect effects. As evidenced by the  
13 significant bi-variate correlation between stereotype threat and contact quality, the link  
14 between the two variables seems to be relevant but potentially too small to be detected with  
15 limited power in a small sample. Second, a conceptual explanation for this non-significant  
16 finding might be that stereotype threat will not always lead to negative effects on contact  
17 quality because some individuals display a challenge reaction and aim to disconfirm the  
18 stereotype after they have experienced stereotype threat (Hehman & Bugental, 2013; Vick,  
19 Seery, Blascovich, & Weisbuch, 2008). This might imply that some employees who  
20 experience stereotype threat invest in their relationship rather than withdraw from it, which  
21 might lead to an overall non-significant effect. Third, and more broadly, this non-significant  
22 finding can also be considered against the backdrop of diversity research that has pointed to  
23 the value of identity-based differences and mechanisms as catalysts for interactions in diverse  
24 groups (Carter & Phillips, 2017; Phillips & Loyd, 2006). As such, positioning identity-related  
25 processes, such as stereotype threat, solely as challenges might be too simplistic because  
26 valuable differences between diverse employees can also fall along identity lines.  
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51 Finally, we add to the literature on diversity management (Nishii, Khattab, Shemla, &  
52 Paluch, 2018) by demonstrating the effectiveness of two different age diversity training  
53 programs. Our study represents one of the few empirical demonstrations of causality in a field  
54 setting with real workplace interactions, which substantiates the robustness of our findings.  
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60 Furthermore, the two training programs are of unique value given that the literature on age

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3 diversity training is very limited. Accordingly, most diversity training programs have focused  
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5 on diversity categories such as gender and ethnicity (Bezrukova et al., 2012), while age-specific  
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7 training initiatives have received much less attention (Schloegel et al., 2016). To date it is  
8  
9 unclear whether findings about other diversity categories can be transferred to age groups  
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11 because age as a diversity category has some unique features. For example, as generation theory  
12  
13 outlines (Joshi et al., 2010), employees from different age groups possess unique knowledge  
14  
15 and perspectives due to the nestedness of their educational and socialization experiences in  
16  
17 time. In addition, the permeability of this category of diversity is high; older employees have  
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19 been young in the past and younger employees will become older employees in the future  
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21 (North & Fiske, 2012), which is typically not the case for other diversity categories such as  
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23 gender or ethnicity. Due to the specific characteristics of age as a diversity category, it seems  
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25 relevant to design training programs that are focused on the specific challenges and benefits  
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27 of age diversity.  
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### 33 **Practical Implications**

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35 Our findings have relevant implications for practitioners. Most importantly, our study  
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37 emphasizes that organizations can utilize age diversity training to address the challenges and  
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39 utilize the benefits of their age-diverse workforces. In order to realize the socioemotional and  
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41 sociocognitive benefits of interactions among age-diverse coworkers, organizations are  
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43 advised to implement our age diversity training (i.e., identity-based, knowledge-based, or  
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45 combined age diversity training).  
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50 In organizations in which categorization into age-based groups and intergenerational  
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52 tensions represent a challenge that needs to be addressed (Kunze et al., 2011; North & Fiske,  
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54 2015), the identity-oriented training might be more useful. For example, in more traditional  
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56 organizations in which age, seniority, and status are highly intertwined, separation into age-  
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58 based subgroups could be more likely and might represent a challenge for effective  
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60 interactions among age-diverse coworkers. In organizations in which the opportunities



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3 inherent in the non-redundant and valuable knowledge of age-diverse coworkers are not fully  
4 realized, even though age-based sub-grouping and intergenerational tensions are not a  
5 hindrance, the knowledge-oriented training might be more useful. For example, coworkers  
6 might experience their relationships as positive and mingle with age-diverse coworkers, but  
7 they might be unaware of the dormant potential inherent in their different knowledge, skills,  
8 and experiences. In many organizations it may be difficult if not impossible to exactly  
9 pinpoint whether interactions among age-diverse employees are hampered by  
10 intergenerational tensions or a lack of mutual knowledge awareness. There can also be  
11 organizations in which both pathways need to be improved. In these cases, organizations may  
12 choose to implement an integrated training to yield the largest benefits given time and budget  
13 restrictions (for more details see Appendix B).

### 24 **Limitations and Future Research Directions**

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Despite our contribution to the literature on the management of age diversity and the  
methodological strength of our study, several limitations need to be considered when  
interpreting the results. First, age-diverse coworker dyads were asked to sign up voluntarily  
for the study, which might have introduced selection bias. An alternative sample generation  
approach would have been to randomly select participating dyads from the pool of all eligible  
dyads within the companies, however, this was not feasible given the ethical and practical  
problems with involuntary training participation. Our sample generation approach might  
imply that employees who signed up might have been more motivated to engage with the  
topic of age diversity than the average employee because they self-selected themselves into a  
half-day training on age diversity. Further, as employees needed to sign up together with an  
age-diverse coworker, it is possible that dyads who had a good relationship before the training  
may have been more likely to volunteer. This might have introduced a positive selection bias  
in our sample, which potentially restricted the range of variable values. This does not,  
however, threaten the validity of our findings. In fact, range restriction would imply that our

