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Effects of Forming Mental Images on True and False Memories

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The present study examined the activation of imaginal information on true and false memories. We asked whether forming mental images would lead to increases in true and false memories relative to a control group that did not form images. Participants in both groups studied 288 unrelated concrete objects, in which some of the objects were presented as pictures, some as words in a red font, and some as both a picture and a red word. Participants then took a standard recognition memory test and two criterial recollection tests. Results showed that hit rates in the imagery group were significantly higher than those in the control group, but false alarm rates did not differ between groups. These results suggest that under certain conditions, mental imagery can lead to enhanced memory without the cost of increased false memories.

Key words: mental images, true memory, false memory

According to Paivio's (1971) dual coding theory, the verbal system processes and stores linguistic information (e.g., visual, auditory, articulatory, and other verbal representations for words), whereas the nonverbal system processes and stores imaginal information (e.g., images for shapes, environmental sounds, actions, skeletal or visceral sensations related to emotion, and other nonlinguistic objects and events). Pavio further proposed that memory for linguistic information is enhanced if relevant imaginal information is activated, and such activation of both verbal and nonverbal systems results in the dual coding of information.

One way to activate imaginal information is to instruct participants to form a mental image of the linguistic information. Such instructions have been found to be effective in learning lists of paired associates (Gupton & Frincke, 1970; Hertzog, Price, & Dunlosky, 2008; Robbins, Bray, Irvin, & Wise, 1974; Rowe & Smith, 1973; Smith, Stahl, & Neel, 1987; Yarmey & Barker, 1971). In these studies, participants were instructed to form images of the word pairs. The dual coding of information provided an additional memory

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trace (i.e., code) that apparently enhanced retention of the word pairs.

However, it has been found that instructions to form mental images do not enhance memory for various other types of materials. For example, using Deese-Roediger-McDermott (DRM) word lists (e.g., butter, food, sandwich, rye, jam, etc.) in which all the words were associates of a nonstudied critical lure (i.e., bread), Newstead and Newstead (1998) found that asking participants to create images of the studied words yielded no significant memory improvement for the studied words. Using an autobiographical memory paradigm, Hynman and Pentland (1996) and Wade, Garry, Read, and Lindsay (2002) guided participants to imagine certain childhood events and describe the images in detail. Results showed that there was no difference in the percentage of events recalled regardless of whether or not participants were given the guided imagery instructions.

In addition to investigating the effects of forming mental images on studied information or experienced events (i.e., true memory), several of the studies cited above (Hyman & Pentlan, 1996; Newstead & Newstead, 1998; Wade et al., 2002) also examined the effect of forming images on items or events that did not occur (i.e., false memory). As noted by Roediger and Gallo (2002), memory research in recent years has increasingly emphasized the errors that people make in retrieving information. These false memories, as defined by Roediger and McDermott (1995), occur when one either falsely remembers an item or event that never happened or remembers the item or event quite differently than the way it actually happened.

Using word lists, several studies have found that instructions to form mental images had no effect on the incidence of false memories (Franco-Watkins & Dougherty, 2006; Newstead & Newstead, 1998). These studies involved asking participants to create images of the words during the study phase, followed by a recall or recognition test. Participants receiving imagery instructions exhibited the same amount of false alarm rates similar to those who received no imagery instructions.

In contrast, several autobiographical memory studies have found that instructions to form mental images did increase the likelihood of generating false memories (Hyman & Pentland, 1996; Wade, Garry, Read, & Lindsay, 2002). In these studies, the participants were asked to imagine an erroneous childhood event suggested by the experimenter, describing the imagined event in detail. Results showed that those participants who received the guided imagery instructions were more likely to falsely remember the fictitious childhood event than participants who were not given the instructions.

Another way to examine the effect of images on memory is to provide an image of the linguistic information (e.g., word lists) along with an image of the word. For example, Schacter and colleagues (e.g., Dodson & Schacter, 2002; Israel & Schacter, 1997; Schacter, Israel, & Racine, 1999) presented one group of participants DRM lists in which the words were studied along with black and white line drawings, whereas a second group studied the words without pictures. In these studies, hit rates to words and pictures were similar, but participants in the picture plus word condition were less likely to falsely recognize nonstudied critical lures than those who studied the words alone. The researchers argued that pictorial encoding was more distinctive than word encoding. Consequently, at test, participants might expect to recollect the pictorial details of studied items and make their recognition decisions on the presence of these distinctive features. Since nonstudied items would not be accompanied with distinctive picture features, the failure to recollect the expected features would suggest that they were not studied. Schacter and colleagues have termed this the "distinctiveness heuristic," in which the absence of distinctive features of an item provides memorial evidence that a nonstudied item has not been previously studied.

