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Cryptomnesia: Delineating Inadvertent Plagiarism

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Cryptomnesia, or inadvertent plagiarism, was experimentally examined in three investigations. Subjects were required to generate category exemplars, alternating with 3 other subjects in Experiments 1 and 2 or with a standardized, written list in Experiment 3. After this generation stage, subjects attempted to recall those items which they had just generated and an equal number of completely new items from each category. Plagiarism of others' generated responses occurred in all three tasks (generation, recall own, and recall new) in each experiment, despite instructions to avoid such intrusions. The amount of plagiarism was greater under more complex generation sequences and for items produced from orthographic relative to semantic categories. The most likely source of plagiarized responses was the person who had responded just before the subject in the generation sequence. Directions for future research are discussed.

The topic of plagiarism is of universal interest to scholar/teachers because of occasional incidents encountered either with colleagues or students. Although intentional plagiarism is clearly an anathema to all professionals, there are situations where duplication occurs inadvertently. This unintentional plagiarism, or cryptomnesia, is the focus of the present article. In the technical definition, cryptomnesia is "...the presence of phenomena in normal consciousness which objectively are memories, but subjectively are not recognized as such." (Taylor, 1965, p. 1111). Cryptomnesia refers to generating a word, an idea, a song, or a solution to a problem, with the belief that it is either totally original, or at least original within the present context. In actuality, the item is *not* original, but one which has been produced by someone else (or even oneself) at some earlier time.

A number of anecdotal discussions of cryptomnesia exist. Some of these recount public scandals where prominent individuals such as Nietzsche (Jung, 1905/1957) and Helen Keller (Bowers & Hilgard, 1986) have been accused of copying portions of other person's works. Freud (1901/1960) related that when he was developing his theory on original bisexuality, Fliess (a friend and professional colleague) reminded Freud that he had given Freud the idea several years earlier. At that time, Freud rejected his claim but later recalled the earlier incident.

There also exist less dramatic stories of cryptomnesia. For instance, Daniels (1972) admitted, in a printed apology, to inadvertent plagiarism after being informed by colleagues that significant portions of his book duplicated the work of others. He noted, "I have certainly been aware that I had an extraordinary ability to remember material when I wanted to, but I have never before realized that I did it unconsciously." (p. 125) Other incidents involve the duplication of one's own scholarly ideas by others (Reed, 1974) or by oneself at a later time (Skinner, 1983; Taylor, 1965). As Skinner (1983) noted, "...one of the most disheartening experiences of old age is discovering that a point you have just made—so significant, so beautifully expressed—was made by you in something you published a long time ago" (p. 242).

Although cryptomnesia has not been directly investigated in a laboratory setting, the related phenomenon of *source amnesia* has been examined. Investigations of source amnesia involve a multistage paradigm. After being provided with certain few facts, subjects are given a cued recall test involving these new facts mixed in with other general information items. As a last step, subjects are asked to identify *where* they learned each fact which they just recalled. If they fail to identify the experimental context as the source of the new facts, then subjects are said to exhibit source amnesia. Source amnesia is similar to cryptomnesia in that information concerning the "context" in which the fact was first experienced has been forgotten. However, with cryptomnesia the recalled information is perceived as original, whereas with source amnesia it is not.

The incidence of source amnesia has been examined with three types of subjects: hypnotized, amnesic, and normal. Within the clinical realm, practitioners have noted that when hypnotized subjects are provided information, they may occasionally remember the information in the posthypnotic state but forget that they learned it while under hypnosis (Thorn, 1960). A number of investigators have examined this phenomenon by giving subjects unique facts while under hypnosis (i.e., "How many moons does Venus have?"; Answer: none) and then repeating those same questions posthypnotically, accompanied by distractor items. If a subject remembers the answer but forgets that he or she learned it under hypnosis, then this is evidence of source amnesia. A small, but reliable, percentage of hypnotized subjects (10%–15%) exhibit source amnesia posthypnotically (Evans, 1979; Evans & Thorn, 1966; Thorn, 1960; Cooper, 1966). Furthermore, Evans and Thorn (1966) found that fact recall and source identification were independent of each other (nonsignificant correlations).

