City University of Hong Kong

LT2204 Language and Mind

Word Association and Word Games

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1. Introduction

The number of words that we have learned is far more than we thought. It is the internal lexicon, or mental lexicon, that helps us store words in our brain in an organized way. Mental lexicon has a complex structure which allows us to store words at various levels, such as phonological and semantic levels. Most importantly, different people construct their own mental lexicons, so they are very unique.

In our report, after stating our aims and methods for our word association experiment, we will analyze and discuss the results of the experiment. Two words games will be created based on the words collected from our experiment. Finally, a conclusion of our work will be given.

2. Aims of the experiment

- To activate our subjects' mental lexicons, and get the first word that the subjects retrieved in their lexicons;

- To find out how the words are connected in the subjects' mental lexicon;

- To identify and analyze the relationship of the stimuli and the word responses given by the subjects;

- To make use of the results of the experiment to create two word games related to activation of mental lexicon;

- Most importantly, to understand more about how our mental lexicon works.

3. Methods of the experiment

I. Young adults, aged 18 – 30, were the participants.

II. A list of 15 word stimuli was compiled. These words are simple and frequently used, and consisted of three word categories:

5 nouns: “flower”, “dog”, “ice-cream”, “window”, “dress”

5 verbs: “sleep”, “smile”, “discuss”, “gather”, “kill”

5 adjectives: “dark”, “fat”, “brown”, “ugly”, “happy”

III. Words were randomized in an alphabetical order so that each word had no semantic connection with the preceding and following word.

1.	Brown	9.	Happy
2.	Dark	10.	Ice-cream
3.	Discuss	11.	Kill
4.	Dog	12.	Sleep
5.	Dress	13.	Smile
6.	Fat	14.	Ugly
7.	Flower	15.	Window
8.	Gather		

IV. Show the words to the subjects one by one in spoken or written form. Subjects were asked to say the first word appeared in their minds.

V. Make a list that contains all the words which our subjects gave and analyze the data with the use of semantic networks.

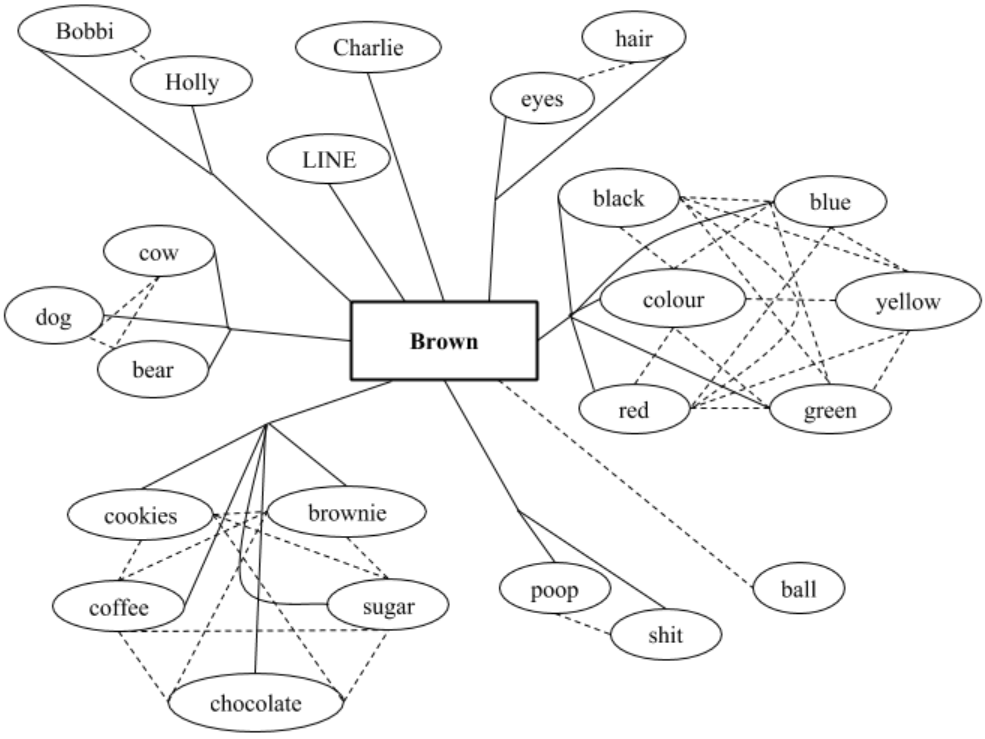
4. Results and Discussion

In this part, the semantic network and sense relations between each stimulus and word responses given by subjects are presented. The results concerning the sense relations between the word stimuli of different word categories and the word responses are discussed.

4.1. Results

4.1.1. Brown (adjective)

- Semantic network:



— : Main sense relations between the stimuli and subjects' word responses

--- : Sense relations between subjects' word responses

- **Sense relations::**

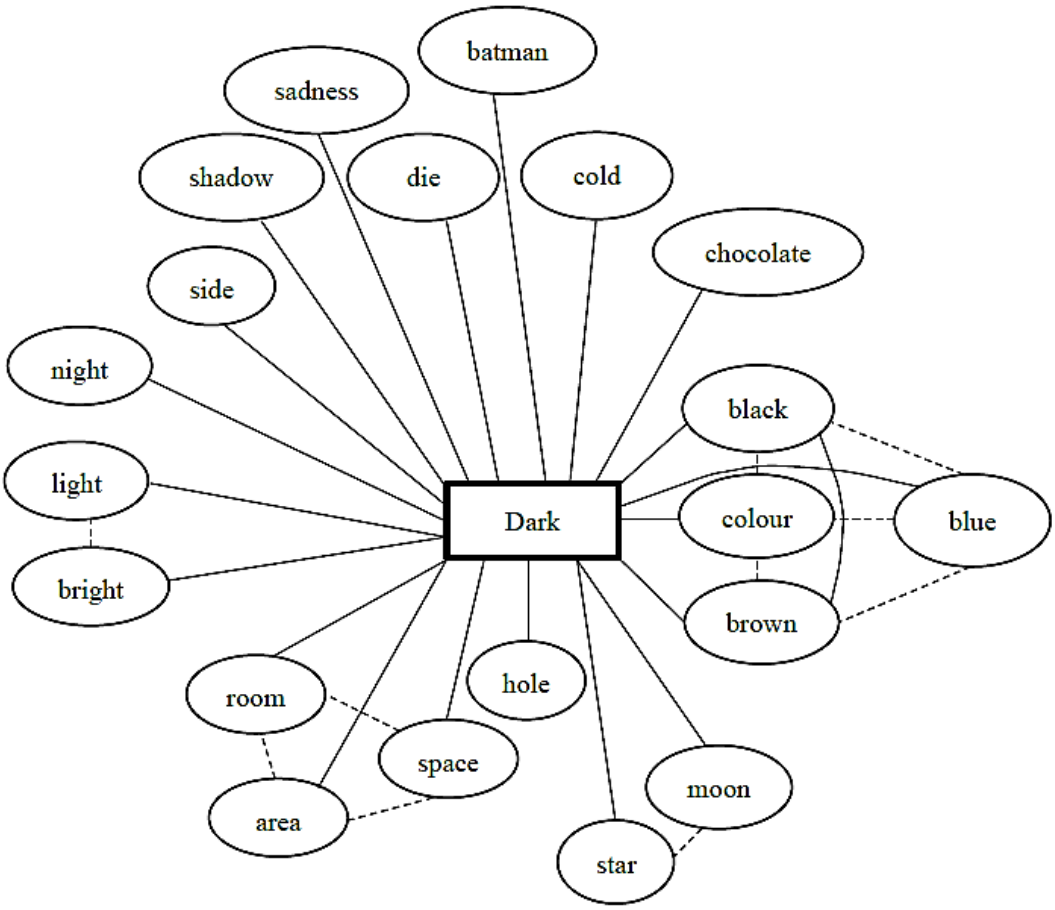
- **Taxonomic - Superordinate**: “colour”
- **Taxonomic - Coordinate**: “black”, “blue”, “yellow”, “red” , “green” share the same superordinate “colour”
- **Attributive relation**: “eyes”, “hair”, “poop”, “shit”, “cookies”, “coffee”, “chocolate”, “cow”, “dog”, “ball”
- **Collocation**: “brownie”, “sugar” ,”Charlie” , “LINE”, “bear”, “Bobbi”, “Holly”
- **Other relationship - Lexeme level**: “bow”[baʊ] is similar in pronunciation with “brown”[braʊn]

Relationship	Taxonomic (Superordinate)	Taxonomic (Coordinate)	Attributive Relation	Collocation	Others (Lexeme)
Frequency	2	7	22	28	1

For the data relating to attributive relation and collocation, see Appendix A.

