

## **Accomplishment identification under the event-script homomorphism model: A cross-linguistic study**

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### **Abstract**

This study investigated the adequacy of the ESH model in explaining accomplishment identification. The representation of an accomplishment event includes the event script, which is composed of sequential stages; in particular, the marking stage may act as an important consequence of the event which helps identifying the event itself from the preceding actions rather than representing a simple change in the theme's property. Speakers of three typologically different languages showed very similar interpretation patterns in terms of script completion, suggesting that the event script contributing to the accomplishment identification may be universal.

### **1 Introduction**

Humans “count” events similarly to objects, but it is unclear how an individual event is mentally represented and stored as semantic knowledge, and how universal such a process is cross-linguistically. This paper focuses on causative accomplishments, seeking to answer the following questions: does the representation of this type of events imply a consequence during perfective sentence reading? If so, what kind of consequence?

Semanticists assume that the property change undergone by the theme plays a critical role in the identification of a causative accomplishment. Consider “John killed a pig”: the sentence can be true only when the pig entered into the state of being dead. However, the Chinese example (1) challenges the idea that the property change in the theme necessarily provides a criterion for identifying a causative accomplishment (Tai, 1984):

- (1) Tā                    shā-le    yì        zhī        zhū,        méi        shā-sǐ.  
PRO.3.SG    kill-PFV   one        CLF        pig        NEG        kill-die  
‘He killed a pig. The pig didn’t die.’

Similar uses have been uncovered cross-linguistically (Ikegami, 1981; Aoki & Nakatani, 2013), questioning the perspective that the theme is the only source for accomplishments identification. Some researchers, therefore, shifted to a cognitive approach highlighting the contribution of the event script (Radvansky & Zacks, 2014; Zhang et al., in press). According to their “event-script homomorphism” (ESH) model, the event schemas or scripts – i.e., a type of semantic knowledge about the commonalities across a set of events (Radvansky & Zacks, 2014) – are considered to be critical in event identification. The progression of an accomplishment corresponds to the unfolding of the stages that comprise the script, and the completion of the marking stages (particularly the final stage) marks

the completion of the accomplishment. Such script knowledge can be concisely encoded in the main verb phrase of a sentence and retrieved when the verb phrase is accessed during comprehension. When reading sentence (1), for instance, readers may generate a representation of a man who just finished the action of injuring the pig and probably is still holding some tools in his hand, along with the representation of a now-dead pig.

This study aimed to test the adequacy of this hypothesized “event-script homomorphism” model in explaining the mental representations of causative accomplishments during sentence reading. We conducted an experiment where Chinese, French and Japanese native speakers read perfective sentences comprising causative accomplishments that in the literature were argued to imply a change of property in the theme. Participants reported their interpretations concerning both the presence/absence of a change in the theme’s property, and, importantly, the degree of script completion. According to the ESH model, these verb phrases should activate a reading in which the critical script stages have all been settled, but the theme’s property has not necessarily changed.

Chinese, French and Japanese interpretation patterns were compared due to their attested typological differences (Tai, 1984; Martin & Gyarmathy, 2019; Ikegami, 1981), yet we argue in favor of a general cross-linguistic cognitive mechanism.

## **2 Experiment**

### **2.1 Participants**

We recruited 30 native Mandarin speakers (18-22 years old, 24 females), 30 native French speakers (21-75 years old, 13 females), and 30 native Japanese speakers (20-43 years old, 15 females). One French speaker reported that she was also a native speaker of Cantonese. All participants received a monetary reward.

### **2.2 Materials and design**

Twenty verb phrases were selected as targets, translated into the three languages, and included in a perfective construction, forming 20 target sentences per language. We developed scripts for the accomplishment events described by the target predicates by preparing prototypical sequences of stages based on encyclopedic research, and subsequently had them confirmed by two linguists (Table 1). Among the 20 target accomplishments, 6 described an event with a 2-stage script, 8 with a 3-stage script, and 6 with a 4-stage script.

They were divided in three versions so that each version was performed by 10 participants per language. In one version, the target sentence was presented twice, and followed by a different task each time: in the property judgment task, participants had to judge whether a property change in the theme was present, absent or if both interpretations were allowed; in the script judgment task, participants judged which sequence(s) of stages was plausible for the target accomplishment event according to sentence interpretation. The combinations of stages were structured in an increasingly compositional manner: A described the first stage of the schema script, B described the second stage

following the first, C (if there was) described the third stage following the first and the second, and so on. When participants inferred from the target sentence that all N-stages of the script had been completed, they were instructed to choose the last option; when they considered the last stage unnecessary to happen in the target event, they were told to choose the penultimate option; when they chose more than one option, it meant that more than one sequence of stages was a possible reading.

