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Patron: Mendoza-Denton, Norma C
Reference #: 7186753

Journal Title: Laboratory phonology 9 /

Volume:
Issue:
Month/Year: 2007
Pages: 443-454

Article Author: Mendoza-Denton, Norma

Article Title: Sociolinguistic Extensions of Exemplar Theory.

Imprint: New York ; Mouton de Gruyter, c2007.

Notes: Billing Notes; FEIN 74-2652689//BLLD acct#51-105

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Weber, Andrea
2001 *Language-specific listening: the case of phonetic sequences.* Ph.D. diss., University of Nijmegen (Max Planck Institute series in Psycholinguistics, 16). Wageningen, The Netherlands: Ponsen and Looijen bv.

Weber, Andrea, and Anne Cutler
2004 Lexical competition in non-native spoken-word recognition. *Journal of Memory and Language* 50: 1–25.

Weber-Fox, Christine, and Helen J. Neville
1996 Maturational constraints on functional specializations for language processing: ERP and behavioral evidence in bilingual speakers. *Journal of Cognitive Neuroscience* 8: 231–256.

Appendix

Detection rates (%) in each condition as a function of the type of contrast (place vs. voicing) with indices for each group.

	Place				Voicing			
Exp. 1	V	U	NC	*P-index*	V	U	NC	*V-Index*
E – E	60	46	89	*35*	25	20	92	*6*
E (low) – F	58	33	82	*55*	53	38	87	*30*
E (high) – F	32	12	84	*28*	70	36	88	*65*
Exp. 2								
A – A	46	11	94	*43*	33	18	91	*20*
A (low) – F	49	24	84	*45*	32	22	84	*16*
A (high) – F	25	6	87	*22*	61	26	86	*59*
F – F	40	17	91	*32*	69	20	92	*70*
F (low) – A	37	19	87	*24*	64	31	87	*62*
F (high) – A	45	23	86	*36*	54	37	92	*29*

Key to abbreviations

Conditions:	viable (V), unviable (U), no-change (NC)
E – E	English subjects hearing English sentences, n = 27
E (low) – F	English subjects (low) hearing French sentences, n = 23
E (high) – F	English subjects (high) hearing French sentences, n = 14
A – A	American subjects hearing American sentences, n = 26
A (low) – F	American subjects (low) hearing French sentences, n = 13
A (high) – F	American subjects (high) hearing French sentences, n = 8
F – F	French subjects hearing French sentences (n=23)
F (low) – A	French subjects (low) hearing American sentences (n=8)
F (high) – A	French subjects (high) hearing American sentences (n=8)

Sociolinguistic extensions of exemplar theory: Comments on Flege, Khattab, and Darcy, Peperkamp and Dupoux

Norma Mendoza-Denton

> Rousting a word out of its bed requires a ruckus that wakes up the rest of the neighborhood.
>
> Beckman and Pierrehumbert (1998:23)

1. Introduction

In the post-generative horizon of early twenty-first century linguistics, exemplar theory is emerging as unifying model within probability-based frameworks used in morphology (Bybee 2001), phonetics and phonology (Johnson 1997; Pierrehumbert 2003), historical linguistics and grammaticalization (Bybee 2002; papers in Bybee and Hopper 2001), language acquisition (Díaz-Campos 2004, Foulkes and Docherty in press), as well as sociolinguistics (Mendoza-Denton, Hay, and Jannedy 2003; Khattab 2002). Papers by Flege; Khattab; and Darcy, Peperkamp and Dupoux in this volume help us to expand the horizons of exemplar theory by allowing us to posit sociolinguistic rubrics (*social saliency, agency*) to strengthen current exemplar theoretic models.

