

Deer Who Are Distant

Response Congruency to Relative Pronouns Across Human and Nonhuman Entities

Denise Dillon

James Cook University, Singapore
denise.dillon@jcu.edu.au

Josephine Pang

James Cook University, Singapore, Townsville, Australia

Abstract

The study explores the influence of relative pronouns WHO or THAT on attributions of humanness across four categories of entities (unnamed nonhuman animals, named animals, machines, and people). Eighty-three university students performed an attribution task where they saw a priming phrase containing one category item with either WHO or THAT (e.g., deer who are ...) and then two trait attribute items (Uniquely Human UH/ Human Nature HN word pairs; e.g., distant-nervous), from which they selected the trait attribute most meaningfully suited to the phrase. Data were analyzed with a repeated measures 2 (humanness: HN traits, UH traits) × 2 (pronoun: WHO, THAT) × 4 (category: unnamed animals, named animals, machines, people) ANOVA. Participants responded relatively faster to HN trait attributes than to UH traits, and responded faster to named animals than to all other entities. Faster responses also ensued for people-WHO pairings than people-THAT pairings, and vice versa for named animals.

Keywords

attributions of humanness – relative pronouns – language and behavior

The study of language processes is important because humans communicate with each other primarily via the written and spoken word. The influence of language on behavior can be subtle (e.g., Hart & Albarracín, 2009), but should

not be ignored. For example, language offers insight into people's mental health, and some therapies involving language are effective in improving mental health (Pennebaker, 2002). As for the specific choice of words we use for referent categories, Brown (1958), an eminent psychologist in the area of child language development, reminded us that "there is a sense in which lexicon determines cognition and inferences about cognition can be based on lexicon" (p. 245). Put simply, we can get a sense of how people are thinking through what they choose to say.

Importantly also, cognitive psychology research has shown that, when faced with a discrepancy between language and belief, people will change one or the other to reduce what is known as cognitive dissonance. In the context of animal advocacy, the choice to include nonhuman animals in the same category of living entities as humans is reflected in subtle language practices such as pronoun use (e.g., hens who suffer in egg factories) (Dunayer, 2001). Another such practice involves metaphors whereby nonhuman animal characteristics are used to infer derogatory evaluations of people (e.g., women who are perceived as overly protective are "clucky") by emphasizing their "animal" nature which is somehow perceived to be less than human (Dunayer, 2001). In recent years, psychological research interest has extended from the content of a message to the linguistic style of the message (e.g., Pennebaker & King, 1999)—that is, how individuals phrase what they wish to say (Pennebaker, Mehl, & Niederhoffer, 2003). Linguistic style is reflected, for example, in the way one uses function words (Pennebaker, 2002) including *THE*, *MY*, *WHO*, *WHICH*, and *THAT*.

Function Words

The class of function words is extremely important, as they give meaning and context to nouns, adjectives, and verbs (Chung & Pennebaker, 2007). They are also some of the most commonly used words in the English language. Although people may pay little attention to function words, they can influence listeners or readers strongly, and provide insight into writers' and speakers' thoughts (Chung & Pennebaker, 2007). Relative pronouns are examples of function words. Of particular interest in the current study are the relative pronouns *WHO* and *THAT*.

Cambridge Dictionaries Online (2016) says the relative pronoun *THAT* is used "to introduce defining relative clauses. We can use *that* instead of *who*, *whom* or *which* to refer to people, animals and things. *That* is more informal than *who* or *which*." In comparison, the entry on *WHO* states this relative pronoun is used to refer to people "and sometimes to pet [sic] animals." This latter usage is all the more common (and probably expected) if an animal has an individualized

name (e.g., Peter the parrot who loves his seeds, versus the wild parrot that ate the bird seed). Jacobs (2005) described the renowned scientist Jane Goodall's struggle to have her first scientific paper accepted in its original form, with chimpanzees referred to as *he* or *she*, and as *who*, whereas the journal editor wanted these amended to *it* and *which*, respectively. However, it seems the practice of using WHO to refer to nonhuman animals is becoming more commonly accepted. Anecdotal evidence also indicates that the word THAT is frequently used when referring to humans (e.g., Students that study hard do well in their exams).

Gilquin and Jacobs (2006) examined the variance in the usage of the pronoun WHO with regard to nonhuman animals over the past 40 years. They compared grammar rules relating to the correct use of the pronoun WHO listed in 45 reputable sources and found that it could be acceptable to use WHO when speaking of nonhuman animals, although only in limited contexts. Some factors that helped determine when the use of WHO was appropriate included mention of the animal's gender, the writer's or speaker's attitude toward the animal, and whether the animal had a name (e.g., Fluffy the cat).

Regarding the use of THAT, anecdotal evidence suggests the word is being used as a replacement for WHO when referring to humans. This may be because grammatically correct use of THAT is not restricted to a particular type of target; consider as examples extracts from news reports (e.g., "throng[s] [of people] that showed up," Hussain, 2010) and articles posted on reputable websites (e.g., "Children that are secondhand smokers could have extended sleep problems," 2009). In some instances, this may be a way for writers to distance either themselves or their audience from bad news.

Some examples include personal reflections of missing children (e.g., "a group of children that were not lucky enough to be sitting at home with their family," Barrett, 2009) and a news report concerning child murderers (e.g., "Robert Kinscherff, a clinical psychologist and senior associate at the US' National Centre for Mental Health and Juvenile Justice, said children that kill usually fall into one of three categories ..."; Brook, 2016). In referring to people as THAT, there could be an element of dehumanization through inclusion in a broader category that includes animals and things instead of the relatively narrower category that includes just people and companion animals. However, more research is required before a more conclusive statement can be made.

Other media, such as classic literary works, are further evidence that the use of THAT as a human referent is pervasive and has been for some time. In *The Catcher in the Rye* (Salinger, 1984/1951), the protagonist Holden Caulfield consistently uses THAT to refer to people (e.g., "that lunatic ... that lived in tombs," p. 54). The narrator in *The Scarlet Letter* (Hawthorne, 1997/1850) also uses THAT in several instances to refer to people; for example, in the introduction, he narrates about "some of the characters that move in [the house]" (p. 37).

