Animalistic dehumanization of older people by younger ones: Variations of humanness

perceptions as a function of a target's age

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Abstract

The present work investigated associations of older people with humanness. Focusing on complementary approaches (attribute-based, metaphor-based, and target-based), four studies tested the hypothesis that older people are the targets of animalistic dehumanization. Using an emotional attribution task, Study 1 (N = 112) explored infrahumanization and shows that young participants attributed more uniquely human emotions to young people than to older ones. No such effect occurred with regards to non-uniquely human emotions. Results of Study 2 (N = 62) replicated this results using a lexical decision task. Using the metaphor-based approach, Study 3 (N = 99) confirmed that older people's dehumanization is restricted to its animalistic form and does not extend to the mechanistic one. Finally, in Study 4 (N = 167), we used a target-based approach, and showed that characteristics initially attributed to older people are perceived as denoting lesser humanness than when these same characteristics are associated with younger people. Results of the four studies provide evidence for an

animalistic form of dehumanization of older people by younger ones. Limits, implications, and future research are discussed.

Keywords: dehumanization, infrahumanization, old people, humanness

There is no doubt that all of us pertain to the same human species. However, historical examples abound to remind us how perceptions of others' full human status depend on the social group to which they belong (Volpato & Andrighetto, 2015). Be it in ancient Rome and Greece, during the crusades, in times of apartheid, or during the Second World War, perceiving others as less than human has always facilitated the mistreatment of these "dehumanized" individuals. Recently, research has further evidenced that ascriptions of humanness to others can also vary more subtly and that humanness denial is not restricted to periods of tense conflicts (Haslam, 2006). In this psychological literature, one question that needs further investigations concerns the potential variation of humanness ascriptions across the lifespan. As people get older, are they more likely to be perceived as full human beings or, to the contrary, do they face the threat of dehumanizing perceptions?

Humanness and dehumanization

Research has identified two different meanings of humanness (Haslam, 2006). On the one hand, humanness is defined by a "human nature" dimension and, on the other hand, by a "uniquely human" dimension (Haslam, Kashima, Loughnan, Shi, & Suitner, 2008; Haslam,

Loughnan, & Holland, 2013; Haslam, Loughnan, Reynolds, & Wilson, 2007). The human nature dimension considers the essential traits that are shared by all human beings. Human nature characteristics link human beings to the natural world and to their biological predispositions (e.g., warmth, curiosity, cognitive flexibility). Such features are set early in human development, predominant inside the human population, and universal among cultures. They are deeply rooted, inherent and immutable. In contrast, the uniquely human dimension is defined as a set of attributes perceived as distinguishing human beings from other animal species (e.g., morality, culture, refinement, secondary uniquely human emotions). Such attributes are acquired somewhat later during human development and can present variability between individuals and cultures (Haslam, 2006; Haslam et al., 2008; Haslam et al., 2007).

In direct correspondence with these two senses of humanness, Haslam (2006) proposed to consider two distinct forms of dehumanization in which other individuals or groups are being compared to two distinct types of non-human entities. First, mechanistic dehumanization occurs when others are being deprived of or perceived as lacking human nature traits. In mechanistic dehumanization, groups and individuals are treated as or associated with robots, automatons, or objects. Second, animalistic dehumanization is evidenced when uniquely human characteristics (those features that distinguish human beings from animals) are being denied to some groups or individuals. The denial or the nonattribution of uniquely human characteristics to others links them to subhuman, animal species (Haslam & Loughnan, 2014).

Dehumanized perceptions of others (be they groups or individuals) are accompanied by a host of important consequences. For instance, dehumanization allows justifying and legitimating derogatory behaviors toward others and it diminishes collective guilt (Castano & Giner-Sorolla, 2006; Haslam, 2006). Dehumanization also helps preserve a positive ingroup identity (Leyens et al., 2003; Leyens & Demoulin, 2006), reduces pro-sociality (Viki, Osgood, & Pillips, 2013) and empathy (Cehajic, Brown, & Gonzalez, 2009), and increases antisocial behaviors (Haslam & Loughnan, 2014). Furthermore, dehumanization affects the victims at both the cognitive (i.e., aversive self-awareness and cognitive deconstructive states) and the affective levels (i.e., feelings of sadness or guilt and shame; Bastian & Haslam, 2011).

Clearly, current evidences on dehumanization tend to indicate that this phenomenon is rather widespread as it affects a large variety of targets (e.g., ethnic groups, homeless people, or women) and is observed in many different contexts (e.g., school, work, or society at large). As suggested before however, we still know little about how humanness perceptions can vary across the lifespan as a function of an individual's age.

Humanness perceptions across the lifespan

Although we cannot dismiss the possibility that the ascription of *human nature* traits could vary as a function of age (see for instance, Wiener, Gervais, Brnjic, & Nuss, 2014), a close inspection of the dehumanization theoretical literature suggests that it is highly probable that perceptions of the extent to which a given individual possesses *uniquely human* traits would depend on that individual's age. Indeed, and contrary to human nature characteristics, uniquely human traits (i.e., those that distinguish human beings from animals) are *not* believed to be set early in human development, to be deeply rooted, immutable, nor inherent. Instead, uniquely human traits are conceived as features acquired later in human development, through socialization and education, and which may vary across individuals and cultures. This conception is also in line with Haslam's (2006) proposition that the denial of uniquely human characteristics corresponds to a vertical conception of humanness in which dehumanized others are placed below oneself on "an ordinal scale of development and evolution" (p. 259).

If uniquely human characteristics are acquired rather than inborn, it consequently follows that young infants cannot possibly possess these uniquely human traits and are therefore perceived and considered (at least temporarily) as less "fully" human beings than their older counterparts. Previous research has indeed shown that children are perceived as scoring very low on uniquely human features, while scoring rather highly on human nature characteristics (Bastian, Laham, Wilson, Haslam, & Koval, 2011; for a similar finding, see also Gray, Gray, & Wegner, 2007). Finally, it has been suggested that animalistic dehumanization sometimes takes the form of a "childlike" treatment of adult others (Haslam, 2006, p. 258).

Now, what is maybe more interesting to examine is how ascriptions of uniquely human traits vary as a function of age later on in human development. On one hand, older adults may be perceived as more evolved on this ordinal scale of evolution, and therefore, attributed higher levels of uniquely human traits than younger adult individuals. On the other hand, full humanness may be in fact reserved to this latter category of younger adults. As we hypothesize in the next section, rather than being perceived as the most evolved human individuals, older adults are, in fact, very likely to become the targets of an animalistic form of dehumanization.

Animalistic dehumanization of older adults

The first rationale for postulating a possible animalistic dehumanization of older people takes its roots in scientific works in anthropology and social psychology. In these fields, a series of scholars have proposed that, for existential concerns, humans feel the need to elevate themselves above nature (Becker, 1973), and are not automatically inclined to perceive themselves as the result of purely biological mechanisms (Deconchy, 2000). According to Terror Management Theory (TMT, Greenberg, Pyszczynski, & Solomon, 1986; Solomon, Greenberg, & Pyszczynski, 1991), human beings search to distance themselves from their physical animality (e.g., body products, cellulite, body hair) and they do so by developing a "symbolic" body. The symbolic body is created by associating the physical body with a set of characteristics that are socially valued (e.g., muscled body, body hair shaved). Such

associations provide the physical body with a social meaning (Goldenberg & Roberts, 2004; Greenberg, Solomon, & Ardnt, 2008). Socially-valued characteristics of the body tend to disappear progressively with age. Because of this, older people remind people of the inevitable degradation of the body, the salience of the physical body over the symbolic one (Isaksen, 2002; Le Breton, 2008), and the undeniable link of human being with the animality reign (Martens, Goldenberg, & Greenberg, 2005).

