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Semantic representations of abstract and concrete categories in the mental lexicon of mono- and bilingual Jordanians: A prototype analysis

This study aimed at finding out whether monolingual Jordanians living in Jordan and bi- and multilingual Jordanians living abroad in western societies differ as to what they see most prototypical in eighteen concrete and abstract categories. The stimuli were selected from the answers of monolingual Arabic speakers. The main question of the study was to what extent cultural and linguistic settings have an effect on the prototypicality rating. The results show significant similarities between the two groups and none of the extralinguistic variables (country of residence, age, gender) had an effect on the rating. These similarities between Jordanians in Jordan and abroad can be explained by their attachment to the Arabic Language, identity and culture, which was stressed more by the abstract categories ratings. However, there were individual differences, which were greater than the group differences.

Keywords: mental lexicon, prototype theory, prototypicality ratings, features generating, abstract and concrete categorization, language and culture exposure, monolinguals and bilinguals

1. Introduction

1.1. Mental representations, concepts and the mental lexicon

Concepts are stored representations in the mind (seemingly in long-term memory) while conceptualization is a process that involves selecting different concepts and organizing them together (seemingly in working memory) to present a certain perspective of a particular situation (Jarvis, 2007). In psycholinguistic and cognitive frameworks, concepts may be defined as the understanding we have about a certain category (Barsalou *et al.*, 2003), or as “a mental representation of a class or individual that is concerned with what is being represented and how that information is generally employed during classification” (Smith, 1995: 502).

According to Boas (1989, cited in Kone, 2013), the linguistic world is essentially diverse, and issues about human perception of reality must be resolved from inside a given perspective (what he called the “inner form of a language”) and by moving among different perspectives. It is not impossible to express the same concept in two languages (Leavitt, 2006). Leavitt argues that linguistic differences imply different experiences and claims that language drives cognition; rather, it is “part of

a social reality”, and in order to comprehend one’s social reality, we must analyze the whole. Language is more than just a method of expressing universal perceptions; language has an influence on the user’s point of view (Sapir, 1929, cited in Kone, 2013).

From a cognitive linguistic point of view, concepts are not formed through language; rather, they exist in the individual’s mentality and language is only a means to exchange and discuss concepts in the communication process. In order to establish communication, concepts need to be verbalized which can take the form of words, phrases, sentences, and entire paragraphs depending on the mental representation, personal meaning, and internal lexicon of the speaker (Nemickienė, 2011).

The mental lexicon is described as a mental dictionary that presents knowledge about the meaning of a word, pronunciation, and syntactic characteristics (Jackendoff, 2002). In other words, it’s the perception of words’ features by an individual. Although the mental lexicon is usually referred to as a “vocabulary” in the mind, studies have shown that it differs considerably from a dictionary. The mental lexicon, for instance, is not arranged alphabetically like a dictionary; rather, it appears to be structured in a more nuanced way, with connections between lexical items related phonologically and semantically (Aitchison, 2003). Researchers focused on the mental lexicon to investigate how it differs between bilinguals and monolinguals. Bilinguals possess one or two internal lexicons. There are at least two lexical representations for each concept, one in each language (Timmer, Grundy, & Bialystok, 2017). In the 1980s, Soares and Grosjean (1984) tested English-Portuguese bilinguals’ processing and had two main findings. One difference is that, while bilinguals can access real words in English as quickly as monolinguals, they are slower at reacting to non-words. The other finding was that bilinguals took longer to access code-switched words than monolinguals. These two findings provide evidence that the bilingual mental lexicon is more complex than the monolingual, and that the processing mechanisms are different for bilingual people, who store at least two languages in their mental lexicons.

It is apparent that there are more concepts than words and some concepts have no linguistic encoding in any language. Pavlenko (2009) proposes to use the term *lexical concepts*: linguistic categories that are linked to words and are seen as multimodal mental representations that include auditory information (sound), visual information (mental imagery), kinesthetic information (sensory-motor), and perceptual information (texture) and are stored in the implicit memory. Such representations are considered dynamic and therefore subject to changes and individual and generational discrepancies, namely between speakers with different experiences, skills, or expertise in the field in question (Murphy, 2002).

There is a difference between what people might think, which is in principle infinite for speakers of any language, and what people regularly think, which may be significantly affected by their language (Leavitt, 2010; Darnell, 2006). An internal representation of the world around us is available to us because of our mental system, a microcosm, yet it is far from a miniature world. It is essential for projecting the envisioned world. The structure of the bilingual mental lexicon, as well as the links between language, thought, and culture, must be considered while investigating the semantic representation of bilinguals (Navracics, 2002).

1.2. Concrete and abstract categories

Generally, concepts are divided into concrete and abstract subcategories that are usually used in philosophy and semantics, and they are subject to contemporary psycholinguistic and cognitive studies.

Words having concrete referents (e.g., *path*, *mirror*) stand for physical objects that exist in time and space, while abstract categories (e.g., *duty*, *aspect*) mostly represent ideas and concepts. Grounded cognition theories suggest that concrete referents capture mainly sensory-motor experiences of the physical surrounding (Barsalou, 1999, 2008), while the abstract ones are more dependent on situational occurrences and introverted information such as emotions (Barsalou & Wiemer-Hastings, 2005). Concrete categories share meaning across languages and cultures more than abstract ones as they have shared conceptual features, and so their semantic representation in the bilingual lexicon is shared. On the other hand, abstract categories in different languages have partially overlapping conceptual features as cultural and linguistic contexts determine the intended meaning (De Groot, 1992), and their meanings tend to be more variable in different languages as they have no tangible referents (Jin, 1990). Levinson (2003) adds that the linguistic categories, which different speakers rely on, could be different in terms of boundaries, structure, or prototypicality of specific category members.