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Source amnesia has also been demonstrated to accompany certain types of organic memory disorders. When Schacter, Harbluk, and McLachlan (1984) presented amnesics with made-up "facts," subjects had difficulty identifying the experiment as the source of the information when tested only a few seconds after input. This was true whether or not the amnesics recalled the fact. Even when they *did* correctly identify the experimental context as the source, they were only at chance levels at recognizing which of two experimenters provided the information. Shimamura and Squire (1987) also discovered similar effects with transient amnesia states resulting from electroconvulsive therapy and noted that source amnesia and fact memory are independent of each other: Subjects with high or low rates of source errors showed equivalent levels of fact recall. Finally, Mitchell, Hunt, and Schmitt (1986) discovered that persons with Alzheimer's disease showed a reasonable level of cued recall for items experienced earlier, although they were only at chance level in discriminating between sources (self or other).

A different form of source memory has been investigated with normal subjects. Johnson and Raye (1981) set the framework for this line of research in their seminal article on reality monitoring, or how we differentiate memories for our internal experiences (ruminations, reflections, and fantasy) from ones that are external (perceptual) in origin. Although this line of research resembles investigations of source amnesia, a major distinction exists: Studies on reality monitoring have focused primarily on *source forgetting* rather than *source amnesia*. As Schacter et al. (1984) pointed out, source forgetting is failure to recognize which of multiple experimental sources provided the item, whereas source amnesia is failure to recognize that the item was even experienced within the recent experimental context.

Several reality monitoring studies that use source alternation are germane to the topic of cryptomnesia. Raye and Johnson (1980) had pairs of subjects alternate in orally generating free or constrained responses to various cues. Additional individuals were present, some of whom simply listened to the responses, and others of whom recorded the responses as they were spoken. Generators performed better than listeners or recorders on a later source identification test (who produced which items?), with no difference between listeners and recorders. Thus, active participation in the generation process seems measurably to enhance source memory.

A similar paradigm was used by Voss, Vesonder, Post, and Ney (1987). Rather than requesting semantic retrieval of restricted associates (Raye & Johnson, 1980), they employed an episodic task where pairs of subjects alternated in the oral recall of a previously presented list of words. Individuals were better at later recognizing (as old) items they had initially produced, compared with words generated by their partner; this result supported the generation effect (Slamecka & Graf, 1978). Surprisingly, however, there was *no* difference in source identification accuracy (who said this?) for words generated by themselves versus those generated by the partner. Again, the fact that there appears to be an independence of source memory from episodic memory supports Evans and Thorn (1966) as well as Shimamura and Squire (1987).

The purpose of the present investigation is to examine cryptomnesia within a controlled generation context. The format of each of three investigations involved the same three-task sequence: Subjects (a) took turns generating members of specific categories, then (b) recalled their own generated instances, and finally (c) generated additional new exemplars. Although this research resembles investigations of source amnesia and source forgetting, our experimental model is closer to cryptomnesia. The critical distinction is that source amnesia occurs when subjects generate an acknowledged old response but forget its origin, whereas cryptomnesia occurs when subjects unintentionally generate an old response but think that it is new. In a sense, cryptomnesia is an extreme form of source amnesia.

Within the present research design, cryptomnesia will be defined as the production of an item in the category generation task which is then repeated by *another* subject either later in the same generation task or in either of two subsequent recall tasks (recalling their own responses or recalling new responses). Although the term *plagiarism* has acquired pejorative connotations, it is used in this article in the neutral, descriptive sense.

Experiment 1

Method

Subjects. Twenty-four undergraduate students at Southern Methodist University participated in the investigation. The study was part of a laboratory exercise in a course on human memory, and subjects were unaware of the purpose of the investigation prior to participation.

Procedure. Subjects were randomly assigned to one of six separate 4-person groups at the start of a class period, and each group was tested in a separate room by a different experimenter.

