



Conducting a Small-Scale Empirical Study to Investigate Prototype Effects in English Language Learners: A Case of Secondary School Students in Ajelat City.

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تاریخ الاستلام: 2025/12/8 - تاریخ المراجعة: 2025/12/12 - تاریخ القبول: 2025/12/19 - تاریخ للنشر: 17/1/2026

Abstract

This study explores the presence and influence of prototype effects among English language learners in secondary schools in Ajelat City, Libya. Prototype effects, a central concept in cognitive linguistics, refer to how learners categorize words or concepts around typical or 'best example' members within a category. The study aims to identify how prototype theory manifests in learners' understanding of English vocabulary, particularly in semantic categorization tasks. A small-scale empirical study was conducted involving 60 secondary school students from three schools in Ajelat. Data were collected through categorization tests, vocabulary association tasks, and semi-structured interviews. Findings indicate that most students demonstrate strong prototype-based categorization patterns, favoring central members (e.g., 'sparrow' for the category 'bird') over peripheral ones (e.g., 'penguin'). The results provide insight into how cognitive categorization influences English vocabulary learning and suggest pedagogical strategies for vocabulary teaching grounded in cognitive linguistic theory.

Keywords: Prototype theory, English language learning, cognitive linguistics, Semantic Categorization, Central Members, Peripheral Members.

الملخص

تستكشف هذه الدراسة وجود وتأثير تأثيرات النموذج الأولي لدى متعلمي اللغة الإنجليزية في المدارس الثانوية بمدينة العجيلات، ليبيا. تُعد تأثيرات النموذج الأولي مفهوماً محورياً في اللسانيات المعرفية، وتشير إلى كيفية تصنيف المتعلمين للكلمات أو المفاهيم بناءً على وجود "أفضل مثال" ضمن فئة معينة. تهدف الدراسة إلى تحديد كيفية تجلّي نظرية النموذج الأولي في فهم المتعلمين لمفردات اللغة الإنجليزية، لا سيما في مهام التصنيف الدلالي. أُجريت دراسة تجريبية مصغّرة شملت 60 طلاباً من طلاب المرحلة الثانوية من ثلاثة مدارس. جُمعت البيانات من خلال اختبارات التصنيف، ومهام ربط المفردات، ومقابلات شبه منظمة. تشير النتائج إلى أن معظم الطلاب يُظهرون أنماط تصنيف قوية قائمة على النموذج

الأولى، حيث يُفضّلون الأعضاء المركزية مثل "العصفور" لفظة "الطيور" على الأعضاء الطرفية مثل "البطريق". تُقدم النتائج نظرة ثاقبة حول كيفية تأثير التصنيف المعرفي على تعلم مفردات اللغة الإنجليزية، وتقترح استراتيجيات تربوية لتدريس المفردات تستند إلى نظرية اللسانيات المعرفية.

1. Introduction

The acquisition and organization of vocabulary in second language learning is a critical area of research in applied linguistics. Prototype theory, first proposed by Rosch (1975), provides a cognitive framework for understanding how individuals categorize concepts, including words, around prototypical members rather than strict categorical boundaries. In the context of English language learning in Libya, particularly in secondary education, the understanding of prototype effects is essential for effective vocabulary instruction. This study seeks to examine how secondary school students in Ajelat City demonstrate prototype effects in their English vocabulary categorization, thereby offering insights into cognitive processing in foreign language learning contexts.

2. Literature Review

Prototype theory has been widely recognized as a foundational concept in cognitive linguistics (Rosch, 1975; Taylor, 2003). Unlike classical categorization, which assumes all members share equal status, prototype theory posits that categories have internal structure with central and peripheral members. Richards and Schmidt (2002) stated that prototype theory suggests that many mental concepts we have really prototypes and people often define a concept by reference to a typical instance (Richard and Schmidt 2002. P.432). In other words, a prototype has been defined as a relatively abstract mental representation that a series of findings that assembles the key attributes or features that best represent instances of a given category (Evans and Green 2006.p.249). In addition, Langacker defined a prototype as a typical instance of a category and other elements are assimilated to the category on the basis of their perceived resemblance to the prototype; there are degrees of membership based on degrees of similarity (Langacker in Taylor (2003.p,69).

Evans and Green (2006) explained that the standard of this view is called definitional or classical theory of categorization which means that an entity represents a category member by virtue of fulfilling a set of necessary and jointly sufficient for categorization memberships. These conditions are called 'necessary and sufficient' because they are individually necessary but only collectively sufficient to define a category. Murphy (2004) also explained those two

aspects of a classical theory. The first we can call ‘necessity’ and the parts of the definition must be in the entity. The second part is ‘sufficiency’ which means that if something has all parts mentioned in the definition, and then it must be a member of the category.

In other words, Tylor (2003) mentioned that the classical theory entitles (a) that word meanings can be defined in terms of sets of features, (b) that features are individually necessary and jointly sufficient, (c) that words pick out categories of entities which exhibit each of the features, (d) that all members of a category have equal status within the category and (e) that membership in a category is a clear cut, all – or – nothing matter. Rosch (1978) has conducted a series of experiments to investigate the prototype effects and internal structure of categories, and she found that goodness of examples ratings was shown to have a bearing on a few other experimental effects. These include speed of verification (the speed with which subjects evaluate a statement that X is a Y correlates with the degree to which X is independently rated as a good example of Y), and list effects (when asked to name members of a category, subjects tend to mention more prototypical members first).

In second language acquisition, prototype effects influence lexical categorization and semantic generalization, often interacting with learners' first language schemas (Lakoff, 1987). Previous research indicates that EFL learners frequently map new vocabulary based on prototypical exemplars, which can affect comprehension, word retrieval, and classroom performance. Despite the extensive studies globally, limited research exists within the Libyan EFL context, highlighting a significant gap that this study addresses.