1.3. Levels of categorization and the Prototype Theory of concepts (PTC)

The ability to categorize is an important element of cognition: determining whether or not a specific object is an instance of a particular category (Jackendoff, 1983). Based on the manifestation of inclusion and degree of specificity, there are three levels of categorization: superordinate, basic and subordinate (Cruse, 2004; Schmid, 2007). Superordinate categories are found at the top of folk taxonomy and they have a high degree of generality. Basic categories are the most culturally significant conceptual knowledge, they display higher class inclusion than subordinate categories, having more members than superordinate categories. Subordinate categories have a low degree of generality and class inclusion. They

also have distinct and highly informative gestalts, as well as various identifying specific characteristics. Subordinate categories are under basic-level categories.

Several theories have been proposed to untangle the nature of concepts and present a coherent explanation of their structure. The *Prototype Theory* developed by Rosch (1975) is one of the most popular accounts and it has developed the cognitive system for interpreting linguistic definitions or categorizations that are used to identify whether entities are fit to be members of a category. A prototype is “the clearest case of a category” (Rosch 1975: 233), and Aitchison (2003) further highlights that the prototype is typical for its classification. The prototype contains the whole set of prototypical characteristics, which can be totally or partially shared by the participants in a given category. A category is a set of attributes that are assumed to be features of groups of people or objects, or “a number of similar objects” (Rosch and Lloyd 1978: 48). The theory is based on empirical research, in which Rosch (1975) presented her participants with a questionnaire that contained category names (bird, vegetable, fruit, clothing, furniture, transport, etc.) followed by around fifty examples of each one. The task was to rate each item out of 7 as a good example of the category. It was found that the participants (over 200 students) showed a very high level of agreement as to which items were the most typical. Rosch (1973) tested the category ‘birds’ and noticed that subjects could accurately rank robins, eagles, chickens, and penguins as successful examples of the concept ‘bird’; in addition, these prototypicality ratings showed how long it took for participants to prove that they were birds.

1.4. Testing the Prototype Theory

Schwanenflugel and Rey (1986) examined the effect of cultural and intercultural familiarity on PTC. They tested the characteristics of 12 categories in monolingual Spanish and monolingual English groups in Florida. The two groups speak two different languages but share the same culture since they live in the same territory. Despite the difference in listing examples for the target categories, the findings of the analysis revealed that there was a consensus between the two groups on the prototypicality ratings of the examples of each category. This correlation in ratings is explained because, as Schwanenflugel and Rey put it, the two groups have the same culture, i.e., they live in the same place, South Florida, as well as have the same customs and everyday life experiences. The findings showed interesting hints concerning the effect of cultural similarities in deciding the degree of representation of examples of their categories.

Lin and Schwanenflugel (1995) conducted research that was undertaken as a reaction towards Schwanenflugel and Rey’s study (1986), who underrated the effect of different cultures by studying two groups of the same culture. Lin and

Schwanenflugel investigated two distinct cultures: American and Chinese. Thirty Chinese speakers from Taiwan and thirty English speakers from the United States were involved in the study. The cultural groups were presented with 10 categories and instructed to rate how prototypical these examples are in each category. The findings demonstrated a surprising connection between cultural familiarity and prototypicality in each culture, with American groups being strongly related to the internal membership structure and characteristics of category members than Chinese groups. The findings also revealed that there was a significant difference in prototypicality between cross-cultural groups.

Alajaleen and Alkhanji (2020) studied the impact of culture on the prototypicality ratings of examples and features belonging to two concepts, one concrete concept ('drinks') and one abstract concept ('freedom'). The results showed that the culture of the participants, i.e. Jordanians and Americans, played an important role in the generation process. Culture affects our experiences and therefore, forms our conceptual framework. Cultural variations between Americans and Jordanians have influenced the process of producing semantic representations and features for each concept. The results showed that the most prominent factors of culture that influenced this process were the social aspects, the geographical aspects, and daily life interactions, including political as well as family connections and activities. Additionally, the results indicate that the most influential factors that led to the discrepancies between the responses of Americans and Jordanians were freedom and drinks in the way of social and religious heritage, political affiliations and desires, traditions, and economic influence, in which the Jordanian society are conservative, whereas American society is liberal.

Another study aimed at finding out whether Europeans and North-Americans differ as to what they consider to be the best examples of categories 'vehicles', 'clothes', 'vegetables' and furniture. Basile (2007) compared the two continents with each other and tried to find out to what extent the cultural differences influence the best examples chosen by the research participants. Further, the prototypes given by European females and males and North-American females and males were compared to point out some differences between the two genders. The findings, according to the frequency of the generated features and examples of the participants from both groups, demonstrate the existence of some good examples (high frequency) and some bad examples (low frequency) that were similar, no matter if we focused on the European or North American results. However, there tend to be clear cultural factors for the better examples selected by the participants. It is reasonable to select prototypes of categories that are well known to the participants in the study. The better-known objects are those that are present in the lives of the participants. So, riding a bike, for example, doesn't seem to be very

popular among people in North America. They consider bikes to be just a lower average example for category vehicles, while Europeans tend to use bicycles more often.