The procedure was divided into three parts: oral group generation, written recall of own responses, and written retrieval of new items. Prior to the group generation task, each subject was randomly assigned to one of four seats in a row. Subjects were informed that they would be taking turns generating exemplars aloud from four different categories, completing one category at a time. The conceptual categories of sports, musical instruments, clothing, and four-legged animals were selected because they were sufficiently large (Battig & Montague, 1969) and required no obvious temporal (e.g., Presidents) or spatial (e.g., states) strategy in the retrieval process.

In the generation task, each subject produced aloud one additional new member of the current category, going in order down the row of four seats. At the end of the row, the cycle started again at the beginning of the row. This sequence was repeated four times, enabling each subject to generate four members of that particular category (one per cycle). Thus, a total of 16 items were generated from each category by the group. Subjects were instructed to provide a *new* exemplar each turn and not to repeat one that had been produced previously.

After each category, the 4 subjects were reassigned seat positions according to a Latin-square format, so that each subject was in a different position in the output sequence for each category. The order of the four categories was randomly determined separately for each of the six groups. The experimenter wrote down the generated exemplars as they were produced, and he tape recorded the session as a backup.

After the group generation stage, subjects were handed a recall sheet with four category labels and eight blank spaces under each label. The subjects were instructed to first write down the four exemplars which they had generated during the group session, and then to generate four completely new items from each category. The subjects were given as much time as necessary to complete this task and were required to write something on each blank.

Results and Discussion

The appropriate control comparison for the occurrence of cryptomnesia is somewhat ambiguous. Because subjects are specifically instructed not to repeat any previous responses, one could argue that *any* repetition is sufficient evidence of cryptomnesia. On the other hand, subjects may have momentary lapses of attention and miss hearing certain responses, making the duplication of an earlier response coincidental generation rather than conversational plagiarism.

One possible control comparison is the probability with which subjects ordinarily repeat their own previously generated responses during an oral free-recall task. Bousfield and Rosner (1970) presented subjects with a list of 20 unrelated words (3 s per item) and allowed 80 s for oral recall. They found that on the first recall trial, 2.6% of the recalled items were repeats of earlier recalled words. This estimate, however, may be too high. Gardiner, Thompson, and Maskarinec (1974) pointed out that the majority of repeated items in such a free-recall task are those from short-term memory, which are minimally processed and "dumped" early in the recall protocol. In fact, when Gardiner and Klee (1976) exaggerated this recency bias by instructing subjects to recall the last list items first, the repetition rate rose to 5.7%. At the other extreme, when Klee and Gardiner (1976) instructed subjects to recall in serial order, minimizing the recency item effect, they discovered that the repetition probability dropped to 1.6%.

In a direct examination of this difference, Gardiner, Passmore, Herriot, and Klee (1977) compared recall of items from each third of the input list and discovered repetition probabilities remarkably similar to those found by Gardiner and Klee (1976) and Klee and Gardiner (1976): 5.7% of the recalled recency items were repeated later in free recall, whereas only 1.4% of primacy items were repeated (percentages derived from Gardiner et al., 1977, Figure 1, p. 48, and Table 1, p. 49). A repetition rate of 1.5%, averaging Gardiner et al.'s (1977) 1.4% and Klee and Gardiner's (1976) 1.6%, appears to be an appropriate reference point for the present investigation because our task also requires retrieval from long-term memory.

One discrepancy between these studies and the present investigation is that they used an episodic task with restricted category size. In a task more similar to ours, Gruenewald and Lockhead (1980) had subjects orally generate as many items as they could from a single semantic memory category (birds, foods, etc.) for 15 min and found an average of 1.6% repetition errors. This repetition percentage is liberal because Gruenewald and Lockhead's (1980) subjects (a) generated considerably more exemplars (range of 31 to 263) than did subjects in the present study (16); (b) they had to remember their previously generated items for up to 15 min, compared with about 10 min in the present study; and (c) they were given no admonition to avoid repetitions, whereas we explicitly told the subjects not to repeat previously uttered items. Although Gruenewald and Lockhead's estimate may be high, we will use it as a reasonable reference point because it is comparable to those percentages found in the previously cited episodic studies.

