Primbing Effects on Event Types Classification: Effects of Word and Picture Stimuli

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Abstract
Event types (ET) have been widely addressed in linguistic literature, but few studies have dealt with the questions of how they are represented, retrieved and processed in the mental lexicon. We report two experiments in which ET categories were found to give rise to semantic priming effects, both with word and picture stimuli. These effects are argued to provide empirical correlates for ET categories in the mental lexicon not only at the lexical level but also at a deeper conceptual level.

Keywords: Semantic priming; event types; verb processing; verb semantics; psycholinguistics.

Introduction
Event types (ET) are an important component of the “event structure template” (Kemmerer & Gonzalez-Castillo, 2010) of the verb, and play crucial role in the temporal constitutian of the sentence. We refer here to Vendler’s (1967) standard classification of predicates into states (STA), activities (ACT), accomplishments (ACC) and achievements (ACH)\(^1\). These categories can be further cross-classified with respect to the features of dynamicity (DYN), durativity (DUR) and resultativity (RES)\(^2\) (see Table 1).

Table 1: Features of Vendler’s event types

<table>
<thead>
<tr>
<th>ET</th>
<th>[dyn]</th>
<th>[durm]</th>
<th>[res]</th>
</tr>
</thead>
<tbody>
<tr>
<td>STA</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>ACT</td>
<td>+</td>
<td>+</td>
<td>–</td>
</tr>
<tr>
<td>ACC</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>ACH</td>
<td>+</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

In particular, we focused on ACHs and ACTs, because they contrast with respect to DUR and RES: ACH \([-\text{dur}, +\text{res}]\) (e.g., land, die); ACT \([+\text{dur}, -\text{res}]\) (e.g. sing, walk).

\(^1\)STA denote properties and situations experienced by the subject as being static (e.g. to know, to be tall); ACT denote non-resultative activities (e.g. to sing, to walk); ACC denote activities with a clear goal or outcome (e.g. to write a book, to walk to the fence); ACH denote a change of state (e.g. to stumble, to die).

\(^2\)DYN distinguishes among static events and dynamic events (e.g. to live, to know, vs. to run, to stumble). DUR events are events perceived as lasting over time (e.g. to knit, to stir), non-DUR events are perceived as punctual (e.g. to fall, to die). RES events entail the existence of a clear outcome or resulting state that has to be reached for the event to be considered completed (e.g. to land, to write a book, vs. to fly, to talk).

Empirical Correlates of Event Types
Event types (ET) have been widely addressed in linguistic literature, but few studies have dealt with the questions of how they are represented, retrieved and processed in the mental lexicon. Noteworthy exceptions are: Gennari and Poeppel (2002, 2003); Finocchiaro and Miceli (2002); Heyde-Zybatow (2004); Bott (2008); Bonnotte (2008).

In particular, Bonnotte (2008) shows semantic priming effects of ET for ACTs and ACHs in French, reporting differences between processing of durativity and resultativity: “facilitation was shown on the former with similar and opposite priming, whereas it was shown on the latter only with similar priming”.

Goal of the work
The main goal of the work was the investigation of ETs in the mental lexicon, their representation and retrieval. We report two experiments based on the semantic priming paradigm (see McNamara, 2005, for a review), aimed at providing empirical correlates for ET categories.

Our starting point was the study in Bonnotte (2008), which we replicated for Italian with some crucial design innovations (Experiment 1). This experiment was conducted at a lexical level, using word stimuli. A second experiment (Experiment 2) introduced picture primes, in order to compare lexical semantic priming with non-linguistic priming, with the aim of delving into a deeper conceptual level than word stimuli.

ET categories were found to give rise to semantic priming effects, both with word and picture stimuli, but with a different pattern of results than in Bonnotte (2008): crucial differences were found at the ET level, and not between processing of durativity and resultativity. Priming effects were registered not only at the lexical level but also at a deeper conceptual level.

Experiment 1
Experiment 1 replicated the study conducted for French by Bonnotte (2008). As in Bonnotte (2008), Experiment 1 was designed to explore semantic priming effects of ET categories in Italian.