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3 analysis presents a more conservative test of our hypotheses, and the effects of the training  
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5 might be even greater if dyads had been chosen randomly.  
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8       Second, even though we manipulated our independent variable and time-separated the  
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10 mediator and outcome variables in line with methodological recommendations (Podsakoff,  
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12 MacKenzie, Lee, & Podsakoff, 2003), our survey-based measures are based on self-reports.  
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14 We chose self-reports as our constructs of interest concern internal psychological processes or  
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16 dyad-specific outcomes that are difficult to assess objectively or through other-report by non-  
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18 dyad members (Conway & Lance, 2010). Nonetheless, the use of self-report measures might  
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20 have introduced common method bias and led to inflated effect sizes between mediator and  
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22 outcome variables. Future research can address this limitation by examining outcomes that  
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24 can more easily be captured by objective measures or other report.  
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28       Third, future studies need to establish the effectiveness of our age diversity training  
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30 programs in different countries and over longer time periods. Switzerland represents a  
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32 Western, industrialized, and individualistic country. Research showed that reactions to  
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34 diversity training can differ between countries, such that trainees from more individualistic  
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36 countries are more receptive to diversity training than trainees from more collectivistic  
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38 countries (Holladay & Quiñones, 2005). Future research can establish the cross-cultural  
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40 generalizability of our findings in more collectivistic countries (House, Javidan, & Dorfman,  
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42 2001). Further, future research can examine the maintenance of training effects. In doing so,  
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44 researchers need to consider possible boundary conditions of long-term training effects. For  
45  
46 example, maintenance of training effects can be affected by need for cognition (Mensmann &  
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48 Frese, 2019), such that employees who enjoy cognitively challenging activities might benefit  
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50 more strongly from training. In addition, researchers may wish to examine training effects on  
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52 more distal employee outcomes (e.g., innovative behavior), to further substantiate the  
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54 effectiveness of the two age diversity training programs.  
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3 Fourth, our sample size is relatively small, which limited the power of our study and  
4 thus our ability to examine boundary conditions of the training programs (Dawson, 2014). We  
5 acknowledge this important limitation even though comparable field experiments, which tried  
6 to manipulate identity-related or knowledge-related variables, have used similar sample sizes  
7 (see Tables 1A and 1B). Nonetheless, future research needs to replicate our findings using  
8 larger sample sizes to further support their robustness. In addition, future research can  
9 advance our findings by examining for whom and under which conditions the two diversity  
10 training programs are most effective. For example, employees with more positive age  
11 diversity beliefs might respond more favorable to the training programs because they  
12 generally enjoy interacting with dissimilar others (Homan, Buengeler, Eckhoff, van Ginkel, &  
13 Voelpel, 2015). In addition, characteristics of the dyad, such as relationship length and  
14 closeness, might shape training effects because the availability of more accurate information  
15 about others reduces activation of and reliance on age stereotypes (Finkelstein, Burke, &  
16 Raju, 1995). Finally, the extent to which participants' supervisors create an age-inclusive  
17 environment by engaging in age-inclusive leadership (Wegge et al., 2012) is also likely to  
18 shape participants' ability to implement the acquired knowledge in their daily work practices  
19 and needs to be examined as a possible boundary condition in future studies.

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22 Fifth, although we had good reasons to focus on age as a social category, other social  
23 identity similarities and differences of the participants might be relevant as well. According to  
24 intersectionality theory, multiple social categories and their interactions should be taken into  
25 account when trying to understand the effects of diversity on work outcomes, because an  
26 older and younger worker are never solely an older and younger worker but always an older  
27 and younger something (e.g., a younger black female or an older white male; Cole, 2009;  
28 Marcus & Fritzsche, 2015). Whether combinations of social categories attenuate or strengthen  
29 the negative and positive consequences of age diversity depends on the contextual age  
30 salience and the combination of social categories. For example, age salience is less likely to  
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## AGE DIVERSITY TRAINING

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3 influence the work outcomes of older white men, because white men are the dominant societal  
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5 group in contemporary Western society. On the other hand, age salience is more likely to  
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7 influence the work outcomes of older white women; when age becomes salient, older white  
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9 women are likely to identify as “older female” instead of as “white female” and as a result  
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11 will experience the additive and unfavorable consequences of a double minority status  
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13 (Barnum, Liden, & Ditomaso, 1995). Since our training programs provided an age-salient  
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15 context, the combination of social categories in the dyads can potentially influence the  
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17 effectiveness of the training programs. Although our sample size restricted us from  
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19 conducting moderator analyses, future research should examine whether and how  
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21 combinations of social categories in the dyads (e.g., a dyad of a younger female with an older  
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23 male worker versus a dyad of a younger male and older female worker) influence the  
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25 effectiveness of the training programs. These future studies could also incorporate  
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27 subjectively measured demographics, such as subjective age, since group membership is  
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29 largely perceptual and these subjective perceptions are the predominant drivers of work  
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31 outcomes (Marcus & Fritzsche, 2015).  
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38 Finally, while we were able to show that the two age diversity training programs have  
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40 unique effects, a naturally arising question is whether combining the two age diversity  
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42 training programs would be even more effective than the individual training programs. This  
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44 question is particularly relevant for future research, given that contemporary theories about  
45  
46 team diversity already aimed to reconcile the opposing predictions implied by social identity  
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48 theory and the information/decision-making perspective (Carter & Phillips, 2017; Van  
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50 Knippenberg et al., 2004). To facilitate research on the effectiveness of an integrated age  
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52 diversity training, we conducted a pilot study in which we tested the effectiveness of an  
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54 integrated age diversity training program with 20 age-diverse coworker dyads (see Appendix  
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56 B for details). We found that the integrated age diversity training increased perceived  
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58 similarity among coworkers and transactive memory system. Our initial findings from the  
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## AGE DIVERSITY TRAINING