Technically, there are two types of plagiarism—copying others and copying oneself. The first type is the most common variety and will be the primary focus of this series of studies. For descriptive simplicity, when the term *plagiarism* is used in this article, it will refer to copying others' responses. Later duplication of one's own previous responses will be labeled *self-plagiarism*.

Generation. During the generation task, 41.7% (10 of 24) of the subjects repeated an item produced by someone else. The 13 plagiarized responses represented 3.4% of all items produced. Adjustment for total repetition opportunities (eliminating the first item generated in the series) increased this to 3.6%. The incidence of repetition intrusions is higher than chance. The 3.6% rate is significantly above the oral self-repetition rate of 1.6% (Gruenewald & Lockhead, 1980), using a one-sample test, $t(23) = 2.26$. In this and all subsequent statistical tests, an alpha level of .05 is used. There were *no* self-plagiarisms in the generation task.

Recall own. In the second stage of the experiment, subjects were asked to recall the four responses that they had previously generated in each category (16 items total). If a subject had already duplicated a response from another subject during the group generation stage, then that particular response was counted as correct if it was recalled during the recall-own test. In other words, a response was counted as plagiarized only once.

For this task, 75.0% of the subjects (18 of 24) intruded at least one item that someone else had given during the group generation stage. These subjects produced 28 plagiarized responses, comprising 7.3% of the total number of responses across all subjects. Compared with the chance level of 1.6% (Gruenewald & Lockhead, 1980), this obtained percentage was significant, $t(23) = 4.14$.

Another comparison for "random" intrusions is the number of *new* responses which subjects inadvertently produced during this task. There were 29.2% of the subjects (7 of 24) who recalled a total of nine new items, which comprised 2.3% of the total responses generated during this task. The difference between plagiarized and new intrusions was significant, $t(23) = 3.59$, suggesting that the items experienced recently are intruding at a higher than chance rate into the subjects' recall of their own responses.

Recall new. When asked to generate four new items from each category, 70.8% of the subjects (17 of 24) intruded at least one item that had been generated by someone else during the generation task. There were 33 intruded words, accounting for 8.6% of the total produced by all subjects. This was significantly different from chance (1.6%; Gruenewald & Lockhead, 1980), $t(23) = 3.65$. There were only two self-plagiarisms (from different subjects) during this task.

Combined analyses. A number of "global" analyses were performed comparing plagiarized responses *across* tasks. In the first, an analysis of variance (ANOVA) revealed a significant difference in the rate of plagiarism across the three tasks, $F(2, 46) = 3.70$, $MS_e = 1.22$. A Newman-Keuls pairwise test showed that the rate was lower in the generation task than under either recall-own or recall-new tasks, with no difference between the latter two tasks.

The second global analysis addressed the question of whether the plagiarisms were produced by the same subset of individuals or whether this error was distributed across all subjects. If a subset of subjects accounts for all the cryptomnesia in each task, then the generality of the phenomenon would be limited. To test this, the number of plagiarized responses was correlated across subjects for each pair of tasks. All three correlations (generate vs. recall own, generate vs. recall new, and recall own vs. recall new) were nonsignificant and ranged from −.32 to .10. Therefore, the probability of individuals plagiarizing responses is apparently independent across tasks.

The third global analysis addressed the source of the intrusions, or where the originator was sitting with respect to the plagiarizing individual. Combining the results across tasks, 38 intrusions originated from the preceding person, 22 from the succeeding person, and 14 from the nonadjacent person. There was a significant difference among sources, $F(2, 44) = 4.91$, $MS_e = 1.35$. A Newman-Keuls pairwise test revealed that intrusions from the preceding person were significantly greater than both of the other positions, with no significant difference between the succeeding and nonadjacent positions.