Previous studies have shown conflicting results regarding the effect of activating mental images on true and false memories. For example, having participants form mental images of paired associates increased later memory for the word pairs, (Gupton & Frincke, 1970; Hertzog, Price, & Dunlosky, 2008; Robbins, Bray, Irvin, & Wise, 1974; Rowe & Smith, 1973; Smith, Stahl, & Neel, 1987; Yarmey & Barker, 1971), but such instructions had no effect when semantically associated word lists were used (Newstead & Newstead, 1998). Furthermore, imagery instructions had no effect on false memories from such lists (Franco-Watkins & Dougherty, 2006; Newstead & Newstead, 1998), whereas instructions to form a mental image of childhood events increased the likelihood of generating false memories (Hyman & Pentland, 1996; Wade, Garry, Read, & Lindsay, 2002). In addition, presentation of pictures with the studied words lowered the false alarm rates of nonstudied words (e.g., Dodson & Schacter, 2002; Israel & Schacter, 1997; Schacter, Israel, & Racine, 1999).

In contrast to previous studies in which participants were either given instructions to form a mental image or provided an image, the present study used both methods in order to activate the imaginal information. To preview our method, participants were randomly assigned to either a control or imagery group. The control group was not instructed to form imaginal information of studied items. The imagery group was instructed to imagine a picture of an item when they saw the same item studied as a red word, and to visualize a red word of an item when they saw the same item studied as a picture.

In contrast to previous studies which used pair-associates or semantically associated word lists, the present study used unrelated concrete words and pictures from Gallo, Weiss, and Schacter (2004). Because words that are high in concreteness also tend to be high in imageability, concrete words were used in the present study in order to facilitate the activation of mental images.

In the present study, we had two research questions. First, we asked whether imagery instructions would increase memory for actually presented information (i.e., true memories). Second, we asked whether instructions to form images of studied material would result in greater confusion at test (i.e., false memories) regarding how that material had been presented (pictures or red words). We hypothesized that true and false memories would differ between the imagery and control groups because of the dual coding of linguistic and imaginal information.

METHOD

Participants

One hundred and ninety-two college students (M = 21.07 years, SD = 2.55) participated in the present study in return for extra course credit. Half of the participants were randomly assigned to the control group (n = 96) and the other half to the imagery group (n = 96). The procedures met all American Psychological Association (APA) ethical principles for use of human subjects (APA, 2002), and participants were provided informed consent in accordance with guidelines set by the Institutional Review Board of a southwestern university.

Materials

Stimuli materials were taken from Gallo, Weiss, and Schacter (2004). These materials consisted of 288 unrelated concrete words and their corresponding pictures taken from the Internet (see Appendix for the words list). Average word length was 6.1 letters (SD = 1.7), average printed word frequency (Kucera & Francis, 1967) was 21.49 per million (SD = 46.52), and average imageability rating (Wilson, 1988) was 583.64 (SD = 34.06). Frequency information was not available for 14% of the words, and imageability rating was not available for 30% of the words. Each picture represented a single isolated object on a white background.

Stimuli materials were divided into 12 sets of 24 items each. The sets were counterbalanced so that each set occurred once in each of the 12 study/test combinations, which were obtained by crossing the four item types (pictures, red words, both, or nonstudied) with the three test types (standard test, red word test, or picture test). The standard test always came first to provide a measure of overall recognition memory for the different classes of stimuli. The order of the two criterial recollection tests was counterbalanced across participants, resulting in a total of 24 counterbalancing conditions.