The phrasing of a sentence in the English language often has implications with regard to dehumanization or, conversely, to the attribution of humanness to nonhumans (e.g., Gupta, 2006). People often attribute humanness to non-human entities (anthropomorphism; Kwan & Fiske, 2008; e.g., “my computer is being stubborn”) and sometimes ascribe lesser humanness to other people (dehumanization; Haslam, 2006). The attribution of human traits to nonhuman entities can be used purposely for effect, especially in art and literature, as first noted by Ruskin (1856). Either through “willful fancy” or by “an excited state of feelings,” the pathetic fallacy involves the attribution of the characteristics of a living creature to an inanimate entity. For example, a poet might write metaphorically about dancing leaves or of the cruel sea. Similarly, anthropomorphism is defined for scientific purposes (i.e., in Reber’s 1985 *Dictionary of Psychology*) as “attributing human characteristics to lower organisms or inanimate objects” with the caution to be “careful not to imbue non-humans with what may be species-specific human characteristics” (p. 42).

In an example of dehumanizing language and thinking, Khanna (2008, p. 41) explores a human-based distancing effect through relatively current events in South Africa. She draws on Hannah Arendt’s analogy whereby Arendt aligns refugees with dogs in their status as dehumanized individuals. In her chapter on the decline of the nation state, and writing about minorities and stateless people, Arendt (1951) argued that, as fame might improve a refugee’s chances of rising through the social strata, so does a stray dog’s chance of survival improve through the individuating act of naming.

Only fame will eventually answer the repeated complaint of refugees of all social strata that “nobody here knows who I am”; and it is true that the chances of the famous refugee are improved just as a dog with a name has a better chance to survive than a stray dog who is just a dog in general (p. 287).

However, Khanna noted suggestions that most police dogs in South Africa should be killed because they are “too psychologically sick to be rehabilitated” (p. 42). Further, as a consequence of a 1998 police-dog attack on illegal immigrants, the connotations of the expression “like a dog” came to be reconsidered such that the act of killing the police dogs involved in the attack on the immigrants could somehow serve as a remediation for human dignity by maintaining a distance between human and dog/animal. Khanna gives literary examples (including Kafka) through which we see that the notion to “die like a dog” is taken to mean death without rights or dignity. Khanna also uses an example from J. M. Coetzee’s novel, *Disgrace*, as a contrast whereby “the only possibility for dogs like these [i.e., police dogs involved in acts of violence against humans] is for them to die with dignity or to be given the gift of death” (p. 42). In contrast, those killed by the police dogs are in the position of dehumanized individuals without recourse to either dignity or grace.

Language use, in turn, may influence behavior (Carroll, 1956). Some research on sexist language supports this view. For instance, Brooks (1983) found that female eighth-grade students in a female-biased language condition rated Occupational Therapist lower on gender appropriateness than did male students. Chartrand, Fitzsimons, and Fitzsimons (2008) were of the opinion that attributing human traits to a nonhuman entity could result in a person unthinkingly reacting to the entity in a particular way. In their experimental study where participants were set up to think about (i.e., primed with) either dogs (loyal), cats (not loyal), or canaries (neutral), dog-primed participants scored higher on a loyalty questionnaire than did cat-primed or canary-primed participants. The effect was independent of participants' self-identification as a dog/cat/bird person. In the preceding paragraphs, there is some support for the idea that language may influence attitudes to both dehumanization and attributions of humanness, and this, in turn, may affect behavior. Gupta (2006) documented examples wherein the pronoun *WHO* attributed human traits (sentience and personality) to nonhuman animals (foxes).

She investigated the use of *WHO* in foxhunting discourse published on the Internet and found (perhaps what some might consider as counterintuitive) that supporters of foxhunting tended to anthropomorphize foxes more than horses or hounds. Supporters seemingly described the fox in anthropomorphic terms as a worthy opponent so as to thereby boost their own status as successful hunters. Those who were pro-foxhunting were also more likely than those who were anti-foxhunting to use *WHO* as a referent to the fox. To explain this point, Gupta drew on Biber, Johansson, Leech, Conrad, and Finegan's reference work (1999, pp. 317-318, as cited in Gupta, p. 108) wherein *he* and *she* form types of "personal reference," while *it* is categorised as "non-personal." As Gupta herself quotes from Biber et al.: "Personal reference expresses greater familiarity or involvement. Non-personal reference is more detached" (p. 108).

She goes on to note that fox-hunting behavior in itself fosters familiarity with foxes through observation of their habits and habitat, and it is perhaps this greater familiarity with foxes that promotes at the same time affection for them. Further, Gupta argues that the greater the attribution of sentience to the fox as prey, the greater the creature's worth as an opponent for the hunter. Sentience is often ascribed more strongly to humans than to nonhuman animals, so humanized attributions to a prey, such as bravery and cunning, increase the esteem of a successful hunter. Says Gupta, "personalizing an animal does not preclude hunting the animal and is not necessary for its defence" (p. 119). It also appears that even within the people category there are degrees of perceived humanness.

Humanness and Dehumanization

In a series of experimental studies, Haslam and his colleagues (Haslam, 2006; Haslam & Bain, 2007; Haslam, Bain, Douge, Lee, & Bastian, 2005) reported evidence for the notion that attributions to humanness range on a continuum from traits believed to be uniquely human (UH) (e.g., moral sensibility) to traits believed to be part of typical human nature (HN) (e.g., interpersonal warmth). Although the former may be unique to humans, not every person has all of these traits; UH traits develop over time and differ from culture to culture, while, in contrast, HN traits are thought to be innate (Haslam, 2006). In addition, although humans share HN traits with other animals, these traits are viewed as an essential part of being human (Haslam, 2006).

Given the evidence for these two types of human attributes, and that dehumanization is defined as the denial of humanness to a target, it stands to reason that there are two corresponding forms of dehumanization. Haslam (2006) identifies these as (a) animalistic dehumanization, where UH traits are denied to a target, likening the target to a nonhuman animal, and (b) mechanistic dehumanization, where HN traits are denied to a target, likening the target to a robot or some other machine. As an outcome of his review of “manifestations and theories of dehumanization,” Haslam proposed that dehumanization is not extraordinary or exercised only in extremity. Instead:

An expanded sense of dehumanization emerges, in which the phenomenon is not unitary, is not restricted to the intergroup context, and does not occur only under conditions of conflict or extreme negative evaluation. Instead, dehumanization becomes an everyday social phenomenon, rooted in ordinary social-cognitive processes. (p. 252)

In the obverse, Gupta's finding that fox hunters tended to humanize the fox is an example of another social phenomenon whereby, to paraphrase Loughnan and Haslam, humanization need not occur only under conditions of harmony or extreme positive evaluation. Loughnan and Haslam (2007) found some support for the idea that the two types of dehumanization exist. They discovered that artists and nonhuman animals were implicitly associated with HN traits, whereas businesspeople and automata¹ were implicitly associated with UH traits. However, their study aims did not extend to exploring whether social cognitive processes influence the humanization of animals.