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3 training integration study suggest that both pathways can be triggered with a combined  
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5 training. These findings are an encouraging first step toward developing and testing an  
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7 integrated program theory with respect to the utility of a combined version of our two age  
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9 diversity training programs. We hope that future research continues these efforts to create and  
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11 test training interventions that enable employee to experience pleasant and effective  
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13 interactions with their age-diverse coworkers.  
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AGE DIVERSITY TRAINING

TABLE 1a: Review of the Age Diversity Training Literature: Theories and Key Constructs

Article information					Theory and key constructs					
#	Authors	Year	Title	Journal	Theory	Manipulated variable	Training focus	Outcomes	Mediators	Moderators
1	Jungmann, Wege, Liebermann, Ries, & Schmidt	2020	Improving Team Functioning and Performance in Age-Diverse Teams: Evaluation of a Leadership Training	Work, Aging and Retirement	Social identity theory	Age-inclusive leadership	Identity	Negative age stereotypes; Appreciation of age diversity; Conflict; Innovative behavior; Team identification	None	Age
2	Sun, Lou, Dai, To, & Wong	2019	The Effectiveness of the Young–Old Link and Growth Intergenerational Program in Reducing Age Stereotypes	Research on Social Work Practice	Contact theory	Interaction across age groups	Identity	Intergenerational attitude; Inter(age)group comfort; Intergroup interaction	None	None
3	Beyer, Wolff, Freiburger, & Wurm	2019	Are Self-perceptions of Ageing Modifiable? Examination of an Exercise Programme With vs. Without a Self-perceptions of Ageing-intervention for Older Adults	Psychology and Health	Not specified	Ageing perceptions; Physical exercise	Identity	Physical functioning; Mental health	None	None
4	Schloegel, Stegmann, Maedche, & van Dick	2016	Reducing Age Stereotypes in Software Development: The Effects of Awareness- and Cooperation-based Diversity Interventions	The Journal of Systems and Software	Contact hypothesis	Age stereotypes	Identity	Bias in performance expectations; Innovation expectations	None	Job role
5	Levy, Pilver, Chung, & Slade	2014	Subliminal Strengthening: Improving Older Individuals' Physical Function Over Time With an Implicit-Age-Stereotype Intervention	Psychological Science	Ideomotor theory; Stereotype embodiment theory	Age stereotypes	Identity	Physical functioning	Ageing perceptions	Age stereotypes
6	Reynolds	2010	Aging and Disability Awareness Training for Drivers of a Metropolitan Taxi Company	Activities, Adaptation & Aging	Adult learning theory	Age; Disability awareness	Identity	Attitudes towards aging	None	None
7	Charness & Velleval	2009	Cooperation, Competition, and Risk Attitudes: An Intergenerational Field and Laboratory Experiment	American Economic Review	Human capital theory; Theory of deferred compensation	Age of co-players	Neither	Risk aversion	None	None
8	Egan & Song	2008	Are Facilitated Mentoring Programs Beneficial? A Randomized Experimental Field Study	Journal of Vocational Behavior	Not specified	Mentoring	Identity	Job satisfaction; Commitment; Person-organization fit; Performance	None	None
9	Kulik, Perry, & Bourhis	2000	Ironic Evaluation Processes: Effects of Thought Suppression on Evaluations of Older Job Applicants	Journal of Organizational Behavior	Ironic processes theory	Thought suppression; Busyiness; Applicant age	Neither	Hiring decisions	None	None

## AGE DIVERSITY TRAINING

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TABLE 1b: Review of the Age Diversity Training Literature: Training Designs and Methods

Article information			Training					Method					
#	Authors	Year	Design	Training delivery	# of sessions	Session duration	Training period	Sample size	Sample type	Sample origin	# waves	Data analysis	Study duration
1	Jungmann, Wegge, Liebermann, Ries, & Schmidt	2020	Randomized controlled field experiment	Classroom	3	2 x 8 hours 1 x 4 hours	2.5 days	47 supervisors 221 employees	Employees	Germany	3	Regression t-tests	1 year
2	Sun, Lou, Dai, To, & Wong	2019	Quasi-experiment	Classroom	6	120 minutes	6 weeks	312	Citizens (non-work)	Hong Kong	3	ANOVA	6 weeks
3	Beyer, Wolff, Freiburger, & Wurm	2019	Randomized controlled field experiment	Classroom	4	25 minutes	6 weeks	84	Older adults	Germany	4	Regression	16 weeks
4	Schloegel, Stegmann, Maedche, & van Dick	2016	Study 1: quasi-experiment Study 2: randomized controlled field experiment	Classroom	1	1 day	1 day	Study 1: 56 Study 2: 74	Software developers	China	3	ANCOVA	18 months
5	Levy, Pilver, Chung, & Slade	2014	Randomized controlled field experiment	Technology-mediated	4	Not specified	4 weeks	100	Older individuals	U.S.	8	ANCOVA and SEM	8 weeks
6	Reynolds	2010	Quasi-experiment	Classroom	3	90 minutes	2 weeks	40	Taxi drivers	U.S.	2	t-tests	2 weeks
7	Charness & Villeval	2009	Study 1: field experiment Study 2: laboratory experiment	Not specified	Not specified	75 minutes	Not specified	Study 1: 87 Study 2: 72	Study 1: employees Study 2: students/retirees	France	2	Tobit model	1 day
8	Egan & Song	2008	Randomized controlled field experiment	Classroom	6	unclear	6 months	158	Employees	U.S.	2	MANCOVA ANCOVA	6 months
9	Kulik, Perry, & Bourhis	2000	Randomized controlled laboratory experiment	Not specified	Not specified	unclear	Not specified	116	Undergraduate students	U.S.	2	ANOVA Regression	1 month