1.5. Goals and the research question of the study

The majority of research on the prototype theory of concrete and abstract concepts has been done in western cultures and among monolinguals. The present research is therefore being undertaken as a response to the lack of prototype-frame studies in the Arab region in general and in Jordan in particular. The goal of this research is to enrich the literature on Prototype Theory by offering insights into new cultures, such as the Arab Jordanian community. It examines the influence of culture and language on the conceptualization of certain concrete and abstract ideas by examining Jordanians in Jordan and abroad.

The study seeks to answer the following question: To what extent does cultural and language proficiency level affect the prototypicality ratings of category members and features in bi- and multilingual Jordanians abroad in comparison to monolingual Jordanians in Jordan? It is hypothesized that there will be qualitative differences between monolinguals and bilinguals in the prototypicality ratings due to effect of the culture or cultures they are exposed to.

2. Methods

2.1. Participants

Twenty-one Arabic Jordanian monolinguals completed a task to gain the stimuli for the main study: 11 males and 10 females with an average age of 30 years old, and 170 Jordanians divided into two groups participated in the main study. The first group consisted of 87 monolingual Jordanians (35 males, 81 living in Jordan, and 6 in Arabic-speaking countries: UAE, Oman, Kuwait, and Saudi Arabia). The second group consisted of 83 bi- and multilingual Jordanians (43 males, living in 15 different countries, e.g. Hungary, Italy, Australia, Germany, USA, France, Canada, Belgium, Czech, Panama, Russia, Serbia, Turkey, Vienna, and the UK). In total, the participants of the second group were collectively exposed to 13 different languages other than Arabic (e.g. English, German, Italian, French, Turkish, Hungarian, Spanish, Chinese, Hebrew, Russian, and Swahili). The age range of the participants was between 18 and 64, with an average age of 32 for both groups.

2.2. Instruments

Two instruments were used to achieve the aims of this study; the first is a free listing test for the abstract and concrete categories targeted in this study and the second one is the prototypicality rating test.

2.2.1. Task 1: Free listing of examples

This task is adapted from Fehr & Russell (1984). In this task, the participants were asked to provide all the possible examples and features that came to their minds when they heard the following ten concrete categories: *animals, clothes, fruits, drinks, vegetables, furniture, birds, vehicles, weapons, and kitchen utensils*. These concrete categories except for 'kitchen utensils' were chosen based on Dufour, R., & Kroll, J. F. (1995), matching words to concepts in two languages: a test of the concept mediation model of bilingual representation. The eight abstract categories were *positive emotions/feelings, negative emotions/feelings, values, positive personality traits, negative personality traits, important life events, female characteristic features, and male characteristic features*. For example, if participants were given a blank sheet of paper with the category 'sports' written on the top, they would list some examples as members of this concept such as 'football', 'basketball', 'tennis' and 'running'.

The online test was divided into 19 sections. The first section presented some information and instructions about the nature and the purpose of the study and asked the participants to provide some biographical information. Each one of the remaining 18 sections included one of the aforementioned abstract and concrete categories with enough space for the participants to provide ten examples of each category. After receiving the responses, the generated examples and the semantic features of each concept were carefully investigated, grouped, and classified. For the sake of clarity and simplicity and to avoid repetition and redundancy, the various syntactic and morphological forms of the same response and synonymous responses were approached as one response. For example, the responses, *honest, honesty, and being honest* were treated as one response: 'honesty'. The answers of each category were counted based on their frequencies and percentages among the participants' responses. Data collected in this task served as input in the categorization process in Task 2 (The Prototypicality Ratings).

2.2.2. Task 2: The Prototypicality Ratings

Participants were asked to rank the collected categories. This process is dependent on the notion of 'graded membership', which is one of the basic principles of the Prototype Theory. To achieve the purpose of the second task, an online 6-point scale questionnaire (adapted from Fehr & Russell, 1984) was developed, in which respondents were asked to rate the members of each category from 1 to 6 as follows: 1: very poor example of the category, 2: poor, 3: fairly poor, 4: fairly good, 5: good and 6: very good.

The online questionnaire consisted of nineteen sections. The first section seeks biographical information and provides some information about the nature and the

purpose of the study as well as some instructions for participants. The other eighteen sections are the eighteen categories (10 concrete and 8 abstracts) that are being examined in this study with nine examples for each category. The basis, on which the nine examples were selected, was adopted from Fehr and Russell's study (1984) as follows: three examples with high frequency, three with moderate frequency, and three with low frequency. The examples mentioned by only one participant were ignored.

2.3. Methods of data analysis

Quantitative-qualitative mixed methods were used. The qualitative method aimed at (i) investigating the lexical representation of the abstract and concrete categories targeted in this study among monolingual Jordanians; (ii) observing the difference of frequency between the given examples; (iii) comparing the abstract and concrete categories; (iv) the word choice between males and females. In addition, a quantitative approach was used to investigate the effect of cultural and language exposure on the prototypicality ratings of the given stimuli between monolingual Jordanians in Jordan and bi- and multilingual Jordanians abroad.

3. Results and Discussion

3.1. General Discussion and findings of the first test (the free listing of examples)

The number of different examples generated for the abstract categories is greater than that for the concrete categories; they had an average of 40.4 different examples for each concrete category while they generated an average of 74.5 different examples for each abstract category. As often claimed (e.g. Borghi and Binkofski, 2014), concrete concepts/words have clear references to material objects (e.g., dog, house), whereas references of abstract ones are not physical entities, but more complex mental states (e.g., thought, happiness), conditions (uncertainty), situations (encounter), and relationships (employment), and this might explain the high diversity of the generated abstract examples.