1 Automata in this sense refers to a moving mechanical device that replicates some form/s of human function.

The current study builds upon Loughnan and Haslam (2007) in that it examines attributions of humanness to four types of nonhuman and human entities. However, instead of social categories of people (i.e., artists, businesspeople), the focus remains on humans and nonhumans, while nonhuman entities are extended to include named animals in addition to unnamed animals and automata as employed in Loughnan and Haslam. The four types of entities are thus unnamed animals², named animals, machines, and people. An additional element in the present study involves the influence of the relative pronouns WHO and THAT on attributions of humanness to entities in the four categories, which is a foray into a relatively new area of research.

As such, the main hypothesis of the current study states that attributions of humanness to entities in four categories—animal, named animal, machine, and people—would be influenced by the use of either WHO or THAT in a priming phrase (e.g., [priming phrase] Deer who are / [humanness trait pair HN-UH] NERVOUS-DISTANT). McNamara (2005) defined priming as, “an improvement in performance in a perceptual or cognitive task, relative to an appropriate baseline, produced by context or prior experience” (p. 3). Among other common findings in priming tasks, McNamara explained that a response congruency effect comes from an incongruence between primes and targets that vary on meaning dimensions such that only when a meaning is congruent to the target is there unconscious activation (hence faster response times). In the context of the current study, the priming phrase includes an entity plus a pronoun that arguably most strongly indicates either a being (WHO) or a thing (THAT). The target here is the humanness trait attribution which, according to Haslam and his colleagues, extends along a continuum of humanness and can indicate dehumanization towards the status of nonhuman animal or, at the other end of the continuum, towards the status of nonliving entities such as machines.

Materials and Methods

Materials

Category Items

A pilot study was conducted to ascertain if entities allocated to four categories were representative. The four types of entities were animal, machine, named animal, and people. For the animal and named animal entities, words that carried strong metaphorical human connotations (e.g., SHARK) were, as much as possible, excluded.

² For the purposes of brevity, the category of “unnamed animals” is from here-on-in referred to as “animals.”

Data regarding the lexical characteristics (e.g., word frequency, word length) of 80 word items representing the four types of entities—20 per category—were obtained from the English Lexicon Project³ (ELP, Balota et al., 2007) website from which researchers can gain such information. Their lexical characteristic data has been collated from thousands of studies using word and nonword stimuli. Due to the nature of language, word frequency distributions are inherently skewed (a small group of high-frequency words and many low-frequency words leads to positive skewness), so a log transformation was used on the raw frequency data to reduce skewness (Zipf, 1935). A single-factor ANOVA revealed that the 80 words were similarly matched on Log frequency across categories ($F(3, 76) = 1.65, p = .18$), and words were also equivalently matched on number of syllables and letters. As frequency data were unavailable for ANDROID⁴, the value used in the calculations for this entity was the mean Log frequency value calculated for other entities in the machines category.

Ten editors, proofreaders, and writers involved in English language publications were recruited via the snowballing method. It was assumed that as these professionals are highly fluent in the English language and are practiced in semantic assessment as part of their job, they would be suitable judges of whether the entities were representative of the respective categories.

The volunteers were asked to rate how representative each entity was of its category on a visual analogue scale (VAS), a 10-cm-long continuous line where the leftmost end indicates “not at all representative” and the rightmost end of the line, “very representative.” From each category, the 10 most representative entities were selected, resulting in 40 entities in total (Appendix 1).

Human Attribute Items

The UH and HN attributes were chosen from Haslam’s previous studies (Haslam & Bain, 2007; Loughnan & Haslam, 2007), and there were an equal number of attributes carrying positive and negative connotations. The humanness attributes along with their affective connotations are shown in Table 1. Of note, DISTANT was selected to replace COLD, which was the original stimulus used in Loughnan and Haslam (2007), as COLD can be interpreted in various ways and was considered to be ambiguous.

3 “The English Lexicon Project (supported by the National Science Foundation) affords access to a large set of lexical characteristics, along with behavioral data from visual lexical decision and naming studies of 40,481 words and 40,481 nonwords.” <http://ellexicon.wustl.edu/>

4 Data collection preceded the advent of the Google Android operating system in 2013.

The attribute terms were matched on lexical characteristics such as length and Log frequency, using data from the ELP website (Balota et al., 2007). The same HN word was always paired with the same UH word (see Table 1), although the position of the word on the screen—whether it was presented above or below—was counterbalanced. Affect valence (i.e., positive/negative connotations) was not considered in analyses or discussion, because it was included as a control feature only to ensure that neither HN nor UH attributes were skewed in either direction connotatively.

Apparatus

The attribution task was generated via the computer program E-Prime Version 2.1 (2008) and run using the associated program, E-Run, which provides millisecond accuracy in timing. Both these programs were installed on a laptop, which was used to collect experimental data; responses were recorded via pressing designated keys on the keyboard. All other programs (including screensavers) were deactivated so as to minimize lag and ensure that the response times recorded were accurate.

Design

The 40 entities (10 in each of the 4 categories) were each presented 12 times—once for each of the six UH/HN attribute pairs with WHO, and once for each of the six attribute pairs with THAT. This resulted in a full set of 480 experimental item sets.

TABLE 1 *HN and UH human attribute item Pairs matched on lexical characteristics*

Affect valence	Human attribute trait types	
	Human Nature (HN)	Uniquely Human (UH)
Positive	CURIOUS	ORGANIZED
	FRIENDLY	HUMBLE
	TRUSTING	POLITE
Negative	JEALOUS	SHALLOW
	AGGRESSIVE	RUDE
	NERVOUS	DISTANT

The attribution task thus consisted of 480 trials, with an additional 12 practice trials prior to the experimental trials to allow participants to familiarize themselves with the experiment. The trials were split into two blocks (block A, block B) of 240 trials each, and the blocks were counterbalanced—half of the participants were presented with the blocks in A-B order, and the other half in B-A order. Within each block, the trials were randomized.