AGE DIVERSITY TRAINING

TABLE 2

Means, Standard Deviations, and Intercorrelations of the Study Variables

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Company <sup>a</sup>	0.44	0.50															
2. Gender difference <sup>b</sup>	0.35	0.48	-.06														
3. Identity training	0.30	0.46	.07	-.30**													
4. Knowledge training	0.35	0.48	.04	.06	-.48**												
5. Perceived similarity (T0)	4.81	1.16	.04	.21*	.07	-.23*											
6. Perceived similarity (T1)	5.17	1.11	.07	.10	.21*	-.14	.74**										
7. Stereotype threat (T0)	2.20	1.00	-.06	-.06	.08	.00	-.25*	-.20*									
8. Stereotype threat (T1)	1.99	0.79	-.25*	.05	-.15	-.03	-.39**	-.43**	.56**								
9. Knowledge utility (T0)	5.10	1.24	-.07	-.04	-.02	-.06	.48**	.44**	-.16	-.06							
10. Knowledge utility (T1)	5.17	1.25	-.09	-.02	-.16	.18 <sup>†</sup>	.37**	.21*	-.13	-.14	.70**						
11. TMS (T0)	5.66	0.54	.04	.16	-.04	-.07	.58**	.53**	-.44**	-.34**	.39**	.26**					
12. TMS (T1)	5.67	0.58	.10	.13	-.01	.11	.50**	.59**	-.20 <sup>†</sup>	-.38**	.41**	.42**	.68**				
13. Contact quality (T0)	6.13	0.69	-.03	.09	-.02	-.11	.57**	.53**	-.50**	-.44**	.38**	.24*	.67**	.54**			
14. Contact quality (T2)	6.25	0.58	-.15	.07	.16	-.14	.57**	.58**	-.34**	-.43**	.41**	.28**	.48**	.53**	.69**		
15. Knowledge transfer (T0)	5.15	1.08	-.17 <sup>†</sup>	.09	-.07	-.11	.38**	.32**	-.06	.04	.63**	.55**	.33**	.34**	.37**	.31**	
16. Knowledge transfer (T2)	5.28	0.94	-.14	.01	-.08	.10	.23*	.34**	-.15	-.12	.49**	.55**	.29**	.47**	.27**	.44**	.55**

Note. *N* = 54 dyads (108 participants). <sup>a</sup> 0 = “Company A” vs. 1 = “Company B”. <sup>b</sup> 0 = “no dyadic gender difference” vs. 1 = “dyadic gender difference”. T = time point of data collection. TMS = transactive memory. <sup>†</sup> *p* < .10, \* *p* < .05, \*\* *p* < .01.