4.1.2. Dark (adjective)

- Semantic network:



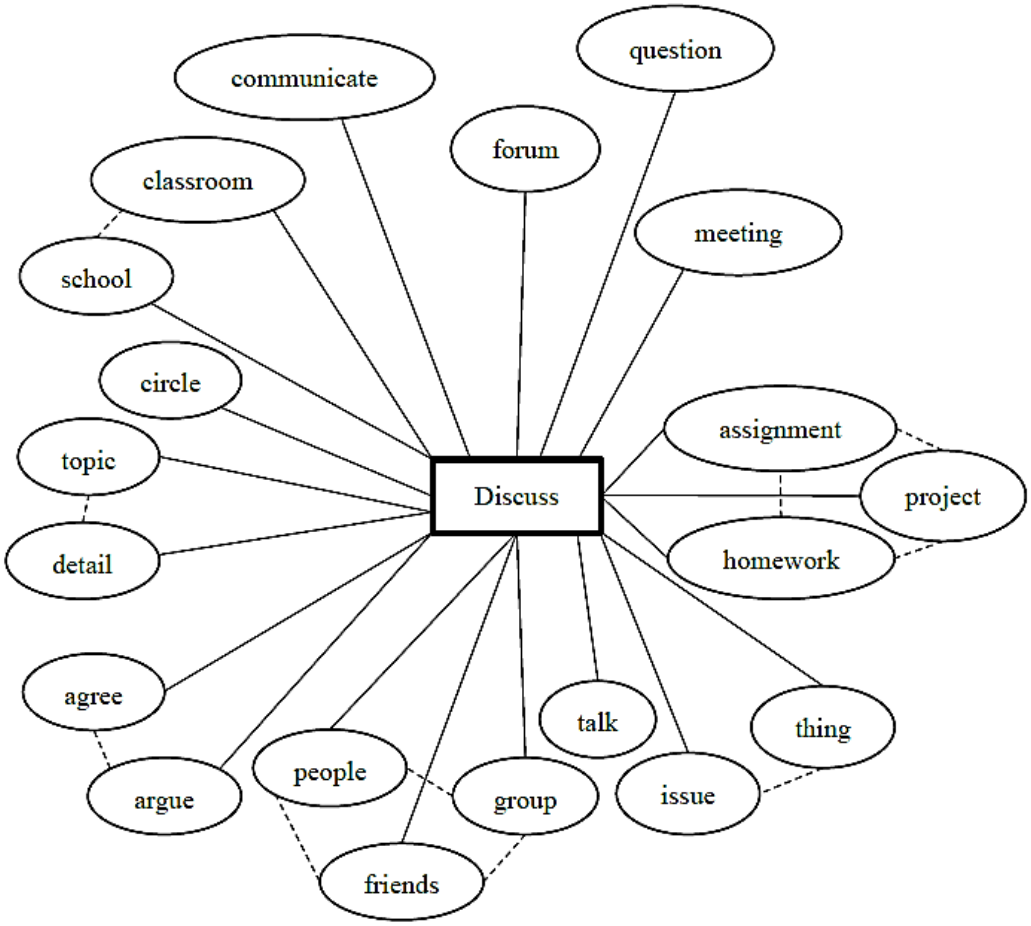
- Sense relations:
  - **Antonym**: “bright”, “light”
  - **Attributive relation**: “chocolate” ,“colour”, “black”, “brown”, “blue”,“room”, “area”, “space” ,“side” ,“night”
  - **Collocation**: “hole”, “shadow”, “batman”, “sadness”, “die”, “cold”, “blind”, “star”, “moon”
  - **Indirect relationship**: “eyes” is the collocation of “blind” as blind means the eyes cannot see; “dog” has an attributive relation with “bark” as dogs can bark

- **Other relationship - Lexeme level**: “bark”[bɑːrk] and “duck” [dʌk] have similar pronunciation with “dark”[dɑːrk]
- **Other relationship - Lemma level**: “darkness” is formed by adding the derivational morpheme “-ness”.

Relationship	Antonym	Attributive Relation	Collocation	Indirect Relation	Others (Lexeme)	Others (Lemma)
Frequency	5	35	11	2	3	4

4.1.3 Discuss (verb)

- Semantic network:

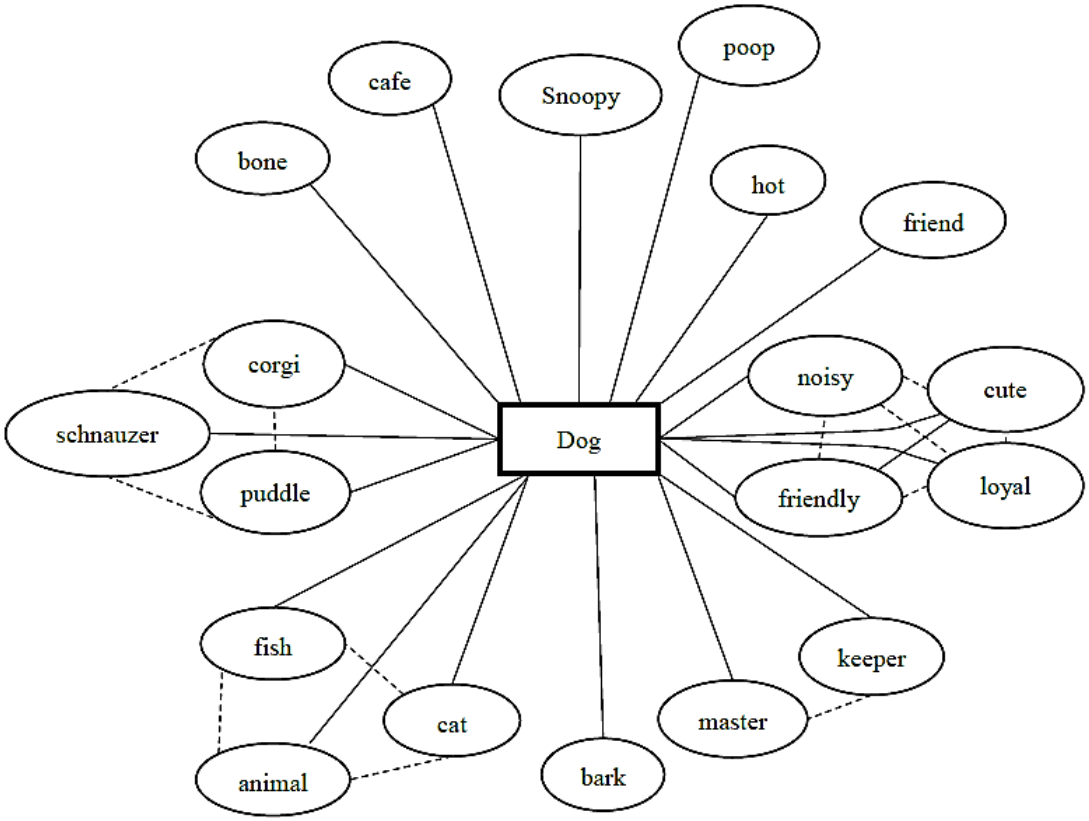


- **Sense relations:**
  - **Synonym**: “communicate”, “talk”
  - **Collocation**: “forum”, “assignment”, “project”, “homework”, “classroom”, “school” , “question”, “meeting”, “thing”, “issue”, “agree”, “argue”, “people”, “group”, “friends”, “topic”, “detail”, “circle”
  - **Other relationship - Lexeme level**: “disgust”[dɪsˈgʌst] has similar pronunciation with “discuss”[dɪˈskʌs];
  - **Other relationship - Lemma level**: “discussion” is formed by adding the derivational suffix “-ion”.

Relationship	Synonym	Collocation	Others (Lexeme)	Others (Lemma)
Frequency	4	45	1	10

4.1.4 Dog (noun)

- Semantic network:



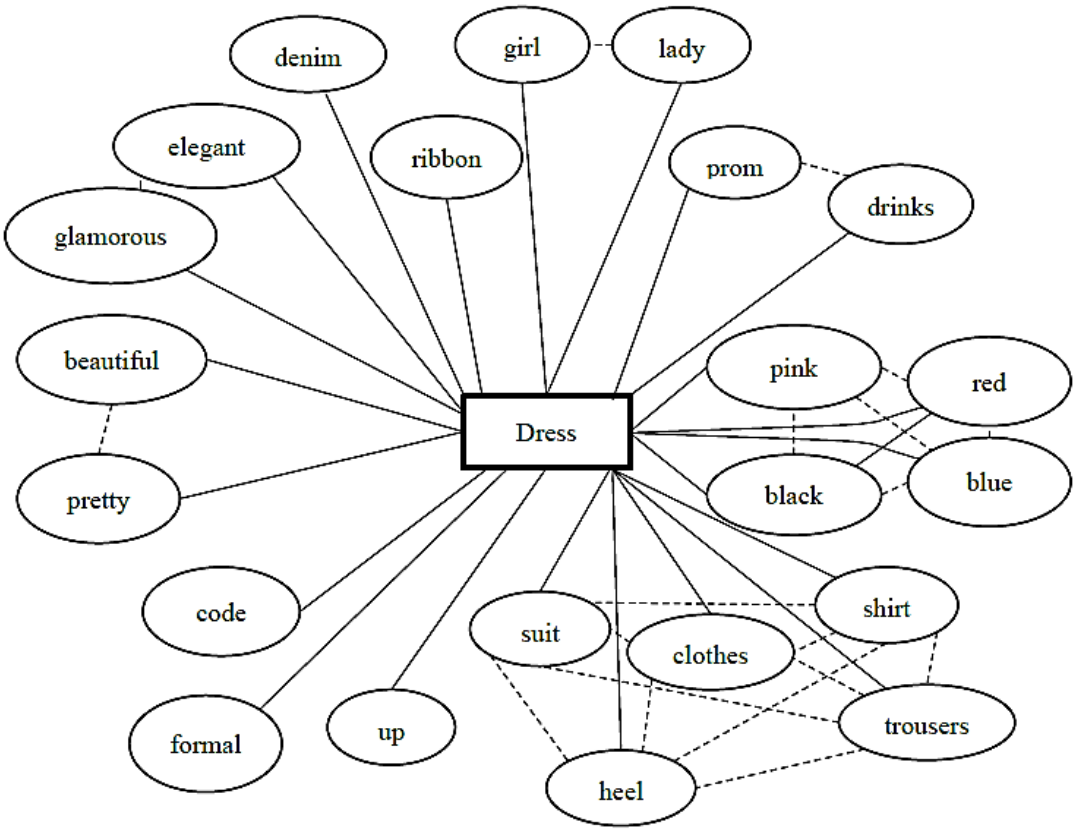
- **Sense relations**
  - **Taxonomic - Superordinate**: “animal”
  - **Taxonomic - Coordinate**: “fish” and “cat” share the same superordinate “animal”
  - **Taxonomic – Subordinate**: “corgi”, “schnauzer” and “poodle”
  - **Attributive relation**: “bark”,“noisy”, “cute”, “loyal”, “friendly"

- **Collocation**: “Snoopy”, “keeper”, “master”, “friend”, “hot”, “poop”, “café”, “bone”

Relationship	Taxonomic (Superordinate)	Taxonomic (Coordinate)	Taxonomic (Subordinate)	Attributive Relation	Collocation
Frequency	1	23	4	17	15