Nevertheless, two main differences were introduced. First of all, prime-target pairs and ACH-ACT sets were checked and tagged with respect to their semantic class, in order to rule out influences of the semantic class and to isolate effects of features pertaining to ETs, i.e. DUR and RES. Semantic
Table 2: Examples of prime-target pairs in Experiment 1

<table>
<thead>
<tr>
<th></th>
<th>target ACH</th>
<th>target ACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>neutral prime</td>
<td>XXX - sparare</td>
<td>XXX - dormire</td>
</tr>
<tr>
<td></td>
<td>XXX - to shoot</td>
<td>XXX - to sleep</td>
</tr>
<tr>
<td>opposite prime</td>
<td>ballare - sparare</td>
<td>entrate - dormire</td>
</tr>
<tr>
<td></td>
<td>to dance - to shoot</td>
<td>to enter - to sleep</td>
</tr>
<tr>
<td>similar prime</td>
<td>entrate - sparare</td>
<td>ballare - dormire</td>
</tr>
<tr>
<td></td>
<td>to enter - to sleep</td>
<td>to dance - to sleep</td>
</tr>
</tbody>
</table>

classes correspond to WordNet topnodes for verbs (Fellbaum, 1998). The prime and target of each test pair never belong to the same semantic class. Semantic classes were also used as a source of variance in the inferential statistic model. As a further difference with Bonnotte (2008) a slightly longer stimulus onset asynchrony (SOA) was used (300ms), in order to avoid spillover effects with longer stimuli.

**Method**

**Participants** 48 native Italian speakers from the University of Pisa and the Scuola Normale Superiore in Pisa volunteered to participate in the experiment and were paid for their participation. All had normal or corrected-to-normal vision.

**Materials** Two groups of 18 intransitive ACT Italian verbs and 18 intransitive ACH Italian verbs were pair-wise balanced for variables known to affect processing costs, such as length, frequency, syntactic frame frequency, ET polysemey; they were used as targets in the priming experiment.

The average length was 8 characters for ACTs (SD = 1.5) and 8 for ACHs (SD = 1.5) and did not differ significantly between the two groups (Kruskal-Wallis: df = 1, χ² = 0, p = 1). Mean frequency (estimated from ColFis, Laudanna et al., 1995) was 129.5 occurrences per 3 million words for ACTs (SD = 165.5), and 88 for ACHs (SD = 173.5) and did not differ significantly between the two groups (Kruskal-Wallis: df = 1, χ² = 1.683, p = 0.2). Syntactic frame frequencies were estimated from Repubblica corpus (Lenci et al., 2010): all verbs were intransitive and strongly monoargumental; ET polysemey was assessed with pre-test 1.

Each target appeared in one of three prime contexts: after a neutral prime (a string of Xs), after a similar prime (a verb of the same ET), after an opposite prime (a verb of opposite ET). As prime verbs we used different verbs than the target verbs. See examples in Table 2. Each prime-target pair was assigned to one of three lists so that an equal number of pairs per each condition appeared on each list, so that exactly one version of each target appeared on each list and so that each participant saw not more than one version of each target.

**Pre-test 1** Italian lacks morphological clues for ET, and verbs tend to be ambiguous with respect to their ET category. Our experiments required non-ambiguous verbs, to be assessed with an inter-annotators pre-test inspired by the one in Bonnotte (2008).

Pre-test 1 was carried out to check our annotation of the verbs according to their ET. Materials for pre-test 1 were 136 predicates (114 transitive VPs - verb + object - and 22 intransitive verbs). Both transitive and intransitive verbs showing all four of Vendler’s (1967) ET categories were used, both to have less constrained answers and to have a broader stimuli set for future experiments.

20 native Italian-speaking students performed the test in a web-based format. Per each event, subjects were asked to choose one of four pictures, one representative of each ET:

![Figure 1: Pictures used in pre-test 1: the long continuous line depicts a state that lasts in time, the long dashed arrow depicts a process that develops over a certain period of time, the short arrow ending with a vertical dash depicts a process that develops over a certain period of time and leads to a result, the short arrow ending with a vertical dash depicts an event that causes a change of state.](image)

...
were subject, target verb, semantic class of the target. Separate analyses any effect of the priming context or of any other factor. logistic regression analysis performed on errors did not yield the effect of opposite and similar prime on decision latencies (DL): both primes show smaller mean DL, suggesting a general facilitation effect (see Figure 2, more detailed information on Table 5). A mixed effect model (see Table 3) of DLs showed that the difference between the neutral prime and the similar prime was significant; furthermore, it yielded a significant effect of the target’s ET.

