



## Mind the generation gap: Differences between young and old in everyday lexical categories



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### ARTICLE INFO

#### Article history:

Received 31 January 2017

Revision received 30 August 2017

Available online 17 September 2017

#### Keywords:

Word meaning

Semantic change

Artifact categories

Categorization

Basic level categories

Individual differences

### ABSTRACT

Considerable stability of the meanings associated with concrete nouns is arguably important for their effective use. On the other hand, variability is observed across time, individuals, and communicative contexts. This study examined the balance between stability and flexibility in meanings of common, basic level artifact nouns by evaluating speaker differences in their use as a function of age, education, and gender. Diverse samples of monolingual Dutch- ( $N \approx 400$ ) and French-speaking ( $N \approx 300$ ) Belgian adults made lexical category judgments for pictures of storage containers. Mixture IRT-analyses revealed the presence of latent groups of categorizers related to age but not gender or education in each language. In both languages, older adults relied more on traditional materials such as glass or cardboard in their judgments, whereas younger adults emphasized relatively new materials such as plastics. This generational difference demonstrates how elements of word meaning can shift over the short-term, linking individual to larger scale variation and providing the foundation for meaning evolution over time.

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### Introduction

Common, concrete nouns like *dog* and *cat*, *table* and *chair*, and *bottle* and *jar* are used readily in communications between native speakers of English with rarely a misunderstanding. From the perspective of the literature on concepts and categories, such ease of use is a natural consequence of the shared, stable nature of the concepts these nouns point to. Smith and Medin (1981) opened their foundational book *Categories and Concepts* arguing that concepts give human experience stability and that mental life would be chaotic without them. Keil (1994) considered category stability essential in a highly variable world, and category stability has been regarded as necessary to prevent communicative breakdowns (Hampton & Passanisi, 2016; Keil, 1994; Verheyen & Storms, 2013). The distinction between surface and deep properties and the proposal of an underlying essence as part of concepts (e.g., Medin & Ortony, 1989) are both aimed at providing stability despite the possibility of variable attention to superficial properties. Furthermore, some evidence suggests stable representation and processing of categories throughout adulthood (e.g., Grieder, Crinelli, Koenig, Wahlund, Dierks, & Wirth, 2012; Light, 1991).

Indeed, implicit in the methodology of most of the vast amount of experimental work on categorization is an assumption that concepts are fundamentally the same within the population studied. Averaging responses across participants in various tasks to characterize the mental representations of a population assumes that variation across individuals and samples is only noise in the data.

From a different time scale and theoretical perspective, however, variability is a given. Labels such as *dog* and *cat*, *chair* and *table*, and so on are the words of a particular language (not language-independent concept tags), and the referential range of their closest equivalents across languages may differ (e.g., Malt et al., 2015). It is also well-known that the meanings associated with words evolve over time. Changes including broadening, narrowing, bleaching, pejoration, and amelioration are common (e.g., Geeraerts, 2010). Such changes imply differences across individuals; as in biology, variation within a population is necessary for longer-term evolution to come about. Furthermore, dialect differences in the uses of words across geographic regions are a given, and variation in the meaning evoked by a word across communicative contexts is well documented (e.g., Anderson & Ortony, 1975; Borghi, Glenberg, & Kaschak, 2004; Clark & Gerrig, 1983).

A small corner of the concepts and categories literature acknowledges considerable variation between individuals. When asked whether a label applies to a set of items, different individuals disagree on the items they are willing to endorse as members of

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the specified lexical category (McCloskey & Glucksberg, 1978; Verheyen, Hampton, & Storms, 2010). Several demographic variables have been shown to contribute to this between-individual variation. One is age. Verheyen, Ameel, and Storms (2011) and Verheyen, Droeshout, and Storms (2017) found differences between older and younger adults in category extension (that is, what entities are accepted as instances of the label) and in feature weights in category judgments for superordinate terms such as *furniture*, *vehicle*, and *vegetable*. Most notably, older adults accepted more items as instances of the lexical category. Malt and Paquet (2013) also found age differences in judgments. They asked about the perceived relation of recently introduced objects such as a cell phone or an electronic swipe key to category labels such as *phone* or *key*. Older adults tended to judge a cell phone or swipe key as not “really” being a phone or a key, whereas younger adults judged that they “really” were.

Other variables matter as well. One is education. Participants whose education ended at the compulsory level in Belgium (about age 18) endorsed more items as category members for superordinate terms such as *furniture*, *vehicle*, and *vegetable* and used different feature weights in their judgments than did participants who had further education (Verheyen & Storms, in press). The impact of higher education may be explained in terms of expertise: Familiarity contributes to rated typicality (Johnson, 2001; Malt & Smith, 1982; Schwanenflugel & Rey, 1986), and more educated participants may have had greater familiarity with some of the rated exemplars, especially for categories such as *sciences*.