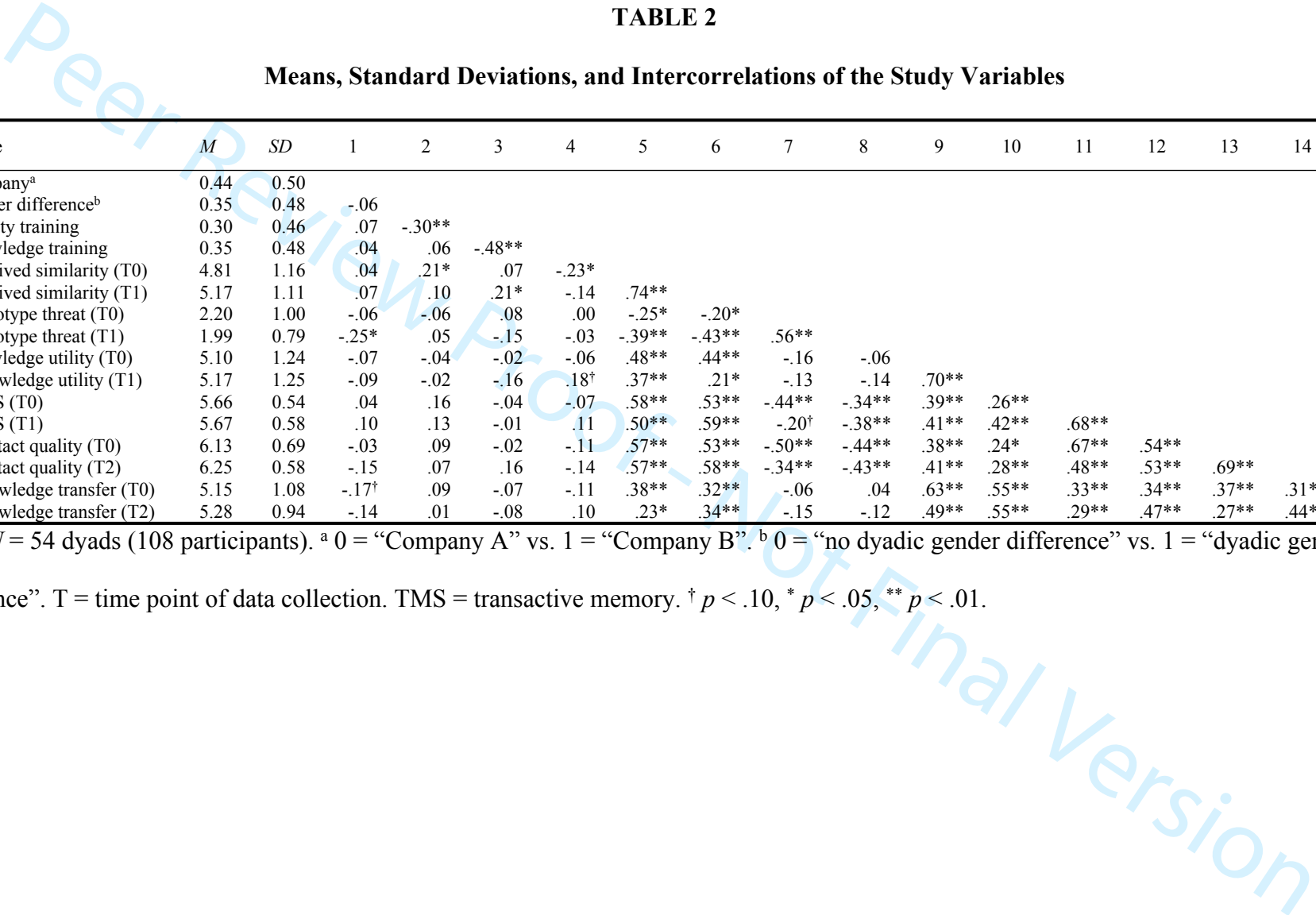


TABLE 3

## Results of Hierarchical Regression Analysis: Identity-Oriented Training

Variable	Perceived similarity (T1)		Stereotype threat (T1)		Contact quality (T2)	
	<i>Estimate</i>	<i>SE</i>	<i>Estimate</i>	<i>SE</i>	<i>Estimate</i>	<i>SE</i>
Intercept	1.50**	.34	1.28**	.20	3.16**	.51
Company <sup>a</sup>	.04	.15	-.30*	.14	-.20*	.08
Dyadic gender difference <sup>b</sup>	-.05	.17	.06	.14	.08	.09
Pre-training perceived similarity (T0)	.72**	.07				
Pre-training stereotype threat (T0)			.46**	.06		
Pre-training contact quality (T0)					.42**	.07
Identity-oriented training	.49*	.20	-.41*	.17	.23*	.11
Knowledge-oriented training	.27	.18	-.19	.17	.08	.10
Post-training perceived similarity (T1)					.13**	.04
Post-training stereotype threat (T1)					-.09	.06
<i>Pseudo-R</i> <sup>2</sup>	.32		.24		.51	

Note.  $N = 54$  dyads (108 participants). <sup>a</sup> 0 = "Company A" vs. 1 = "Company B". <sup>b</sup> 0 = "no dyadic gender difference" vs. 1 = "dyadic gender difference". \*  $p < .05$ , \*\*  $p < .01$ .

TABLE 4

Results of Hierarchical Regression Analysis: Knowledge-Oriented Training

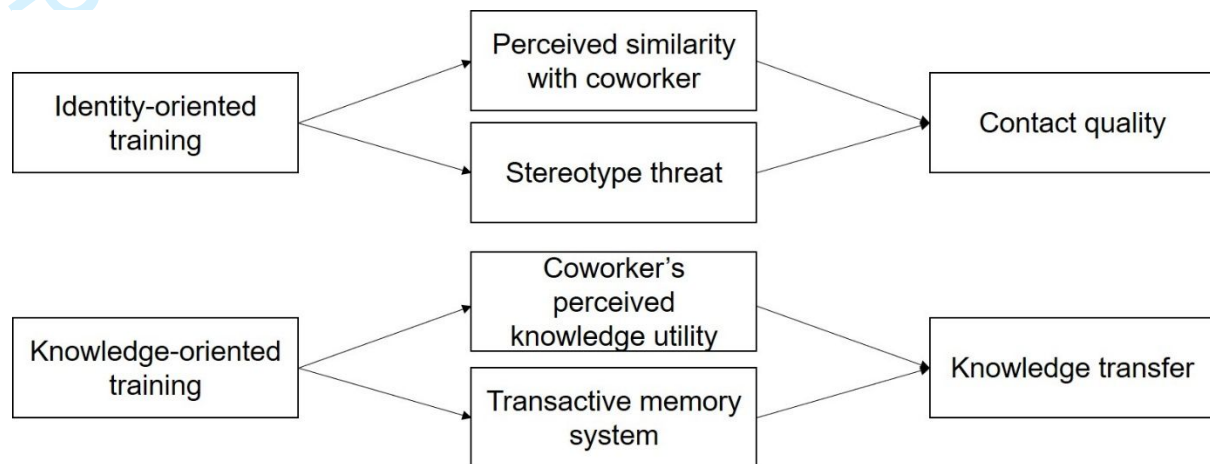
Variable	Perceived knowledge utility (T1)		Transactive memory (T1)		Knowledge transfer (T2)	
	<i>Estimate</i>	<i>SE</i>	<i>Estimate</i>	<i>SE</i>	<i>Estimate</i>	<i>SE</i>
Intercept	1.28**	.42	1.28**	.45	0.54	.73
Company <sup>a</sup>	-.09	.19	.07	.09	-.17	.16
Dyadic gender difference <sup>b</sup>	.02	.22	.07	.10	-.14	.17
Pre-training perceived knowledge utility (T0)	.73**	.07				
Pre-training transactive memory (T0)			.74**	.08		
Pre-training knowledge transfer (T0)					.29**	.08
Identity-oriented training	-.02	.25	.20	.12	-.01	.19
Knowledge-oriented training	.58*	.23	.27*	.11	.11	.19
Post-training perceived knowledge utility (T1)					.17*	.07
Post-training transactive memory (T1)					.43**	.14
<i>Pseudo-R</i> <sup>2</sup>		.28		.41		.29