The second reason for which older people are particularly at risk of facing animalistic dehumanization relates to the fact that aging processes and older people are often associated with cognitive deficiencies, reasoning failures, problematic communication skills, or memory and mental difficulties (Erber, Szuchman, & Prager, 1997; Hummert & Ryan, 1996; Joanette, Kahlaoui, Maheux, & Ska, 2010; Lambert et al., 2016; McCann & Giles, 2002; McCann, Cargile, Giles, & Bui, 2004; Palmore, 1999; Palmore, Branch, & Harris, 2005). All these elements trigger perceptions of older individuals as lacking in cognitive competence; perceptions that, in turn, are likely to prompt an animalistic form of dehumanization of these targets. Indeed, previous research has evidenced a link between the competence dimension of social judgment and perceptions of others as possessing uniquely human characteristics (Vaes et al., 2012; Vaes & Paladino, 2009). Specifically, social groups that are judged high on human uniqueness tend to be also evaluated as competent, but not warm (Haslam, Loughnan, Kashima, & Bain, 2009). Importantly, warm but incompetent social groups (e.g. older people, children, artists) are often rated poorly on human uniqueness (Loughnan & Haslam, 2007). Although mechanistic dehumanization of the older people is not necessarily excluded, this should be less likely to occur than animalistic dehumanization. Indeed, mechanistic dehumanization is more often targeted at groups that are stereotyped as high in competence but low in warmth (Loughnan & Haslam, 2007; Vaes & Paladino, 2009).

Finally, recent research on hostile work environments (Wiener et al., 2014), and on contact between caregivers and care home residents (Drury, Abrams, Swift, Lamont, & Gerocova, 2016) provided preliminary empirical evidence for the animalistic dehumanization of older adults. First, research by Wiener and colleagues (2014) has shown that after having received a derogatory comment at work, senior workers were perceived as animalistically dehumanized. Second, recent data from Drury and colleagues (2016) has evidenced that negative contacts between caregivers and care home residents also predict the animalistic dehumanization of the residents (Drury et al., 2016). Interestingly, in both studies, older workers and care home residents were also mechanistically dehumanized. However, these two studies dealt with specific contexts (workplace, home residency) and specific forms of interactions (discrimination, negative contact), which likely induced the perception of older people as also lacking human nature traits. For instance, in Wiener et al.'s study, the context triggered stereotypes regarding the assumptive rigidity and lack of agency of older workers. Similarly, in the study by Drury and colleagues, the context triggered the image of older people as fungible recipients of help. Again, research is needed to investigate whether the mechanistic dehumanization of older people also holds when one deals with older people as a superordinate category or whether its occurrence is restricted to these specific contexts of interactions.

Multiple approaches to humanness and dehumanization

In the last decades, many researchers have investigated humanness associations and dehumanization, both in its mechanistic and its animalistic forms, in relation with a large variety of intergroup and interpersonal contexts. In doing so, they have applied different kinds of approaches: the attribute-based, the metaphor-based, and the target-based approaches (Loughnan, Haslam, & Kashima, 2009).

The attribute-based approach (e.g., Leyens, Demoulin, Vaes, Gaunt, & Paladino, 2007; Demoulin et al., 2004b) focuses on the specific features defining each of the two senses of humanness and considers dehumanization to occur when others are being deprived of some or all of these characteristics. In this perspective, denying human nature attributes to individuals or groups (e.g., friendly, curious, nervous) reduces them to objects or automatons that lack warmth, agency, and depth. In contrast, denying uniquely human attributes (morality, civility, dishonesty) to others leads to reducing them to animals. In such case, others are perceived as rude, uncultivated, lacking self-control and intelligence. Their behaviors are considered as motivated by their instincts rather than by some form of rationality (Haslam, 2006; 2014; Vaes, Leyens, Paladino, & Miranda, 2012). This approach also includes empirical works on infrahumanization. According to infrahumanization theory, animalistic dehumanization occurs in intergroup context when people attribute more uniquely human emotions (secondary emotions: e.g., shame, passion) to their own ingroup than to other groups. Such differential attribution between groups doesn't emerge on non-uniquely human emotions (primary emotions: e.g., fear, pleasure) as those are considered by lay people as emotions that are shared by both human and (some) other animals.

The metaphor-based approach focuses on the association of social groups with nonhuman entities; either animals or robots. For instance, research has shown that some outgroups (e.g., artist, black people) are linked to words semantically associated with the animal concept (e.g., pet, creature, wild) or are directly link to animal words (e.g., ape, dog) meanwhile social ingroups are associated with humanness (e.g., civilian, person) or with humans themselves (Boccato, Capozza, Falvo & Durante, 2008 ; Goff, Eberhardt, Williams & Jackson, 2008 ; Haslam, Loughnan, & Sun, 2011 ; Saminaden, Loughnan, & Haslam, 2010 ; Viki et al., 2006). Similarly, several studies have shown a mechanistic dehumanization of other social categories (e.g., business people, police officers), which are directly associated with or assimilated to robots (e.g., Hetey & Eberhardt, 2014; Loughnan & Haslam, 2007).

Finally, the target-based approach proposes a reverse causal path to the one typically investigated in the attribute-based approach of the dehumanization literature (Vaes, Heflick, & Goldenberg, 2010). While the attribute-based approach relies on a set of characteristics that are pre-tested to be more or less associated with the human concept, the target-based approach stresses that the humanness value of a specific trait depends on the category to which it is associated. According to this line of reasoning, (de)humanization of a group depends on the amount of humanness attributed to the characteristics of this group. For example, Paladino & Vaes (2009) presented a set of attributes to their Italian participants and described these characteristics as either typical of the Italian group or typical of another group (i.e., Slavs, Albanians, or Belgians). Participants then judged each of the presented traits on a uniquely human dimension. Results showed that, regardless of trait specificity, any characteristic associated with the Italian group was perceived as more uniquely human than the characteristics associated with the comparison group.

Researchers have used each of the three above methodological approaches independently of one another. In the present research, we examined humanness perceptions of younger and older adults using all of these various approaches. Specifically, we examine whether, compared to younger adults, older adults are associated more (or less) with metaphors of humanity than with metaphors of animality, whether they are attributed more (or less) uniquely human attributes, and whether, when older adults are associated with a set of traits, the human level perception of these traits is higher (or lower) than the human level of traits that are associated with young adults.