4.1.5 Dress (noun)

- Semantic network:



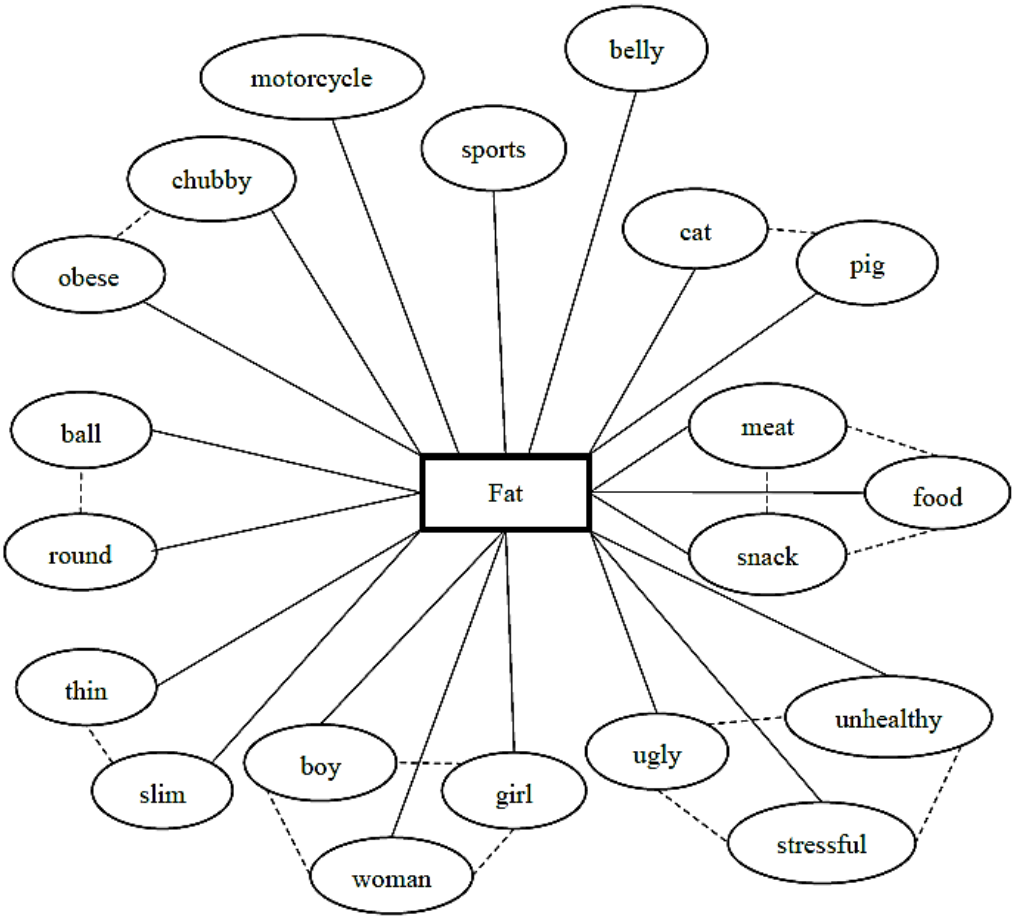
- **Sense relations:**
  - **Taxonomic - Superordinate**: “clothes”
  - **Taxonomic - Coordinate**: “suit”, “shirt”, “trousers” and “heel” share the same superordinate “clothes”
  - **Attributive relation**: “denim”, “pink”, “black”, “red”, “blue”, “beautiful”, “pretty”

- **Collocation**: “ribbon”, “prom”, “drinks”, “girl”, “lady”, “code”, “up”, “formal”, “glamorous”, “elegant”
- **Other relationships - Lexeme level**: “jezz”[dʒæz] has similar pronunciation with “dress”[dres]
- **Other relationships - Lemma level**: “dressing” and “dresses” are formed by adding the inflectional suffix “-ing” and “-es” respectively

Relationship	Taxonomic (Superordinate)	Taxonomic (Coordinate)	Attributive Relation	Collocation	Others (Lexeme)	Others (Lemma)
Frequency	3	9	13	31	1	3

4.1.6 Fat (adjective)

- Semantic network:

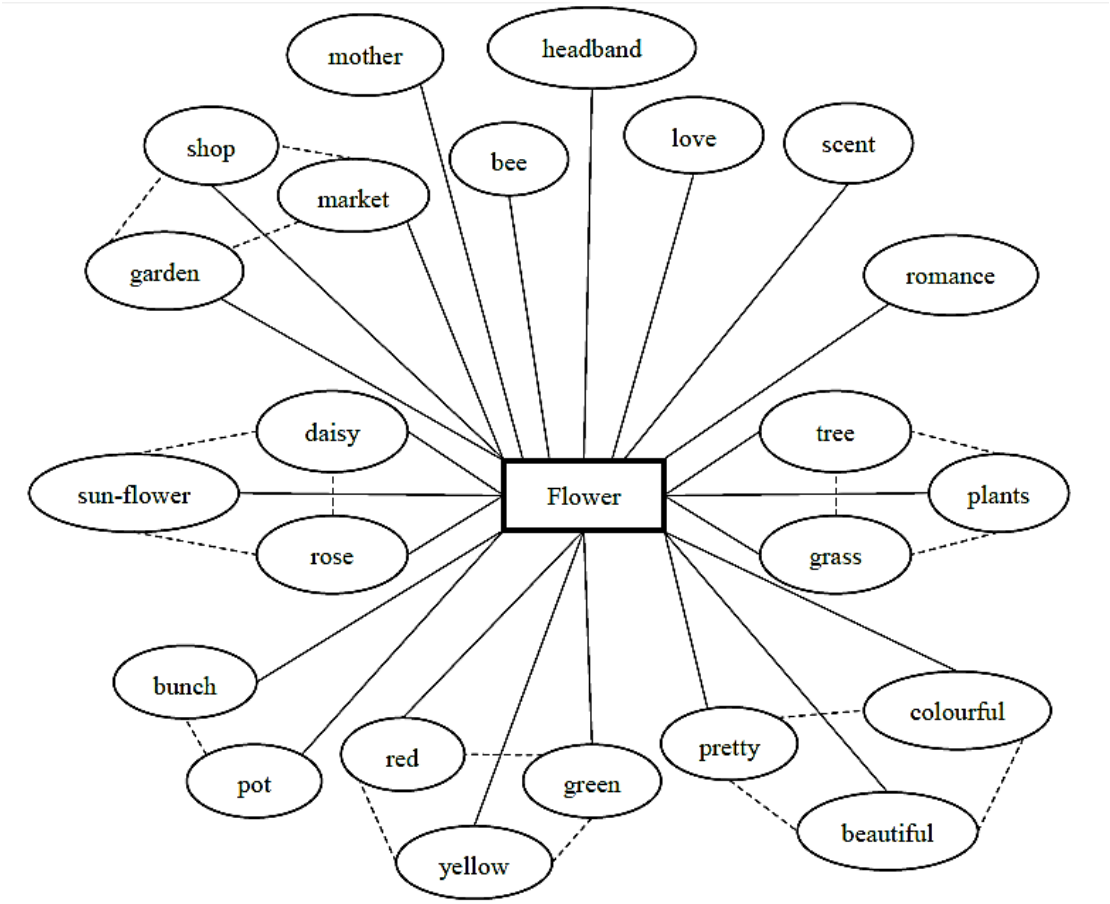


- **Sense relations:**
  - **Synonym**: “obese”, “chubby”
  - **Antonym**: “thin”, “slim”
  - **Attributive relation**: “cat”, “pig”, “boy”, “woman”, “girl”
  - **Collocation**: “motorcycle”, “food”, “meat”, “snacks”, “sports”, “stressful”, “ugly, “unhealthy”, “ball”, “round”, “belly”
  - **Other relationships - Lexeme level**: “fire”[faɪr] has similar pronunciation with “fat”[fæt dɑːrk]
  - **Other relationships - Lemma level**: “fatty” is formed by adding the derivational suffix “-ty” and “fatter” is formed by adding the inflectional suffix “-er”

Relationship	Synonym	Antonym	Attributive Relation	Collocation	Others (Lexeme)	Others (Lemma)
Frequency	2	9	31	15	1	2

4.1.7 Flower (noun)

- Semantic network:



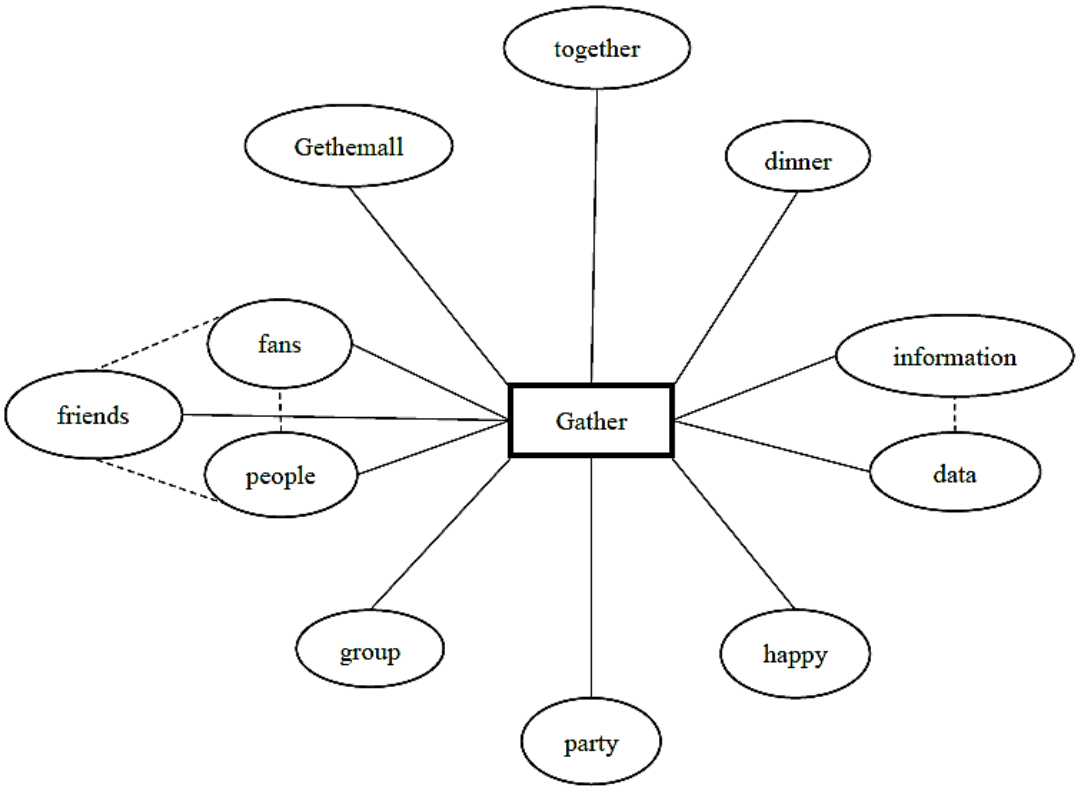
- Relationships:
  - **Taxonomic - Superordinate**: “plants”
  - **Taxonomic - Coordinate**: “tree” and “grass” share the same superordinate “plants”
  - **Taxonomic - Subordinate**: “daisy”, “rose” and “sun-flower”
  - **Attributive relation**: “red”, “green”, “yellow”, “beautiful”, “pretty”, “colourful” “denim”, “pink”, “black”, “red”, “blue”, “beautiful”, “pretty”
  - **Collocation**: “romance”, “love”, “headband”, “bee”, “mother”, “bunch”, “pot”, “scent”, “garden”, “shop”, “market”