General accuracy was .86 (.89 for DUR, .82 for RES). A logistic regression analysis performed on errors did not yield any effect of the priming context or of any other factor.

Design  Experiment 1 had a 2x3 within-subjects design (2-levels factor being the ET of the target, and 3-levels factor being the type of prime context) with one between-subjects factor (DUR task, RES task).

Results

The neutral prime level was used as a baseline to evaluate the effect of opposite and similar prime on decision latencies (DL); both primes show smaller mean DL, suggesting a general facilitation effect (see Figure 2, more detailed information on Table 5). A mixed effect model (see Table 3) of DLs showed that the difference between the neutral prime and the opposite prime was highly significant, and the difference between the neutral prime and the similar prime was significant; furthermore, it yielded a significant effect of the target’s ET.

General accuracy was .86 (.89 for DUR, .82 for RES). A logistic regression analysis performed on errors did not yield any effect of the priming context or of any other factor.

Separate analyses  Four separate analyses were conducted, one for each ET (ACH and ACT) within each task (DUR and RES), using four smaller-scale mixed effect models (see Table 4). A significant difference between the neutral prime level and the opposite prime level was found on ACH targets for both DUR and RES tasks. A significant difference between the neutral prime level and the similar prime level was found on ACT targets in the DUR task.

Table 3: Experiment 1 - Mixed Effect Model: \( \log(dl) \sim \text{prime} + \text{et} + \text{task} + (1|\text{subj}) + (1|\text{verb}) + (1|\text{sem}_\text{cl}) \)

| Estimate | MCMCmean | HPD95lower | HPD95upper | pMCMC | Pr(>|t|) |
|----------|-----------|------------|------------|-------|----------|
| (Intercept) | 9.49 | 9.66 | −12.78 | 30.79 | 0.16 | 0.00 |
| primeopp | −0.09 | −0.09 | −0.14 | −0.04 | 0 | 0.00 |
| primesim | −0.05 | −0.05 | −0.10 | −0.01 | 0.02 | 0.02 |
| etACT | −0.10 | −0.11 | −0.21 | 0.01 | 0.06 | 0.04 |
| taskris | 0.09 | 0.09 | 0.00 | 0.18 | 0.06 | 0.12 |

Table 4: Experiment 1 - Separate analyses: \( \log(dl) \sim \text{prime} + (1|\text{subj}) + (1|\text{verb}) + (1|\text{sem}_\text{cl}) \)

| Estimate | MCMCmean | HPD95lower | HPD95upper | pMCMC | Pr(>|t|) |
|----------|-----------|------------|------------|-------|----------|
| (Intercept) | 9.48 | 9.48 | 9.34 | 9.62 | 0 | 0 |
| opp | −0.1 | −0.1 | −0.18 | −0.02 | 0.02 | 0.02 |
| sim | −0.03 | −0.03 | −0.11 | 0.05 | 0.47 | 0.45 |
| (Intercept) | 9.4 | 9.4 | 9.23 | 9.56 | 0 | 0 |
| opp | −0.06 | −0.06 | −0.15 | 0.02 | 0.13 | 0.12 |
| sim | −0.11 | −0.11 | −0.20 | −0.03 | 0.01 | 0.01 |
| (Intercept) | 9.61 | 9.61 | 9.43 | 9.71 | 0 | 0 |
| opp | −0.15 | −0.15 | −0.26 | −0.04 | 0.01 | 0.01 |
| sim | −0.06 | −0.06 | −0.16 | 0.06 | 0.32 | 0.29 |
| (Intercept) | 9.45 | 9.45 | 9.32 | 9.58 | 0 | 0 |
| opp | −0.07 | −0.07 | −0.17 | 0.03 | 0.16 | 0.14 |
| sim | −0.02 | −0.02 | −0.12 | 0.08 | 0.71 | 0.66 |

Figure 2: RT means for the different priming contexts in Experiment 1.