The memory task was programmed by E-prime experimental software (Version 1.1; Schneider, Eschman, & Zuccolotto, 2002), and presented in a Dell Desktop PC with 17-inch screen. Participants studied 216 unique items, with 1/3 presented as red words, 1/3 presented as pictures, and 1/3 presented as both red words and pictures. During the study phase, each item was presented first for 700 ms, using a black Courier New font in lowercase letters. The word was then replaced with either a picture of the word or with the same word in red for 2000 ms. Pictures ranged in size from 1 inch × 1 inch to 3 inches × 3 inches. Red words were presented in a Kristen ITC font that was visibly larger and notably distinct from the Courier New font. A blank screen for 700 ms separated each picture or red word from the next item. Items were randomly presented during study, with the exception that 1/3 of the items from each study/test combination were presented in the beginning, middle, and end of the study phase. This was done to ensure an even sampling of the different types of items across the three sections of the study phase, which were separated by two rest prompts. For items that were studied as both a picture and a red word, the two occurrences were randomly spaced in the corresponding third of the study list.

During the test phase, items were presented using the same black font that was used for each item during study, so that the perceptual overlap between the study and test phases could not serve as a cue for whether the item had been studied with a red word or with a picture (or both). Each test contained four types of items: items studied as red words, items studied as pictures, items studied as both red words and pictures, and nonstudied items. On the standard recognition test, 3/4 of the items were true targets and 1/4 were lures, whereas on the criterial recollection tests, half of the items were targets and the other half were lures. For each of the three tests, items were freshly randomized for each participant.

Design

The research design was a 2 (instruction: control vs. imagery) × 4 (study item type: both, red word, picture, new) mixed analysis of variance (ANOVA). Instruction type was the between-subjects factor and study item type was the within-subjects factor. In the control group, participants were asked to pay close attention to both the words and pictures because their memory would later be tested. In the imagery group, participants were instructed to imagine a picture of an item when they saw the same item studied as a red word, and to visualize a red word for an item when they saw that item presented as a picture. They were also asked to press the key labeled “yes” if the picture or red word they generated was vivid and press “no” if it was not. In the both condition, each item was studied twice on separate occasions, once as a picture, and another time as a red word. In the red word condition, each item was studied only as a red word. In the picture condition, each item was studied only as a picture. In the nonstudied condition, the items were not studied.

On the standard recognition test, participants were instructed to say “yes” to any item that they studied, regardless of whether it had been studied as a red word or a picture. The two criterial recollection tests included a red word test and a picture test. On the red word test, participants were instructed to say “yes” only to items that had been studied as red words, regardless of whether the item had also been studied as a picture. On the picture test, participants were instructed to say “yes” only to words that they had studied as pictures, regardless of whether the picture had also been studied as a red word.

Procedure

Participants were tested in small groups of up to three people each in a laboratory. After completing the informed consent form, all participants completed the study and test phases during a 30-minute session. Procedure for the memory task was adapted from Gallo, Weiss, and Schacter (2004, Experiment 1).

During the study phase, participants were told that they would study a list of items presented on the computer screen. Some items were studied as red words, some studied as pictures, and some as both red words and pictures. The control group was told to pay close attention to both the words and pictures because their memory would later be tested. The imagery group was instructed to imagine a picture of an item when they saw the same item studied as red words, and to visualize a red word for an item when they saw that item studied as a picture. They were also asked to press the key labeled “yes” if the picture or red word they generated was vivid and press “no” if it was not. The total study phase took approximately 20 min, with two break prompts (“Rest briefly. Press space to resume study phase.”) separating the beginning, middle, and end of the study list.

Following the study phase, participants were given three recognition tests. For the standard recognition test, participants were told that they would see test words, one at a time, and that some of these words were studied (with red words or pictures or both) and some were not studied (new items). Participants were told that if they remembered an item either as a red word or as a picture, they should respond by pressing the key labeled “yes.” If they did not remember studying the item as a red word or as a picture, they should respond by pressing the key labeled “no.” Following the standard recognition test, participants were given two criterial recollection tests, adapted from Gallo et al. (2004). In the criterial recollection procedure, participants are instructed to say “yes” to an item only if it satisfies a certain criterion (e.g., the item was presented in a certain context). Therefore, on the red word criterial test, participants were told that their memory for the red words would be tested. They were instructed to respond “yes” only if they remembered studying the test word in red letters. They were reminded that some of the red words were also studied as pictures, and some of the red words were never studied as pictures. Thus, whether or not they remembered studying a picture would be irrelevant on the red word test. Instructions for the picture criterial test was identical, except that participants were instructed to say “yes” only to words that they had studied as pictures, and that their memory for red words would now be irrelevant. All three of the tests were self-paced, and the experimenter made sure that participants fully understood each of the sets of instructions. Following the final test, participants were debriefed and dismissed.