A final analysis addressed the normative frequency of plagiarized responses. The median ordinal rank of all items generated was 11 (Battig & Montague, 1969), while the median rank for plagiarized responses was 7. Only plagiarism from the recall-own and recall-new tasks was included. In the generation task, a bias exists towards plagiarizing high-frequency items because they occur relatively earlier in the output and therefore have more opportunities to be duplicated. For the statistical test, the *mean* plagiarized item rank of 8.83 was compared with an expected value of 11. Substituting the mean for the median was necessary for the statistical test and actually provided a conservative test of the difference. This difference was significant, $t(60) = 2.07$, suggesting that subjects selectively plagiarized those exemplars that were higher in normative frequency.

The outcome from Experiment 1 suggests that the phenomenon of cryptomnesia occurs reliably across samples of conceptual categories (four), tasks (oral and written), and time frames (from several seconds to 10 min later). Subjects rarely repeat their *own* earlier responses: No self plagiarisms occurred during the generation task, and only two occurred during the recall-new task. Thus, it appears that subjects monitor self-generated and other-generated information in different ways; this is consistent with the generation effect (Slamecka & Graf, 1978) and reality monitoring studies (Johnson & Raye, 1981; Raye & Johnson, 1980; Voss et al., 1987). Furthermore, we found that (a) the rate of plagiarism was higher in the written tasks than in the oral generation task, (b) the most likely person to be plagiarized is the one preceding the subject, and (c) subjects tend to plagiarize relatively higher frequency responses.

Added control group. Although the comparisons with routine repetition frequencies from previous investigations have provided evidence of cryptomnesia, we decided to test a control group that was more comparable to the present design. We randomly selected 8 additional students from an Experimental Psychology class. Each subject was tested individually and told that he or she would be generating 16 exemplars from each of four different semantic categories. After a category name was announced, the subject orally produced 16 different instances from that particular category while the experimenter recorded the responses. These categories were the same ones used in Experiment 1, and the order of category generation was balanced by using a Latin-square technique in such a way that within the first 4 (and the second 4) subjects tested, each category occurred in each ordinal position one time.

Out of the total of 512 items generated by the 8 subjects, there were only two repeated items. After adjustment for repetition opportunities (eliminating the first item in the output), the repetition percent was 0.4. The cryptomnesia percentage during the generation stage in the present study (3.6) is nine times that expected by this chance measure (0.4).

These data were reanalyzed by creating two "pseudogroups" of 4 subjects each. Their output was analyzed as if it were generated in an interactive, rather than an independent fashion. For instance, Subject A's responses were selected from Positions 1, 5, 9, and 13; Subject B's responses from Positions 2, 6, 10, and 14; Subject C's responses from Positions 3, 7, 11, and 15; and Subject D's responses from Positions 4, 8, 12, and 16. In this manner, a "continuous" string of 16 responses was artificially created. For both groups of 4 subjects, four different hypothetical output orders were used so that each subject was in Seat 1 across all four categories, then in Seat 2 across all four categories, and so forth. This analysis allowed each item to be compared against "previous" ones to determine the chance level of overlap. This, in turn, gave an estimate of what the repetition frequency should be if subjects were not paying *any* attention to previous responses.

This "repetition rate" was 17.5%, suggesting that subjects in Experiment 1 were attending to other subjects' output. Because the actual repetition rate of 3.6 is between the two extremes represented by full monitoring (0.4%) and no monitoring (17.5%), subjects were able to avoid duplication better than chance but unable to do this as well as when generating by themselves.

Three other aspects of these contrived duplications argue that the repetitions in Experiment 1 are qualitatively different from chance overlap. First, source individuals were equally distributed across preceding, succeeding, and nonadjacent positions in the control group (as one would expect), whereas this was not true for the experimental groups. Second, the output *position* (out of 16) when the repetition occurred was much later for experimental subjects (mean = 11.95) than for control subjects (mean = 8.80). This difference was significant, $t(16) = 2.89$. Finally, there were *no* instances where duplications occurred during the first round of four responses for the experimental subjects, whereas more than a quarter of the repetitions for the control group occurred during this portion of the output.