**Table 1.** Exemplar trial of a target accomplishment *bake a sweet potato*.

<b>Target</b>	Chinese Predicate → 烤一个地瓜		
<b>Predicate</b>	French Predicate → griller une patate douce Japanese Predicate → 一個のサツマイモを焼く		
<b>Critical Sentence</b>	Chinese Critical Sentence → 王五用烤箱烤了一个地瓜。 French Critical Sentence → Camille a grillé une patate douce au four. Japanese Critical Sentence → 田中はオーブンで一個のサツマイモを焼いた。		
<b>Property Judgment</b>	<b>Chinese</b> 请判断地瓜熟了吗？  (a) 熟了 (b) 没熟 (c) 都有可能	<b>French</b> Est-ce que la patate douce est bien cuite après la grillade ?  (a) Oui, la patate douce est bien cuite.  (b) Non, la patate douce n'est pas bien cuite.  (c) (a) et (b) sont tous les deux possibles.	<b>Japanese</b> サツマイモがどのような状態になるのかについて判断してください  (a) 食べられる状態 (b) 食べられる状態ではない (c) 両方の可能性がある
<b>Script Judgment</b>	<b>Chinese</b> 请判断下列哪些场景与“王五用烤箱烤了一个地瓜。”的描述相符？（可多选）  (a) 预热烤箱 (b) 预热烤箱 → 洗干净并擦干地瓜 (c) 预热烤箱 → 洗干净并擦干地瓜 → 将地瓜放入烤盘并烤45分钟	<b>French</b> Quelles sont les situations/quelle est la situation qui correspond(ent) à la description de la phrase "Camille a grillé une patate douce au four." ? (Le choix multiple est possible.)  (a) Préchauffer le four (b) Préchauffer le four → Laver la patate douce et l'essuyer (c) Préchauffer le four → Laver la patate douce et l'essuyer → Mettre la patate douce dans la plaque de four et enfourner 45 minutes	<b>Japanese</b> 以下のシーンのうち、「田中はオーブンで一個のサツマイモを焼いた。」という表現の意味を正しく表すものを判断してください。（複数回答可）  (a) オーブンをあらかじめ加熱させる (b) オーブンをあらかじめ加熱させる → サツマイモを綺麗に洗い、水を拭き取る (c) オーブンをあらかじめ加熱させる → サツマイモを綺麗に洗い、水を拭き取る → サツマイモをトレーに置き、45分ほど焼く

## 2.3 Results and discussion

Results from the property judgment task showed that 94 trials (47%) for Chinese, 66 (33%) for

French, and 45 (22.5%) for Japanese out of 200 were responded with option C. Statistics confirmed the divergence of property judgment between the three languages as already reported by previous works ( $p < .001$ ): compared to French and Japanese speakers, Chinese speakers showed a stronger tendency to represent accomplishments without specifying the property change in the theme.

In contrast, 188 trials for Chinese, 189 for French and 180 for Japanese out of 200 were judged to imply the almost total completion of the script since participants selected the scenes including all N stages or/and N-1 stages which indicated a salient consequence in terms of event script completion, whereas only very few trials were interpreted as if all stages were possible (10 for Chinese, 5 for French, and 12 for Japanese). The distribution of responses yielded no significant difference between languages ( $p > 0.1$ ).

A further investigation of the sentences responded with C in the property judgment task illustrated that, despite of the lack of a consequence in terms of property change, these sentences were nevertheless represented with a salient consequence of the event script being (mostly) completed. For these sentences, the proportions of “scenes with N or/and N-1 stage” and “all scenes” were: 89.4% vs. 8.5% for Chinese, 93.9% vs. 3.0% for French, and 91.1% vs. 2.2% for Japanese. It is thus believed that the script knowledge reflected as the sequence of stages is firmly represented and retrieved.

### 3 Conclusion

This study investigated the interpretation of accomplishments in three different languages. Compared to French and Japanese speakers, Chinese speakers were less likely to link the event described by an accomplishment with a change in the theme’s property. Critically, readers of all three languages showed similar interpretation patterns in terms of script knowledge, with a large proportion of them recognizing a salient consequence with the marking stage(s) being completed even when the theme’s property was considered not necessarily changed. Results suggest that the event script contributing to the accomplishment identification may be universal, thus supporting the ESH model.

### References

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