The most frequent examples for the concrete categories have a sufficient number of features attributed to them and according to Rosch (1975), many common semantic categories are based on concepts with a prototype structure. Possible members of such categories are organized on the basis of how similar they are to a prototype, for example, 'fruit' is tied to being round sweet and has seeds and 'animals' are visualized normally for having four legs and slimy skin, 'birds' with feathers and the ability to fly, also the participants in this study mentioned non-members of a category such as a 'bat', which is a mammal, for the category 'birds' because it has some features that most birds also have. On the other hand, and by

looking at the generated features, we can see that the generated features for each category are distinct and a basic visual image cannot be formed for it, Wittgenstein (1958) states that members of a category may have some similarities but no one set of characteristics links all category members.

It is not easy to find reasons for why certain best examples are chosen by certain groups of people. However, most differences between the generated examples can be explained by the different cultural norms in societies (Basile, 2007). Examples of those norms are *Abaya* and *dishdasha* as ‘clothes’ since they are common clothing in the Arab region in general and Muslim countries in particular, in addition to not mentioning *alcoholic drinks* for the category ‘drinks’ for the same religious reasons. So, if using the bus as a means of transportation is not common to people in one culture, it will be difficult for them to see it as a typical vehicle. One always chooses something that one knows or is interested in.

A comparison between the generated examples of the categories ‘clothes’, ‘vehicles’, ‘vegetables’ and ‘furniture’ between Jordanians in this study and North Americans and Europeans from Basile’s (2007) study shows some differences and similarities to which are the most and the least frequent examples listed for the mentioned categories. These similarities or differences may be related to the different cultures. According to Kramsch (1998), by looking at culture and its relationship with the language we can imagine the difference in terms of world views and mental activities between community members and members from other communities.

Looking at the abstract categories in my data, I note that there is no clear break in the frequency of listing scores between the extremes, no obvious boundary between available and unavailable categories. Rather, there is a gradual change from instances that come readily to mind. The subtypes of the generated abstract categories varied widely in how readily they came to mind. At one extreme was *honesty*, listed by most of the participants for the categories ‘positive personality traits’ and ‘values’. This implies that Jordanians value honesty the most. Moreover, *dutifulness to parents* was one of the most frequent examples for the category ‘values’ since it is a very important virtue in the Jordanian culture. Jordan is a Muslim country, and the Islamic teaching encourages having an obligation towards our parents.

Culture plays a crucial part in generating concepts and the most influential factors in this process are society, geography, politics, and everyday life experiences besides family relationships and activities. The presence and absence of certain examples in each category’s list, as well as the frequency at which the shared items are listed, show variations. These results support Croft and Cruse’s (2004) assumption that daily life experiences form our understanding of the universe and

the meaning of its concepts. Daily-life experiences control how people, who live in one place, perceive, function, act, etc., on a daily basis. Everyday life experiences are often regarded as reference points for socio-cultural research.

3.2. Results and discussions of the second test: The prototypicality ratings

This part of the study explores whether or not cultural and language differences affect the way Jordanians rate the prototypicality of some examples for the eighteen categories given in the test. A general look at the results shows that there are no significant differences between the mean ratings according to the responses of the concrete and the abstract categories between monolingual Jordanians in Jordan and bi- and multilingual Jordanians abroad. These results will be discussed in three parts: the first part concerns findings related to the concrete categories between monolinguals and bilinguals, the second part discusses the findings related to the abstract categories between monolinguals and bilinguals while the third part discusses some gender-related findings.

As mentioned earlier, the first test was the basis for choosing the stimuli for the prototypicality rating test. Table 1 shows the nine examples that were chosen from the free listing of examples test as stimuli for both abstract and concrete categories.

Table 1. The nine examples used as stimuli for each category in the prototypicality rating test.

Category	Stimuli
Positive Emotions	Love, happiness, trust, optimism, energetic, comfort, pleasure, appreciation, determination
Negative Emotions	Sadness, frustration, failure, anger, jealousy, arrogance, fear, sorrow, pessimism
Values	Honesty, humility, sincerity, dutifulness to parents, helping others, respecting others, altruism, forgiveness, politeness
Positive personality traits	Honesty, optimism, patience, sincerity, open-minded, social intelligence, courage, attractiveness, cheerfulness
Negative personality traits	Hatred, envy, hypocrisy, liar, pessimistic, impulsive, untrustworthy, aggressive, indecisive
Important life events	Marriage, graduation, traveling, losing a loved one, pregnancy, high school graduation, war, first job, childbirth
Female characteristic features	Beauty, good manners, tenderness, femininity, affectionate, kindness, soft voice, politeness, passionate
Male characteristic features	bearing responsibility, courage, loyalty, stylish, tolerance, protective, magnanimity, honesty, generosity
Animals	Lion, elephant, giraffe, whale, camel, sheep, crocodile, rhino, mouse
Clothes	Blouse, jacket, socks, Abaya, belt, gloves, hijab, pajama, shorts
Fruits	Orange, strawberry, pineapple, kiwi, pear, cocoa, dates, pomegranate, fig
Drinks	Tea, Nescafe, water, soda, anise decoction, sage decoction, mocha, yogurt, latte
Vegetables	Cucumber, potato, garlic, zucchini, lemon, broccoli, mulukhiyah, peas, lettuce