Exemplar theory is a model for language learning and use based on the notion that multimodal, detail-preserving episodic memory underlies the cognitive representation and processing of language. In the lexicon, for instance, it is not merely words that are stored: Talker-specific characteristics such as gender and voice quality have been shown to be retained by listeners, facilitating access to lexical representations (Goldinger 1997). Episodic memory traces include linguistic material as well as social and contextual information; storage limitations are not formally assumed by the theory at this point (Johnson 1997). Perceptual categories, whether they be grammatical (phonemes, morphemes, etc.), social (female, working class, etc.), or contextual (i.e., lexical neighborhood, genre, etc.) are not *a priori* givens that are acquired early on by the learner and to which input is then matched. Rather, categories are

epiphenomenal, emerging anew with each comparison-matching task. The current token-to-be-matched not only undergoes comparison with all past experiences of similar tokens in the input; the token itself increments the categories to which it is eventually assigned and provides a new set of potential matching data. This is consistent with sociolinguistic and linguistic anthropological understandings of language both reflecting and constructing social reality (cf., Goodwin and Duranti 1992).

Although exemplar theory is uniquely compatible with current sociolinguistic understandings of the social construction and performance of identity (Mendoza-Denton, Hay, and Jannedy 2003; Strand 1999; Johnson in press), its primary thrust has been in providing evidence that frequency of tokens in the input and the organization of such frequency in time serves the purposes of category organization (Dell 2000; Díaz-Campos 2004; Bybee 2001; see also papers in Bybee and Hopper 2001): This type of evidence questions the need for innate categories, parameters, optimality-based accounts, rules and even segments (Goldinger and Azuma 2003; Carter 2003). Exemplar theoretic accounts then rely on distributional characteristics and covariation in the input to explain emergent patterns. Input frequency and recency/priming are two well-adumbrated areas of inquiry within psycholinguistically-oriented exemplar theory and other models of phonological, lexical, and semantic competitive activation (Beckman and Pierrehumbert 1998; Luce and Pisoni 1998; Metsala 1997); less well-understood are social mechanisms through which attention and other factors can be modeled. Since clearly not all input into the speech learning system is given equal weight in terms of output, researchers have independently suggested mechanisms such as attributes of attention (Nosofsky 1987), various types of weighting (Smith and Zárate 1992), and stereotyping (Strand 1999; Niedzielski 1999) in perception. But how are these probabilistic input and memory accounts reconciled with sociolinguistic evidence? The papers in this volume give us several insights which I will summarize as themes below, ending with some supplemental examples from my own work to illustrate of how sociolinguistic understandings allow us to make empirically grounded advances to exemplar theory.

2. Frequency of Exposure and the Two-Way influence of L1, L2

In the paper by Flege (this volume), one of the clearest associations that emerges is a direct relationship between native-like L2 phonology and amount of exposure to L2, and a simultaneous inverse relationship between more-native-like L2 and less-native-like L1 (as measured by percentage of participants' lives spent in the L2 (host) country, which influences their quotidian language use). Of the 240 native Korean-speaking participants living in the U.S. that were subjects in the study, only one individual, who had arrived in the U.S. at the age of nine years, was judged as producing both L1 (Korean) and L2 (English) sentences without a detectable foreign accent. This echoes findings in the paper by Darcy et. al., suggesting that perceptual "accent" decreases with greater consistent exposure to L2 (as shown by comparison between more vs. less fluent bilinguals). In a sense this is disheartening for L2 heritage learners and educators, because it implies that there is a zero-sum game at work in language learning: Speak more Korean, and you'll sound less native-like in English. Speak more English, and you'll gain both production and perception accuracy in it, but will experience Korean attrition. There are both language-structural as well as sociolinguistic implications for these statements.

First, on the language-structure side, the zero-sum game of native-like accents squares well with exemplar theoretic understandings of frequency and recency effects. If we assume that only one language is activated at a time (cf. Magloire and Green 1999), as do Darcy et. al., then it is the most recent language used or perceived which receives the activation effects from recency, and that same language which experiences the boost of frequency. If degree of exposure encourages the buildup of more robust representations of L2, then L1 must necessarily decrease by not undergoing simultaneous activation.