All instructions and text were shown in white font on a black background, the only exception being the “No response detected” screen, which was shown in red font on a black background.

Questionnaire

A questionnaire administered after the experiment collected demographic data (e.g., age and gender) and assessed participants’ basic grammatical knowledge in a short grammaticality test comprising 10 questions checking if participants knew how to properly use *WHO* and *THAT* (modeled after Jacobs, 2005), and a section to ascertain that participants understood the meaning of the humanness items. For the latter, they were to put a checkmark next to the attribute words that they understood.

The 10 questions were based on simple statements used in English language classes to test understanding of basic rules of grammar. Participants were to select the word (either *WHO* or *THAT*) best suited to fill in the blank in the sentence. An example of one of the grammaticality test items is “Yesterday I saw a lawyer _____ was really old.”

Participants

Eighty-three participants took part in the experiment. All participants were Psychology students from James Cook University (Singapore campus), recruited via an advertisement posted on the research recruitment notice board. All participants had English as their first language, and normal or corrected-for-normal vision. Respondents received partial course credit for participating, although four participants were not eligible for credit and received no incentive.

The majority of the participants were female (78%), with 18 males (22%) in the sample, and participant age ranged from 18 to 40 years ($M = 22.47$ years, $SD = 4.61$ years). The sample consisted primarily of students of Chinese ethnicity (63%), and 24% of the sample was of Indian ethnicity. The rest of the sample were either from other ethnic groups (e.g., Malay, Caucasian) or of mixed ethnicity (e.g., Chinese-Indian).

Participants generally exhibited a good grasp of basic grammar; the majority (81%) obtained a perfect score on the grammaticality test, and the lowest score on the test was 7 out of 10 (one participant). Most participants indicated

that they understood all 12 human attribute words (95%), with 9 being the lowest number of words understood.

Procedure

Participants completed the task individually and independently. As part of the verbal briefing before the task, participants were warned that although the trials would seem repetitive, it was very important that they continually use the same decision-making process throughout the experiment; that is to say, they had to choose the most suitable attribute of the two presented after the probe phrase for every trial. Additionally, they were cautioned that they had to respond within a certain amount of time, after which they would see a screen displaying the phrase “No response detected.” They were told that if this screen appeared, they should respond more quickly afterward.

For each trial, participants were presented with a fixation cross in the middle of the screen for 500 ms to focus their attention on the center of the screen, followed by the probe phrase (e.g., “monkeys who are”) for 2,000 ms, then the UH/HN pair words for 2,000 ms. The sequence either ended with a response from the participant selecting one of the two attributes on screen, or the sequence timed out after 2,000 ms and the “No response detected” screen was displayed. The inter-stimulus interval was set at 500 ms.

Results

Analysis of Data

For all participants, response times faster than 500 ms were replaced with blank responses. Missing data, recorded in E-Run as 0 ms, were also replaced with blank cells. Data collected from 15 participants were excluded, as more than 25% of their overall data were blank and it was suspected that participants had been responding as rapidly as possible as a strategy to move through items quickly. In addition, data from three participants were lost due to corruption of files or computer program errors.

After all exclusions and losses of data, 65 data sets were analyzed using SPSS, with the alpha level set to .05 for all analyses. A repeated measures 2 (Humanness: HN, UH) \times 2 (Pronoun: WHO, THAT) \times 4 (Entity category: animals, named animals, machines, people) ANOVA was run. Partial eta squared is reported throughout (η_p^2). According to Cohen's (1988) recommendations, η_p^2 values below .01 are considered small, .06 as moderate, and .14 and above as large.

Across all analyses, skewness and kurtosis statistics fell in the +2 to—2 range; hence, the assumption of normality was not violated. The assumption

of homogeneity of variance was violated when data were analyzed across categories. However, ANOVA is generally robust even when assumptions are violated (Howell, 2002), so we proceeded with parametric analyses. Mean response times across all conditions are displayed in Table 2. Mean response times for individual items across HN-primary and UH-primary pairs are presented in Appendix 1a-b.

Main and Interaction Effects

A main effect for humanness was found, $F(1, 64) = 4.64, p = .035, \eta_p^2 = .068$. However, even though the difference is statistically significant and the effect size is moderate, in practical terms response times to HN items and to UH items differ very little, by only about 6 ms (Figure 1).

A main effect for pronoun was absent, $F(1, 64) = .98, p = .326, \eta_p^2 = .015$, but a significant main effect for entity category was observed, $F(3, 62) = 4.33, p = .008, \eta_p^2 = .173$, indicating that participants responded differently to stimuli from the four entity categories. Regardless of pronoun, the fastest response times were for the named animal category, followed by the animal category, the people category, and the machine category (Figure 2).

An interaction between pronoun and entity category was found to be statistically significant, $F(3, 62) = 3.17, p = .03, \eta_p^2 = .133$. Given an initial expectation that the effect of pronoun use would be subtle, this interaction is reassuring. The interaction between entity categories and pronouns is shown in Figure 3.

TABLE 2 *Mean response times in milliseconds (and standard deviations) for items across all conditions (humanness, pronoun, entity category)*

Entity categories	Human nature		Uniquely human	
	That	Who	That	Who
Animals	1,055 (43.84)	1,047 (52.92)	1,066 (52.33)	1,068 (49.72)
Named animals	1,066 (40.44)	1,076 (48.42)	1,085 (49.22)	1,078 (39.19)
Machines	1,046 (39.88)	1,055 (45.55)	1,053 (40.19)	1,056 (35.22)
People	1,081 (34.31)	1,065 (46.60)	1,079 (45.20)	1,059 (33.15)

To test the for simple main effects of pronoun, four paired-samples t tests (two-tail) were performed to test the difference between mean response times to priming phrases including THAT and WHO across each of the four entity categories. The values used in the calculations were average response times collapsed across the two humanness conditions, and a new alpha of .0125 was applied using the Bonferroni correction for familywise error in multiple comparisons. No significant difference was found for entity categories of animals, $t(58) = 0.33, p = .74$, named animals, $t(58) = -0.81, p = .42$, or machines, $t(58) = -0.16, p = .87$. There was a significant difference in mean response times for trait attributions when paired with either THAT or WHO when it came to people, $t(58) = 2.69, p = .01$. Participants responded more slowly when trait attributes were paired with the relatively incongruent THAT (e.g., “Farmers that are friendly”) than when paired with WHO.