- **Other relationships - Lexeme level**: “flour”[flaʊə] has the same pronunciation with “flower”[flaʊə]
- **Other relationships - Lemma level**: “flowering” means blooming of flowers and is formed by adding the inflectional suffix “-ing”

Relationship	Taxonomic (Superordinate)	Taxonomic (Coordinate)	Taxonomic (Subordinate)	Attributive Relation	Collocation	Others (Lexeme)	Others (Lemma)
Frequency	1	11	19	12	14	2	1

4.1.8 Gather (verb)

- Semantic network:



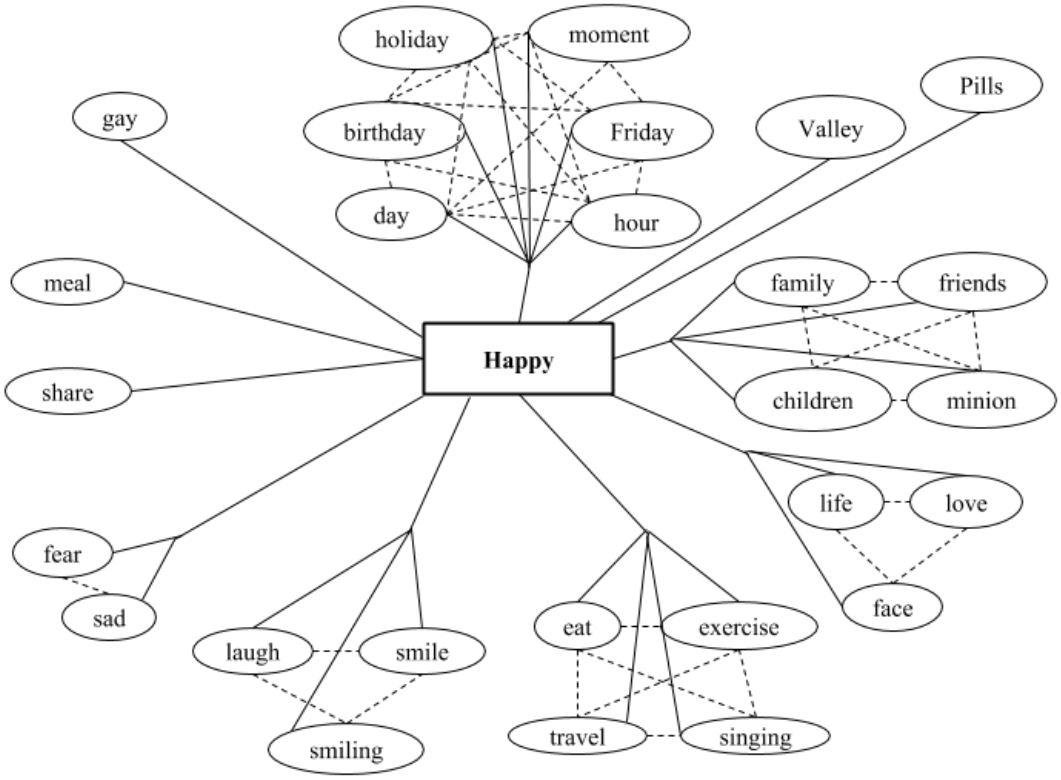
- **Sense relations:**
  - **Synonym**: “group”
  - **Attributive relation**: “together”

- **Collocation**: “dinner”, “party”, “happy”, “Gethemall”, “information”, “data”, “fans”, “friends”, “people”
- **Other relationship - Lexeme level**: “father”[fɑːðə] and “grandfather”[grænfɑːðə] have similar pronunciation with “gather”[gæðə]
- **Other relationship - Lemma level**: “gathering” is formed by adding the inflectional suffix “-ing”.

Relationship	Synonym	Attributive Relation	Collocation	Others (Lexeme)	Others (Lemma)
Frequency	2	11	25	6	16

4.1.9 Happy (adjective)

- Semantic network:



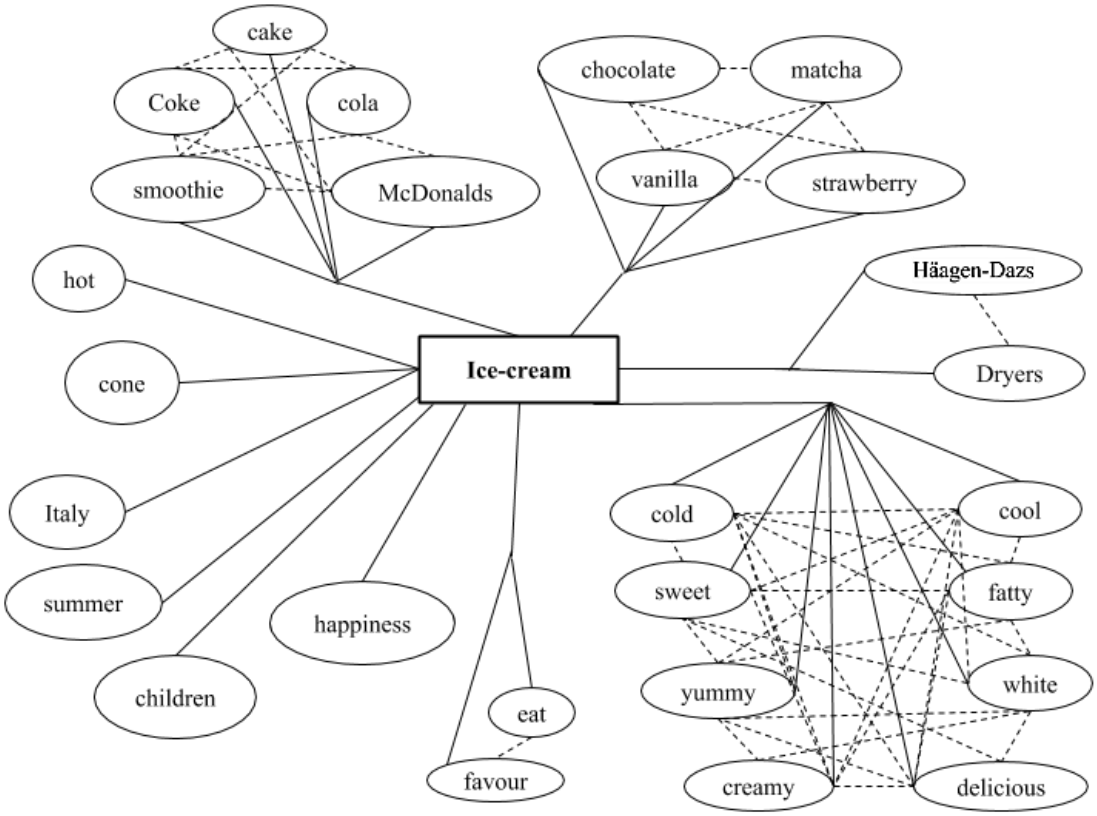
- **Sense relations:**
  - **Synonym**: “gay”
  - **Antonym**: “fear”, “sad”

- **Attributive relation**: “day”, “holiday”, “moment”, “life”, “love”, “children”, “family”, “friends”, “face”
- **Collocation**: “meal”, “birthday”, "Friday”, “Minion”, “valley”, “pills”, “together”, “share”, “hour”, “eat”, “exercise”, “travel” and “singing”, “laugh”, “smile” and “smiling”
- **Other relationship - Lemma level**: “happily” and “happiness” are words made by adding derivational morphemes “-(i)ly” and “-(i)ness” respectively to “happy”; “unhappy” is made by adding the prefix “un-” to “happy”

Relationship	Synonym	Aynonym	Attributive Relation	Collocation	Others (Lemma)
Frequency	1	10	9	31	9

4.1.10 Ice-cream (noun)

- Semantic network:

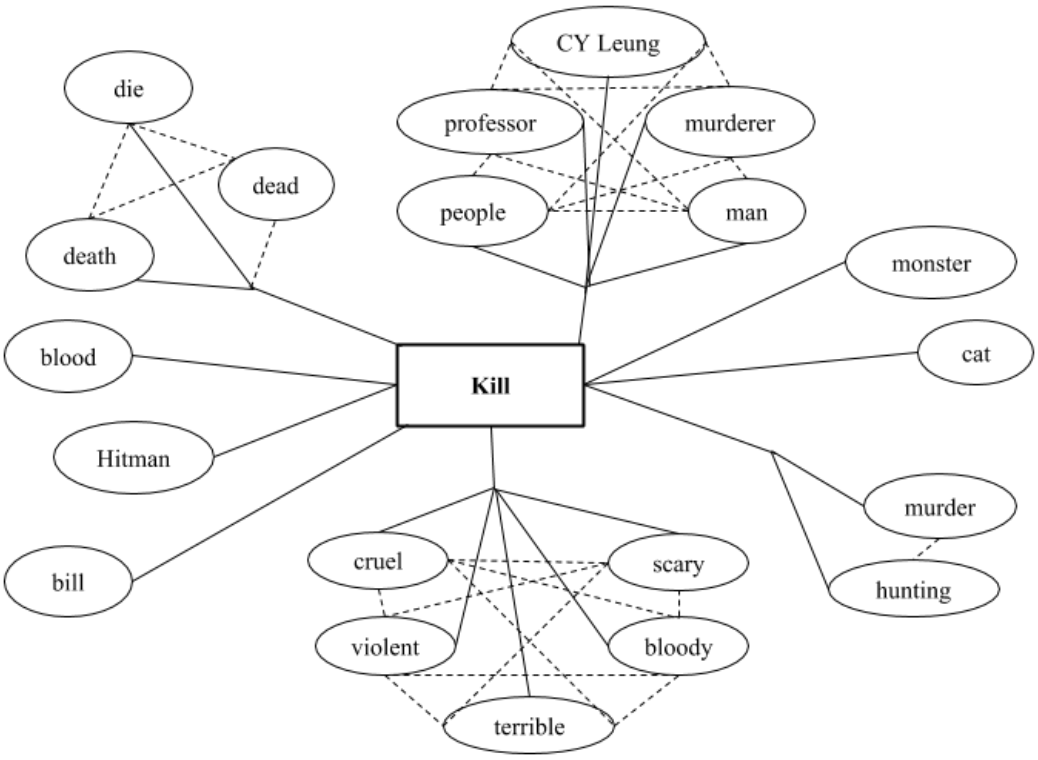


- **Sense Relations:**
  - **Taxonomic - Coordinate**: “cake”, “cola”, “Coke”, “smoothie” share the same superordinate “food”
  - **Taxonomic - Subordinate**: “Dryers” and “Häagen-Dazs” (ice-cream brands); “chocolate”, “matcha”, “strawberry” and “vanilla" (flavor)
  - **Attributive relation**: “cold”, “cool”, “creamy”, “delicious”, “sweet”, “white”, “yummy” and “fatty”
  - **Part-whole relation**: “cone”
  - **Collocation**: “McDonalds”, “hot”, “summer”, “Italy”, “happiniess”, “favour”, “children”, “eat”
  - **Other relationship - Lemma level**: “ice” is formed by clipping of the prime “ice-cream”

Relationship	Taxonomic (Coordinate)	Taxonomic (Subordinate)	Attributive Relation	Part-whole Relation	Collocation	Others (Lemma)
Frequency	9	11	25	4	10	1

4.1.11 Kill (verb)

- Semantic network:

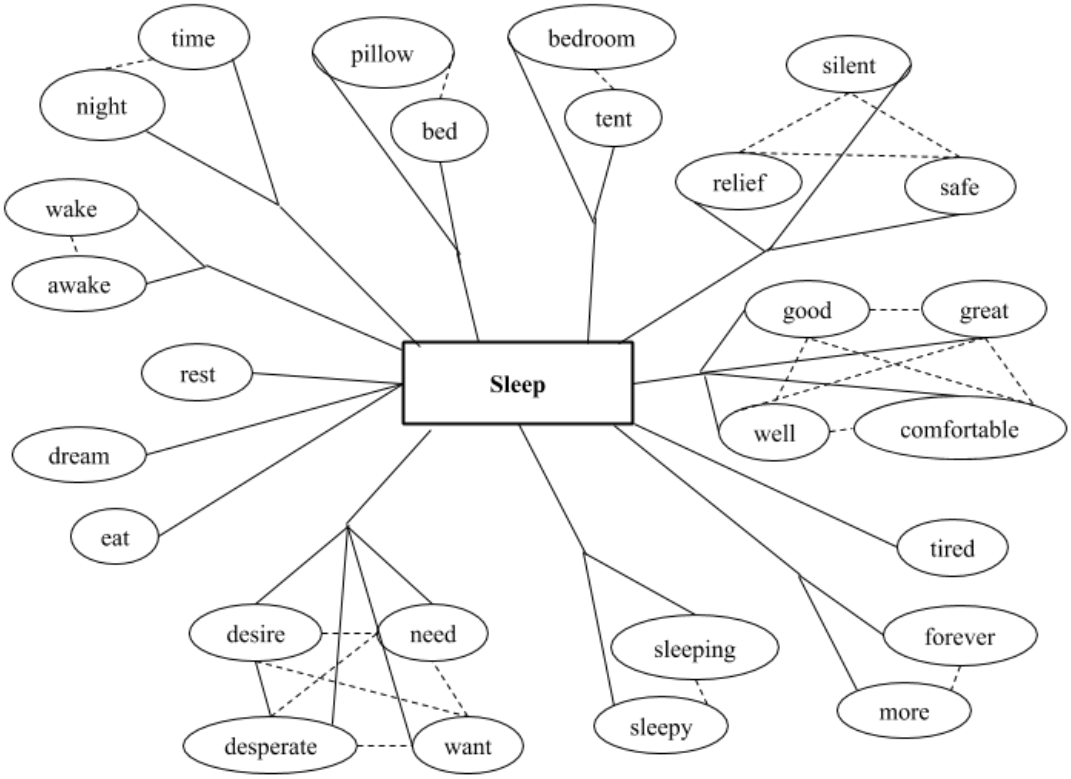


- **Sense Relations:**
  - **Synonym**: "hunting"
  - **Collocation**: "dead", "death", "die", "blood", "murder", "man", "people", "professor", "CY Leung", "murderer", "cat", "monster", "bloody", "cruel", "scary", "terrible", "violent", "bill", "Hitman"
  - **Other relationship - Lemma level**: "killer" is made by adding the derivational morpheme "-er"

Relationship	Synonym	Collocation	Others (Lemma)
Frequency	1	49	10

4.1.12 Sleep (verb)

- Semantic network:

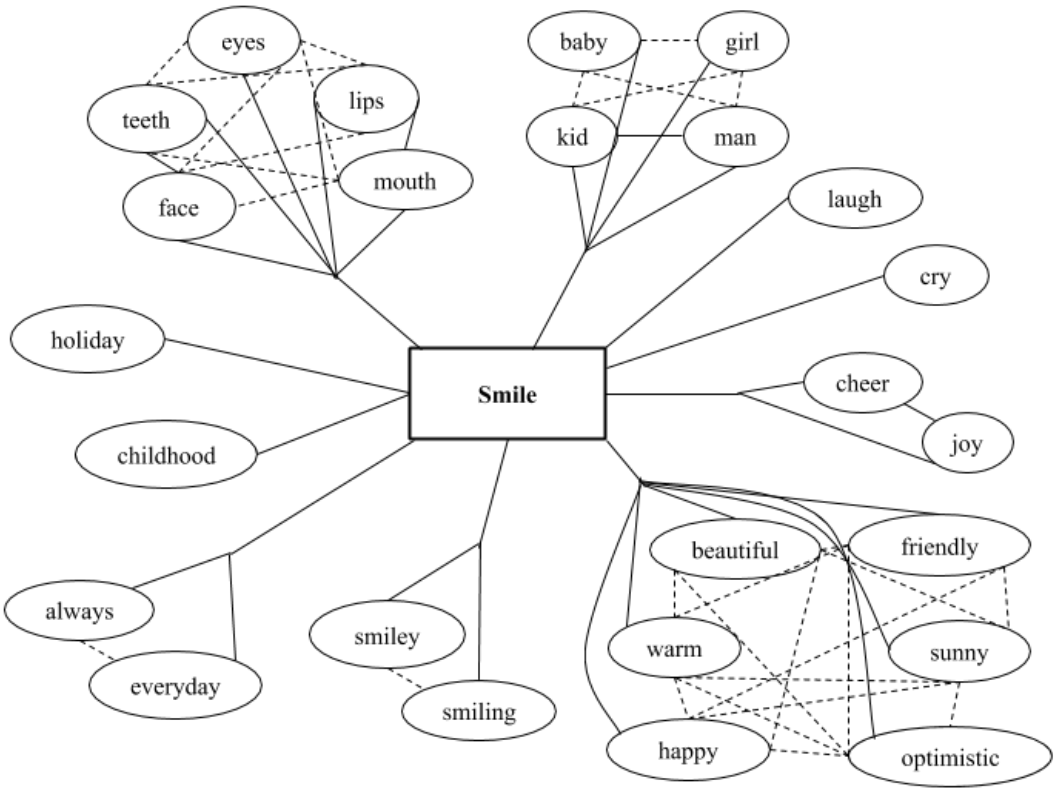


- **Sense Relations:**
  - **Synonym**: “rest”
  - **Antonym**: “wake”, “awake”
  - **Attributive relation**: “more”, “forever”, “comfortable”, “good”, “great”, “well”
  - **Collocation**: “desire”, “need”, “desperate”, “want”, “tired”, “relief”, “safe” , “silent”, “time”, “night”, “bedroom”, “tent”, “bed”, “pillow”, ”eat”, “pig”, “dream”
  - **Other relationship - Lemma level**: “sleepy” and “sleeping” are formed by adding derivational morpheme “-y” and inflectional morpheme “-ing” to the prime respectively

Relationship	Synonym	Antonym	Attributive Relation	Collocation	Others (Lemma)
Frequency	4	3	9	38	6

4.1.13 Smile (verb)

- Semantic network:



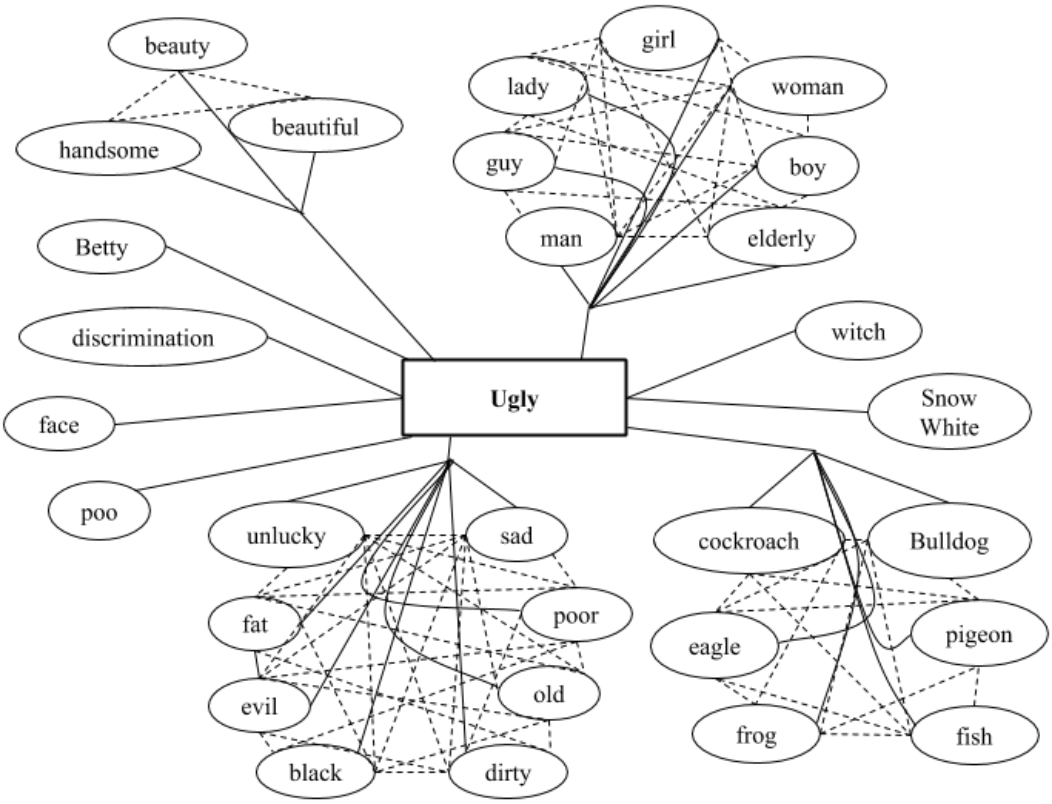
- **Sense Relations:**
  - **Synonym**: “laugh”
  - **Antonym**: “cry”
  - **Attributive relation**: “always”, “everyday”
  - **Collocation**: “friendly”, “happy”, “optimistic”, “warm”, “sunny”, “beautiful”, “cheer”, “joy”, “face”, “eyes”, “lips”, “mouth”, “teeth”, “baby”, “girl”, “kid”, “man”, “holiday”, “childhood”

- **Other relationship - Lexeme level**: “smell”[smɛl] and “spider”[spaɪdə] are words that are similar in pronunciation with “smile”[smaɪl]
- **Other relationship - Lemma level**: “smiley”, “smiling” are formed by adding a derivational morpheme “-y” and an inflectional morpheme “-ing” to “smile” respectively

Relationship	Synonym	Antonym	Attributive Relation	Collocation	Others (Lexeme)	Others (Lemma)
Frequency	7	3	3	41	2	4

4.1.14 Ugly (adjective)

- Semantic network:



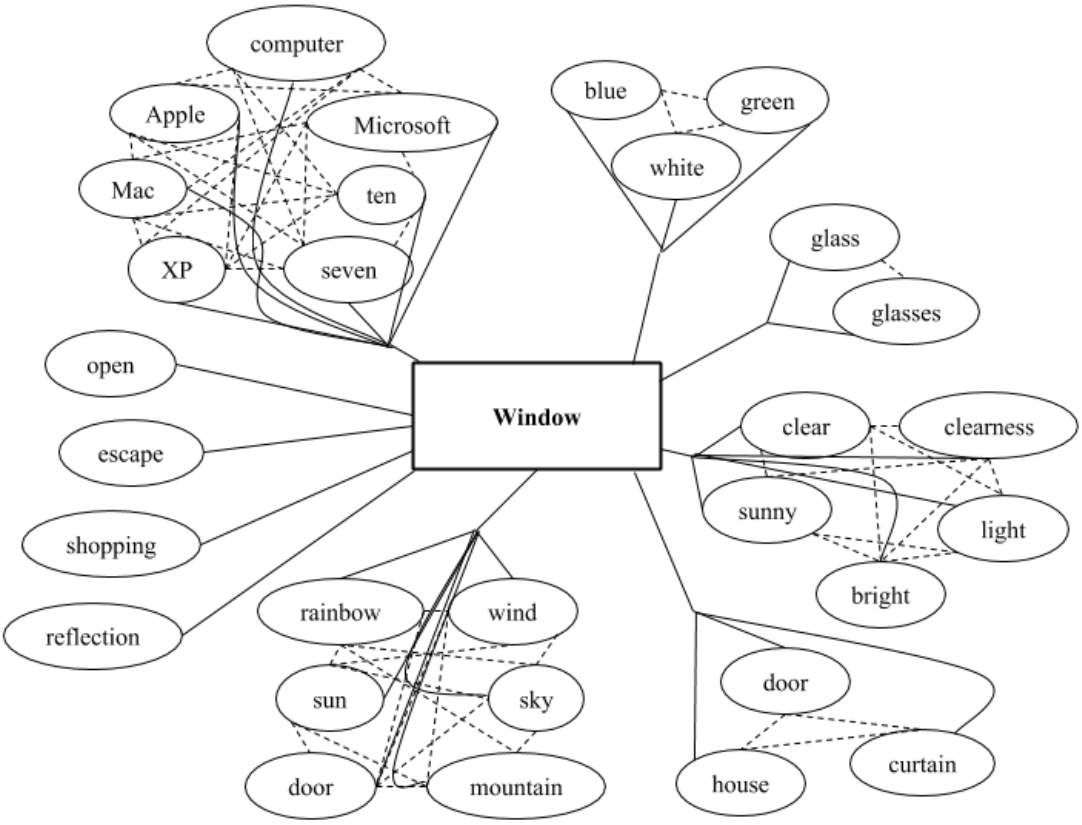
- **Sense Relations:**
  - **Antonym**: “beautiful”, “handsome”

- **Attributive relation**: “boy”, “girl”, “guy”, “lady”, “man”, “woman”, “elderly”, “human”, “face”
- **Collocation**: “witch”, “snow white”, “cockroach”, “Bulldog”, “pigeon”, “fish”, “frog”, “:eagle”, “unlucky”, “sad”, “poor”, “old”, “fat”, “dirty”, “evil”, “black”, “Betty”, “poo”, “discrimination”
- **Indirect relationship**: “beauty” is associated with “beautiful” through the relation at lemma level –changing the word category from adjective “-ful” to noun “-y”, which is the antonym of “ugly”

Relationship	Aynonym	Attributive Relation	Collocation	Indirect Relation
Frequency	11	20	26	3

4.1.15 Window (noun)

- Semantic network:



- **Sense Relations:**
  - **Attributive relation**: “glass”, “glasses”, “clear” ,“clearness”
  - **Part-whole relation**: “house”
  - **Functional relation**: “escape”
  - **Collocation**: “open”, “door”, “curtain”, “light”, “bright”, “view”, “sky”, “rainbow”, “sun”, “mountain”, “white”, “blue”, “green”, “sunny”, “wind”, “reflection”, “shopping”
  - **Indirect relationship**: “computer”, “Apple”, “Mac”, “seven”, “ten”, “XP”, “Microsoft” –they are associated from the computer program “Windows” through collocation; while “Windows” is formed by adding a suffix “-s” to “window”
  - **Other relationship - Lexeme level**: “widow”[wɪdəʊ] has similar pronunciation with “window”[wɪndəʊ]

Relationship	Attributive Relation	Part-whole Relation	Functional Relation	Collocation	Indirect Relation	Others (Lexeme)
Frequency	6	1	1	30	21	1

4.2 Discussion

The following tables show the frequency of the relationships between the stimuli of each of the three word categories and word responses.

4.2.12 Nouns

Relationship	Taxonomic (Superordinate)	Taxonomic (Coordinate)	Taxonomic (Subordinate)	Synonym	Antonym	Attributive Relation	Part-whole Relation	Functional Relation	Collocation	Indirect Relation	Others (Lexeme)	Others (Lemma)
Frequency	5	52	34	0	0	73	5	1	100	21	4	5
Percentage	1.67%	17.33%	11.33%	0.00%	0.00%	24.33%	1.67%	0.33%	33.33%	7.00%	1.33%	1.67%

4.2.13 Verbs

Relationship	Taxonomic (Superordinate)	Taxonomic (Coordinate)	Taxonomic (Subordinate)	Synonym	Antonym	Attributive Relation	Part-whole Relation	Functional Relation	Collocation	Indirect Relation	Others (Lexeme)	Others (Lemma)
Frequency	0	0	0	18	6	23	0	0	198	0	9	46
Percentage	0.00%	0.00%	0.00%	6.00%	2.00%	7.67%	0.00%	0.00%	66.00%	0.00%	3.00%	15.33%

4.2.14 Adjectives

Relationship	Taxonomic (Superordinate)	Taxonomic (Coordinate)	Taxonomic (Subordinate)	Synonym	Antonym	Attributive Relation	Part-whole Relation	Functional Relation	Collocation	Indirect Relation	Others (Lexeme)	Others (Lemma)
Frequency	2	7	0	3	35	117	0	0	111	5	5	15
Percentage	0.67%	2.33%	0.00%	1.00%	11.67%	39.00%	0.00%	0.00%	37.00%	1.67%	1.67%	5.00%

As shown in the tables above, collocation relation has the highest percentage in nouns (33%) and in verbs (66%), and a high percentage in adjectives (37%) as well. It is because collocation relation is not limited in word categories or cultures, as long as two words co-occur frequently. Also, people can create new word combination as long as its meaning is understandable by others shared with similar culture background. One remark is that our subjects are Hong Kong citizens and some words that co-occur in their minds in the experiment are often originated in Cantonese, such as "開心 share" from "happy" and "衛蘭肥過部電單車"(Wei Lan is fatter than a motor cycle) from "fat". This can show the variety of collocation.

