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A new on-line resource for psycholinguistic studies

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Abstract

Picture naming is a widely used technique in psycholinguistic studies. Here, we describe new on-line resources that our project has compiled and made available to researchers on the world wide web at http://crl.ucsd.edu/~aszekely/ipnp/. The website provides access to a wide range of picture stimuli and related norms in seven languages. Picture naming norms, including indices of name agreement and latency, for 520 black-and-white drawings of common objects and 275 concrete transitive and intransitive actions are presented. Norms for age-of-acquisition, word-frequency, familiarity, goodness-of-depiction, and visual complexity are included. An on-line database query system can be used to select a specific range of stimuli, based on parameters of interest for a wide range of studies on healthy and clinical populations, as well as studies of language development.

Keywords: Cross-linguistic studies; Picture naming; Response times; Name agreement; Nouns; Verbs; Object; Action

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The International Picture-Naming Project (at the Center for Research in Language of the University of California, San Diego) has conducted a series of picture-naming studies in an effort to build databases that can be used in future cross-linguistic research. This note briefly describes the resources that the project has compiled and made available to researchers on the world wide web (http://crl.ucsd.edu/~aszekely/ipnp/) or has documented in publications to date. We present a wide range of picture stimuli and related reaction time norms in seven languages.

Picture naming is a widely used technique for the investigation of lexical retrieval, in normal children and adults, and in various clinical populations. Timed studies of picture naming were among the first paradigms ever used to study the mental chronometry of language processing, from pioneering studies by Cattell, through the work of Snodgrass and colleagues (Snodgrass & Vanderwart, 1980; Snodgrass & Yuditsky, 1996), to recent studies investigating covert and overt picture naming using functional magnetic resonance imaging and event-related brain potentials.

The CRL International Picture-Naming Project adapts this technique for use in cross-linguistic studies of lexical access. The project has collected data from recognition (picture–word verification) and retrieval (picture naming) paradigms, in isolation and in phrase and sentence contexts. These behavioral measures have been applied across age levels and clinical populations; they have also been adapted for use with functional imaging techniques such as ERP and fMRI.

Object and action norming studies in seven languages

The primary database contains 795 picture stimuli, 520 of common objects and 275 of transitive and intransitive actions. All are black-and-white line drawings. In the past few years, we have obtained object-naming norms (including indices of name agreement and latency) for 520 black-and-white drawings of common objects in seven different languages (American English, German, Mexican Spanish, Italian, Bulgarian, Hungarian, and the variant of Mandarin Chinese spoken in Taiwan; a study of Spanish–English bilinguals is underway). This corpus includes 174 pictures from the original Snodgrass and Vanderwart set as well as additional items from other sources. The rationale for using a much larger list of items in cross-cultural studies is to achieve a balance over languages in the experimental parameters of interest (e.g., target word length, target word frequency, and other factors that affect "nameability"). Action-naming norms are also available (or nearly complete) for 275 black-and-white drawings of concrete transitive and intransitive actions in English, Hungarian, Spanish, Italian, Bulgarian, and Chinese. Subjective ratings of several picture and word attributes have been collected (age-of-acquisition, word-frequency, familiarity, goodness-of-depiction and visual complexity) for the full (795 item) action–object corpus in some of the above languages (see present status of IPNP studies on our website for details). For those words that emerged as the dominant or target names in the picture-naming study, word-reading, and word-repetition naming norms have been collected (or are underway) in English, Italian, Hungarian, Bulgarian, and Chinese.

The dominant name of each item was defined empirically as the target name produced by the largest number of subjects. Target names were not preselected, nor was there an attempt to match them along parameters like length and imageability. Rather, dominant items emerged empirically from the data; we then used multivariate analyses to determine the contribution of word and picture properties to aspects of naming performance.