Overall overview of the studies

The general aim of this research was to empirically examine whether older people are dehumanized by younger ones in an animalistic way or whether they are, in contrast, considered as the most evolved individuals on the ordinal scale of humanity. As a first step, Studies 1 and 2 use an attribute-based approach. In Study 1, we test whether young people fail to attribute uniquely human (secondary) emotions to older people. In Study 2, we examine, via a lexical decision task (LDT, Wittenbrink, Judd, & Park, 1997), whether uniquely human emotions are less associated in memory with older people than with younger ones. As a second step, Study 3 focuses on a metaphor-based approach. In this study, we rely, once again, on a LDT to investigate whether dehumanization of older people is restricted to its animalistic form or whether it extends to the mechanistic one. Finally, Study 4 tests the reverse causal path by examining whether traits associated with older people trigger a perception of lower human value than the traits associated with younger individuals. All studies were conducted among French volunteers and students who did not exceed age 39, because youth end is considered at age 39 by French people (Abrams, Vauclair, & Swift, 2011). Finally, because there is no available meta-analysis on the effects we are investigating, we estimated all sample size on the basis of published studies on dehumanization using similar designs.

Study 1

In a first study, we used an attribute-based approach and relied on a classic infrahumanization task (Leyens et al., 2001) to test animalistic dehumanization of older adults. The classic infrahumanization task distinguishes primary (non-uniquely human) from secondary (uniquely human) emotions. Infrahumanization (i.e., animalistic dehumanization) is said to occur when people attribute more secondary emotions to one group than to another, while making equal attribution of primary emotions to both groups. Thus, we expected primary emotions to be equally attributed to younger and older targets, whereas we expected secondary emotions to be attributed more to younger than to older targets.

Method

Participants

Participants were 112 undergraduate volunteers (58 women, 53 men and 1 unknown) ranging in age from 18 to 37 (M = 22.10, SD = 4.19). All of them were native French speakers. They were recruited on the campus of a French university for a study on the link between personality and categorization processes, and were randomly assigned to one of the two experimental conditions of a 2 (target type: younger people vs. older people) x 2 (emotion type: primary vs. secondary) x 2 (valence: positive vs. negative) mixed design, with target type as between-subject factor. After the task was completed, participants were fully debriefed about the aim of the study. This study did not receive any research ethics committee approval because the country where the study was conducted does not have an institutional review board. We estimated the sample size on the basis of previous work using a similar design (55 participants in Boccato et al., 2007) and doubled the sample size because target type was a between-subject factor in our study.

Procedure and materials

Participants were asked to complete two supposedly unrelated tasks. First, all participants performed a name recognition task (i.e., names of older people versus younger people), used to activate the inter-group context (Boccato, Cortes, Demoulin, & Leyens, 2007). Participants had to categorize typical names of older people and younger people in their respective categories.

Secondly, participants had to complete a questionnaire based on the classic paradigm of infrahumanization (Leyens et al., 2001). Participants had to select, from a list of 24 words, 12 words that they considered typical characteristics of younger people or older people. Half of

them were instructed to describe a typical young person and the other half a typical old person.

The 24 words list comprised 3 positive secondary emotions (*allégresse*, gladness; *jovialité*, joviality; *être amoureux*, to be in love), 3 negative secondary emotions (*dédain*, disdain; *rancoeur*, rancor; *gêne*, embarrassment), 3 positive primary emotions (*attachement*, attachment; *satisfaction*, satisfaction, *être content*, be happy), 3 negative primary emotions (*tension*, strain; *anxiété*, anxiety; *énervement*, irritation) selected from Demoulin et al. (2004a)¹, as well as 12 fillers from the Stereotype Content Model (6 competence words and 6 warmth words ; Fiske et al., 2002) pretested in a previous study by Rohmer & Louvet (2012).

Results

A 2 (target type: young people vs. old people) x 2 (emotion type: primary vs. secondary) x 2 (valence: positive vs. negative) repeated measures ANOVA, with the first factor as between-participant variables and the last two as a within-participants variables, was conducted on the mean number of emotions selected by the participants. Results showed a main effect of emotion type (F(1, 110) = 17.95, p < .001, $y^2 = .14$), with primary emotions being more attributed (M = 3.66, SD = 1.09) than secondary ones (M = 2.98, SD = 1.06). The main effect of the target was marginally significant (F(1, 110) = 3.43, p = .07, $y^2 = .04$), participants tended to attribute more emotions to young (M = 6.89, SD = 1.44) than to older targets (M = 6.42, SD = 1.21), regardless of emotion's type or valence. The main effect of valence was not significant (F(1, 110) = .28, p = .60, $y^2 = .002$). Two-way interactions emerged between the target type and the valence (F(1, 110) = 4.70, p = .03, $y^2 = .05$), the emotion type and the valence (F(1, 110) = 26.43, p < .001, $y^2 = .19$), as well as the expected

¹ For the infrahumanization stimuli, 40 emotions were first selected from a large pool of emotional stimuli (Demoulin et al., 2004a). We then conducted a preliminary study on fifty students (M age = 22.26; SD = 2.32; 44 females and 6 males) to rate the extent to which stimuli were typical of old and young people on a 7-point scale (1 = not at all typical to 7 = totally typical). Participants had to rate typicality in a within subject design. We retained a set of emotions such that positive and negative emotions differed on their valence, primary and secondary emotions differed on their humanity, and all emotions were perceived as equally typical of both young and older people.

interaction between the target type and the emotion type, (F(1, 110) = 5.84, p = .02, $y^2 = .05$). This latter interaction was however moderated by valence (F(1, 110) = 22.89, p < .01, $y^2 = .17$). Indeed, pairwise Bonferroni-corrected comparisons ($\alpha = .0125$) showed that the pattern consistent with the infrahumanization hypothesis emerged only on positive secondary emotions: Participants attributed more positive secondary emotions to younger than to older targets (t(110) = 5.89, p < .001, d = 1.19), but attributed the same level of positive primary emotion to both targets (t(110) = -1.01, p = .32, d = -0.19). However, with regards to negative emotions, attributed similar levels of negative primary and secondary emotions to both targets (t(110) = -0.21, p = .84, d = 0.04) and t(110) = 1.66, p = .10, d = -0.25, respectively). These means are displayed in Table 1.

Insert Table 1

Discussion

Study 1 aimed at assessing whether younger people considered older ones as the most evolved and "full human" individuals, or whether they tend to animalistically dehumanize them. Our results partially confirmed the dehumanizing hypothesis. Specifically, younger participants attributed more emotions related to human uniqueness (i.e., secondary emotions) to younger people than to older ones, while no such difference emerged for non-uniquely human emotions (i.e., primary emotions). Importantly, however, this pattern of results emerged only on positive emotions. The latter result only partially supports the infrahumanization theoretical perspective as according to this framework, the differences in secondary emotions attributions ought to be observed irrespective of emotional valence. This being said, the present findings can hardly be interpreted in terms of ingroup favoritism because the larger attribution of positive emotions to younger targets only concerns secondary emotions and not primary ones. In case of ingroup favoritism, primary as well as secondary positive emotions should have been attributed to the young targets. To further explore our effect, we thought to replicate the above results in a second study.

Study 2

Study 1 utilized an attribute-based approach and relied on a measure of self-reported attribution. In Study 2, we again examined our research question with an attribute-based approach but this time using a measure of automatic association, i.e. a Lexical Decision Task (LDT). On the basis of Study 1's results, we expected to observe stronger automatic association between younger people and secondary, uniquely human emotions than between older people and those same emotions. Memory associations regarding primary emotions with the two types of target should not differ.