RESULTS

Unless noted otherwise, a significance level of $p < .05$ was used on all statistical tests.

True Recognition

Data for true recognition (i.e., hit rates) for all participants are presented in Table 1. On the standard recognition test, a 2 (instruction: control vs. imagery) × 3 (study item type: both, red word, picture) mixed analysis of variance (ANOVA) revealed a main effect of study item type, $F(2, 380) = 216.095$, $p < .001$, partial $\eta^2 = .532$. Further pairwise comparisons using a Bonferroni correction showed that all study item types were significantly different from each other. Hit rates to items studied once as a picture and another time as a red word (.92) were greater than hit rates to items studied only as a red word (.72), and to items studied only as a picture (.79). Hit rates to items studied as pictures (.79) were also higher than those to items studied as red words (.72). There was also a main effect of instruction, $F(1, 190) = 17.656$, $p < .001$, partial $\eta^2 = .085$. Further pairwise comparisons using a Bonferroni correction showed that hit rates to all study item types in the control group (.77) were significantly lower than those in the imagery group (.85).

There was an interaction between study item type and instruction, $F(2, 380) = 61.035$, $p < .001$, partial $\eta^2 = .243$. Further pairwise comparisons using a Bonferroni correction showed that hit rates to items studied once as a picture and another time as a red word in the control group (.90) were lower than those in the imagery group (.95, $p < .05$), hit rates to items studied as red words in the control group (.62) were also lower than those in the imagery group (81, $p < .05$), but hit rates to items studied as pictures in the control group (.80) did not differ from those in the imagery group (.78, $p > .05$).

On the red word test, a 2 (instruction: control vs. imagery) × 2 (study item type: both, red word) mixed analysis of variance (ANOVA) revealed a main effect of study item type, $F(1, 190) = 158.431$, $p < .001$, partial $\eta^2 = .455$. Further pairwise comparisons using a Bonferroni correction showed that hit rates to items studied once as a picture and another time as a red word (.72) were greater than hit rates to items studied only as a red word (.58). There was also a main effect of instruction, $F(1, 190) = 16.588$, $p < .001$, partial $\eta^2 = .080$. Further pairwise comparisons using a Bonferroni correction showed that hit rates to all study item types in the imagery group (.70) were significantly higher than those in the control group (.60). However, there was no interaction between study item type and instruction, $F(1, 190) = .091$, $p = .764$, partial $\eta^2 = .000$.

On the picture test, a 2 (instruction: control vs. imagery) × 2 (study item type: both, picture) mixed analysis of variance (ANOVA) revealed a main effect of study item type, $F(1, 190) = 78{,}337$, $p < .001$, partial $\eta^2 = .292$. Further pairwise comparisons using a Bonferroni correction showed that hit rates to items studied once as a picture and another time as a red word (.76) were greater than hit rates to items studied only as a picture (.66). There was also a main effect of instruction, $F(1, 190) = 13.013$, $p < .001$, partial $\eta^2 = .064$.

Further pairwise comparisons using a Bonferroni correction showed that hit rates to all study item types in the imagery group (.76) were significantly higher than those in the control group (.66). However, there was no interaction between study item type and instruction, $F(1, 190) = .053$, $p = .818$, partial $\eta^2 = .000$.

Table 1

Mean Recognition of Each Study Item Type as a Function of Test Type for the control and imagery groups (N = 192)

	Control (n=96)		Imagery (n=96)		Total (N=192)	
	Mean	*SEM*	Mean	*SEM*	Mean	*SEM*
Standard test						
Both hits	.90	.01	.95	.01	.92	.01
Red word hits	.62	.02	.81	.02	.72	.01
Picture hits	.80	.02	.78	.02	.79	.01
New False Alarms	.12	.01	.11	.02	.12	.01
Red word test						
Both hits	.67	.02	.77	.02	.72	.01
Red word hits	.53	.02	.63	.02	.58	.01
Picture False Alarms	.39	.02	.45	.02	.42	.02
New False Alarms	.16	.02	.09	.01	.12	.01
Picture test						
Both hits	.71	.02	.80	.02	.76	.01
Red word False Alarms	.17	.02	.21	.02	.19	.02
Picture hits	.62	.02	.71	.02	.66	.02
New False Alarms	.08	.01	.07	.01	.07	.01

False Recognition

Data on false recognition rates for all participants are also presented in Table 1. On the standard recognition test, a one-way analysis of variance (ANOVA) revealed no difference between the control group (.12) and the imagery group (.11) on false alarms to nonstudied items, $F\ (1, 190) = .007$, $p = .931$.