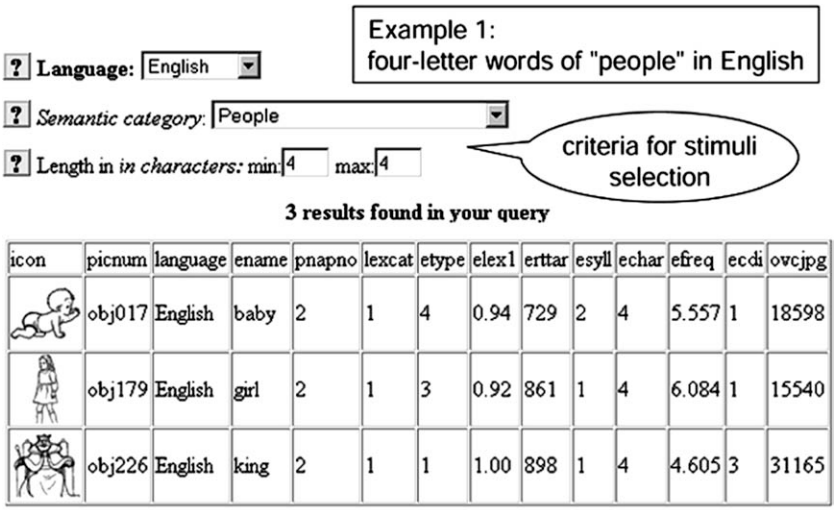
Results from initial studies

Our first goal was to characterize the factors affecting English speakers' object and action naming in a timed picture-naming paradigm (Szekely et al., in press). Using the full set of drawings representing 520 objects and 275 actions, Szekely et al. observed massive differences between object and action naming for all dependent variables. An important general finding was that matching object and action items for variables like frequency, age of acquisition, or picture complexity did not result in a match for measures of naming difficulty (e.g., name agreement or latency). Conversely, object and action items matched for naming difficulty invariably differed in their other lexical and pictorial properties. A reaction time disadvantage for action naming remained even after controlling for picture properties, target word properties, name agreement itself (reflecting the differential ambiguity of nouns and verbs) as well as a measure of conceptual or psychological complexity based on the number of relevant objects in the scene.

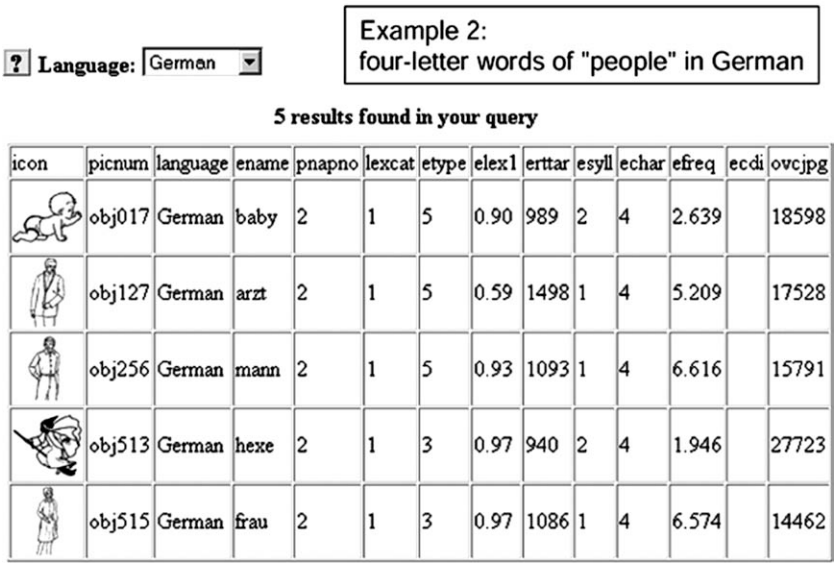
In a companion study, Székely et al. (2003) looked specifically at factors affecting word retrieval. In prior timed and untimed studies by Snodgrass and Vanderwart (1980) and Snodgrass and Yuditsky (1996), concerns were raised that participants could not reliably name large numbers of items in a single session. We showed that reliable results are obtained in a single session for 520 items, and validated our method against previous findings by Snodgrass and colleagues for overlapping items. For these items, comparable levels of name agreement and latency were obtained; we also replicated effects of length, frequency, both objective and subjective age of acquisition, and visual complexity

on reaction time and name agreement measures. Szekely et al. found that name agreement was unaffected by order of presentation, although there was gradual increase in reaction times across the session, requiring use of multiple random orders.