Experiment 2

Experiment 2 was designed to extend the examination of cryptomnesia to a broader range of stimulus conditions. One goal was to determine whether increases in task monitoring difficulty would lead to increases in the rate of cryptomnesia. Gardiner et al. (1977) found that having subjects listen to white noise during oral recall increased the number of repetition errors, compared with a control group with no white noise. In order to vary monitoring difficulty, subjects either generated items in one block of 16 (as in Experiment 1), in four temporally separate blocks of 4, or one at a time in a continuous mix of all four categories. A second motivation for this manipulation was to provide a more realistic analogue to natural conversation. Cryptomnesia occurs frequently in ongoing conversations (cf. Taylor, 1965) which rarely proceed as a series of discrete and nonoverlapping topics, but rather as an intermixing of various conversational threads.

In addition to semantic categories, we added orthographic categories. Because people usually process conversation at a semantic level, we assumed that orthographically based generation would be more difficult and would result in more cryptomnesia. However, there is some research which suggests the opposite. Johnson, Raye, Foley, and Foley (1981) compared conditions where subjects generated responses related to the stimulus by meaning (semantic) or by first letter (orthographic). Although recall and recognition were better in the semantic condition, differentiation between items heard and generated was more accurate under the orthographic condition.

In Experiment 2, we also investigated subjects' confidence in their correct versus incorrect (plagiarized) responses produced during the two written tasks. Finally, we added a different type of control comparison. Instead of generating items in isolation, as in Experiment 1, these control subjects generated responses from only one category but alternated with 3 other subjects generating from their own categories.

Method

Subjects. Sixty-four subjects from sections of Introductory Psychology at Southern Methodist University were tested in the investigation. Participation was voluntary, with extra course credit given as an incentive.

Design. A 2 × 4 between-subjects design was employed, with independent variables of type of materials (two levels) and generation pattern (four levels). For the materials variable, subjects generated items from either semantically or orthographically defined categories. The generation pattern variable consisted of four levels: whole, quarter, single, and control. In the whole groups, all 16 members of each category were generated consecutively. In the quarter groups, only four (of 16) members of a category were generated consecutively, before switching to another category. Therefore, items from each category were generated in four separate blocks, with the four different categories alternating throughout the production sequence.

For the single and control groups, category members were not produced consecutively, but rather interspersed among items from other categories. For the single groups, subjects did *not* know before each turn which category they would be generating from. In contrast, subjects in the control groups generated items only from their own category assigned at the start of the session.

Materials. The four semantic categories were the same as in Experiment 1. The four orthographic categories were defined as words beginning with the letter pairs *BE*, *FO*, *MA*, and *TH*. These combinations were among the most frequently occurring letter pairs at the start of written words, according to the Mayzner and Tresselt (1965) norms.

Procedure. Experiment 2 used the same task sequence as in Experiment 1: generate, recall own, and recall new. Four subjects participated in each generation group, and two separate groups were tested under each of the eight conditions of the design, yielding 16 different groups of subjects. The groups were randomly assigned to condition, with the restriction that within the first and second block of eight groups tested, each of the eight conditions of the experiment was represented one time. The 4 subjects in each group were randomly assigned to one of the four seat positions.

In the whole groups, the generation procedure was identical to that in Experiment 1. For the quarter groups, subjects generated items from a different category on each "cycle." Prior to *each* pass down a row, the experimenter read aloud the name of one of the four categories. After four complete passes, four items from each of the four categories had been produced, at which point the subjects were reassigned chair positions. Each category occurred once in each of the four ordinal positions across the four seating rotations.

In the single groups, each successive item generated was from a different one of the four categories. Before each subject spoke, the experimenter indicated the category by turning over a card with a category name printed on it. The order of categories was counterbalanced by using a Latin-square arrangement, so that within each seating rotation (four times down a row of subjects), a member of each category was generated once by each subject. Thus, each subject generated four members from each category across the four seating rotations.

For the control groups, each of the 4 subjects was randomly assigned one of the four categories at the start of the experiment and generated items exclusively from that category throughout the group generation procedure. All other aspects of the generation task were the same as in the whole groups.