On the red word test, a 2 (instruction: control vs. imagery) × 2 (study item type: picture false alarms vs. new false alarms) mixed analysis of variance (ANOVA) revealed a main effect of study item type, $F(1, 190) = 441.764$, $p < .001$, partial $\eta^2 = .699$. Further pairwise comparisons using a Bonferroni correction showed that false alarms to items studied as pictures (.42) were significantly higher than those to nonstudied items (.12). No main effect of instruction was found, $F(1, 190) = .043$, $p = .836$, partial $\eta^2 = .000$. However, There was an interaction between study item type and instruction, $F(1, 190) = 20.008$, $p < .001$, partial $\eta^2 = .095$. Further pairwise comparisons using a Bonferroni correction showed that false alarms to items studied as pictures in the control group (.39) did not differ from those in the imagery group (.45), but false alarms to nonstudied items in the control group (.16) were higher than those in the imagery group (.09).

On the picture test, a 2 (instruction: control vs. imagery) × 2 (study item type: red word false alarms vs. new false alarms) mixed analysis of variance (ANOVA) revealed a main effect of study item type, $F(1, 190) = 94.128$, $p < .001$, partial $\eta^2 = .331$. Further pairwise comparisons using a Bonferroni correction showed that false alarms to items studied as red words (.19) were significantly higher than those to nonstudied items (.07). No main effect of instruction was found, $F(1, 190) = .577$, $p = .448$, partial $\eta^2 = .003$. However, there was an interaction between study item type and instruction, $F(1, 190) = 5.131$, $p < .05$, partial $\eta^2 = .026$. Further pairwise comparisons using a Bonferroni correction showed that false alarms to items studied as red words in the control group (.17) did not differ from those in the imagery group (.21), and false alarms to nonstudied items in the control group (.08) also did not differ from those in the imagery group (.07). Even though there were numerical differences in false alarms to items studied as red words and to nonstudied items between the two groups, the differences were not large enough to be significant.

DISCUSSION

The present study examined the activation of imaginal information on true and false memories, using unrelated concrete items and the criterial recollection procedure (Gallo et al., 2004). Our goal was to examine the effect of forming mental images on both true and false memories. In our study, participants were instructed to form a mental image of an object when that object appeared as a word in a red font, and to form a mental image of a red word referring to an object presented as a picture. Our results showed that activating mental images increased true memory but had no significant effects on false memory.

More specifically, our results showed that hit rates to all study item types in the imagery group were significantly higher than those in the control group on the standard recognition test, the red word test and the picture test. When participants were instructed to imagine a picture of an item presented as a red word, and to visualize a red word of an item presented as a picture, participants exhibited higher hit rates overall than those participants who were not given such instructions. We suggest that the activation of imaginal information prompted the imagery group during the study phase to represent all items with both a verbal code and a picture code, consistent with PaIvio's (1971) dual coding theory. The generation of dual codes in the imagery group may have increased hit rates in a similar fashion to that observed in Paivio's (1971) study in which participants exhibited higher hit rates to concrete words than to abstract words.

In contrast to previous studies showing that imagery can lead to greater false memories (Hyman & Pentland, 1996; Wade, Garry, Read, & Lindsay, 2002), our results revealed no difference in false alarms rates between the imagery group and the control group on the standard recognition test, the red word test and the picture test. Even though the activation of imaginal information should have prompted the imagery group to encode all items using both verbal and picture codes, generating both codes did not lead to an increase in the false alarm rates of the imagery group compared to the control group as we had predicted.

The fact that we did not find an increase in false memories as a function of generating mental images may have resulted from two factors. First, imagery participants may have been allotted insufficient time to form detailed images. These participants were given only two seconds to imagine a picture of an item studied as a red word, and two seconds to visualize a red word of an item presented as a picture. This relatively brief time may have been insufficient to allow them to form stable images that they would later confuse with studied events. A second potential factor that may have suppressed false memories in the imagery group is the fact that participants were instructed to form images of the stimuli only once. In some previous studies showing that forming mental images can increase false memories, participants were instructed to form repeated mental images (e.g., Goff & Roediger, 1998; Johnson, Raye, Wang, & Taylor, 1979). Therefore, it is possible that increasing presentation time and having participants form multiple images of the stimuli may lead to greater false alarms than what we found in the current study.