The first study from the project to report cross-linguistic findings is Bates et al. (2003). Here, timed picture naming was compared across seven languages that vary along dimensions known to affect lexical access. Analyses over items focused on factors that determine cross-language universals and cross-language disparities. With regard to universals, Bates et al. found that the number of alternative names had large effects on reaction time within and across languages after target–name agreement was controlled, suggesting that these alternative names might act as lexical competitors, ones exerting inhibitory effects on target names. For all seven languages, word frequency and goodness of depiction had large effects, but objective picture complexity did not. Effects of word structure variables (length, syllable structure, compounding, and initial frication) varied markedly over languages. Strong and theoretically interesting cross-language correlations were found in naming latencies, frequency, and length. For instance, cross-language frequency effects were observed (e.g., Chinese frequencies predicting Spanish reaction times)



icon	picnum	language	ename	pnapno	lexcat	etype	elex1	erttar	esyll	echar	efreq	ecdi	ovcjpg
	obj017	English	baby	2	1	4	0.94	729	2	4	5.557	1	18598
	obj179	English	girl	2	1	3	0.92	861	1	4	6.084	1	15540
	obj226	English	king	2	1	1	1.00	898	1	4	4.605	3	31165



icon	picnum	language	ename	pnapno	lexcat	etype	elex1	erttar	esyll	echar	efreq	ecdi	ovcjpg
	obj017	German	baby	2	1	5	0.90	989	2	4	2.639		18598
	obj127	German	arzt	2	1	5	0.59	1498	1	4	5.209		17528
	obj256	German	mann	2	1	5	0.93	1093	1	4	6.616		15791
	obj513	German	hexe	2	1	3	0.97	940	2	4	1.946		27723
	obj515	German	frau	2	1	3	0.97	1086	1	4	6.574		14462

Fig. 1. Selecting stimulus items from the database via on-line query.

even after within-language effects were controlled (e.g., Spanish frequencies predicting Spanish reaction times).

The internet source for pictures and norms

The stimulus items as well as the norms from these studies are collected on our web site at: http://www.crl.ucsd.edu/~aszekely/ipnp/. These pages provide the pictures as downloadable material and the norms for each of the languages. Only a subset of the stimulus pictures is publicly available (freeware) because of copyright issues; please contact us for more information regarding the remaining material. The cross-language database is organized by lexical item, and includes results of the norming study itself together with lexical information—such as frequency, age of acquisition, and so forth—for the associated target names.

Querying the database

Using the database query system, it is possible to view cross-linguistic data for all 795 stimulus items. This system allows users to specify parameters that will enable researchers to tailor their stimulus sets for a wide range of studies on healthy and clinical populations, as well as studies of language development. Fig. 1 presents two examples of stimulus selection from the on-line query system. In the first example stimulus items with four-letter English dominant responses were selected from the "people" semantic category. Results show that three items (baby, girl, and king) met these criteria. In the second example the same conditions were used for the German norming pool. Results show that five stimulus items from the "people" category (baby, arzt, mann, hexe, and frau) were named with four-letter German words. The stimuli are listed with a small icon representing the picture items along with their individual picture number (picnum), empirically determined dominant—or target—names (name), syntactic (pnapno), and semantic (lexcat) categories, and main dependent variables of the picture norming study. These include the number of alternative names used (type), the percent name agreement on the target name (lex1), and the mean reaction time of the target name (rttar). The main independent variables for the picture and the dominant response are included as well; length of the target name in syllables (syll) and characters (char), word frequency of the target name (freq), objective age-of-acquisition measures (cdi), and objective visual complexity (ovcjpg). Each word's reported attributes are based on the target name, i.e., the dominant name given by the largest number of participants in the study (see Székely et al., 2003 for more details on the methods of the on-line picture norming experiment used). A detailed description of the variables used in the international picture norming studies can be found on the query page, as well as on the web pages linked to the recent picture norming studies we summarize above. The database for all the above variables and languages can also be downloaded from our website.

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