The three-way interaction among humanness, pronoun and category was not significant, $F(3, 62) = .81, p = .491, \eta_p^2 = .038$. The lack of a statistically significant interaction among the three variables means the main hypothesis of the study was not supported.

Discussion

The main hypothesis—that attributions of humanness to entities such as animals, named animals, machines, and people would be influenced by the use of

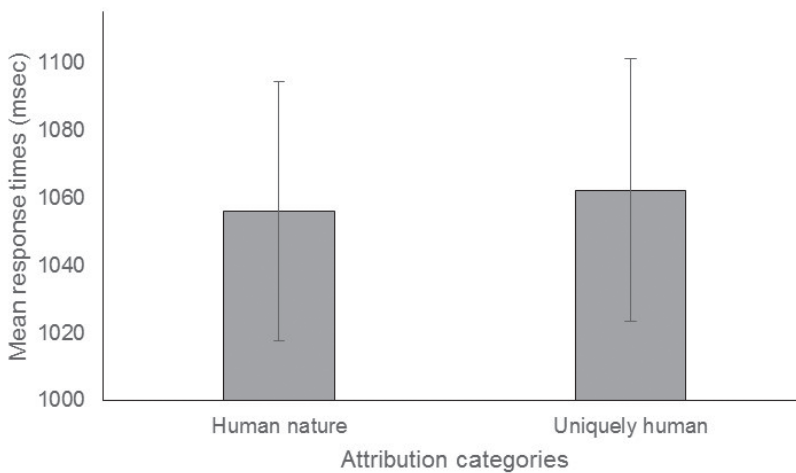


FIGURE 1 Mean response times in milliseconds to HN attribute words and UH attribute words. The error bars indicate 95% confidence intervals.

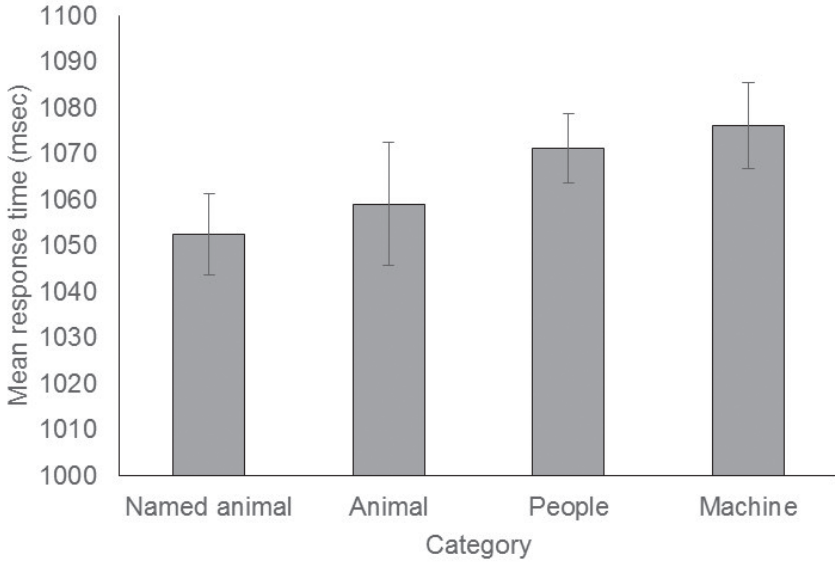


FIGURE 2 *Mean response times in milliseconds to items from the four categories: animals, machines, named animals and people. Error bars indicate 95% confidence intervals.*

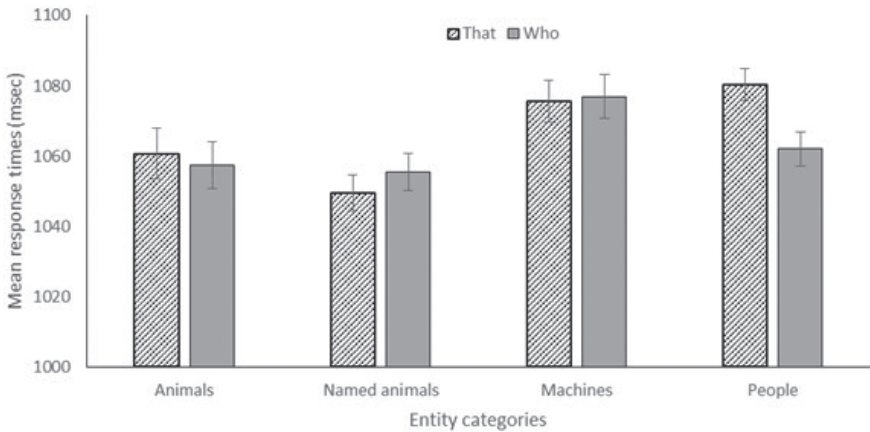


FIGURE 3 *Interaction between entity category and pronoun, which was found to be significant across subjects and bordered significance across items. Error bars indicate standard error.*

either WHO or THAT in a priming phrase—was not supported by the data collected in this study. However, the results still present interesting information that adds to the literature.

A strong main effect for category (large effect size) was found, indicating that people responded differently according to the entities in the four categories. This makes logical sense, as one would expect participants to find some congruence with other humans relative to other entities. As for attributing humanness to the various types of entities, verbal feedback from participants indicated that most found it extremely odd to attribute human traits to machines in particular, and this is reflected in the relatively slower response times to machine items. However, the people category produced the second slowest response times and this was not anticipated; one would expect that response times to items in the people category would be fastest, as all UH and HN word choices are related to people but not all of them are related to the other categories.

A possible explanation for this might be that the humanness attribute words chosen for the study were incongruent with particular items in the people category, as certain professions are stereotypically linked to specific characteristic human traits (Loughnan & Haslam, 2007). For example, journalists may be stereotyped as curious people and soldiers may be seen as aggressive, but aggression and curiosity may not fit into the stereotyped perceptions of journalists and soldiers, respectively. This incongruence may have resulted in relatively slower response times on particular items, thereby affecting the overall category mean. Further study regarding attributions of humanness across various professions may be of assistance in explaining the results of the current study.