Method

Participants

The sample consisted of 60 native French-speaking volunteers comprising 41 women (68.30%) and 19 men (31.70%) ranging in age from 18 to 35 (M = 22.45, SD = 3.33). This sample comprised a majority of students (88.30%) recruited at and around the campus of a French university for a study presented as an experiment about word recognition. This study did not receive any research ethics committee approval because the country where the study was conducted does not have an institutional review board. This experiment is a 2 (prime type: younger people vs. older people) x 2 (emotion type: primary vs. secondary) x 2 (valence: positive vs. negative) within-subject design. As for Study 1, we estimated the sample size on the basis of previous work (55 participants in Boccato et al., 2007).

Procedure and material

Participants were asked to complete a computer task presented as a study about word recognition. During the LDT, participants had to decide whether a string of letters was a legitimate French word or not. After the task, participants received a funnel debriefing, modeled after Bargh & Chartrand (2000), allowing opportunities to disclose dependent variables and the purpose of the study.

We used Direct RT software (empirisoft) for programming the LDT. On each trial, a fixation point appeared in the center of the screen for 3,000 ms, followed by a prime presented for 150 ms (supraliminal prime). A 100 ms inter-stimuli interval succeeded the prime (stimulus onset asynchrony (SOA) was 250 ms) and was followed by a target letter sequence. The letter sequence remained on screen until the participant provided a response or for a maximum of 3 seconds. Participants had to respond by pressing one of two keys indicating if the letter sequence was a legitimate French word (by pressing a 'Yes' key) or not (by pressing a 'No' key). Once the participant had responded, the next trial started after an inter-trial interval of 3 s.

As materials for the LDT we used 15 prime pictures: 5 older people faces, 5 younger people faces, and 5 usual objects (neutral primes). For older and younger people primes, we retained a set of pictures already used and pretested in a previous study (Boudjemadi, 2009)². Usual object primes were pictures selected from the International Affective Picture System and rated as emotionally neutral according to IAPS norms (IAPS; Lang, Bradley, & Cuthbert, 1999).

For the target words, we used: 3 positive secondary emotions (*bonheur*, happiness; *sérénité*, serenity; *compassion*, compassion), 3 negative secondary emotions (*honte*, shame; *amertume*, bitterness; *mépris*, contempt), 3 positive primary emotions (*surprise*, surprise; *attraction*, attraction; *plaisir*, pleasure), 3 negative primary emotions (*dégoût*, disgust; *peur*, fear; *colère*, anger), and 12 non-words (pronounceable anagrams of the selected secondary and primary emotions with first and last letters reversed)³. After 12 practice trials, each target

² Primes can be obtained upon request.

³ Words referring to secondary positive (M = 31.07; ET = 43.03) and secondary negative emotions (M = 38.43; ET = 56.16) are similar in terms of frequency, whereas primary positive emotion words are more frequent (M = 85.99; ET = 86.69), and primary negative emotion words even more (M = 208.58; ET = 298.87). Concerning

word (24) was associated once with each prime type (3), for a total of a 72 test trials.

Results

Preliminary analyses

We conducted a 2 (emotion type: primary vs. secondary) x 2 (valence: positive vs. negative) repeated measures ANOVA on the mean of humanness scores, all factors as within participants variables. Only a main effect of the emotion type emerged (F(1, 59) = 47.06, p < .001, $\eta^2 = .43$). Replicating previous findings (Demoulin et al., 2004a), participant attributed more humanness to secondary emotions (M = 6.04, SD = 0.75) than to primary ones (M = 4.93, SD = 1.62). We also conducted a 2 (emotion type: primary vs. secondary) x 2 (valence: positive vs. negative) repeated measures ANOVA on the mean of valence scores. Only main effect of valence emerged (F(1, 59) = 62.98, p < .001, $\eta^2 = .51$). As expected, positive emotions were evaluated more positively (M = 6.03, SD = 0.50) than negative ones (M = 2.88, SD = 0.81).

Following Wittenbrink et al. (1997), we computed a *facilitation/inhibition (F/I) score* by subtracting, from the response latency of a target word following the neutral prime, the latency for the same target word following younger or older primes. Positive differences indicated greater facilitation and negative differences indicated greater inhibition. Dependent variables in all analyses were F/I difference scores. We deleted outlying reaction times faster than 150 ms and slower than 1500 ms (3.34%) (Wittenbrick et al., 1997; Subra, Muller, Bègue, Bushman, & Delmas, 2010; Wentura & Degner, 2010). Two participants were excluded due to extreme error percentage (higher than 20%). None of the participants declared having perceived a potential link between primes and targets. None of the participants declared having taken part in other studies on dehumanization.

their length, words referring to primary positive (M = 8.33; ET = 1.53) and secondary positive emotions (M = 8.33; ET = 1.53) are identical and longer than primary negative emotion words (M = 5; ET = 1), and secondary negative emotion words (M = 6; ET = 1.73). However, given these patterns, these differences cannot account for our results.

Infrahumanization

We performed a 2 (prime type: younger people vs. older people) x 2 (emotion type: primary vs. secondary) x 2 (valence: positive vs. negative) repeated measures ANOVA on the mean F/I scores. All factors were within-participant variables. The main effect of prime type was marginally significant (F(1,59) = 3.16, p = .08, $\eta^2 = .05$), with younger primes eliciting more facilitation (M = 28.33; SD = 48.35) than older ones (M = 19.03; SD = 47.97). Neither the main effect of valence (F(1,59) = 0.74, p = .39, $\eta^2 = .012$), nor the main effect of emotion type $(F(1,59) = 2.22, p = .14, \eta^2 = .04)$ were significant. The interaction between emotion type and valence was not significant (F(1,59) = 0.23, p = .63, $\eta^2 = .004$), but the interaction between prime type and valence was (F(1,59) = 8.13, p = .006, $\eta^2 = .12$). The expected interaction between prime type and the emotion type was marginally significant (F(1,59) =2.89, p = .09, $\eta^2 = .05$), and was moderated was the valence, replicating Study 1 (F(1.59)= 4.90, p = .03, $\eta^2 = .08$). Consistent with the infrahumanization hypothesis, pairwise Bonferroni-corrected comparisons ($\alpha = .0125$) showed that responses to positive secondary emotions were facilitated more when preceded by a younger prime than by an older one (t(59)=3.95, p=.001, d=1.03), whereas facilitation responses to primary positive emotions did not differ as a function of prime type (t(59) = -.64, p = .70, d = 0.17). Similar to what happened in Study 1, responses to neither primary negative emotions, nor to secondary negative emotions were impacted by the type of prime being used (t(59) = .60, p = .72, d = -0.15) and t(59) = .55, p = .76, d = -0.20 respectively). Again, the infrahumanization effect emerged only on positive emotions. Mean response times are displayed in Table 2.