Measuring amount of exposure, for Flege, is not to be confused with age-of-arrival (AOA) effects. Although the two are strongly correlated, Flege maintains that in fact AOA ("critical period") effects are merely a reflection of amount of exposure effects. Over the large domain of an individual's life, *frequency* of exposure/production may be approximated by the self-reported language use measure in Flege's study, whereas *recency* of exposure is roughly captured as a combination of language dominance and percentage of life spent in the host country. As Flege points out though, simply living in an L2 environment does not guarantee L2 use. This leads me to the sociolinguistic implications of this work.

3. Implications for Varieties in Contact

Despite the gloomy predictions in Flege's research, if we take a step back we realize that this is *absolutely* business as usual for varieties in contact, in fact these processes are the very engines of language variation and change. Khattab's work (2002; this volume) as well as Roberts'(1997) work on the acquisition of sound change in progress bear this out: Roberts, for example, shows that children as young as three years old from Philadelphia who have as models Philadelphia-native parents are actively participating in the very complicated sound changes involving short-a distribution in the city, whereas children whose parents are not native to the city are only partially participating. Similary, Khattab shows that English-Arabic bilingual children's realizations are cued to their immediate environments, with English realizations that are phonetically closer to friends of the children and to those friends' parents, rather than to the L2 English being produced by their own parents. The only time the children's English has Arabic substratal features is when the children are codeswitching into English *while speaking to the parents*. It is when addressing them directly, and taking into account their phonologies and perceptual accents (as per Darcy et. al.), that children produce Arabic-accented English. In Khattab's account, the multiple-trace model stores speaker-specific information and associates it with stored tokens. Arabic-speaking children thus retain and reproduce their mothers' accented English tokens when speaking to their mothers, but not to their peers. Multilinguals (and style-shifting monolinguals) carefully calibrate their speech for their interlocutors using information found in the signal. If we can be assured that L1 and L2 influence each other in the cognitive structures of individual speakers from production studies such as Flege's, and from perception studies such as that of Darcy et. al., then major discoveries await us in understanding perceptual "accents" in people exposed to more than one variety of a single language.

Bilinguals growing up in immigrant enclaves (where children have many more examples of accented L2 targets) will retain more L1 features in their L2 than bilinguals living in isolation from their L1. It is thus unsurprising that Flege found accented L1 and L2 when he tested Korean-Americans' utterances against the percepts of Koreans living in Korea and against native English speaking Americans who were probably not from the Koreans' U.S. community (Flege does not provide information about the communities of origin of either the NK bilinguals or of the listeners

asked to rate their Korean or their English). As the bilingual community gradually loses sending-country L1 immigrants (or circular migration is restricted), some of the L1 features that have acquired social indexical meaning will become part of $L1_2$, resulting in a new, "ethnic" variety of L1. If migration is not completely restricted, community-wide bilingualism may result, with L1, $L1_2$, L2, and $L2_1$ socially distributed according to relative prestige of L1 and L2.

If what is arising in such a community is the genesis of a regional-ethnic dialect, it is not surprising that the Korean-Americans would sound different to everyone else. Would they sound accented to U.S. Koreans from the same neighborhoods? What if instead of a generic U.S. English target Korean bilinguals have as their target the utterances of Korean-Americans around them, as would be suggested by Khattab's research? Might Korean-Americans from the community be able to tell not just whether they had an accent but what generation they were? In our work with Japanese Americans living in Northern California, Melissa Iwai and I found rapid generational shift in the pronunciations of Japanese-American native English speakers, motivated by an anxiety on the part of older (*Nisei*) generation to have their children sound "more Caucasian" as a linguistic ideological response to severe streotype threat: many among that older generation had experienced the mass internment of Japanese Americans in the U.S. during World War II (Mendoza-Denton and Iwai 1994).

In a community that has extensive language or dialect contact, $L1_2$, $L1_3$, $L1_4$ can interact, giving rise to different historical outcomes and variously inflected varieties such as $L1_{2,3}$ or $L1_{3,4}$. Such has been the case in dialect studies of major cities in the ethnically mixed cities of the United States and Canada. For example, Boberg 2004 has found that native English-speaking Montrealers of Irish, Italian, and Jewish ethnic origin display important sociophonetic differences. He explains: "The unusual tenacity of ethnophonetic variation in Montreal English is explained in light of the minority status of English, and the [...] segregation of ethnic groups in distinct neighborhoods..." (2004: 538).