Furniture	Bed, TV, table, sofa, carpet, wardrobe, chandelier, dining table, washbasin
Birds	Eagle, pigeon, bat, seagull, penguin, ostrich, swan, chick, sparrow
Vehicles	Car, plane, ship, truck, spacecraft, submarine, helicopter, train, tank
Weapons	Pistol, machine gun, bomb, dagger, catapult, arrow and bow, Kalashnikov, ax, sword
Kitchen utensils	Spoon, ladle, knife, plate, frying pan, colander, jug, kettle, microwave

3.2.1. An analysis of prototypicality ratings of the concrete stimuli between monolinguals and bilinguals

The findings (Table 2) show that there are no significant differences between the mean ratings according to the responses of the concrete categories. The highlighted means show the three most prototypical examples for each category. Although there are some differences in some categories in which examples are the most prototypical but the data shows that monolingual Jordanians and bilingual Jordanians abroad rated most of the first three categories similarly as can be seen from the highlighted means in the table.

The two groups rated the three most prototypical examples for the categories ‘birds’, ‘clothes’, ‘drinks’, and ‘vehicles’ with some differences on which is the first, second or third prototype, for example, monolingual Jordanians rated *pigeon* and *blouse* the highest for the categories ‘birds’ and ‘clothes’ while bilinguals rated *sparrow* and *jacket* to be the highest. Although there is no statistical difference, the rating has a greater proportion for *sparrow* than for *pigeon* in the group living abroad. *Jacket* and *blouse* are very close in both populations, which means, irrespective of where they live, these two items of clothes they consider to be the most typical.

Table 2. The mean prototypicality ratings of the concrete categories

Examples	Monolingual Jordanians in Jordan	Bi- and multilingual Jordanians abroad	Examples	Monolingual Jordanians in Jordan	Bi- and multilingual Jordanians abroad
<u>Birds</u>			<u>clothes</u>		
Swan	4.94	4.84	Jacket	5.82	5.9
Penguin	4.02	3.84	Socks	4.93	5.07
Ostrich	4.79	4.58	Belt	4.24	4.41
Eagle	5.79	5.87	Blouse	5.86	5.89
Pigeon	5.82	5.93	Hijab	5	4.6
Bat	4	3.69	Shorts	5.26	5.25
seagull	5.6	5.63	Gloves	4.2	4.03
chick	4.8	4.48	Abaya	5.52	5.06
Sparrow	5.82	5.97	Pajama	5.66	5.56
<u>Animals</u>			<u>Weapons</u>		
Mouse	4.78	4.65	Sword	5.4	5.4

AHMAD NAJI

Giraffe	5.67	5.84	Pistol	5.87	5.95
Whale	4.66	4.39	Arrow and bow	4.98	4.9
Lion	5.82	5.95	Machine gun	5.74	5.81
Crocodile	5.03	5.17	Catapult	4.94	5
Elephant	5.73	5.93	Ax	3.55	3.81
Rhino	5.43	5.67	Kalashnikov	5.8	5.73
Camel	5.77	5.81	bomb	5.77	5.64
Sheep	5.75	5.8	Dagger	5.02	5.19
<u>Fruits</u>			<u>Furniture</u>		
Pear	5.59	5.74	TV	4.68	5.04
Cacao	2.78	2.86	Sofa	5.8	5.79
Orange	5.71	5.79	Bed	5.8	5.79
Pineapple	5.67	5.87	Table	5.59	5.71
Date	3.85	4.2	Carpet	5.27	5.13
Strawberry	5.78	5.82	Chandelier	4.74	4.85
fig	5.49	5.67	wardrobe	5.71	5.63
Kiwi	5.59	5.64	Dining table	5.2	5.47
pomegranate	5.56	5.74	Washbasin	4.57	4.54
<u>Kitchen utensils</u>			<u>Vegetables</u>		
Spoon	5.88	5.8	Lettuce	5.63	5.73
Frying pan	5.82	5.92	cucumber	5.83	5.78
Microwave	4.98	4.8	Peas	5.36	5.42
Knife	5.8	5.91	Zucchini	5.73	5.75
Plate	5.8	5.74	Mulukhyyah	5.41	4.95
Kettle	5.22	5.26	Potato	5.75	5.73
Jug	5.34	5.46	broccoli	5.56	5.45
Ladle	5.71	5.68	Garlic	5.16	5.06
Colander	5.42	5.4	Lemon	5.08	4.65
<u>Drinks</u>			<u>Vehicles</u>		
Tea	5.83	5.9	Car	5.87	5.97
Yogurt	3.96	3.74	Truck	5.44	5.5
Water	5.81	5.85	Train	5.42	5.26
Anise decoction	5.55	5.46	spacecraft	3.86	3.89
Soda	5.65	5.52	Plane	5.29	5.08
Nescafe	5.73	5.54	Ship	5.05	5.03
Mocha	4.98	5.03	Helicopter	4.55	4.51
Sage decoction	5.43	5.26	Tank	3.4	3.71
Late	5.13	5.15	Submarine	3.45	3.63

Figures 1 and 2 show the similarities between the two groups of monolinguals and bilinguals by presenting the average range for each concrete category rated by the participants. It can be illustrated that the range of the categories was between 1.5 and 6 for the monolinguals. Most of the examples have high ratings, for example, ‘birds’, ‘kitchen utensils’ and ‘vegetables’ were rated between 3.8 and 6. On the other hand, category ‘vehicles’ ranged between 1.5 and 5.8. Moreover, the range of ratings for the bi- and multilingual participants does not show a significant difference from the monolinguals. Bi- and multilingual participants have low ratings for ‘vehicles’ category examples between 2 and 6, while they have some high ratings for ‘birds’, ‘animals’, ‘kitchen utensils’ and ‘vegetables’ (lowest is 3.6 and highest is 6).