Insert Table 2

Additionally, we also tested whether prime-emotion associations were facilitated or inhibited in an absolute sense by testing if they differed significantly from zero. Because the infrahumanization pattern emerged on positive emotions only, the analyses reported below concerns only positive emotions. The analysis revealed that younger people primes facilitated responses to both positive primary emotions (t(59) = 3.87, p < .001, d = 0.71) and to positive secondary ones (t(59) = 2.41, p = .02, d = 0.44). The facilitation of positive primary emotions preceded by an old people prime was also significant (t(59) = 3.42, p = .001, d = 0.62). Finally, responses to positive secondary emotions when preceded by older people primes showed no significant effects of facilitation or inhibition (t(59) = -.93, p = .35, d = -0.17).

Discussion

In the second study, our aim was to replicate previous results obtained in Study 1. As hypothesized, reactions to primary emotions did not differ as a function of the prime used, whereas responses to secondary positive emotions were facilitated more when preceded by a younger prime than by an older one. This pattern of results does not emerge on negative emotions. The present results are thus consistent with those obtained in the previous study but they also partially differ from the more general infrahumanization theory framework.

Study 3

Using an attribute-based approach, our first two studies suggest that rather than being perceived as the most "evolved" individuals, older adults tend to be (at least partially) animalistically dehumanized by younger people. Study 3 had two main aims. First, we thought to replicate this effect using a metaphor-based approach. Second, we thought to explore whether dehumanization of the superordinate category of older adults also concerns its mechanistic form or whether it is restricted to the animalistic one. Third, due to the fact that facial characteristics can activate specific stereotypes (see Hummert, Gartska, & Shaner, 1997), we used different primes in Study 3 (typical names of the category) than in Study 2 (pictures) to ensure priming of the superordinate category). Moreover, in order to prevent awareness of the purpose of the experiment, we used subliminal priming in Study 3. Thus, in

Study 3, we focused on metaphor-based approach and examine the automatic association in younger people's memory between older and younger people and two types of non-human entities, namely animals and machines. In line with our reasoning, we predict a stronger association in memory of animal-related words with older than with younger people. Concerning the association with machine words, we expect the difference between older and younger to be smaller or nonexistent.

Method

Participants

For this study, we recruited 99 voluntary native French speakers, 48 women (48.50 %) and 50 men (50.50 %) and 1 unknown, ranging in age from 18 to 32 (M = 21.52, SD = 3.22). This study did not receive any research ethics committee approval because the country where the study was conducted does not have an institutional review board. The experiment is a 2 (prime type: younger people vs. older people names) x 2 (target type: animal vs machine words) within-subject factor design. We estimated the sample size on the basis on previous work using a similar design (23 participants in Boccato et al., 2008). However, the present study compares animalistic to mechanistic dehumanization instead of comparing animalistic dehumanization to a neutral control condition (e.g., animal vs. human pictures in Boccato et al., 2008). That is why we recruited a larger sample to increase to power of the present study.

Procedure and materials

As in the previous study, all participants were asked to complete two supposedly unrelated tasks: a name recognition task the LDT, they received a funnel debriefing allowing opportunities to disclose awareness of the primes, dependent variables, and the purpose of the study.

We used Direct RT software (empirisoft) for programming the LDT. On each trial, first a fixation point appeared in the center of the screen for 500 ms, followed by a prime

presented for 16.67 ms (subliminal prime). A non-word mask (qtrzsdt) presented for 166.70 ms succeeded the prime and was followed by a target letter sequence. The letter sequence remained on screen until the participant's response. Once the participant had responded, the next trial started after an inter-trial interval of 500 ms.

Primes were 12 letter sequences: 4 typical younger people names (Lea, Manon, Kevin, Dylan), 4 typical older people names (Odette, Ginette, René, Maurice), and 4 non-words as neutral primes (vgtpnb, nkltfcq, xfcspl, ysztrfc). Typical names for each target group were pretested on a sample of French-speaking students (N = 32)⁴.

For the target words, we conducted a pretest on a sample of 48 participants (24 men and 24 women) ranging in age from 17 to 52 (M = 21.54; SD = 5.60). Participants were asked to rate the extent to which a set of words were associated with animals and with machines on two 7-point scale ranging from 1 = not at all associated with) to 7 = totally associated with). Participants also rated words' valence on a 7-point scale (from 1 = very negative to 7 = very positive). Some participants (n = 22) had to give their opinion toward a set of 20 animal words and 18 fillers, while other participants (n = 26) gave their opinion toward a set of 20 machine words and 18 fillers. On the basis of the results, we selected 8 animal words (*troupeau*, herd; *fourrure*, fur; *gibier*, bushmeat; *femelle*, female; *mâle*, male; *nature*, nature; *primate*, primate; *pédigrée*, pedigree), and 8 machine words (*ordinateur*, computer; *robot*, robot; *appareil*, device; *androïde*, android; *automate*, automaton; *logiciel*, software; *artificiel*, artificial; *cyborg*, cyborg)⁵. The selected animal words were more associated with animals (M = 6.57; SD = 0.42) than with machines (M = 1.27; SD = 0.41) (t(47) = 46.08, p < .001, d = 12.77).

⁴ Participants were instructed to rate the extent to which 40 names were typical of different age groups on a 5point scale (1 = 20 years and less; 2 = 20 to 40 years; 3 = 40 to 50 years; 4 = 50 to 60 years; 5 = 60 years and older). The selected younger people names (M = 1.40; SD = 0.30) were rated younger than the selected older people ones (M = 4.52; SD = 0.38) (t(31) = -34.19, p < .001).

⁵ Words referring to animality (M = 12.26; ET = 19.50) and to machines (M = 13.55; ET = 17.40) are similar in frequency (t(7) = 0.001, p = .97), and in length (F = 1.4, p = .27; (M = 6.75; ET = 1.39) for words referring to animality, and (M = 7.75; ET = 1.58) for words referring to machines).

The selected machine words were more associated with machines (M = 6.41; SD = 0.36) than with animals (M = 1.63; SD = 0.73) (t(25) = 26.74, p < .001, d = 8.3). Animal words (M = 4.08; SD = 0.85) and machine words (M = 4.28; SD = 0.91) did not differ in valence (t(47) = 1.37, p = .18, d = 0.41). We also selected 16 anagrams (pronounceable anagrams of the selected targets words with first and last letters reversed) of the selected words as non-words for the LDT but only 8 of them were randomly presented to participants. So, after 12 practice trials, each target word (24) was associated once with each prime type (12), for a total of a 288 test trials. All words were presented in capital letters.

Results

Preliminary results

As in Study 2, we compute a F/I score as dependent variable.. Response latencies for non-words and outlying reaction times (under 150 ms and above 1 500 ms) were excluded from analysis (2.80%) (Wentura & Degner, 2010). None of the participants declared having perceived primes or a potential link between primes and targets. None of the participants declared having taken part in other studies on dehumanization.