A common outcome in this type of situation is that the inflected varieties acquire social indexicality relative to each other. In the study that I conducted in a California high school, discussed below, small differences in phonetic implementation cued degree of membership in tight-knit gang affiliated-groups. Linguistic anthropological studies show code-switching, style-shifting, and register-shifting operate at a social indexical level while

simultaneously arising within the constraints of linguistic structure. The human symbolic-manipulative capacity to compare variable frequencies, coupled with the ability to group frequency clusters into groups, serves learners well not only in acquiring the lexicon, the phonology, and the morphology of their language, but also the social structures that surround them.

4. Social Saliency and Agency

As Dell (2000) points out, similarity—the converse of saliency—is at the heart of modern theories of learning and cognition, and yet its main challenge is the difficulty in its measurement, especially because items are both similar and different along many axes simultaneously. Lexical neighborhood studies like Luce and Pisoni's (1998) work and phonological studies including the work of Frisch (2000) identifying dissimilarity constraints are leading the way in psycholinguistics. In sociolinguistics and historical linguistics, understanding linguistic behaviors that are judged by hearers to be socially salient is an analogous problem. Recent debates on grammaticalization and the role of speaker agency relative to economy and clarity exemplify these currents. Haspelmath (2000), for instance, claims that *extravagance* (the maxim directing speakers to speak in such a way that they get noticed through lexical, phonological, and syntactic innovation) is the driving force behind language change. But how do speakers "get noticed"? In the rest of this commentary, I briefly describe my ethnographic study of Latina girls involved in gang-affiliated networks in the San Francisco Bay Area, and conclude with a reflection on the role of discourse markers in social saliency and agency in language variation.

5. An Ethnographic Look at Social Saliency among Chicano English-Speaking Girls

An ethnographic study is one that aims to make sense of a case study by understanding it from what is known in anthropology as an "emic" perspective; that is to say, a perspective as close as possible to that obtained by the participants, and which is arrived at through extensive participant-observation fieldwork. To this end, I conducted fieldwork in a public high school in the Northern California Bay Area from 1994-1997. Among

Latinas/os in this high school, students distinguished recently-arrived immigrants from long-term residents, and the most extreme exponents of the distinction, though small in number, belonged to youth gangs that were organized around these ideological principles. The focus of my study was on the girls in these self-identified gang groups. The gang girls who sided with recently arrived immigrants from Mexico identified as "Sureñas" (*Southerners*), while the long-term residents, also of Mexican descent, identified themselves as "Norteñas" (*Northerners*).

In this high school, with a student body of approximately 1200 students, Latinas/os made up roughly one-fifth of the school population, with circular migration common and Spanish and English being used as resources for the construction of social identities. The Norteña/Sureña distinction was reflected in many different levels of symbolic behavior, including code choice (English versus Spanish use), musical tastes, clothing, makeup, verbal art practices (swearing, playing the dozens, Spanish word games), and school performance. Mendoza-Denton (forthcoming) provides a more detailed account both of the ethnography and of the linguistic results that are only briefly sketched here.

I report on the multivariate analysis of 1800 tokens of /ɪ/ and their variable raising to [i] among the girls. Tokens appearing in sociolinguistic interviews were collected from "stable" representatives of six social groups:

1. Norteñas, and
2. Sureñas: Core gang members who had undergone a ritual induction.
3. Wannabe Norteñas, and
4. Wannabe Sureñas: Peripheral gang members not having undergone induction.
5. Disco Girls: Participants in multiethnic friendship groups
6. Latina Jocks: "Popular" students, participating in mainstream school activities.