The current study showed that activating images of stimuli can enhance true memory without increasing false memory. Regardless of whether participants imagined a picture of an item presented as a red word or visualized a red word when presented with a picture, true memory as measured by hit rates was increased. Such a strategy might be helpful to teachers working with students who are learning vocabulary, clinicians working with patients who have memory issues, or shoppers attempting to memorize grocery lists. For example, teachers might use flash cards with pictures and vocabulary words and then ask students to imagine pictures of the words or visualize words referring to the pictures. By putting signs with pictures and words on the objects or places, clinicians might be able to help patients enhance their memory of these objects and places. Visualizing pictures of the items on the shopping list, shoppers might be able to better remember those items when they are at the grocery store.

As we discussed previously, participants in the imagery group were given only a brief time to form images of the stimuli and we instructed participants to form an image only once. This procedure might represent a possible limitation of our study, given our null results regarding false memories. Therefore, future studies using similar materials should include a condition in which multiple mental images are formed, along with a provision in which participants are given a greater amount of time to form images. In addition, future research should examine the degree to which individual differences in imagery ability might lead to differences in both true and false memories

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Appendix

Word List

mailbox	snowman	violin	bed	nest	tape	suitcase
rope	waffle	airplane	necklace	mixer	horse	dragon
heart	trampoline	saddle	canoe	racecar	crown	bulldozer
matches	octopus	bench	lamp	stapler	car	wallet
peacock	anchor	ostrich	worm	rainbow	helicopter	cheese
razor	towel	pitcher	cherries	nail	fence	lizard
corkscrew	mug	cactus	eggs	desk	footprints	dartboard
caterpillar	hippopotamus	pig	pail	harp	lighthouse	toaster
rake	peas	bull	mushroom	turkey	fish	trombone
key	piano	sweater	walrus	jacket	windmill	carousel
ring	beaver	glasses	speakers	bandaid	bow	trophy
snail	skateboard	refrigerator	hanger	computer	dollars	elephant
camel	tree	bear	buffalo	book	socks	goat
lighter	camera	grasshopper	airpump	pie	magnet	plant
sandwich	ghost	table	fork	backpack	package	gloves
radio	seahorse	maracas	comb	starfish	rhinoceros	pliers
dinosaur	pear	watch	kangaroo	bat	mirror	watermelon
seal	cigar	microwave	monkey	knife	wheelchair	handcuffs
zebra	tie	cookie	hose	pan	fireplace	pretzel
boots	skunk	crutches	spider	slide	telephone	iron
sheep	cow	hammock	frog	thumbtack	blender	cat
joystick	sneakers	compass	alligator	owl	fan	drum
check	spatula	flower	house	banana	peanuts	racket
submarine	calendar	tuba	crayon	parrot	hamburger	orange
beetle	donut	swan	strawberry	notebook	bathtub	medal
apple	shirt	shelves	bucket	clover	corn	overalls
tractor	doll	astronaut	xylophone	microscope	pancakes	globe
skull	armadillo	canon	deer	yoyo	funnel	telescope
tent	football	sofa	dog	lemon	carrot	balloons
turtle	television	shovel	toothbrush	shoe	screen	lantern
palette	koala	penguin	potato	pineapple	drill	chain
bowl	dumbbell	bicycle	parachute	tiger	apron	pencil
barrel	accordion	cassette	pumpkin	spoon	vase	pepper
shorts	scissors	whistle	crab	truck	flashlight	dustpan
battery	gun	typewriter	butterfly	leaf	pillow	wagon
cake	giraffe	fox	broom	lobster	screwdriver	needle
duck	boat	hotdog	microphone	basket	pacifier	
brain	briefcase	snake	lightbulb	kite	hammer	
iceskate	hairdryer	clock	onion	train	umbrella	
dress	bread	hourglass	coconut	guitar	mouse	
tomato	calculator	panda	bus	castle	pipe	
dice	belt	sword	scooter	eagle	wrench	