The observed main effect for humanness, with significantly slower responses when uniquely human trait attributes were used as primes compared with human nature trait attributes provides partial support for Haslam's concept of humanness (Haslam, 2006). That responses to HN and UH attribute items differed in a statistically significant manner provides support for the idea that UH and HN traits each collectively convey psychologically different meanings. While in practical terms the difference of 6 ms appears minimal, the effect size is moderate and indicates that further exploration could be fruitful.

The interaction between pronoun and category was statistically significant. Nevertheless, the *t*-test analyses revealed that the significant interaction was due to the pronoun difference for items in the people category with slower mean response times for primes including THAT than WHO. From a grammatical viewpoint, the results make sense, as WHO should be the most appropriate referent to people items relative to other entities, resulting in easier, faster processing and so the briefest response times. Since Loughnan and Haslam (2007) already found artists to be associated with HN traits and businesspeople to be associated with UH traits, a possible avenue of study may involve the

investigation of how WHO and THAT may influence the attribution of humanness to artists and businesspeople. By focusing on these two specific examples about which information is already available, the research may help to clarify the results of the current study.

Aside from statistical results, several noteworthy observations were also generated from the experiment. Firstly, not many participants voluntarily mentioned the WHO/THAT discrepancy in the 480 experimental items. Of those who did, the most common complaint was that the probe phrases were referentially incorrect (e.g., “printers who are ...”). However, when the WHO/THAT discrepancy was pointed out, most acknowledged that they had noticed some items featured WHO and others featured THAT. Incongruous combinations were most often noticed and remembered, and machine items with WHO were noted as the most distinctive (e.g., “treadmills who are ...”). A few participants also said they had not noticed the WHO/THAT variations at all.

Although the main hypothesis was not supported, it may be premature to conclude that WHO and THAT primes did not have an effect on attributions of humanness across various types of human and nonhuman entities. It could be that the phenomenon is so subtle that the current experimental design did not register it; as mentioned previously, even though statistically significant differences were found, in reality these differences in response time were very small. This is not to say that the current design was ineffective; in general, statistical power was found to be good and the overall design was strong (e.g., within-subjects design, ample representation per category, sufficient repetitions). However, to find the most appropriate methodology, future research could compare the efficacy of the attribution task used here with other suitable methods such as a lexical decision task.

Of course, we must also consider the limits to ecological validity intrinsic to experimental designs. Neither the study reported here nor any proposed experimental studies could properly capture the lived experience of people's daily encounters with and deployment of language, intentional or otherwise. This is not to say experimental studies such as this one are not valuable in being able to capture measurable responses to nuances of difference in linguistic constructions—they certainly can. However, corpus analyses via searches through Google or other large corpora such as those employed by Gupta (2006) and Jacobs (2005) have their own limitations in the onus of having to read through large quantities of text to locate patterns. Gupta acknowledged the need to “reduce the number of hits to a figure that is small enough for me to read and large enough for me to see some patterns” (p. 111).

What might be considered another limitation of the study is that the limited participant sample does not allow us to examine potential cultural variation. However, given that this is a novel attempt to address a previously untested

research question, it cannot be expected that we could control for potential cultural variation in the representations of nonhuman animals (or machines for that matter). The aforementioned corpus analysis methodology might also be better suited to determine cultural variations so that these are more clearly identified, prior to any attempt to incorporate these as a factor in an experimental design.

Conclusion

As concerns the current study, another possible explanation for the non-significant results obtained for the three-way interaction is that WHO may be no longer closely linked to humanness and therefore nullifying the response congruency effect in this context. In terms of rhetorical strategies employed in both human and nonhuman animal advocacy, the current study findings offer the insight that people seem to have no unconscious leaning towards perceiving nonhuman animals as only things in that there was no obvious response congruency effect between THAT or WHO for entities in the animal and named animal categories. Gupta's finding that fox hunters readily referred to foxes as WHO is perhaps not so much an overt exploitation of language to justify violence but rather an unconscious shifting of foxes along the humanness continuum through acknowledging their human nature characteristics. The response congruency effect was evident for the people category such that participants appeared to find some incongruence when people were referred to as THAT (e.g. "musicians that are ..."), which perhaps reduces the notion of beingness. Unfortunately, this neither explains the relatively common use of THAT in reference to people in everyday communication nor provides any further insight into the theorized humanness continuum with respect to people.

Gilquin and Jacobs (2006) and Gupta (2006) both found that WHO is no longer solely used to refer to humans. In particular, Gilquin and Jacobs (2006) examined the use of WHO with nonhuman animals over the past 40 years, indicating that language changes are likely to be gradual such that most people may not notice. Considering how widespread is the generalized use of THAT in reference to humans (e.g., in novels such as the still-popular *The Catcher in the Rye*, and in current newspaper articles), it could be that any previously strong link between WHO and humanness is fading, as people begin to replace the relative pronoun WHO with THAT. In short, it is possible that WHO is gradually being replaced by THAT, to the extent that it no longer carries humanizing, phenomenological connotations of being. There is scope for further text analysis studies tracking the use of WHO and THAT in relation to humanness attributes or dehumanizing words (respectively) to properly document this hypothetical shift in language use.

Acknowledgments

The authors are sincerely grateful to Dr. George Jacobs and the three independent reviewers who provided editorial advice and insightful comments on drafts of the manuscript.