Gender may also influence judgments. Kempton (1981) noted differences between men and women in the classification of pottery in traditional Mexican communities. Women were more conservative in category extensions, possibly linked to their greater expertise in this domain. Stukken, Verheyen, and Storms (2013) also demonstrated differences between men and women for superordinates such as *sports*, *professions*, *clothing*, *toys*, and *addictions*. For example, a skipping rope was considered a better example of a *toy* by women than by men. In line with the other expertise effects, this gender difference could be due to women having more frequently encountered a skipping rope in their play.

Ultimately, a full picture of how word meanings (or, in concepts-and-categories terminology, lexicalized concepts) operate, needs to account for the balance between stability and flexibility that must exist. On the one hand, there must be room for variability over historical time and dialect groups, and across communicative contexts. On the other hand, there must be enough shared and stable elements of meaning for speakers to understand one another synchronically, and, to a large extent, diachronically. Although a given word can take on an infinite set of meanings in the right context, at the same time, it cannot mean just anything; successful communication using contextually-derived meanings still depends on shared knowledge between speakers and addressees (Clark, 1983). Continuity across time is also implied by the fact that every new generation learns the language from the generation before and communicates with the preceding one.

### Study overview

The current study was aimed at shedding light on the balance between stability and variability across individuals in the meanings of common, basic level artifact nouns, and the nature of any observed variability. To do so, we focused on labels for common household objects. Malt and Paquet's (2013) study that compared judgments between older and younger adults used artifacts that have undergone rapid change in the last several decades due to technological advances. Verheyen et al.'s studies (2011, 2013, 2017, in press) that found an impact of several demographic variables on judgments used a wider range of lexical categories, but all

the terms they presented were at the superordinate level. Superordinate level terms are distinct from basic level ones in several respects. They label sets of entities that tend to share few features in common, do not have shared motor patterns of interaction with them, and do not lend themselves to being thought of in terms of a unitary mental image (Rosch, Mervis, Gray, Johnson, & Boyes-Braem, 1976). They are used much less frequently than basic level terms and are learned later by children (Rosch et al., 1976), and they tend to be used to talk about collections rather than individual entities (Murphy & Wisniewski, 1989; Wisniewski & Murphy, 1989). Most fundamentally, and consistent with the preceding observations, they do not label groupings of entities that are conspicuous as groupings per se (Berlin, 1992; Hunn, 1977). Within the natural world (as studied with respect to plants and animals), the presence of specific superordinate terms is more variable across languages. For instance, some languages may lack terms similar to *tree* or *animal* while others have it (see Malt, 1995 for review). Together, these observations suggest that the groupings identified by superordinate level terms may be particularly abstract and ill-defined, and thus unstable and susceptible to a high level of variation across individual judgments.

In contrast, we investigate the application of basic level terms labeling familiar, common concrete objects for containing and dispensing health and beauty aids, serving and storing foods, and the like. These objects are used by people of all ages and educational levels. For the most part, unlike in the rural Mexican communities studied by Kempton (1981), they are used by both genders. In any case, gender-based differences in familiarity with the objects are likely to be minimal due to less strongly sex-typed activities in our target population. These objects have not been subject to the kinds of recent technological advances that have created something of a digital divide between young and old at this point in Western history. In everyday discourse, it is unlikely that most people experience awareness of differences based in age, gender, or educational experience in the use of words for these objects.

On these bases, one might expect a high level of stability in judgments of category extension and in the features used to determine the application of terms to objects. If this is true, it would suggest that for terms for common household objects such as those tested here, stability dominates over variation. Individuals may be highly consistent in applying these terms to objects regardless of gender or education, and any change in the evolution of meaning over time may require many generations to develop and become conventional.

Despite these arguments, the alternative possibility is open that even basic level artifact terms such as those studied here will show a high degree of variation across individuals. Artifacts in this domain do not fall into groupings that are “crying out to be named” (Berlin, 1992, p.53) to the same extent that genus-level plants and animals appear to (Berlin, 1992; Hunn, 1977). Our past studies have found a substantial degree of cross-language variation in the number and composition of lexical categories for containers, using stimulus sets similar to those used here (e.g., Ameel, Storms, Malt, & Sloman, 2005; Malt, Sloman, Gennari, Shi, & Wang, 1999). Here we examine whether substantial variation among speakers of a given language also occurs, although perhaps not to the extent matching between-language variation. If it does occur, it might be manifest simply as idiosyncratic variation across individuals. Alternatively, it might be linked to demographic variables, reflecting some systematic aspect of exposure to and experience with the objects based on within-language group membership. Given that in the sampled populations, people frequently interact across genders, educational level, and age, if variation is linked to the first two but not age, this outcome would suggest that subtle experience-based differences in artifact term meanings can co-exist across speakers and potentially remain

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