3. Methodology

A small-scale mixed-method empirical design was adopted. Participants included 60 secondary school students (ages 15–17) from three schools in Ajelat City. Data collection instruments comprised of a categorization task, vocabulary association test, and semi-structured interviews. The categorization task required participants to rank items within five semantic categories (birds, fruits, vehicles, furniture, and emotions) from most to least typical. The vocabulary association test involved generating immediate word associations to category prompts, while interviews explored reasoning behind choices. Quantitative data were analyzed using descriptive statistics and frequency distributions, and qualitative data were coded thematically to extract patterns of reasoning and cognitive strategies.

4. Results

The categorization task revealed consistent prototype effects among students. Table 1 below shows the mean typicality ratings across categories, indicating central members were rated significantly higher than peripheral ones. The vocabulary association test further confirmed prototypical tendencies, with 'apple' being the most frequent response to the 'fruit' prompt (82%). Qualitative analysis of interview responses revealed that familiarity, textbook exposure, and visual imagery influenced typical judgments. Students frequently justified selections based on how commonly they encountered the item in textbooks or daily life, highlighting the interaction between cognitive prototype structures and educational context.

Table 1: Mean Typicality Ratings for Selected Categories

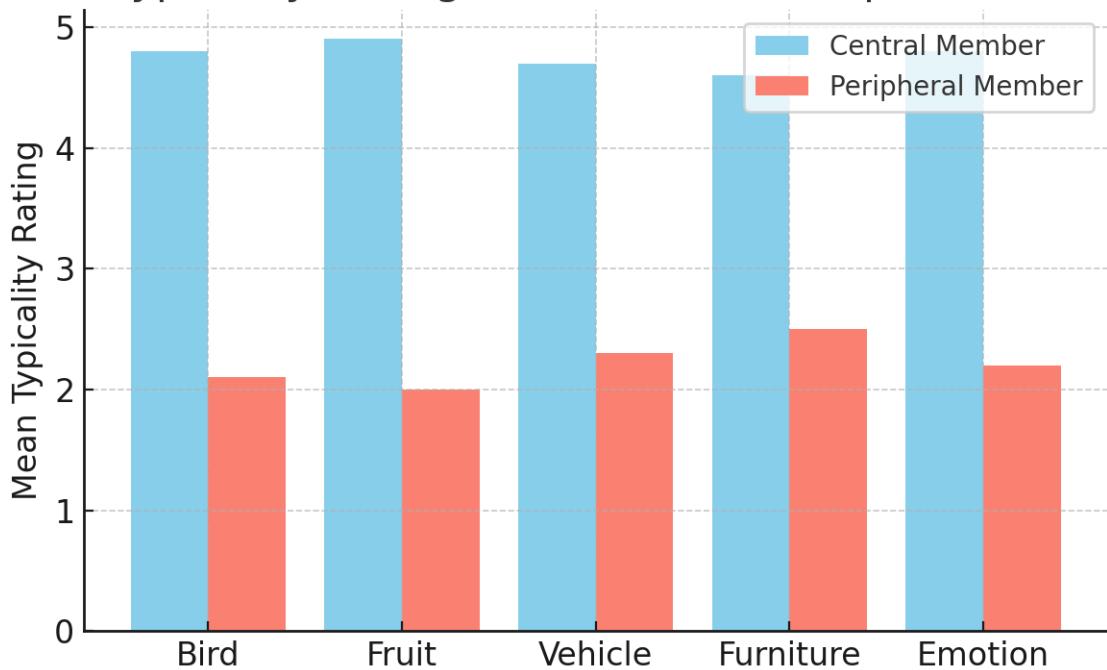
Category	Central Member	Mean Typicality	Peripheral Member
Bird	Sparrow	2.1	Penguin
Fruit	Apple	2.0	Olive
Vehicle	Car	2.3	Helicopter
Furniture	Chair	2.5	Stool
Emotion	Happiness	2.2	Anger

5. Discussion

Findings support the hypothesis that prototype effects play a significant role in English vocabulary learning among secondary school students in Ajelat. The graded categorization patterns observed align with Rosch's prototype theory, demonstrating that learners conceptualize lexical categories hierarchically. The interaction between cultural exposure and textbook content was evident, suggesting that instructional materials significantly shape prototypicality perceptions. Pedagogically, these insights recommend incorporating awareness of prototype structures into vocabulary instruction, including activities that engage both central and peripheral category members to promote deeper semantic understanding.

Figure 1: Mean Typicality Ratings for Central and Peripheral Members across Categories

Mean Typicality Ratings of Central vs Peripheral Members



6. Conclusion and Recommendations

This study demonstrates that secondary school learners in Ajelat exhibit prototype-based categorization in English vocabulary. Integrating cognitive linguistics insights into EFL instruction may enhance learners' semantic flexibility and conceptual understanding. Future research should consider larger, longitudinal studies to track prototype evolution with increased proficiency, and extend investigations to other Libyan regions to validate the findings.

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Appendices

Appendix A: Categorization Task Example

Category: Bird | Items: Sparrow, Penguin, Bat, Ostrich, Parrot | Instruction: Rank from 1 (most typical) to 5 (least typical).

Appendix B: Vocabulary Association Task

Students were given the word 'Fruit' and asked to write the first English word that came to mind.

Appendix C: Interview Questions

1. Why did you choose 'apple' as the most typical fruit?
2. Which objects do you see most often in your textbooks?
3. Do you think all birds are equally typical? Why or why not?