Dehumanization

We performed a 2 (prime type: younger people vs. older people) x 2 (target type: animal vs. machine) repeated measures ANOVA with both factors as within participants variables. Results revealed a statistically significant main effect of target type (F(1, 98) = 7.13, p = .009, $\eta^2 = .07$) showing that animal words' recognition (M = 4.92; SD = 23.30) was facilitated in comparison to machine words' recognition (M = -4.76; SD = 29.53). The main effect of prime type was marginally significant (F(1, 98) = 2.72, p = .10, $\eta^2 = .03$), and showed that older primes (M = 2.09; SD = 23.83) tended to generally facilitate words recognition compared to younger primes (M = -1.93; SD = 22.18). As expected, the interaction between prime type and target type was significant (F(1, 98) = 14.84, p < .001, $\eta^2 = .13$). Pairwise Bonferronicorrected comparisons ($\alpha = .025$) showed that facilitation was reliably greater when animal words were preceded by older primes than by younger ones (t(98) = 3.63, p < .001, d = 0.43). For the machine words, no statistically significant difference was observed as a function of prime type (t(98) = -1.43, p = .16, d = -0.13). Means response times are displayed in Table 3.

Insert Table 3

Finally, we tested whether prime-target associations were facilitated or inhibited in an absolute sense by testing if they differed significantly from zero. Results revealed that older people primes facilitated responses reliably with regards to animal words (t(98) = 3.68, p < .001, d = 0.52) and inhibited responses reliably with regards to machine words (t(98) = -2.07, p < .001, d = -0.29). All the other F/I scores did not differ significantly from zero (all ps > .45).

Discussion

Study 3 replicates the findings regarding older people's animalistic dehumanization with a metaphor-based approach. We found that responses to animal-related words were facilitated when preceded by an older people prime while such facilitation did not occur when the prime referred to younger individuals. Interestingly, no such difference between younger and older primes occurred when target words referred to the machine concept. This latter finding lends some support for the hypothesis that, with regards to the superordinate category, dehumanization of older people is restricted to its animalistic form and does not extend to the mechanistic one.

Study 4

Studies 1 and 2 partially support the hypothesis regarding an animalistic dehumanization of older people using an attribute-based approach. Study 3 replicates these

results with a metaphor-based approach. In Study 4, we examine once again older people's dehumanization but this time by means of a target-based approach (Paladino & Vaes, 2009; Vaes et al., 2010). In view of this approach, humanness of a trait depends on the category to which it is attributed. On top of lending further support for the dehumanization effect, the target-based approach proposes an interesting addition to the other two methodological perspectives. Indeed, as stated above, the target-based approach to dehumanization investigates the reverse causal path. While the attribute-based perspective relies on a set of pre-defined characteristics that are related to the humanness concept and examine how these characteristics are then attributed to the groups, the target-based approach stresses that, independently of the absolute human value of a given characteristic, the attribution of that characteristic to a dehumanized group will trigger a perception of lower human value. In line with this reasoning, we hypothesized that participants would rate characteristics as of higher human value when these have been associated with younger people rather than with older ones, regardless of the desirability of these characteristics.

Method

Participants

We recruited 167 French-speaking volunteers (83 women and 84 men) on the campus of a French university. They ranged in age from 18 to 29 (M = 21.61, SD = 2.44). Participants were recruited for a study on personality and culture, and were randomly assigned to the two experimental conditions of a 2 (target: young vs. old) x 2 (desirability: desirable vs. undesirable) x 2 (consistency with target: consistent vs. inconsistent) mixed design, with the first variable as between-subject factor. After the task was completed, participants were fully debriefed about the aim of the study. None of these volunteers participated to the previous studies. This study did not receive any research ethics committee approval because the country where the study was conducted does not have an institutional review board. We estimated the sample on the basis of previous work using a similar design (79 participants in Paladino and Vaes, 2009). However, our sample is larger because participants' recruitment was conducted independently by several experimenters who accepted all people who volunteered.

Materials

Following Vaes et al.'s (2010) procedure, we conducted a series of pretests in order to select a set of characteristics. In a first pretest, 37 students aged from 18 to 26 (M = 21.00; SD = 2.45) generated typical and non-typical old people and young people characteristics. Half of the participants (n = 20) generated first old people then young people characteristics. For the remaining participants (n = 17), the order of the tasks was reversed. Secondly, the 83 generated characteristics were presented to another group of 119 participants aged from 18 to 30 (M = 21.54; SD = 2.96) who rated the extent to which the characteristics were typical of young people (n = 58) or old people (n = 61) on a scale ranging from 1 = not at all typical to 7 = *totally typical*. Participants also had to evaluate the degree of desirability of these words on a scale ranging from 1 = not at all desirable to 7 = totally desirable. On the basis of these ratings, 16 characteristics were selected: 4 desirable stereotypical young people characteristics (joueur, playful; rêveur, dreamy; sociable, sociable; ouvert, open), 4 undesirable stereotypical young people characteristics (*influençable*, impressionable; *stressé*, stressed; *impatient*, impatient, fainéant, lazy), 4 desirable stereotypical old people characteristics (mature, mature; attentionné, thoughtful; gentil, kind; sage, sage), and 4 undesirable stereotypical old people characteristics (fragile, fragile; seul, alone; grincheux, cranky; plaintif, plaintive). These 16 characteristics were presented to a third sample of participants (N = 28) aged from 18 to 28 (N= 20.64; SD = 2.38) who judged on a 7-point scale the degree of humanness of each characteristics (1 = shared with animals to 7 = uniquely human). We conducted 2 (desirability: desirable vs. undesirable) x 2 (target: young vs. old) repeated measures ANOVA

on the mean of humanness scores, all factors as within participants variables. Results revealed no main or interactive effects (all ps > .15) showing that the characteristics retained are considered equivalent in terms of humanness.

Procedure

To show that characteristics are perceived as more human when attributed to younger people rather than to older ones, we conducted an experiment divided into two parts. We asked participants to complete two supposedly unrelated tasks. The first part of the experiment was a bogus research allowing us to assign characteristics with the two relevant groups. Participants were thus informed of the results of a French-Canadian study carried out in 2014 and conducted on a representative sample of younger and older people including 1204 women and 1386 men. The study revealed that younger and older people reacted differently to new positive and negative events (problematic and non-problematic situations). For half of the participants (n = 82), characteristics attributed to younger people or older people were the typical characteristics pretested of each groups. In other words, they were informed that playful, dreamy, sociable, and open were the characteristics shown by young people in new non-problematic situations, and that impressionable, stressed, impatient, and lazy were the characteristics shown by young people in new problematic situations. These same participants were also informed that mature, thoughtful, kind, and sage were the characteristics shown by older people in new non-problematic situations, and fragile, alone, cranky, and plaintive were the characteristics shown by older people in new problematic situations. For the remaining participants (n = 85), the condition was reversed: Typical positive and negative characteristics of young people were associated with older people and typical positive and negative characteristics of older people were associated with young people. Participants' agreement with these results was assessed. They were also asked to report their opinion on the study.

These questions were added to make sure that participants had read and understood the differences between young and older.

After the first questionnaire, participants were asked to complete a second unrelated questionnaire presented as a pilot study for a future experiment. Participants had to judge on a 7-point scale the degree of humanness of a set of 30 characteristics (1 = shared with animals to 7 = uniquely human). Among the presented characteristics, 16 were the characteristics previously associated with the two groups and 14 were fillers. At the end of this part, participants were thanked and debriefed. None of the participants declared having taken part in other studies on dehumanization.