In a multivariate analysis (performed with the logistic regression program VARBRUL) of the sociophonetic variation of these communities of practice, I found that among social and linguistic factors, the following phonetic segment was the most significant factor in the raising of /ɪ/ to [i]. A sonority hierarchy was evident, with following engma being by far the most likely environment for the raising of /ɪ/. The second most significant factor determining the variation was the social group the speaker belonged

to, with ritually-inducted Norteñas and Sureñas being by far the heaviest users of the raised variants. In addition, most of the variation was being carried in highly-frequent, discourse-marking usages of the Th-Pro forms *something*, *anything*, and *everything*, and these grammatically innovative, discourse-marking usages were in turn being employed by socially iconic speakers, who were not only leaders in the group but clearly models for the usage of these variables in the community.

Here is an example of the discourse marking usage:

1 Norma: They say that the Norteñas look you up and down and that Sureñas will look you in the eye.
2 Sadgirl: Well I guess it depends on the person
3 because one person will look at you and everything,
4 but they'll kind of be scared at the same time.
5 Cause they'll probably say, oh, look at her and everything,
6 and if the girls turns back and everything,
7 they could either back down or back up,
8 and go, hey, what's on, you know?
9 Then she can look at you up and down and everything, you know,
10 go around you know?

It is in the close examination of ethnographic situations that we can see the detailed workings of linguistic choices that speakers make, and the in vivo consequences of the laboratory-based insights that we have about how exemplars work. The statistical analysis of the speech behavior of these girls involved in gangs sheds light on frequency, social saliency, and agency as components in our models of language and cognition.

In a recent article, William Labov claims that "social evaluation is performed over a lemmatized lexicon," (Labov 2006), rather than at the word-specific, remembered-token level as has been the working hypothesis in exemplar theory (Pierrehumbert 2002; Foulkes and Docherty 2006). High-frequency discourse markers such as those of the Th-Pro series may provide a good starting point for analysis due to their ability to carry phonetic information, to get the speaker noticed through grammatical salience and social innovation, and to be picked up and used as part of the repertoire of iconic speakers. In order to extend exemplar theory further into sociolinguistic domains, we will need to bring together the motivations of social agents with the internal workings of probabilistically-emergent linguistic structures.

References

Beckman, Mary, and Janet Pierrehumbert
1998 Interpreting "phonetic interpretation" over the lexicon. In *Phonetic Interpretation: Papers in Laboratory Phonology VI,* John Local, Richard A. Ogden, and Rosalind Temple (eds.), 13-37. Cambridge: Cambridge University Press.

Boberg, Charles
2004 Ethnic patterns in the phonetics of Montreal English. *Journal of Sociolinguistics* 8 (4): 538-568.

Bybee, Joan
2001 *Phonology and Language Use.* Cambridge: Cambridge University Press.

Bybee, Joan
2002 Word Frequency and Context of Use in the Lexical Diffusion of Phonetically Conditioned Sound Change. *Language Variation and Change* 14 (3): 261-290.

Bybee, Joan and Paul Hopper
2001 *Frequency and the Emergence of Linguistic Structure.* Amsterdam: John Benjamins.

Carter, Paul
2003 Extrinsic phonetic interpretation: Spectral variation in English liquids. In *Papers in Laboratory Phonology VI: Phonetic Interpretation,* John Local, Richard A. Ogden, and Rosalind Temple (eds.), 234-249. Cambridge: Cambridge University Press.

Darcy, Isabelle, Sharon Peperkamp and Emanuel Dupoux
This volume Bilinguals play by the rules: Perceptual compensation for assimilation in late L2-learners.

Dell, Gary
2000 Acquisition and the lexicon. In *Papers in Laboratory Phonology V,* Michael Broe and Janet Pierrehumbert (eds.), 335-348. Cambridge: Cambridge University Press.

Diaz-Campos, Manuel
2004 Acquisition of sociolinguistic variables in Spanish: Do children acquire individual lexical forms or variable rules? In *Laboratory Approaches to Spanish Phonology,* Timothy Face (ed.), 221-236. Berlin: Mouton de Gruyter.

Flege, James
This volume Language Contact in bilingualism: Phonetic system interactions.

Frisch, Stefan
2000 Temporally organized representations as phonological units. In *Papers in Laboratory Phonology 5: Acquistion and the Lexicon.* In Michael Broe and Janet Pierrehumbert (eds.), 283-298. Cambridge: Cambridge University Press.