As for nouns, taxonomic relation (30%) and attributive relation (24%) also have a high percentage among other relations. The reason behind the high frequency in taxonomic relation is that people is likely to remember or identify things in the form of "A is a B" or "A is a kind of B", while A is the target and B is the category or genre of A. This form of hyponymy can help people organize things easily. The high frequency for attributive relation is due to the fact that nouns can be the modifier of the second noun when they are in a noun-noun combination. Indirect relation (7%), part-whole relation (2%), and functional relation (0.3%) are least frequent in nouns because the paths are relatively complicated and people do not assess the word through a complicated path at first.

As for verbs, one noticeable high percentage comes from lemma level relation (15%). It is because verbs can be added with different morphemes to form

another word, which is different in categories or meanings. Those morphemes are short in length (such as “un-” and “-ness”), so people can remember easily. For attributive relation (8%) and synonyms (6%), they are less frequent, since verb attributives are most likely to appear in sentence level but not lexical level, and there are not many verbs have their synonyms. Antonyms (2%) is least frequent because most verbs form their opposites by adding morphemes like “un-” or “dis-”-, which is counted in lemma level relation.

As for adjectives, attributive relation accounts for the highest percentage (39%), because they are commonly used to describe and modify nouns. Antonym relation is frequent (12%) since people usually identify adjectives with their opposites in order to learn and determine the contrast of the adjectives. For example, it is easier to say one is tall when we see a shorter one. Taxonomic relation (3%), indirect relation (2%) and synonym (1%) are least frequent because people are less likely to organize adjectives in those relations, as the most common usage of an adjective is being used as a modifier.

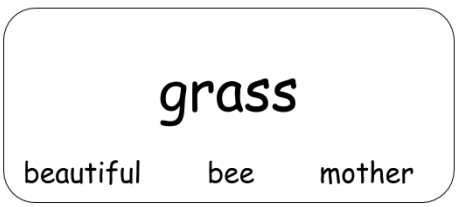
At the lexeme level, similar pronunciation can be found from stimuli and word responses but occurrence of this phonological relationship is less frequent than semantic relationship for all the three word categories.

5 Creation of word games

From the data collected from the experiment, two word games are created. (see Appendix B for the games)

5.1 "Guess What"

- Nature: Educational
- Objectives: To train players' organizing and communication skills; to help them develop critical thinking skills; to activate the internal lexicons of the players
- Target: Primary to secondary school students
- Number of players: 3 or more
- Setting: There will be a collection of cards. Each card contains one of the primes and 3 words which are collected from our subjects in the experiment. One of the words is larger than the other 3, it is the target word of that card.
- Samples:



• Rules:

I. Each player gets a card at the beginning of the round, and they should not show it to the others.

II. Players need to construct one sentence using all the three small words in their cards, without saying the target word, and to let others guess what the target word is.

III. In every round, players take turn to be the one who makes sentence.

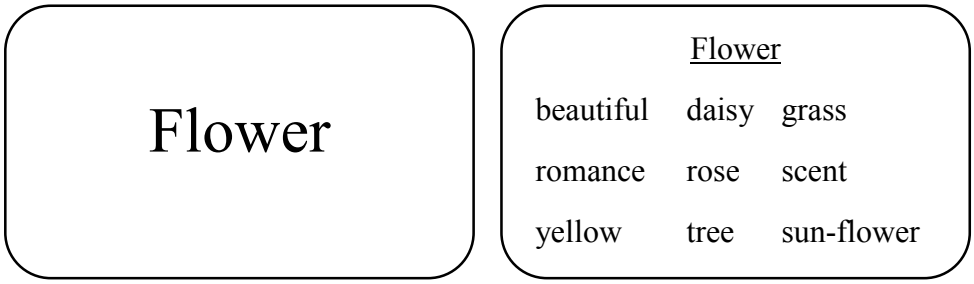
IV. The one who knows the target word can get one point.

V. The one who constructs the sentence with a correct guess from the others can also get one point, since it shows that he/she has good organizing and communication skills.

VI. Players can set time limit for guessing and decide when to end the game so as to make the game more exciting.

5.2 "Word Chess"

- Nature: Educational, Recreational
- Objectives: To activate players' internal lexicons and learn more words through the suggested answers and the words provided by other players
- Target: Primary school students
- Number of players: 2 or more
- Setting: The game contains a step-counting board, chesses, word cards and answer keys. The word card shows a prime word for players to activate the associated words. The answer key is the nine most frequently associated words of each prime that suggested by the subjects in the experiment. The players need to prepare blank sheets for writing their answers.
- Samples:



• Rules:

I. Each player gets his / her own chess and places it on the step of START.

II. Each player draws 3 word cards at the beginning of the game.

III. To initiate the round, the first player needs to choose one of his / her card (usually the most familiar one) and shows the card to other players to let all the players know the prime word.

IV. All the players need to think of 1 – 5 words which are associated with the prime word and write them on a blank sheet within 3 minutes.

V. Match the associated words with the answer key.

VI. For each matched one, the player will gain 1 score and his / her chess can go 1 step forward.

VII. Additionally, the players gain another 1 score if one player matches an associated word with another player.

VIII. After counting the scores, the second player repeats the step of initiating the next round and so on.

IX. A player becomes the winner when he / she gets 25 scores and the game ends.

6 Conclusion

In our study, an experiment about word association was carried out. The results show that word categories play a crucial role in word association. People have an access to different categories with different relations, but not one relation for all categories. Culture and background also contribute to the differences among words in mental lexicons. Based on our experiment, two educational and recreational word games are created, aiming at activating the mental lexicons of players and training their communication skills when playing the games.

References

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Appendices

Appendix A

Attributive relation and collocation relation of primes and subjects' words.

1. Brown

Attributive relation

"eyes", "hair", "poop", "shit", "cookies", "coffee", "chocolate", "cow", "dog", "ball" –they can be described as brown in colour.

Collocation:

"brownie" –it is a dessert food;
"sugar" –"brown sugar" is a kind of sugar used when cooking;
"Charlie" –"Charlie Brown" is the character in the cartoon "Snoopy";
"LINE", "bear" –Brown, a bear, together with Cony, a bunny, are famous characters from the message app "LINE";
"Bobbi" –"Bobbi Brown" is a famous cosmetics brand;
"Holly" –"Holly Brown" is the name of a café in Hong Kong.

2. Dark

Attributive relation:

"chocolate" — it can be used as a type of chocolate which tastes bitter;
"colour", "black", "brown", "blue" — they can be described the depth of colours;
"room", "area", "space" — they can be described the darkness inside the area
"side" — it can be used to describe the negative face of a thing / person;
"night" — it can be used to describe the dim night.

Collocation:

"hole" — "Dark hole", also called as "Black Hole", is a region of spacetime that nothing can escape from inside it;
"shadow" — "Dark Shadow" is an American horror comedy film;
"batman" — "The Dark Knight" is a superhero film that the main character is called Batman;
"sadness" — when it is dark, people often feel sad(ness);
"die" — people often believe that when they die, the mental world will become darkness;
"cold" — both "dark" and "cold" are often used to describe a night;
"blind" — blind people is like living in darkness;
"star" and "moon" — they can be seen when the sky is dark.

3. Discuss

Collocation:

“forum” — there is a famous online forum called Hong Kong Discuss;
“assignment”, “project”, “homework” — these are the works that the young adults usually need to discuss for;
“classroom”, “school” — the places that the young adults usually discuss in;
“question” — people need to discuss as there is a question for them;
“meeting” — people usually hold meetings to discuss something;
“thing”, “issue” — they are the abstract nouns that people discuss for;
“agree”, “argue” — agreement and argument usually appears in a discussion;
“people”, “group”, “friends” — characters that discuss with;
“topic”, “detail” — the general things that people usually discuss;
“circle” — people usually form a circle to have discussion.

4. Dog

Attributive relation:

“bark” — dogs can bark;
“noisy”, “cute”, “loyal”, “friendly" — they are typically descriptions of dog in people’s mind.

Collocation:

“Snoopy” — Snoopy is the world famous cartoon dog character from the comic called Peanuts;
“keeper”, “master” — people who keep dogs are called keepers or masters;
“friend” — people always think that dogs are human’s best friends;
“hot” — “hot-dog” is a common food;
“poop” — people often say “狗屎 (English: “dog’s poop)” in Cantonese;
“café” — “dog café” is the café which keeps dogs inside and famous in Hong Kong recently;
“bone” — the typically food for dog is “bone” in people’s mind;

5. Dress

Attributive relation:

“denim” — it is used to describe the denim textile of dress;
“pink”, “black”, “red”, “blue” — they are the colour that describe the dress;
“beautiful”, “pretty” — they are adjectives that describe the dress.

Collocation:

“ribbon” — people often wear the dress with a ribbon;
“prom”, “drinks” — people wear dress to go prom or drinks;
“girl”, “lady” — they usually wear dress;
“code” — “dress code” is a common collocation which means the rule of dressing;
“up” — “dress up” means to wear formally for some special purposes;
“formal” — in formal setting, girls and ladies usually wear dress.
“glamorous”, “elegant" — they are used to praise the appearance of people who wear a dress.

6. Fat

Attributive relation:

“cat”, “pig” —they can be described that those animals have a fat body;
“boy”, “woman”, “girl” — they can be described that those people have a fat body.

Collocation:

“motorcycle” — the famous Hong Kong singer Leon Lai have said that his artist Janice Vidal is fatter than a motorcycle (“衛蘭肥過部電單車”);
“food”, “meat”, “snacks” — the reason of getting fat is the intake of food;
“sports” — when people are fat, they do sports;
“stressful”, “ugly, “unhealthy” — the common feelings after people get fat;
“ball”, “round” — the body shape of people who are fat;
“belly” — people will have a big belly if they are fat.