Figure 1. The range from 1-6 of rating the concrete categories for monolingual Jordanians

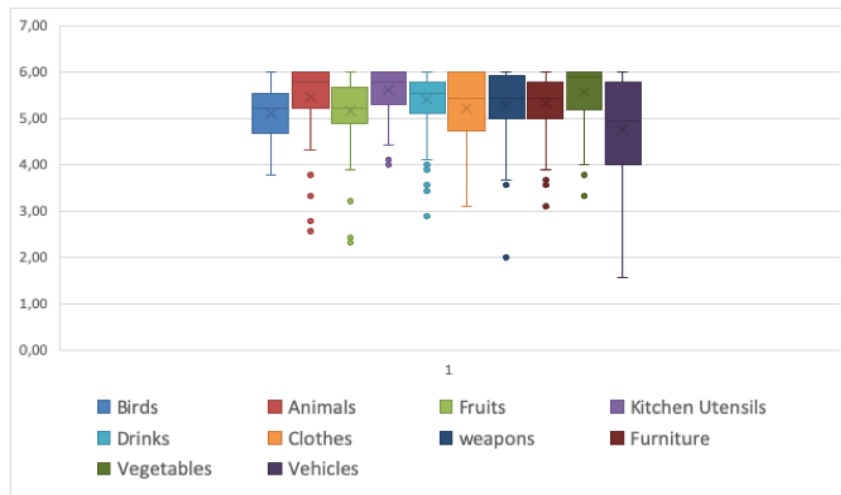
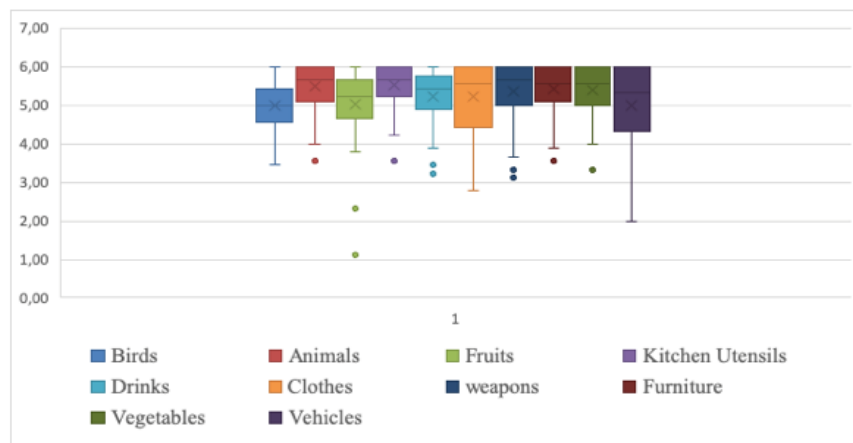


Figure 2. The range from 1-6 of rating the concrete categories for bi- and multilingual Jordanians



3.2.2. The analysis of prototypicality ratings of the abstract stimuli between monolinguals and bilinguals

Table 3 indicates that there are no statistically significant differences in the ratings of the examples of abstract categories. There might be some insignificant differences for most of the categories, for example, the features *hatred* and *lying* were most prototypical for bilinguals while *impulsive* and *hypocrisy* were most prototypical for monolinguals for the category ‘negative personality traits’ along with some other differences for the categories ‘female characteristic features’ and ‘important life events’.

On the other hand, and as can be seen in Table 3, Jordanians (either in Jordan or abroad) completely agreed on what would be the prototype for the categories: ‘positive emotions’, ‘negative emotions’ and ‘male characteristic features’. For instance, *optimism* was highest for the category ‘positive emotions’ in both groups and the same with *pessimism* for the category ‘negative emotions’. We note from the data that although there was not a great difference in the mean ratings between the groups, the prototypes differed from one category to the other.

Table 3. The mean prototypicality ratings of the abstract categories

Examples	Monolingual Jordanians in Jordan	Bi- and multilingual Jordanians abroad	Examples	Monolingual Jordanians in Jordan	Bi- and multilingual Jordanians abroad
<u>Positive emotions</u>			<u>Negative personality traits</u>		
Love	5.51	5.59	Hatred	5.56	5.56
Optimism	5.73	5.85	Envy	5.66	5.67
Energetic	5.37	5.53	Pessimism	5.45	5.5
determination	5.36	5.65	Impulsive	4.57	4.9
Happiness	5.68	5.85	Lying	5.56	5.59
Trust	5.49	5.7	aggressive	5.57	5.46
comfort	5.22	5.54	indecisive	4.39	4.71
Pleasure	5.16	5.54	Untrustworthy	5.14	4.92
appreciation	5.1	5.48	Hypocrisy	5.57	5.52
<u>Negative Emotions</u>			<u>Important life events</u>		
jealousy	4.68	4.6	Childbirth	5.56	5.57
frustration	5.27	5.25	Marriage	5.39	5.19
Anger	5.01	5.01	First job	5.18	5.06
Failure	5.05	4.8	War	5.18	5
Sadness	5.28	5.15	Travelling	5.11	4.79
Sorrow	4.85	4.86	University Graduation	5.41	5.32