In the DUR task, ACTs are able to prime both ACT and ACH targets; on the other hand, in the same task ACHs never prime either ET. This might depend on the fact that ACT are positively marked with the feature of DUR, which is relevant for this task. However, in the RES task, only ACTs have a significant priming effect on ACH targets, suggesting that priming occurs in this case only when the target is positively marked with the feature of RES, activated in this task. Here

### Design
Experiment 1 had a 2x3 within-subjects design (2-levels factor being the ET of the target, and 3-levels factor being the type of prime context) with one between-subjects factor (DUR task, RES task).

### Results
The neutral prime level was used as a baseline to evaluate the effect of opposite and similar prime on decision latencies (DL); both primes show smaller mean DL, suggesting a general facilitation effect (see Figure 2, more detailed information on Table 5). A mixed effect model (see Table 3) of DLs showed that the difference between the neutral prime and the opposite prime was highly significant, and the difference between the neutral prime and the similar prime was significant; furthermore, it yielded a significant effect of the target’s ET.

General accuracy was .86 (.89 for DUR, .82 for RES). A logistic regression analysis performed on errors did not yield any effect of the priming context or of any other factor.

### Separate analyses
Four separate analyses were conducted, one for each ET (ACH and ACT) within each task (DUR and RES), using four smaller-scale mixed effect models (see Table 4). A significant difference between the neutral prime level and the opposite prime level was found on ACH targets for both DUR and RES tasks. A significant difference between the neutral prime level and the similar prime level was found on ACT targets in the DUR task.
Table 5: RT means (in ms) and standard deviations in Experiment 1 and Experiment 2

<table>
<thead>
<tr>
<th></th>
<th>Experiment 1</th>
<th></th>
<th>Experiment 2</th>
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<tbody>
<tr>
<td></td>
<td>DUR</td>
<td>RES</td>
<td>DUR</td>
</tr>
<tr>
<td></td>
<td>ACH</td>
<td>ACC</td>
<td>ACH</td>
</tr>
<tr>
<td></td>
<td>mean</td>
<td>sd</td>
<td>mean</td>
</tr>
<tr>
<td>neu</td>
<td>1370</td>
<td>403</td>
<td>1291</td>
</tr>
<tr>
<td>opp</td>
<td>1242</td>
<td>382</td>
<td>1186</td>
</tr>
<tr>
<td>sim</td>
<td>1312</td>
<td>370</td>
<td>1100</td>
</tr>
</tbody>
</table>

it is more the contrast between the [−res] of ACTs and the [+res] of ACHs to produce a priming effect.

**Experiment 2**

Experiment 1 showed significant priming effects of ET at the lexical level. The aim of Experiment 2 was to delve to a deeper conceptual level, in order to assess if ETs are “pure linguistic” categorizations or if they rather apply also to non-linguistic input. With this purpose, a key modification was applied to Experiment 1: picture primes were used instead of word primes.

**Method**

**Participants** 42 native Italian speakers from the University of Pisa and the Scuola Normale Superiore in Pisa volunteered to participate in the experiment and were paid for their participation. All had normal or corrected-to-normal vision.

**Materials** Targets from Experiment 1 were also used as targets for Experiment 2. Each target appeared in one of three prime contexts: after a neutral prime (a pattern of Xs), after a similar prime (a picture depicting an event of the same ET), after an opposite prime (a picture depicting an event of opposite ET). Picture primes were selected from the IPNP database (Bates et al., 2000, see examples in Figure 3) and their association with ET categories was assessed through pre-test 2. Each prime-target pair was assigned to one of three lists so that an equal number of pairs per each condition appeared on each list, so that exactly one version of each target appeared on each list and so that each participant saw not more than one version of each target.

![Figure 3: Picture primes: neutral prime, ACH picture (to break), ACT picture (to ski).](image)

**Pre-test 2** Non-ambiguous verb stimuli were selected through pre-test 1; a similar pre-test was conducted to select picture stimuli for Experiment 2. Materials for pre-test were 87 pictures from the IPNP database. Again, all four of Vendler’s ET categories were used as possible answers. 20 native Italian-speaking students performed the test in a web-based format. Procedure was the same as in pre-test 1.