References

- Arendt, H. (1951). The decline of the nation-state and the end of the rights of man. In *The Origins of Totalitarianism*. Retrieved 15 February, 2017, from http://www.cscd.osaka-u.ac.jp/user/rosaldo/15Decline_nation-state.html
- Balota, D. A., Yap, M. J., Cortese, M. J., ... Treiman, R. (2007). The English lexicon project. *Behavior Research Methods*, 39(3), 445-459.
- Barrett, J. (2009, December 27). Remembering the children that are still missing [Web log message]. *Blogger News Network: High-quality English language analysis and editorial writing on the news*. Retrieved January 23, 2017, from <http://www.bloggernews.net/123377>
- Brook, B. (2016, February 11). Experts warn of triggers that can turn kids into killers in the wake of an 11-year-old charged with murder. *Lifestyle: Real Life True Stories*. Retrieved January 23, 2017, from <http://news.com.au>
- Brooks, L. (1983). Sexist language in occupational information: Does it make a difference? *Journal of Vocational Behavior*, 23(2), 227-232.
- Brown, R. (1958). *Words and Things*. Glencoe, IL: The Free Press.
- Cambridge Dictionaries Online. (2016). Retrieved April 23, 2016, from <http://dictionary.cambridge.org/dictionary/english/who>
- Carroll, J. B. (Ed.). (1956). *Language, thought, and reality: Selected writings of Benjamin Lee Whorf*. Cambridge, MA: MIT Press.
- Chartrand, T. L., Fitzsimons, G. M., & Fitzsimons, G. J. (2008). Automatic effects of anthropomorphized objects on behavior. *Social Cognition*, 26(2), 198-209.
- Children that are secondhand smokers could have extended sleep problems. (2010, January 24). *UK Health Centre*. Retrieved from <http://www.healthcentre.org.uk/sleep-disorders/news.html>
- Chung, C., & Pennebaker, J. (2007). The psychological functions of function words. In K. Fiedler (Ed.), *Social communication* (pp. 343-359). New York, NY: Psychology Press.
- Dunayer, J. (2001). *Animal equality: Language and liberation*. Derwood, MD: Ryce Publishing.

- Gilquin, G., & Jacobs, G. M. (2006). Elephants who marry mice are very unusual: The use of the relative pronoun who with nonhuman animals. *Society & Animals*, 14(1), 79-105.
- Gupta, A. F. (2006). Foxes, hounds, and horses: Who or which? *Society & Animals*, 14(1), 107-126.
- Hart, W., & Albarracín, D. (2009). What I was doing versus what I did: Verb aspect influences memory and future actions. *Psychological Science*, 20(2), 238-244.
- Haslam, N. (2006). Dehumanisation: An integrative review. *Personality and Social Psychology Review*, 10(3), 252-264.
- Haslam, N., & Bain, P. (2007). Humanising the self: Moderators of the attribution of lesser humanness to others. *Personality and Social Psychology Bulletin*, 33(1), 57-68.
- Haslam, N., Bain, P., Douge, L., Lee, M., & Bastian, B. (2005). More human than you: Attributing humanness to self and others. *Journal of Personality and Social Psychology*, 89(6), 937-950.
- Hawthorne, N. (1997). *The Scarlet Letter*. Retrieved January 20, 2010, from <http://www.gutenberg.org/dirs/etext92/sclr13.txt> (Original work published 1850).
- Hussain, Z. (2010, January 24). Lauded for role in Johor's growth. *The Sunday Times*, p. 2.
- Jacobs, G. (2005). Extending the circle of compassion to include nonhuman animals: the case of the use of who as seen in grammars and dictionaries. *Language and Ecology*, 1(4). Retrieved April 11, 2008, from <http://www.ecoling.net/journal.html>
- Khanna, R. (2008). Indignity. *Positions: East Asia Cultures Critique* 16(1), 39-77.
- Kwan, V. S. Y., & Fiske, S. T. (2008). Missing links from social cognition: The continuum from nonhuman agents to dehumanised humans. *Social Cognition*, 26(2), 125-128.
- Loughnan, S., & Haslam, N. (2007). Animals and androids: Implicit associations between social categories and nonhumans. *Psychological Science*, 18(2), 116-121.
- McNamara, T. P. (2005). *Semantic Priming: Perspectives from Memory and Word Recognition*. New York, NY: Psychology Press.
- Pennebaker, J. W. (2002). What our words can say about us: Toward a broader language psychology. *Psychological Science Agenda*, 15(1), 8-9.
- Pennebaker, J. W., & King, L. A. (1999). Linguistic styles: Language use as an individual difference. *Journal of Personality and Social Psychology*, 77(6), 1296-1312.
- Pennebaker, J. W., Mehl, M. R., & Niederhoffer, K. G. (2003). Psychological aspects of natural language use: Our words, our selves. *Annual Review of Psychology*, 54, 547-577.
- Ruskin, J. (1856). Of the pathetic fallacy. In *Modern Painters*, volume 3, part 4. Retrieved February 15, 2017, from <http://www.ourcivilisation.com/smartboard/shop/ruskinj/>
- Salinger, J. D. (1984). *The Catcher in the Rye*. Harmondsworth, United Kingdom: Penguin in association with Hamilton. (Original work published 1951).
- Zipf, G. K. (1935). *The Psychobiology of Language*. Boston, MA: Houghton Mifflin.

Appendix 1a: Mean response times (ms) for HN-primary pairs

Item	HN stimuli	UH stimuli	unnamed animal	named animal	machine	people							
Stimulus pairs HN primary	Pronoun “that”	Pronoun “who”	Pronoun “that”	Pronoun “who”	Pronoun “that”	Pronoun “who”	Pronoun “that”	Pronoun “who”					
1	curious	organized bears	976	1035	Bessie	979	1064	androids	990	1103	actors	1123	1035
2	friendly	humble	988	968	the cow	1047	984	androids	1023	998	actors	1075	1027
3	trusting	polite	1040	1155	Bubbles	1038	1021	automobiles	1055	1140	actors	1128	1073
4	jealous	shallow	1060	1029	the goldfish	1035	1159	automobiles	1055	1134	actors	1085	1074
5	aggressive	rude	1039	1047	Cyrus	1120	1089	cars	1089	1080	farmers	1034	1100
6	nervous	distant	1060	1068	the rooster	1084	1058	cars	1047	1134	farmers	1125	1122
7	jealous	shallow	1016	1030	the rooster	1071	1119	cars	1110	1073	farmers	1093	1122
8	aggressive	rude	1045	992	the rooster	1047	1045	computers	1082	1138	journalists	1060	1078
9	nervous	distant	1024	1013	Jack the goat	1095	1077	computers	1107	1065	journalists	1098	1083
10	curious	organized deer	1034	1004	Jack the goat	993	1026	computers	1011	995	journalists	1083	1083