Pessimism	5.42	5.31	Pregnancy	4.95	4.97
Fear	4.65	4.92	High school graduation	5.04	5.26
Arrogance	4.95	4.92	Losing a loved one	5.5	5.36
<u>Values</u>			<u>Female characteristic features</u>		
Honesty	5.89	5.93	Politeness	5.49	5.53
helping others	5.57	5.76	Beauty	4.93	5.02
dutifulness to					
parents	5.59	5.68	Soft voice	4.7	4.87
Humility	5.52	5.65	Affectionate	5.36	5.5
politeness	5.66	5.69	Good manners	5.48	5.48
altruism	5.24	5.21	Femininity	5.39	5.58
respecting others	5.72	5.86	Tenderness	5.19	5.34
sincerity	5.51	5.76	Educated	4.79	5.06
forgiveness	5.43	5.68	kindness	5.36	5.51
<u>Positive personality traits</u>			<u>Male characteristic features</u>		
Cheerfulness	5.44	5.54	Loyal	5.4	5.21
Honesty	5.27	5.53	Bearing responsibility	5.67	5.65
Courage	5.35	5.45	Courage	5.48	5.48
Social					
intelligence	5.29	5.37	magnanimity	5.58	5.54
Sincerity	5.44	5.45	Stylish	5.01	4.97
Open-minded	5.19	5.39	Honest	5.58	5.56
attractiveness	4.51	4.68	Generosity	5.57	5.4
optimism	5.63	5.73	Tolerant	5.43	5.23
Patience	5.36	5.54	Protective	5	4.6

Figures 3 and 4 show the average range of ratings for the abstract categories and from the data, we noticed high similarities between monolinguals and bilinguals for most of the categories just like it was mentioned earlier in the analysis of the concrete data.

Figure 3. The range from 1-6 of rating the abstract categories for monolingual Jordanians

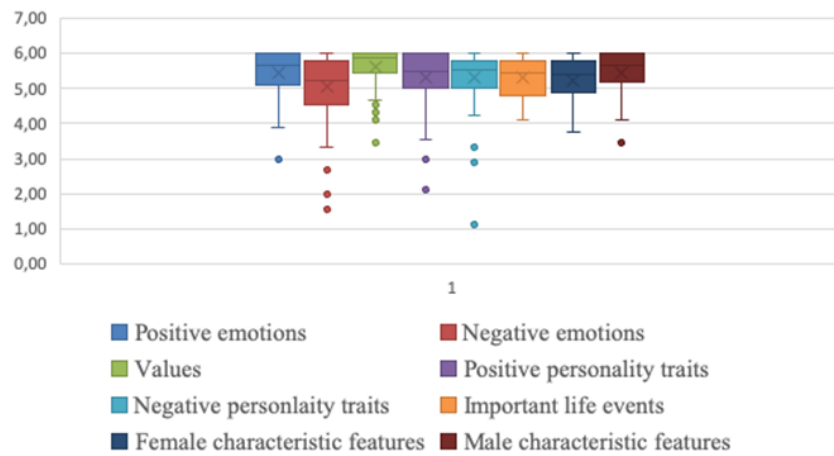


Figure 4. The range from 1-6 of rating the abstract categories for bi- and multilingual Jordanians

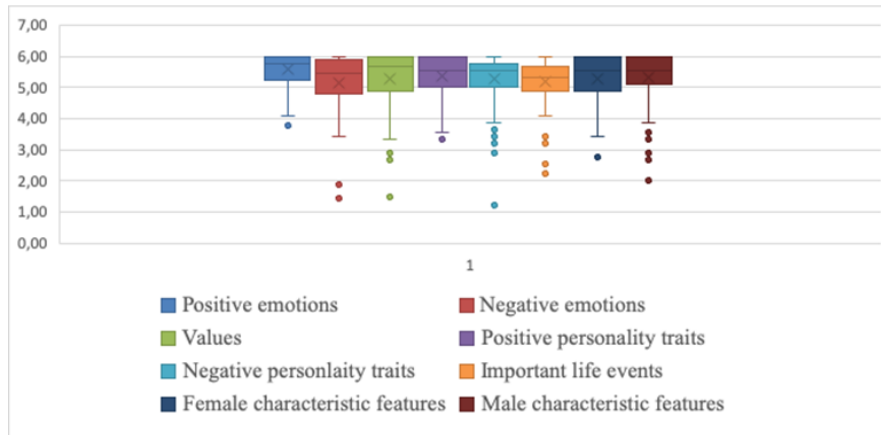
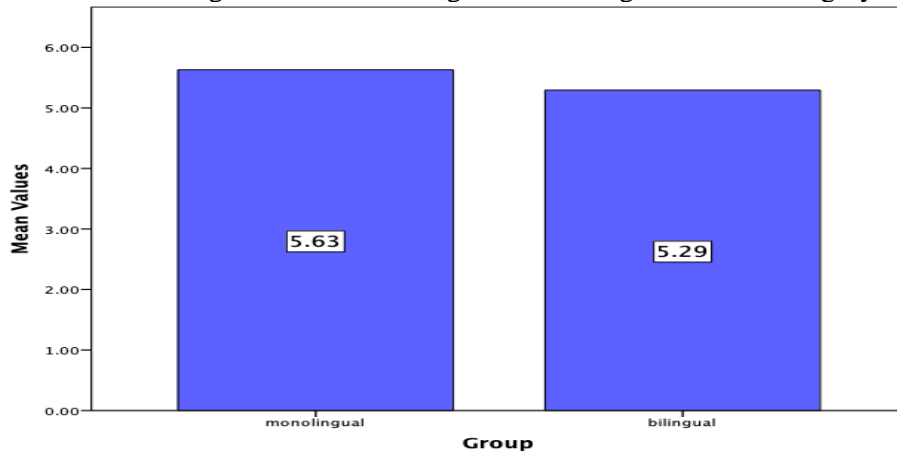


Figure 5 provides an example of the mean range for the abstract category ‘values’. Between the two groups, the range of rating the features of ‘values’, namely *honesty, humility, sincerity, dutifulness to parents, helping others, respecting others, altruism, forgiveness and politeness* is 5.63 in the monolingual group, which is higher than how the bilingual Jordanians rated, and this difference was found to be statistically significant ($p < .05$).