Results

Following Paladino & Vaes' (2009) procedure, we centered the humanness rating for each 16 characteristics. A 2 (target: young vs. old) x 2 (desirability: desirable vs. undesirable) x 2 (consistency with target: consistent vs. inconsistent) repeated measures ANOVA, with the two first factors as within-participant variables and the third factor as between-participant variable, was performed. In line with our hypothesis, we expected only the main effect of the target to emerge, over and beyond the consistency of the characteristics with the target rated in the pretest, and over and beyond the desirability of these characteristics. As expected, results showed only a main effect of the target type (F(1, 166) = 14.55, p < .001, $y^2 = .08$). Regardless of pre-tested consistency of the characteristics with the two target groups, and regardless of these characteristics' desirability, participants judged characteristics that are associated with young people as having a higher human value (M = 0.14; SD = 0.83) than characteristics that are associated with older people (M = -0.12; SD = 0.77). More crucial for our purpose, the interaction between the target and the consistency with target (F(1, 165) =0.003, p = .96, $y^2 = 0$), and the interaction between the target and the desirability of the traits (F(1, 166) = 0.14, p = .70, $y^2 = .0001$) were not significant. Neither the main effect of the consistency with target (F(1, 165) = 1.66, p = .20, $y^2 = .01$), nor the main effect characteristics 'desirability were significant (F(1, 166) = 0.001, p = .98, $y^2 = 0$). Neither, the interaction between the consistency with target and the characteristics 'desirability (F(1, 165) = 0.19, p = .67, $y^2 = .001$), nor the second order interaction (F(1, 165) = 0.002, p = .97, $y^2 = 0$) were significant.

Discussion

In Study 4, we used the target-based approach to lend further support for our hypothesis concerning the animalistic dehumanization of older people. We predicted and found that characteristics associated with older adults are perceived as less uniquely human than these same characteristics when they are associated with younger people. These findings confirm the bi-directional causal path between characteristics' attribution to older adults and the perceived human value of these characteristics. That is, not only do people attribute uniquely human characteristics more to younger people than to older ones, but they also perceive characteristics that are associated with younger people as having a higher human value than those associated with older people.

General Discussion

According to literature on humanness and dehumanization, human uniqueness features are acquired later in human development rather than innate (Haslam, 2006; Haslam, Bastian, & Bissett, 2004). In this line of reasoning, it could be argued that perceived human uniqueness of others increases with age and that older people should be perceived as the most 'uniquely human' individuals. However, human beings feel the need to distance themselves from their physical animality (Greenberg, Pyszczynski, & Solomon, 1986; Solomon, Greenberg, & Pyszczynski, 1991), and older people likely remind us this animality because of the cognitive degradation they sometimes suffer. Therefore, it could also be hypothesized that older people would be animalisticaly dehumanized by younger adults and be perceived as lacking uniquely human features.

The set of experiments presented in this paper were designed to disentangle these two alternative hypotheses and to explore whether older people are perceived as more human than their younger counterparts or whether they rather face an animalistic form of dehumanization. Using an attribute-based approach, Studies 1 and 2 focused on the differential attribution and association of uniquely human, secondary emotions with the older and younger groups. In line with the infrahumanization phenomenon (Boccato et al., 2007), Study 1 showed that secondary emotions (but not primary ones) are preferentially attributed to young rather than older people and study 2 showed that that older people primes lead to lower accessibility of secondary emotions than younger ones. This effect, however, proved to be only reliable for positive secondary emotions and not for negative ones.

Study 3 was performed to replicate these findings using a metaphor-based approach. We tested young peoples' implicit association between younger and older people primes, on the one hand, and animal-related words and machine-related words, on the other hand. As expected, results showed a higher accessibility of animal words when preceded by older people primes than by younger people ones. Interestingly, recognition of the machine-related words did not vary as a function of prime type. These results suggest that the animalistic dehumanization effect does not extend to the other form of dehumanization (i.e., mechanistic dehumanization). Finally, Study 4 used a target-based approach to show that dehumanization of older people not only results from the attribution of low-human value characteristics to this group, but also that the perceived human value of a given characteristic depends on the group to which it is associated (i.e., the reverse causal path). Overall, these results show that older adults, and not younger ones, are animalisticaly dehumanized.

Limitations and future studies

As any research, however, the present set of studies is not devoid of some limitations. Hereafter, we discuss these limitations and we introduce some proposition for future research. The first limitation that one should note relates to the unexpected valence findings of both Studies 1 and 2. Indeed, according to the theoretical literature (Leyens et al., 2000), infrahumanization of others is evidenced in the differential attribution of both positive and negative secondary emotions to groups. Unexpectedly, in Studies 1 and 2, the differential attribution of secondary emotions only occurred on the positive side. The same kind of response pattern has been previously obtained in other infrahumanization studies (see Boccato et al., 2007, Study 1; Viki & Abrams, 2003). In addition, valence effects were also found in the study of Wiener and collaborators (2014) on older workers. This being said, the exact interpretation of this unexpected valence effect is, at this stage, still unclear. For instance, one could postulate that the obtained results could be due to a floor effect. In such noncompetitive, non-conflictual intergenerational context, attributions of and associations with negative features might, indeed, not prevail and most effects could therefore occur on positive attributes. Importantly, however, the obtained effects cannot be interpreted in terms of simple ingroup favoritism. As a matter of fact, if ingroup favoritism was at play, one should have expected to also evidence differential attribution and association patterns on primary emotions; something that is definitely not the case. Importantly, the drawbacks of Studies 1 and 2 should be put in perspective with the results of Studies 3 and 4 that replicate older people's animalistic dehumanization effects with different methodologies.

The second limitation of our set of studies relates to the research population we investigated. The studies presented in this paper focused on rather young participants ($Ms_{age} = 22.10, 22.45, 21.52, 21.61$, for Studies 1, 2, 3, and 4 respectively) and none of them exceeded the limit of perceived young age in France (Abrams et al., 2011). Obviously, considering the restricted age range of our participants, we cannot generalize our conclusion of older people's

animalistic dehumanization to other age groups. More research is thus clearly needed in order to examine whether individuals from all ages perceive older people in a dehumanized way or whether older people's animalistic dehumanization is an effect that is particularly or solely salient among younger individuals. On the one hand, previous research has shown that animalistic dehumanization can be conceptualized as an intergroup phenomenon and one could thus hypothesize that older people's dehumanization is the result of a categorization of these older individuals as outgroup members by younger adults. In this case, dehumanized perceptions of older people should be restricted to the younger population. On the other hand, we theoretically speculated that animalistic dehumanization of older adults could occur because older people remind us of the inevitability of our own death. As they get older, people face stronger existential threats and develop cognitive strategies allowing them to avoid identification with the social group "old". Put differently, older people are "never me but another person more advanced in chronological age and more affected by decay" (Caradec, 2012; Coudin & Beaufils, 1997). If this hypothesis proved to be true, then older people's dehumanization could and should also be observed even among older individuals as a way to help them defend against the existential threat of their own mortality and distance them from their animal nature (Vaes et al. 2010). Future research should thus investigate not only how dehumanization is susceptible to affect individuals from different ages but also how one's tendency to dehumanize others fluctuates as a function of one's own age.