Note. *N* = 54 dyads (108 participants). <sup>a</sup> 0 = "Company A" vs. 1 = "Company B". <sup>b</sup> 0 = "no dyadic gender difference" vs. 1 = "dyadic gender difference". \* *p* < .05, \*\* *p* < .01.



FIGURE 1

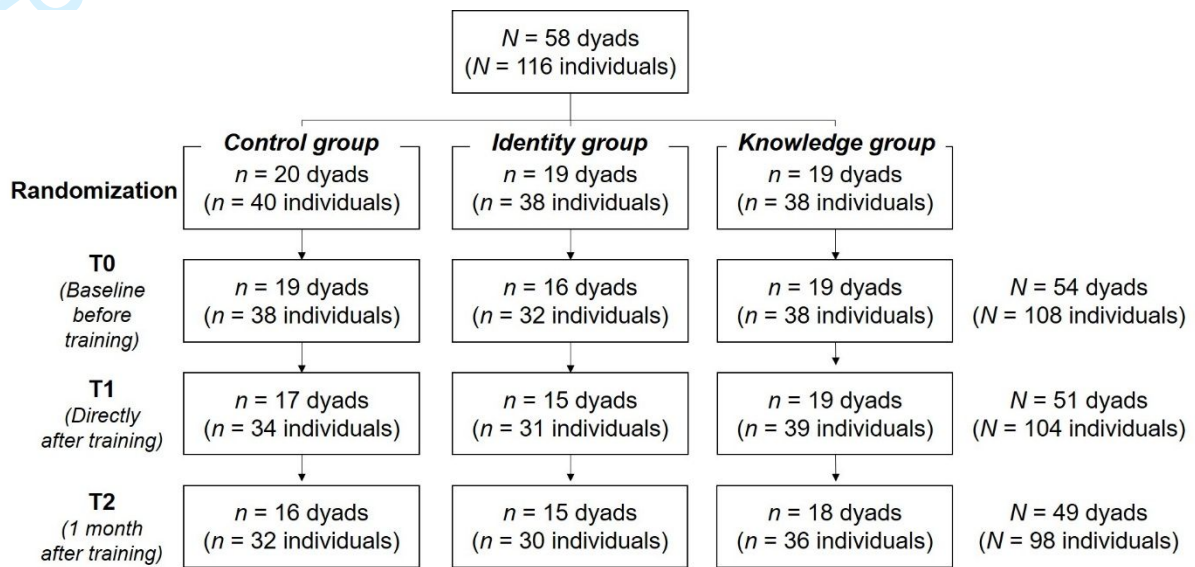
## Conceptual Model



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FIGURE 2

## Sample Randomization and Attrition



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FIGURE 3

## Modules and Activities of The Age Diversity Training Programs

Identity-oriented training		Knowledge-oriented training	
Module	Activities / content	Module	Activities / content
1 Introduction to age diversity	Information on demographic change Discussion on (dis)advantages	1 Introduction to age diversity	Information on demographic change Discussion on (dis)advantages
2 Reflection on own and partner's bias	Intergroup attribution exercise Reflection on (meta)stereotypes Group discussion	2 Scientific input	Theoretical background on information/decision-making perspective and knowledge types
3 Scientific input	Theoretical background on social identity and categorization theory, in-group bias, and stereotypes	3 Reflection on own and partner's knowledge	Reflection and visualization of own and partner's knowledge and skills based on "knowledge trees"
4 Identity integration	Identification of shared and unique identity aspects; overarching identity Visual summary	4 Knowledge integration	Identification of shared and unique knowledge aspects Visual summary
5 Development of action plan	Agreement on three joint activities and planning of follow-up meeting	5 Development of action plan	Agreement on three joint activities and planning of follow-up meeting
6 Reflection: Lessons learned	Discussion of takeaways in terms of new knowledge, skills, and attitudes	6 Reflection: Lessons learned	Discussion of takeaways in terms of new knowledge, skills, and attitudes

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AGE DIVERSITY TRAINING

APPENDIX A

TABLE A1

Demographics Across Experimental Groups

Experimental group	% Females	% Female same-gender dyads	% Male same-gender dyads	% Mixed gender dyads	Education	Age		Organizational tenure		Dyad tenure	
						<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Waiting control	35%	11%	39%	50%	11% PhD/MBA 16% bachelor/master 65% apprenticeship 8% high school	41.49	13.45	14.00	11.59	3.75	2.46
Identity training	32%	27%	60%	13%	7% PhD/MBA 29% bachelor/master 61% apprenticeship 3% high school	40.55	13.59	13.73	9.80	3.50	2.45
Knowledge training	38%	17%	44%	39%	11% PhD/MBA 38% bachelor/master 43% apprenticeship 8% high school	41.35	14.79	13.91	12.31	3.31	3.30

Note. N = 54 dyads (108 participants).