Figure 5. The mean range between monolinguals and bilinguals for the category ‘values’



3.2.3. The analysis of prototypicality rating findings related to gender

Figures 6 and 7 show the range of rating the concrete category ‘fruits’ and the abstract category ‘values’ between males and females. As shown in the figures, in the females’ group of both ‘Values’ and ‘Fruits’ is higher rated than in the males’ group; and the difference is statistically significant ($p < .05$).

Figure 6. The range rating of the category ‘fruits’ between males and females

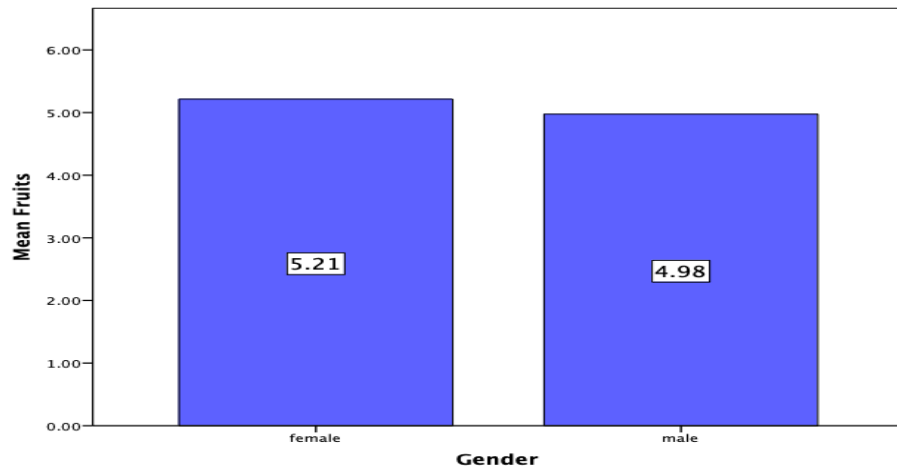
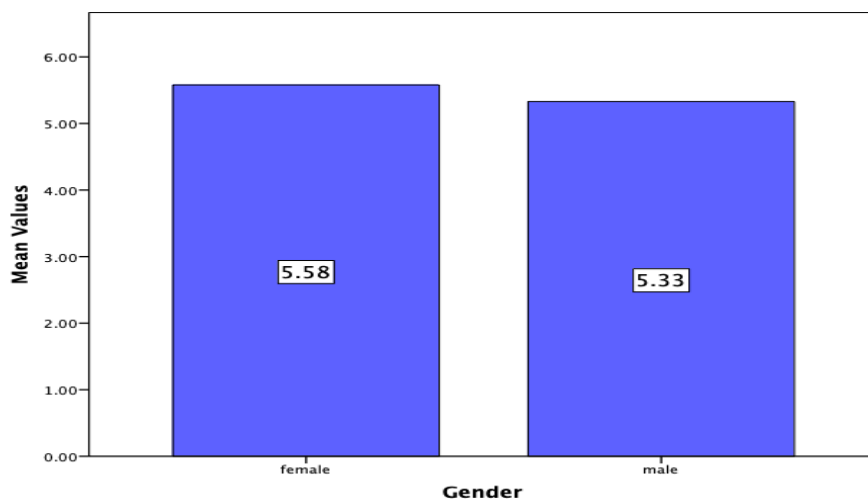


Figure 7. The range rating of the category ‘values’ between males and females

The distribution of the items from being very strong or very weak examples on the 6-point scale adopted in the present study supports the most fundamental principle of the Prototype Theory. That is, not all objects in a given category have the same status: some are main prototypes of the category, some are moderate prototypes, and still, others are peripheral prototypes, Rosch & Lloyd (1978) Finally, the prototypical rating method of the categories’ members confirms that each of these examples that are being investigated in this study has a semantic structure that is part of a general cognition process.

4. Conclusion

When we conceptualize, we do so by means of prototypes, as research cited above and this short study suggests. Even if the categories do not have clear boundaries, and some examples are seen as better or worse representatives of the category, members usually have similarities by shared features one can point to. Findings showed that culture played an important role in the generating process when comparing the generated features and examples of Jordanians in this study with North Americans and Europeans from Basile's (2007) study. Culture is influenced by what Croft and Cruse (2004) call “daily-life experiences”, which form our conceptual structures. The findings revealed that the most influential aspects of culture that affected this process were the societal aspect, the geographical aspect, and everyday life experiences including political as well as family relationships and activities.

As for the main research question, the findings revealed that culture and language exposure had no significant impact on the prototypical ratings of the targeted categories among Jordanian monolinguals in Jordan and bilingual Jordanians

abroad. On the contrary, the outcomes were very similar. None of the aspects measured in the study (age, country of residence, gender) contributed to forming significant differences between the responses of Jordanians.

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