Third, more effort should be devoted at understanding the underlying mechanisms of older people's dehumanization. As suggested in the theoretical introduction, animalistic dehumanization of older people could be triggered for two different reasons. On one hand, animalistic dehumanization could result from a cognitive process. Because older people are often perceived as cognitively deficient (Pasupathi, Carstensen, & Tsai, 1995; Richeson & Shelton, 2006), and because cognitive maturity is a primary determinant of uniquely human

perceptions, animalistic dehumanization could be triggered by the cognitive representations associated with older adults. On the other hand, animalistic dehumanization of the older adults could also come as the result of some motivational processes linked to people's fear of death (Greenberg, Schimel, & Martens, 2002). Indeed, older people remind younger ones of the inevitable degradation of the body, the salience of the physical body (Isaksen, 2002; Le Breton, 2008), and the undeniable link of human beings with animality (Martens et al., 2005). Investigating whether animalistic dehumanization of older adults is the consequence of a cognitive or a motivational process (or both) is clearly beyond the scope of the current paper. Future research should however investigate this further.

Finally, our work focused on a superordinate category, which is the broad category 'older people'. Such social categories include a variety of information organized into meaningful subtypes (Richards & Hewstone, 2001; Rosch, 1978) which yield a more accurate grasp on the nature of social perception (Coats & Smith, 1999; Eckes, 1994; Hummert, 1999; Schneider & Bos, 2011). It has been recently shown that some older people subtypes (e.g., "physically active") are perceived as both warm and competent therefore contrasting with the superordinate category perception (Clément-Guillotin, Radel, & Chalabaev, 2015). In addition, not all older people subtypes are associated with decay, loss of cognition, or degraded body (Hummert, 1999) and some of these subtypes could refer to a positive perception of aging in accordance with Western cultural values (Greenberg et al., 2002). So many results in ageism research, including ours, could be conditioned by the kind of representation that each subtype activates in people's mind.

In view of the heterogeneity of stereotypes in memory, it is plausible to assume that dehumanization of specific older adult subtypes would be different from the one observed in relation to the superordinate category, like the mechanistic dehumanization of older workers found in Wiener and collaborators' study (2014), and the dehumanization of old-age care home residents in Drury and collaborator's work (2016). Specifically, Wiener and colleagues (2014) showed that the derogation of older workers leads people to perceive them as both mechanistically and animalisticaly dehumanized. In this specific context, the older worker subtype enhanced the perception of older people's incapacity to change, to learn, and to adapt to new technologies. Similarly, Drury and colleagues' work (2016) dealt with a specific context in which the caregivers' job is to take care of older people; a context that might have prompt the perception of older people as fungible objects they have to manage, especially in a context of negative contacts with the residents. In the present paper, our aim was to point the kind of dehumanization associated to the older people group at large, and therefore to the most salient stereotypes regarding the superordinate category (Hummert, 1990). We argue that as far as the superordinate category of older people is concerned, animalistic dehumanization.

Finally, some efforts should also be devoted at understanding how animalistic dehumanization of older people differentiates itself from mere ageism. Although theoretically the two phenomena are quite distinguishable (i.e., animalistic dehumanization referring to people's perceptions that older people are "less human" than younger adults and ageism to people's prejudice and negative feelings towards older people), future research should be conducted to examine the differential effects that these phenomena have on subsequent behaviors people display at older adults.

On the consequence of older people's dehumanization

Previous literature has highlighted the multiple consequences of dehumanization. In the case of older adults, animalistic dehumanization could also serve as a psychological mechanism that underlies some specific forms of discriminatory behaviors that older people often face. In particular, animalistic dehumanization could explain why older people often suffer from patronizing behaviors (Hummert, Shaner, Garstka, & Henry, 1998; Williams &

Nussbaum, 2001) and the use of baby-talk (Ryan, Hummert, & Boich, 1995). Indeed, animalistic dehumanization has been conceptualized as a form of dehumanization in which others are conceived as unevolved or less-evolved individuals on a hierarchical scale of evolution. Such a conception encompasses both the depiction and perception of others as animal-like and as child-like, irrational, and unsophisticated; a set of characteristics that could set the stage for patronizing forms of treatment (Haslam, 2006).

Animalistic dehumanization of older adults could also explain why older people are often excluded in medical practices from clinical trials or are undertreated while going through oncological treatment (Schroyen, Adam, Jerusalem, & Missotten, 2015; Schroyen, Missotten, Jerusalem, Gilles, & Adam, 2016). Indeed, adequate medical treatment of animalistically dehumanized patients might be perceived as fundamentally less important or necessary than the application of such treatment to "fully" human patients. Evidence for such an argument is found in a study by Cikara and colleagues (Cikara, Farnsworth, Harris, & Fiske, 2010). These authors used the trolley moral dilemma (Unger, 1996) to investigate people's utilitarian decisions to kill one person in order to preserve the lives of 5 others. Utilitarian decisions were found to be perceived as more morally acceptable when the person to be killed was a member of a strongly dehumanized category (i.e., homeless people; Harris & Fiske, 2006) than when he or she was presented as an ingroup member. What this research suggests is that the lives of dehumanized targets are perceived as less essential, more dispensable, and more sacrificable than the lives of other people. In sum, it is plausible to suggest that animalistic dehumanization of older people works as an anteceedent in the decisions to undertreat these patients.

Finally, future research should examine the incorporation of dehumanization perceptions into older people's self-concepts as well as its potential consequences. Recent research has indeed examined self-dehumanization effects on victims of dehumanization and has shown their consequences on cognitive and emotional functioning (e.g., Bastian & Haslam, 2011). Most recently, it has been found that animalistic self-dehumanization among homeless people increases (vs. decreases) reliance on dysfunctional (vs. functional) coping strategies (Demoulin & Leyens, in prep.). In line with this, one could speculate that (self-) dehumanization will also have important consequences on older people's behaviors and emotions.

Coda

As a whole, the present set of studies tends to suggest that humanness ascriptions on the uniquely human dimension follow a curvilinear path across the lifespan. While previous research has shown that young infants and children are perceived as still lacking some of those uniquely human traits that they will later acquire (Bastian, et al., 2011; Gray et al., 2007), the present results show that older adults are also perceived as being deprived of these uniquely human features.

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Table 1

Mean attribution of Positive and Negative Emotions as a Function of Target Type.

		Valence			
	Pos	Positive		Negative	
	Primary	Secondary	Primary	Secondary	
	emotion	emotion	emotion	emotion	
Target type					
Young people	1.58 (0.93)	2.15 (0.77)	2.00 (0.85)	1.15 (0.82)	
Old people	1.76 (0.93)	1.27 (0.81)	1.97 (0.87)	1.42 (0.91)	

Table 2

Mean Response Facilitation/Inhibition (ms) to Type of Emotion as a Function of Type of Prime, Relative to a Neutral Prime.

Valence		
Positive	Negative	

	Primary	Secondary	Primary	Secondary
	emotion	emotion	emotion	emotion
Prime type				
Young people	29.64	31.83	30.01	21.83
Old people	27.36	-10.18	32.88	26.05

Table 3Animal Words, and Mechanic Words as aFunction of Type of Prime, Relative to a NeutralPrime.

	Target	
	Animal Mechan	
	words	words
Prime type	M	М
Young people	-1.34	-2.53
Old people	11.18	-6.99