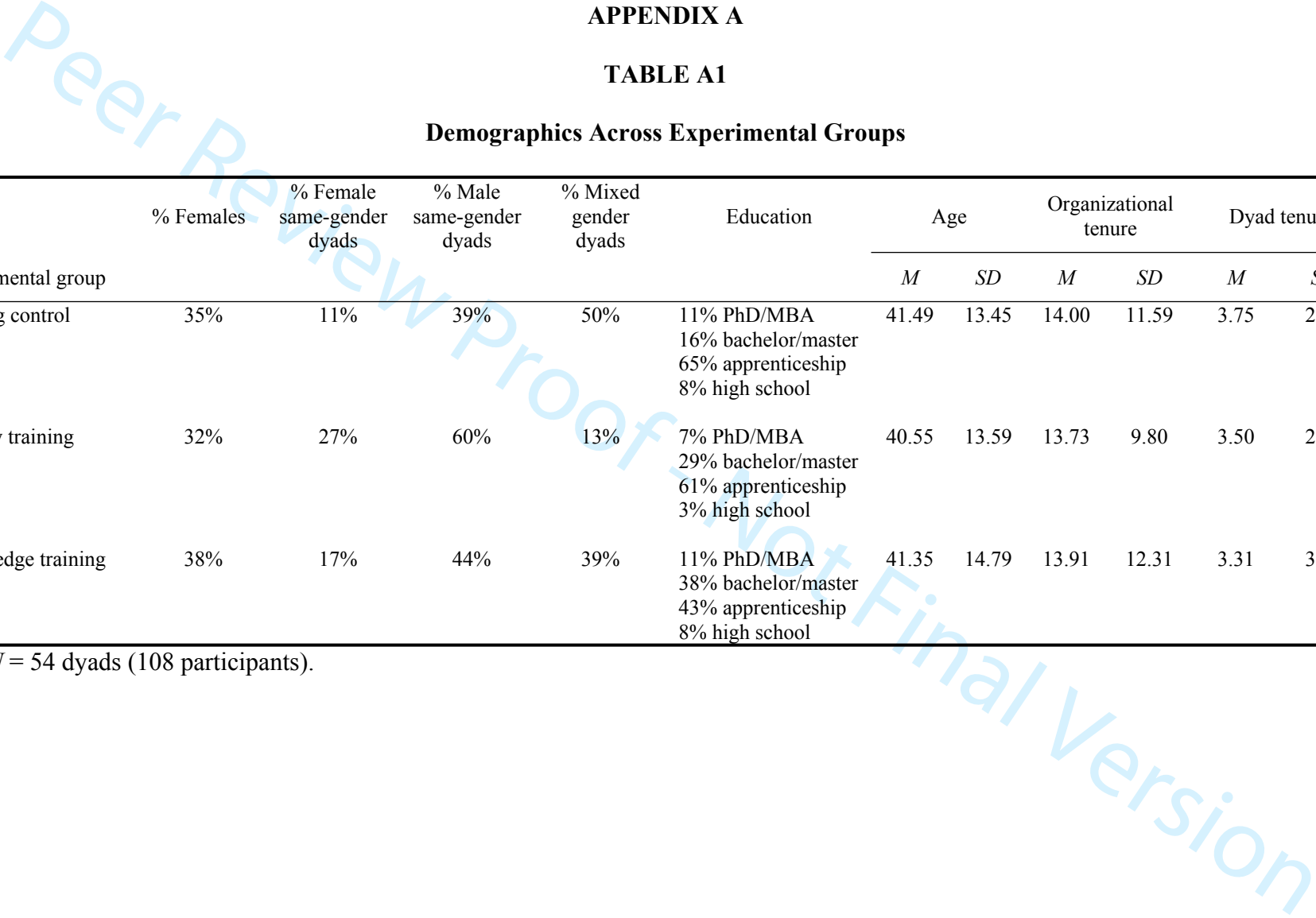


TABLE A2

## Means Across Experimental Groups and Age Groups on Focal Variables

Experimental group	Perceived similarity		Stereotype threat		Contact quality		Perceived knowledge utility		Transactive memory		Knowledge transfer	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Waiting control												
Pre-training	5.01	1.23	2.11	1.11	6.29	0.59	5.29	1.28	5.73	0.57	5.44	0.85
Younger dyad members	4.90	1.25	2.35	1.33	6.30	0.66	5.69	1.22	5.74	0.47	5.85	0.69
Older dyad members	5.12	1.23	1.86	0.79	6.28	0.53	4.91	1.25	5.71	0.65	5.05	0.81
Post-training	5.08	1.00	2.19	0.86	6.29	0.56	5.10	1.33	5.58	0.59	5.24	0.92
Younger dyad members	5.06	0.97	2.31	0.91	6.20	0.53	5.42	1.33	5.55	0.49	5.55	0.81
Older dyad members	5.10	1.06	2.06	0.82	6.38	0.59	4.79	1.31	5.60	0.69	4.95	0.95
Knowledge training												
Pre-training	4.45	1.30	2.16	0.86	5.99	0.79	4.98	1.37	5.62	0.57	4.99	1.23
Younger dyad members	4.65	0.95	2.57	0.99	6.06	0.86	5.25	1.39	5.68	0.45	5.65	0.80
Older dyad members	4.28	1.55	1.79	0.50	5.93	0.73	4.74	1.34	5.58	0.67	4.36	1.26
Post-training	4.94	1.40	1.97	0.92	6.16	0.71	5.46	1.10	5.74	0.64	5.43	0.94
Younger dyad members	4.88	1.41	2.18	1.07	6.15	0.72	6.01	0.72	5.84	0.48	5.60	1.00
Older dyad members	5.00	1.44	1.79	0.74	6.18	0.72	4.97	1.17	5.65	0.76	5.26	0.87
Identity training												
Pre-training	4.91	0.84	2.38	1.02	6.06	0.72	5.02	1.08	5.60	0.49	4.99	1.12
Younger dyad members	4.93	0.83	2.20	0.71	6.10	0.75	5.53	0.89	5.63	0.51	5.45	0.73
Older dyad members	4.89	0.88	2.56	1.26	6.02	0.70	4.50	1.02	5.57	0.49	4.53	1.27
Post-training	5.51	0.72	1.83	0.44	6.38	0.47	4.90	1.33	5.65	0.52	5.17	0.99
Younger dyad members	5.53	0.64	1.91	0.29	6.38	0.53	5.48	1.26	5.72	0.45	5.73	0.44
Older dyad members	5.49	0.82	1.76	0.54	6.38	0.42	4.32	1.17	5.58	0.60	4.60	1.07