Stimulus pairs		Pronoun	Pronoun	Pronoun	Pronoun	Pronoun	Pronoun	Pronoun	Pronoun
HN primary		“that”	“who”	“that”	“who”	“that”	“who”	“that”	“who”
Item	HN UH	unnamed	named	machine	people				
	stimuli	stimuli	animal						
11	friendly humble	1007	1024	983	995	1047	982	1068	980
12	trusting polite	1051	1045	1011	1039	1045	1004	1122	1050
13	curious organized jackals	1043	1005	1036	1034	1042	1011	1070	994
				the		facsimiles		mayors	
				sheep					
14	friendly humble	1024	934	1016	1051	1019	1001	1045	1046
15	trusting polite	1104	1118	1091	1078	1051	1057	1055	1048
16	jealous shallow lions	1103	1049	1076	1116	1112	1044	1052	1102
				the		generators		musicians	
				hamster					
17	aggressive rude	969	943	1004	1031	1063	1091	1128	1072
18	nervous distant	1095	1081	1095	1091	1046	1073	1075	1073
19	jealous shallow monkeys	1072	1085	1036	1029	1061	1099	1109	1094
				Paris		printers		nurses	
				the cat					
20	aggressive rude	1041	1035	1093	1036	1146	1067	1054	1035
21	nervous distant	1085	1080	1099	1143	1076	1124	1097	1055

(cont.)

Stimulus pairs		Pronoun	Pronoun	Pronoun	Pronoun	Pronoun	Pronoun	Pronoun	Pronoun
HN primary		"that"	"who"	"that"	"who"	"that"	"who"	"that"	"who"
Item	HN	UH	unnamed	named	machine	people			
	stimuli	stimuli	animal	animal					
22	jealous	shallow	moose	Polly	robots	sailors	1092	1114	1149
				the			1105		
				para-			1009		
				keet			1092		
23	aggressive	rude	1028	1014	1074	1014	1099	1148	1062
24	nervous	distant	1050	1136	1087	1047	1092	1065	1079
25	curious	organized	1074	1041	Prince	1084	1028	1052	1133
				the dog					
26	friendly	humble	1060	1100	1019	954	1091	1095	984
27	trusting	polite	1101	1120	1015	1046	1132	1137	1099
				Silver					
28	curious	organized	1065	1083	1043	1087	1028	1073	1051
				the					
				horse					
29	friendly	humble	1098	1032	976	1013	1086	1080	947
30	trusting	polite	1163	1098	1062	1040	1138	1110	1107

Appendix 1b: Mean response times (MS) across items for UH-primary pairs

Item	UH stimuli	HN stimuli	unnamed animal	named animal	Pronoun "that"	Pronoun "who"	Pronoun "that"	Pronoun "who"	machine	Pronoun "that"	Pronoun "who"	people	Pronoun "that"	Pronoun "who"
1	rude	aggressive	bears	1012	1040	1030	1009	1037	androids	1058	1069	actors	1033	1033
2	shallow	jealous		1053	1080	1104	1069	1141		1025	1076		996	996
3	distant	nervous		1146	1111	1022	1096	1078		1078	1059		1029	1029
4	polite	trusting	beavers	1068	1105	1080	1077	1133	automo-biles	1137	1140	ambassa-dors	1042	1042
5	humble	friendly		1037	1035	1060	1068	1152		1074	1062		1024	1024
6	organized	curious		1031	1021	1003	1054	1053		1116	986		1038	1038
7	polite	trusting	coyotes	1126	1022	1098	1111	1057	cars	1060	1042	farmers	1075	1075
8	humble	friendly		1091	1088	1020	1076	1016		1095	1055		1068	1068
9	organized	curious		981	1022	1006	1044	1034		1085	1116		1089	1089
10	rude	aggressive	deer	1035	1035	1027	1038	1088	comput-ers	1094	1010	journalists	1007	1007
11	shallow	jealous		1032	1061	1069	1083	1045		1073	1167		1089	1089

(cont.)

Stimulus pairs		Pronoun	Pronoun	Pronoun	Pronoun	Pronoun	Pronoun	Pronoun						
UH primary		“that”	“who”	“that”	“who”	“that”	“who”	“that”						
UH	HN	unnamed	named	unnamed	named	unnamed	named	unnamed						
stimuli	stimuli	animal	animal	animal	animal	machine	people	people						
12	distant	nervous	1054	1098	1065	1067	1136	1032	1055	1025				
13	rude	aggressive	jackals	1021	990	Mary the sheep	1029	1027	facsimiles	1022	1025	mayors	1026	1040
14	shallow	jealous	1014	1065	994	1069	1064	1082	1048	1091				
15	distant	nervous	1021	1063	1031	1008	1020	1078	1084	1040				
16	polite	trusting	lions	1189	1129	Mike the hamster	1082	1103	genera-	1193	1072	musicians	1072	1129
17	humble	friendly	1056	1121	981	1039	1074	1184	1108	1046				
18	organized	curious	1060	1025	1047	990	1069	1073	1100	1115				
19	polite	trusting	monkeys	1124	1159	Paris the cat	1093	1133	printers	1128	1115	nurses	1088	1076
20	humble	friendly	1046	1023	1069	1067	1124	1077	1047	1072				
21	organized	curious	1004	1008	1012	1040	1008	980	1075	1024				
22	polite	trusting	moose	1086	1140	Polly the parakeet	1178	1076	robots	1100	1086	sailors	1143	1089
23	humble	friendly	1046	1044	1040	1013	1146	1090	1013	1042				

Item	UH stimuli	HN stimuli	unnamed animal	named animal	Pronoun "that"	Pronoun "who"	machine	people	Pronoun "that"	Pronoun "who"	Pronoun "that"	Pronoun "who"
24	organized	curious	1096	1006	1059	1011	1134	1088	1061	1067		
25	rude	aggressive	tigers	1058	1053	Prince	shredders	1057	1099	soldiers	1072	1029
26	shallow	jealous	1124	1123	1077	1034	1101	1035	1180	1100		
27	distant	nervous	1185	1074	1056	1027	1017	1072	1102	1072		
28	rude	aggressive	wolves	1009	1011	Silver	treadmills	1099	1104	tourists	1116	1059
29	shallow	jealous	1109	1177	1091	1091	1134	1131	1129	1110		
30	distant	nervous	1078	1102	1064	1087	1083	1032	1083	1047		