7. Flower

Attributive relation:

“red”, “green”, “yellow” —they are the colour that describe the flower;
“beautiful”, “pretty”, “colourful” — they are adjectives that describe the flower.

Collocation:

“romance” — people often think receiving flowers is a kind of romance ;
“love” — people will send flowers to the one they love;
“headband” — it is often made with flowers;
“bee” — bee pollinates flowers;
“mother” — people will send flowers to their mother on mother’s day;
“bunch”, “pot” — they are the quantity nouns of flowers;
“scent” — a flower often has a good scent;
“garden”, “shop”, “market” — these are the places where flowers can be found;

8. Gather

Attributive relation:

“together” — people group things together.

Collocation:

“dinner” — people usually have dinner for gathering with others;
“party” — a party will gather a number of people;
“happy” — subjects feel happy when they gather with other people;
“Gethemall” — it is a trendy online shop that gather Hong Kong customers to buy overseas commodity (集運團購);
“information”, “data” — people usually gather these things to do a further study or analysis;
“fans”, “friends”, “people” — characters that gather together.

9. Happy

Attributive relation:

“day”, “holiday”, “moment”, “life”, “love”, “children”, “family”, “friends”, “face” — they can be described by “happy”.

Collocation:
“meal” —“Happy Meal” is the name of the children’s meal sold in McDonalds;
“birthday”,"Friday” —”happy birthday” and “happy Friday” are common wishes for birthdays or the end of weekdays;
“Minion” —a comedic movie that makes people laugh;
“valley” —“Happy Valley” is a place in Hong Kong;
“pills” —“Happy Pills” is an American pop song;
“together” —“Happy together” is widely used as song titles or lyrics, film and television titles. For example, it is the name of a South Korea variety show, and the name of two Hong Kong films;
“share” —“happy share”(Cantonese: “開心 share”) is a common phrase used in Hong Kong, meaning to share news to listeners;
“hour” —“happy hour” means a period of pleasant time;
“eat”, “exercise”, “travel” and “singing” –the activities that people would do when they are delighted, depending on their personalities;
“laugh”, “smile” and “smiling”— the actions or characteristics that people would commonly do to show that they are happy.

10. Ice-cream
Attributive relation: “cold”, “cool”, “creamy”, “delicious”, “sweet”, “white”, “yummy” and “fatty” can be used to describe how ice-cream tastes.

Collocation:
“McDonalds” –the place where ice-cream can be found;
“hot”, “summer” –ice-cream help people cool down during hot days, like summer;
“Italy” –Italian ice-cream is famous for its intense flavor and smooth texture;
“happiniess”, “favour”, “children” –ice-cream is favoured by children because of its sweet flavor and it is a symbol of happiness to them.
“eat” –an action that people do with ice-cream.

11. Kill
Collocation:
“dead”, “death”, “die” and “blood” –the results from the action “kill”;
“murder” –the crime of killing a person;
“man”, “people”, “professor”, “CY Leung”, “murderer”, “cat”, “monster” –they can be the one who kill somebody or being killed;
“bloody”, “cruel”, “scary”, “terrible” and “violent” –feelings that people have towards killing;
“bill”, “Hitman” –“Kill Bill” is an American two-part martial film; while “Hitman” is a video game series involving story lines about killing.

12. Sleep
Attributive relation: “more”, “forever” –describe the quantity of sleeping;
“comfortable”, “good”, “great”, “well” –describe the quality of sleeping.

Collocation:
“desire”, “need”, “desperate”, “want” –people need to sleep to recover energy;
“tired”, “relief”, “safe” , “silent” –it is easy to fall asleep when people have these feelings or the environment is silent;
“time”, “night” –people usually sleep at night;

“bedroom”, “tent”, “bed”, “pillow”– the place or the things that people sleep in or with;
”eat”, “pig” –in Hong Kong, it is common to think “if one only eats and sleeps, he/she will be like a pig”;
“dream” –the thing that occurs during sleeping.

13. Smile
Attributive relation: “always” and “everyday” can describe the frequency of smiling.

Collocation:
“friendly”, “happy”, “optimistic”, “warm”, “sunny”, “beautiful”, “cheer”, “joy” –it is usual for people to give one of these positive images to others when smiling;
“face”, “eyes”, “lips”, “mouth”, “teeth” –the most eye-catching body parts when people smile;
“baby”, “girl”, “kid”, “man”, “holiday”, “childhood” –these people or events give subjects an impression of joy easily.

14. Ugly
Attributive relation: “boy”, “girl”, “guy”, “lady”, “man”, “woman”, “elderly”, “human”, “face” –they can be described as having a bad appearance.

Collocation:
“witch”, “snow white”, “cockroach”, “Bulldog”, “pigeon”, “fish”, “frog”, “eagle” – different subjects have different animates that they think it is ugly;
“unlucky”, “sad”, “poor”, “old”, “fat”, “dirty”, “evil”, “black” –similar with “ugly”, they contain a negative interpretation;
“Betty”— “Ugly Betty” is an American comedy-drama series;
“poo”— an excrement from the body;
“discrimination”— some people think if one is ugly, he/she will be discriminated by others easily.

15. Window
Attributive relation: “glass” and “glasses” can be the material of window; “clear” and “clearness” can describe the appearance of window.

Collocation:
“open” – “open the window” is a common phrase in daily lives;
“door” – in Cantonese, “door” and “window” co-occur as one phrase (門窗);
“curtain”— it is set in front of windows to block sunlight;
“light”, “bright” – window allows light to go into the house and make it bright;
“view”, “sky”, “rainbow”, “sun”, “mountain”, “white”, “blue”, “green”, “sunny” – things that people can usually see when looking out from window;
“wind” – opening the window allows ventilation;
“reflection” – people can see their reflection on window;
“shopping” –“window shopping” means watching the products displayed in windows without buying.

Appendix B Word games

Game 1: "Guess What"

Game card

flower love red garden	**grass** beautiful bee mother
gather group fans happy	**dinner** friends party information
happy share laugh family	**travel** life holiday gay
ice-cream summer yummy Dryers	**smoothie** ice-cream favour cold
kill blood cruel Hitman	**murderer** violent hunting death
Sleep pillow pig want	**dream** night well more
smile childhood baby always	**warm** eyes smile cry

ugly	discrimination
face Betty poo	unlucky handsome witch

window	rainbow
clear shopping house	glass reflection bright

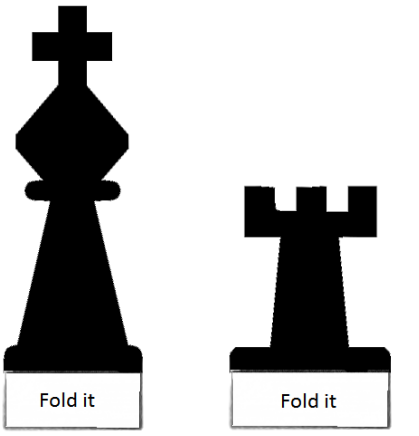
Game 2: "Word Chess"

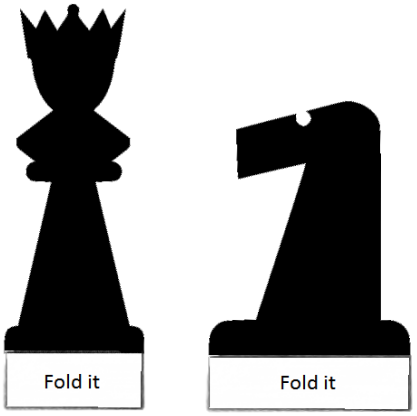
Game card

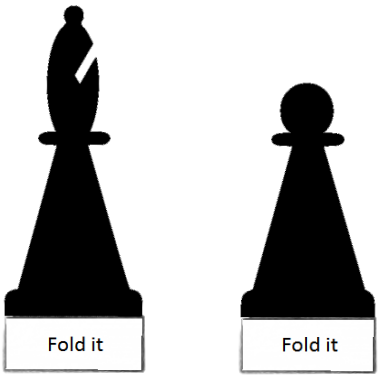
Step-counting Board

WIN!
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
START

Chesses







Word Card	Answer Key

1.

Word Card	Answer Key		
Brown	Brown		
	bear	black	browine
	chocolate	coffee	colour
	hair	poop	sugar

2.

Word Card	Answer Key		
Dark	Dark		
	black	bright	chocolate
	darkness	light	night
	room	moon	sadness

3.

Word Card	Answer Key		
Discuss	Discuss		
	discussion	disgust	forum
	group	issue	meeting
	project	talk	topic

4.

Word Card	Answer Key		
Dog	Dog		
	animal	bark	bone
	cat	corgi	cute
	friend	loyal	poop

Word Card **Answer Key**

5.

Word Card	Answer Key
Dress	Dress clothes code girl pink pretty prom red shirt trousers

6.

Word Card	Answer Key
Fat	Fat belly chubby food obese pig slim snacks sports thin

7.

Word Card	Answer Key
Flower	Flower beautiful daisy grass romance rose scent yellow tree sun-flower

8.

Word Card	Answer Key
Gather	Gather data father friends gathering group information party people together

Word Card **Answer Key**

9.

Word Card	Answer Key
Happy	Happy birthday Friday gay happiness laugh sad smile together unhappy

10.

Word Card	Answer Key
Ice-cream	Ice-cream cake chocolate cold cone delicious eat strawberry sweet yummy

11.

Word Card	Answer Key
Kill	Kill Bill blood dead death die killer murder murderer people

12.

Word Card	Answer Key
Sleep	Sleep awake bed comfortable dream pig pillow rest sleepy tired

Word Card **Answer Key**

13.

Word Card	Answer Key
Smile	Smile beautiful cheer cry face happy joy laugh optimistic smiling

14.

Word Card	Answer Key
Ugly	Ugly beautiful Betty cockroach face old poor sad unlucky witch

15.

Word Card	Answer Key
Window	Window computer door glasses open shopping sky view widow wind

- End