To summarize the generation procedure, subjects in the whole, quarter, and single groups generated a total of four members for each of the four conceptual categories, but in different production patterns. Control group subjects generated 16 members of one category and listened while the other 3 subjects produced 16 items from each of the three other categories. Subjects in all groups switched seat positions after each four cycles (16 responses). The experimenter wrote down each word generated and taped each session as a backup.

After the generation stage, all subjects performed the recall-own and recall-new tasks. These were identical to Experiment 1, except that subjects indicated their confidence in the correctness of each response produced by circling a letter next to it: P = positive, SS = somewhat sure, and G = guess.

Results and Discussion

The percentages of error responses produced during Experiment 2 are displayed in Table 1, separately for each task, generation pattern, and item type. Next to each percentage is the number of subjects, out of eight, who made that type of error. In addition to plagiarisms, two other types of errors are

Table 1
Percent Incorrect (% Inc.) Responses and Number of Subjects Exhibiting Each Type of Error (No., out of 8) in Experiment 2

	Generation				Recall own				Recall new			
	Plagiarism								Plagiarism			
	Others		Self		Plagiarism others		New		Others		Self	
Group	% Inc.	No.	% Inc.	No.	% Inc.	No.	% Inc.	No.	% Inc.	No.	% Inc.	No.
					Semantic categories							
Whole	5.0	4	0.0	0	5.5	3	1.6	1	10.9	8	0.8	1
Quarter	3.3	3	0.0	0	4.7	4	2.4	3	5.5	4	0.0	0
Single	12.5	8	0.0	0	9.4	6	4.7	5	13.3	7	0.0	0
Control			0.0	0			7.1	5	21.1	8	2.3	2
					Orthographic categories							
Whole	5.0	6	0.8	1	13.3	6	14.1	7	10.2	5	0.8	1
Quarter	7.5	7	1.6	2	12.5	8	15.6	7	16.4	8	2.3	2
Single	19.2	7	6.3	5	16.4	7	15.6	8	18.0	6	2.3	2
Control			9.4	6			18.0	7	16.4	7	0.8	1

presented in Table 1: self-plagiarisms (in the generate and recall-new tasks) and new-response intrusions (in the recall-own task).

Generation. Subjects in the control groups were excluded from this analysis because there was no person to plagiarize from (they were the only persons generating from their category). An ANOVA revealed a significant difference in the plagiarism percentage across generation pattern, $F(2, 42) = 7.34$, but not for the item type, $F(1, 42) = 1.91$, or for the interaction of generation pattern with item type, $F(2, 42) = 1.02$, $MS_e = 11.09$. A Newman-Keuls pairwise test applied to the generation pattern main effect revealed that the single group was significantly higher than both of the other groups, with no difference between whole and quarter groups. Therefore, jumping from category to category elicited more plagiarisms than did blocking category generations by 4 or 16 items. The overall intrusion rate of 8.8% across the experimental groups (whole, quarter, and single) was significantly higher than the chance rate of 1.6% (Gruenewald & Lockhead, 1980) $t(47) = 4.75$. This deviation from chance was also significant for both the semantic (6.9%; $t[23] = 3.54$) and orthographic (10.6%; $t[23] = 3.47$) conditions.

No self-plagiarism errors were made by subjects in the semantic condition during the generation task. However, there were a number of self-plagiarisms in the orthographic conditions, which differed significantly across generation patterns, $F(3, 28) = 4.62$, $MS_e = 0.73$. A Newman-Keuls test revealed significant pairwise differences only between the control and whole groups and between the control and quarter groups. A comparison of self-plagiarisms and other plagiarisms for orthographic subjects revealed a significantly greater number of other plagiarisms, $F(1, 21) = 9.16$, which did not interact with generation pattern, $F(2, 21) = 1.06$, $MS_e = 2.74$.

