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Remembering Prices: Numeric Cognition, Language, and Price Recall

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Remembering Prices: Numeric Cognition, Language, and Price Recall**ABSTRACT**This paper examines how consumers process multi-prices (e.g., prices that consist of several components like \$329 for a camera and \$16 for delivery) from a linguistic and numeric cognition perspective. We theorize that when consumers read multi-prices, they encode the numbers phonologically. This can lead to overtaxing working memory capacity as consumers calculate the total price of the package and to less accurate price recall for multi-prices that have longer number names (e.g., number names with more syllables). We find evidence for this process in three studies, both across different languages and within languages.

[to cite]:

Hyeong Min Kim and David Luna (2006) , "Remembering Prices: Numeric Cognition, Language, and Price Recall", in NA - Advances in Consumer Research Volume 33, eds. Connie Pechmann and Linda Price, Duluth, MN : Association for Consumer Research, Pages: 235-235.

[url]:

<http://www.acrwebsite.org/volumes/12421/volumes/v33/NA-33>

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EXTENDED ABSTRACT

This paper examines the role of language on price recall. Three experiments show that the linguistic coding of prices can influence the accuracy of individuals' mental calculations and subsequent price recall. We trace the root of this effect to the length (i.e., the number of syllables) of the number names to be processed. Based on prior research, we theorize that when several prices are presented together, individuals encode them phonologically. They rehearse subvocally the number names of the individual prices as they read them and perform calculations. This process is constrained by the capacity of working memory. Thus, when individuals encode the numbers in a language that requires fewer syllables to rehearse them, total price recall will be more accurate than if they encode the numbers in a language that requires more syllables. Similarly, if we consider a single language, when individuals process numbers with shorter names, their subsequent recall will be more accurate than when they process numbers with longer names.

To date, research studying language differences in information processing has explored issues like presentation modality (Tavassoli and Han 2001; 2002), language-specific markers (Schmitt and Zhang 1998), or differences in information load across the languages known by bilinguals (Luna and Peracchio 2001). This paper investigates a new area in which language impacts information processing: number cognition. This is an exceedingly important area of consumer behavior since consumers engage in number processing any time they make a purchase. In particular, we study how number processing influences memory for multi-dimensional prices, which are prices that consist of more than one number (e.g., "\$729 dish washer, plus \$45 installation fee"), or prices of multiple items (e.g., \$20 beer and \$13 potato chips in one shopping trip). Both multi-dimensional prices and prices of multiple items will be referred to as "multi-prices." We focus on multi-prices in this research because consumers are frequently exposed to them and because their processing involves the calculation of a total price, so the linguistic and numeric effects we investigate are particularly applicable to them. Thus, number names with more syllables (e.g., "seven" vs. "six") are likely to overtax working memory, which can make the calculation of total prices more difficult. This, in turn, may lead to lower price recall accuracy.

Two major contributions emerge from this research. First, we highlight the important role of numeric cognition in research on price perception. Previous pricing research suggests that price recall is influenced by various factors such as required effort to accurately process price information, consumers' choice of a processing strategy, and price knowledge (Estelami and Lehmann 2001; Estelami 2003; Monroe and Lee 1999; Morwitz, Greenleaf, and Johnson 1998). However, as Monroe and Lee (1999) point out, little research on price recall has been conducted based on numeric cognition. Our approach is based on current theories of linguistic processing and mental arithmetic, so we provide new insights to pricing research. Second, and more generally, we extend the notion of linguistic influences on cognition to number processing. Although recent research has examined how language influences other areas of cognitive processing (e.g., Schmitt and Zhang 1998), the influence of language on number cognition is still unexplored in spite of the importance of number processing for pricing and promotion. We investigate how language affects the accuracy of

mental calculations and provide evidence that the effects we find take place during encoding of prices, not retrieval.

The paper begins with a brief review of the literature on mental arithmetic and language. Study 1 shows that there are differences in the recall accuracy of the total price of two multi-prices, depending on the language in which the prices are processed. When respondents process the prices in a "short" language (a language that requires fewer syllables to encode a number phonologically) versus in a "long" language, they display higher accuracy. Studies 1 and 2 attribute this result to encoding effects. In other words, number-length is shown to influence price recall accuracy when the numbers are initially read. Study 3 validates the effect of number name length on price recall in a single-language setting and finds the effect regardless of the magnitude of the prices.

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