Results showed an inter-subject observed agreement of .42, inter-subject expected agreement of .26 and a kappa mean value of .21. 12 ACH pictures and 12 ACT pictures showing best agreement were chosen as primes for Experiment 2. Kappa mean value for chosen pictures was .42 (.41 for ACHs, .43 for ACTs).

**Procedure** Procedure was the same as in Experiment 1, with one difference: picture stimuli required longer times to be processed, and so SOA was set to a higher value (700 ms); SOA was assessed by asking 10 more participants from the same pool as in Experiment 1 and 2 to name the pictures. 700 ms was estimated as the shortest presentation time to allow the participants to identify the picture.

**Design** Design was the same as in Experiment 1.

![Figure 4: RT means for the different priming contexts in Experiment 2.](image)
supported by the crucial innovation we introduced in the ex-
relevant for the mental lexicon. This conclusion is further
of ET, thus providing evidence to the idea that ETs are indeed
(2008), our experiments yielded significant priming effects
In line with both our expectations and the study in Bonnotte
absence of priming effects with ACTs, both as target or prime.
RES), using four smaller-scale mixed effect models (see Ta-
of the task and of the featural value ([+/−dur], [+/−res]) of the
General accuracy was .92 (.94 for DUR, .90 for RES). A
emonic regression analysis performed on errors did not yield
any effect of the priming context or of any other factor.
Separate analyses Four separate analyses were conducted, one
of ET (ACH and ACT) within each task (DUR and
using four smaller-scale mixed effect models (see Ta-
A significant difference between the neutral prime
level and the similar prime level was found on ACH targets
for both DUR and RES tasks.
A striking difference with respect to Experiment 1 is the
absence of priming effects with ACTs, both as target or prime.
This fact might be due to the inherently “static” character of
picture stimuli, which makes the [+/−dur] of ACTs less salient.

General Discussion and Conclusions
In line with both our expectations and the study in Bonnotte
(2008), our experiments yielded significant priming effects
of ET, thus providing evidence to the idea that ETs are indeed
relevant for the mental lexicon. This conclusion is further
supported by the crucial innovation we introduced in the ex-
periments, i.e. controlling the semantic class of prime and
target verbs. The priming effects can thus be related to the
more abstract event structure shared by verbs that greatly dif-
fer for other dimensions of their meaning.

In addition to this, two different modalities were explored
and contrasted: word primes and picture primes. Using pic-
ture stimuli is a first but significant attempt to place the study
of ETs within a broader frame of study of event meaning
in cognition. The Embodied Cognition Framework (Evans
& Green, 2006; Haggard et al., 2007; Barsalou, 2008) sug-
gests that semantic representations are not purely amodal, but
rather grounded in our sensorimotor perception, and it has
been suggested that processing a verb might involve “covertly
recapitulating” the event it refers to (Kemmerer & Gonzales-
Castillo, 2010).

The effect of facilitation given by the word primes is not
surprising; the negative priming which we report for the pic-
ture primes is usually explained with a combination of in-
hibition (an effort of selective attention to avoid a previous
stimulus) and memory retrieval (see Tipper, 2001, for a re-
view). Picture primes seem to act at a deeper level than word
primes, and it is crucial that the negative priming is found in
the similar prime condition: similar primes seem to be more
difficult for subjects to ignore.

Moreover, the pattern of results offered by this study sug-
gests a different explanation of such priming effects than the
one offered by Bonnotte (2008) (see Table 8). Bonnotte
(2008) suggests a crucial difference between processing of

DLS\(^4\) showed that the difference between the neutral prime
and the similar prime was the only one to reach significance;
furthermore, it yielded a significant effect of the target’s ET,
of the task and of the featural value ([+/−dur], [+/−res]) of the
target.

General accuracy was .92 (.94 for DUR, .90 for RES). A
logistic regression analysis performed on errors did not yield
any effect of the priming context or of any other factor.

Separate analyses Four separate analyses were conducted, one
for each ET (ACH and ACT) within each task (DUR and
RES), using four smaller-scale mixed effect models (see Ta-
Table 7).