Note. *N* = 54 dyads (108 participants).

**APPENDIX B****PILOT TRAINING INTEGRATION STUDY**

Building on contemporary diversity theories that aimed to reconcile the social identity theory and information/decision-making perspective (Carter & Phillips, 2017; Van Knippenberg et al., 2004), we took a first step towards developing and testing an integrated training program. After having learned about the utility of an age-diverse coworker's knowledge, employees may be more alert to opportunities for knowledge exchange. In addition, identifying and feeling more similar with the coworker—as stimulated by the identity-related intervention pathway—will likely enhance the employee's motivation to interact with the coworker and to make use of the available knowledge transfer opportunities. As a result, the socioemotional and the cognitive pathways triggered by our age-diversity training programs might reinforce each other's effects.

**Sample**

To test the influence of an integrated age diversity training program, we recruited an independent sample of 20 age-diverse coworker dyads (average age = 46.54 years with a *SD* of 12.50; average age difference = 20.26 years with a *SD* of 6.57; average dyad tenure = 3.96 years with a *SD* of 2.79; 74% were female) from a university in the Netherlands. Participants worked in different faculties in non-academic positions. Age-diverse coworker dyads received a coffee voucher worth €30 for their participation. All participants received a combined version of the identity-oriented and knowledge-oriented training. We decided to omit a control group for pragmatic reasons as the sample size was too small to split participants into two groups. In terms of adaptation of the training, combination of the content from the identity-oriented and the knowledge-oriented training meant that we extended the training duration by half an hour. Further, we reduced the time allocated to the explanation of theoretical background (i.e., social identity theory, information/decision-

making perspective) and the time for reflection on own biases and knowledge. This reduction allowed us to implement shortened but sufficiently similar versions of the age-diversity training programs used in our main study.

### Procedure and Measures

A Dutch PhD student in HR Management delivered all training sessions as a half-day workshop format (i.e., 4.5 hours; see Figure B1). Age-diverse dyads could choose to participate at one of three training dates. The language of instruction was Dutch. Participants responded to a pre-training baseline questionnaire and a post-training questionnaire directly after the workshop. Both questionnaires included measures for one socioemotional (i.e., perceived similarity,  $\alpha = .82$ ; e.g., “My colleague and I are alike in a number of areas”) and one sociocognitive mechanism (i.e., transactive memory,  $\alpha = .71$ ; e.g., “I have knowledge about an aspect of our work that my colleague does not have”) outlined in our dual pathway model.

### Analysis and Results

We analyzed the data using paired samples t-tests to compare pre-training and post-training mean values. We found significant differences for both perceived similarity with coworker ( $M_{\text{pre-training}} = 4.63$ ,  $M_{\text{post-training}} = 5.20$ ,  $t = 3.52$ ,  $df = 30$ ,  $p = .001$ ), and transactive memory ( $M_{\text{pre-training}} = 5.51$ ,  $M_{\text{post-training}} = 5.79$ ,  $t = 3.49$ ,  $df = 30$ ,  $p = .002$ ). These findings are encouraging with respect to the utility of an integrated version of our age diversity training. Unfortunately, the small sample size in combination with the drop-out over time prevented us from administering a 1-month follow up questionnaire with the outcome variables (knowledge transfer and contact quality). Consequently, our training integration study must be considered merely as a first step towards developing and testing an integrated program theory.

FIGURE B1

### Modules and Activities of The Integrated Age Diversity Training Program

Integrated training	
Module	Activities / content
1 Introduction to age diversity	Information on demographic change Discussion on (dis)advantages
2 Reflection on own and partner's bias	Reflection on (meta)stereotypes Group discussion
3 Scientific input 1	Theoretical background on social identity and categorization theory, in-group bias, and stereotypes
4 Identity integration	Identification of shared and unique identity aspects; overarching identity Visual summary
5 Scientific input 2	Theoretical background on information/decision-making perspective and knowledge types
6 Reflection on own and partner's knowledge	Reflection and visualization of own knowledge and skills based on "knowledge trees"
7 Knowledge integration	Identification of shared and unique knowledge aspects Visual summary
8 Development of action plan	Agreement on three joint activities and planning of follow-up meeting
9 Reflection: Lessons learned	Discussion of takeaways in terms of new knowledge, skills, and attitudes