Foulkes, Paul and Gerard Docherty
2006 The social life of phonetics and phonology. *Journal of Phonetics* 34: 409-438.

Goldinger, Stephen
1997 Words and voices: perception and production in an episodic lexicon. In *Talker Variability in Speech Processing*, Keith Johnson and John W. Mullenix (eds.), 33-66. Academic Press, San Diego.

Goldinger, Stephen and Tamiko Azuma
2003 Puzzle-Solving Science: The Quixotic Quest for Units in Speech Perception. *Journal of Phonetics* 31: 305-320.

Goodwin, Charles and Alessandro Duranti
1992 Rethinking Context: An Introduction. In *Rethinking Context: Language as an Interactive Phenomeno,* A. Duranti and C. Goodwin (eds.), 1-43. Cambridge: Cambridge University Press.

Haspelmath, Martin
2000 The relevance of extravagance: a reply to Bart Geurts. *Linguistics* 38 (4): 789-798.

Johnson, Keith
1997 Speech perception without speaker normalization: An exemplar model. In *Talker Variability in Speech Processin,* Keith Johnson and John W. Mullennix (eds.), 145-165. San Diego: Academic Press.

Johnson, Keith
2006 Resonance in an exemplar-based model: The emergence of social identity and phonology. *Journal of Phonetics* 34: 485-499.

Khattab, Ghada
2002 /l/ production in English–Arabic bilingual speakers, *International Journal of Bilingualism* 6: 335-353.

Khattab, Ghada
This volume Variation in vowel production by English-Arabic bilinguals.

Labov, William
2006 A sociolinguistic perspective on sociophonetic research. *Journal of Phonetics* 34: 500-515.

Luce, Paul and David Pisoni
1998 Recognizing spoken words: The Neighborhood Activation Model. *Ear & Hearing* 19 (1): 1-36.

Magloire, Joël, and Kerry Green

1999 A cross-language comparison of speaking rate effects on the production of Voice Onset Time in English and Spanish. *Phonetica* 56: 158-185

Mendoza-Denton, Norma, and Melissa Iwai

1994 They Speak More Caucasian: Generational Differences in the Speech of Japanese-Americans. In *SALSA I: Proceedings of the First Annual Symposium About Language and Society – Austin,* Robin Queen and Rusty Barrett (eds.), 58-67. Austin: Department of Linguistics, University of Texas.

Mendoza-Denton, Norma, Jennifer Hay, and Stefanie Jannedy

2003 Probabilistic sociolinguistics: Beyond variable rules. In *Probability Theory in Linguistics,* Rens Bod, Jennifer Hay, and Stefanie Jannedy (eds.), 98-138. MIT Press, Cambridge, MA.

Mendoza-Denton, Norma

Forthcoming *Homegirls: Language and Symbolic Behavior in the Making of Latina Youth Styles*. London: Blackwell.

Metsala, Jamie L.

1997 An examination of word frequency and neighborhood density in the development of spoken-word recognition. *Memory & Cognition* 25 (1): 47-56 Jan.

Niedzielski, Nancy

1999 The effect of social information on the perception of sociolinguistic variables. *Journal of Language and Social Psychology* 18: 62-85.

Nosofsky, Robert

1987 Attention and learning processes in the identification and categorization of integral stimuli. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 13: 87-108.

Pierrehumbert, Janet

2003 Probabilistic phonology: Discrimination and robustness. In *Probability Theory in Linguistics,* Rens Bod, Jennifer Hay, and Stefanie Jannedy (eds.), 177-228. MIT Press, Cambridge, MA.

Roberts, Julie

1997 Hitting a moving target: Acquisition of sound change in progess by Philadelphia children. *Language Variation and Change* 9: 249-266.

Smith, Eliot and Michael Zárate

1992 Exemplar-based model of social judgment. *Psychological Review* 99 (1): 3-21.

Strand, Elizabeth

1999 Uncovering the role of gender stereotypes in speech perception. *Journal of Language and Social Psychology* 18: 86-99.