### Table 6: Experiment 2 - Mixed Effect Model: \(\text{log}(dl) \sim \text{prime + et + featval + (1|subj) + (1|verb) + (1|sem.cl)}\)

| Estimate MCMCmean HPD95lower HPD95upper pMCMC Pr(>|t|) |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| (Intercept)                 | 9.34                        | 9.44                        | 9.31                        | 9.49                        | 0                           | 0                           |
| primeopp                    | 0.01                        | 0.01                        | −0.02                       | 0.03                        | 0.68                        | 0.69                        |
| primesim                    | 0.05                        | 0.05                        | 0.03                        | 0.08                        | 0.00                        | 0.00                        |
| etACT                       | −0.08                       | −0.08                       | −0.14                       | −0.02                       | 0.01                        | 0.01                        |
| taskris                     | 0.14                        | 0.14                        | 0.05                        | 0.22                        | 0.00                        | 0.02                        |
| featval+                    | −0.05                       | −0.05                       | −0.08                       | −0.03                       | 0.00                        | 0.00                        |

### Table 7: Experiment 2 - Separate analyses: \(\text{log}(dl) \sim \text{prime + (1|subj) + (1|verb) + (1|sem.cl)}\)

| Estimate MCMCmean HPD95lower HPD95upper pMCMC Pr(>|t|) |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| (Intercept)                 | 9.38                        | 9.41                        | 9.24                        | 9.54                        | 0                           | 0                           |
| opp                         | 0.02                        | 0.01                        | −0.04                       | 0.07                        | 0.59                        | 0.55                        |
| sim                         | 0.08                        | 0.08                        | 0.02                        | 0.13                        | 0.00                        | 0.00                        |

| (Intercept)                 | 9.26                        | 9.26                        | 9.18                        | 9.33                        | 0                           | 0                           |
| opp                         | 0.03                        | 0.03                        | −0.02                       | 0.08                        | 0.22                        | 0.21                        |
| sim                         | 0.02                        | 0.02                        | −0.02                       | 0.07                        | 0.36                        | 0.34                        |

| (Intercept)                 | 9.52                        | 9.51                        | 9.35                        | 9.68                        | 0                           | 0                           |
| opp                         | −0.02                       | −0.02                       | −0.08                       | 0.03                        | 0.52                        | 0.48                        |
| sim                         | 0.07                        | 0.07                        | 0.01                        | 0.12                        | 0.01                        | 0.01                        |

| (Intercept)                 | 9.46                        | 9.46                        | 9.39                        | 9.53                        | 0                           | 0                           |
| opp                         | −0.01                       | −0.01                       | −0.06                       | 0.04                        | 0.71                        | 0.7                         |
| sim                         | 0.03                        | 0.03                        | −0.02                       | 0.09                        | 0.21                        | 0.19                        |

\(^4\)Fixed effects were prime, task, ET of the target, featural value ([+/−dur], [+/−res]) of the target; random effects were subject, target verb, semantic class of the target.
durativity and resultativity: “facilitation was shown on the former with similar and opposite priming, whereas it was shown on the latter only with similar priming”. Nevertheless, the pattern emerging from our experiments does not show great differences between processing of durativity and resultativity, but rather suggests a difference at the level of ET categories, which seem to differ with respect to their behavior in both tasks. Differences in priming effects across ET categories can be ascribed to different lexical encodings of their ET features: the [+dur] and [−res] of ACTs is more ductile and subject to contextual adaption, whereas ACHs are more “inherently” [−dur] [−res]. Moreover, ACTs do not seem to be affected by priming with picture stimuli, which might be problematic in conveying the [+dur] [−res] nature of ACTs. In the near future a comparison will be carried out with a similar study of Russian (Batiukova et al., 2010).

The use of videos was also contemplated for this study, but pictures were preferred for a first exploration of the visual modality because the IPNP database provided a convenient standard of stimuli and because picture primes allowed for shorter SOAs. This would not have been the case for video stimuli. Nevertheless, videos have been used in the investigation of event representations (e.g. Gennari et al., 2002) and, since they could provide a better depiction of both DUR and RES, this modality would definitely be of some interest for further work, in order to more thoroughly investigate ET representations in the mental lexicon.

ET categories were found to give rise to semantic priming effects, at both word and picture levels, which, albeit with crucial cross-modal differences, provide empirical correlates for ET categories in the mental lexicon and suggest that ETs are not only a linguistic phenomenon, but relate with our way of conceptualizing events in the world.

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