Recall own. Data are not presented for the control groups in the recall-own task because they could emit only self-plagiarisms. The rate of plagiarism was higher in orthographic than semantic conditions, $F(1, 42) = 8.85$, but there was no difference across the three generation patterns, $F(2, 42) = 1.08$, and no interaction of generation pattern with item type, $F < 1$, $MS_e = 4.37$. The plagiarism probability, across all three experimental groups, was 10.3%, which was significantly greater than chance (1.6%; Gruenewald & Lockhead, 1980), $t[47] = 4.47$. This difference from chance was significant within both semantic (6.5%; $t[23] = 3.54$) and orthographic (14.1%; $t[23] = 6.33$) conditions.

New-response intrusions showed the same pattern as plagiarisms. These errors were significantly more frequent in the orthographic than semantic conditions, $F(1, 56) = 28.04$, but there was no effect of generation pattern, $F < 1$, nor any interaction of generation pattern with item type, $F < 1$, $MS_e = 2.07$. A direct comparison of new-response errors versus plagiarisms revealed a significant difference for semantic groups, $F(1, 21) = 5.49$, $MS_e = 1.78$, but not for orthographic groups ($F < 1$). In summary, the new-response errors were more frequent with orthographic than with semantic materials, and plagiarisms exceeded new-response errors in semantic but not orthographic conditions.

An additional analysis addressed a possible alternative to cryptomnesia in the recall-own task. Suppose that when subjects recall their own responses, they have completely forgotten items produced by others during the generation task. Rather than plagiarizing items, they are selecting "new" items from their long-term memory store, some of which happen to duplicate those produced earlier by other subjects.

To check this possibility, the control groups were used to establish chance probabilities for coincidental overlap. For each control subject, *new* response errors from the recall-own task were compared with generated items from each of the three experimental groups. Three scores were computed for each control subject, indicating the probability of an erroneous new response duplicating a response produced by subjects in the whole, in the quarter, or in the single groups during the generation task. Excluding 4 control subjects who exhibited no intrusions, these resulting chance overlap probabilities were .26, .29, and .23 for comparisons with the whole, quarter, and single groups, respectively. In contrast, for the experimental group subjects, the proportion of total errors accounted for by plagiarisms was .54, .49, and .56 for the whole, quarter, and single groups, respectively. In other words, about half (.53) of the error responses in the experimental groups consisted of plagiarisms, while only a quarter (.26) of the control groups' error responses represent potential plagiarisms. This difference in overall proportions was significant, $z = 3.79$.

The final analysis of the recall-own data concerns the mean confidence ratings. As shown in Table 2, the preponderance of intruded items (plagiarized and new) was given a low confidence rating (guess), whereas the vast majority of correct items was given a high confidence rating (positive). After a numerical conversion of the confidence ratings ($P = 1$, $SS = 2$, $G = 3$), statistical tests revealed significant differences between plagiarized and correct responses, $t(28) = 9.51$, as well as between new and correct responses, $t(25) = 6.50$. A direct test between the plagiarized and new items was not performed because there was an insufficient number of subjects who exhibited both types of errors. However, the percentages indicate that subjects' confidence in repeated and new responses is very similar.

Recall new. Control group subjects were included in the analysis of plagiarisms in the recall-new task because they had the opportunity to plagiarize items generated by the other subjects. An ANOVA indicated no significant effect of item type ($F < 1$), generation pattern, $F(3, 56) = 1.66$, or their interaction, $F(3, 56) = 1.24$, $MS_e = 3.82$. The overall plagiarism probability of 14.0% was significantly higher than chance (1.6%; Gruenewald & Lockhead, 1980), $t[63] = 7.92$, and this deviation from chance was also significant within the semantic (12.7%; $t[31] = 5.30$) and orthographic (15.3%; $t[31] = 5.04$) conditions.

There were some self-plagiarisms in the recall-new task. As in the generation task, the semantic subjects were less likely to make this type of error than were orthographic subjects. Because of the small number of items and subjects involved, a statistical test was not performed.

The mean confidence ratings for correct versus plagiarized items produced in the recall-new task were presented in Table 2 (there was an insufficient number of self-plagiarisms to warrant inclusion in this table). As in the recall-own task, subjects were significantly more confident in correct compared with plagiarized responses, $t(45) = 5.57$. Interestingly, the mean confidence rating of plagiarized responses was significantly higher in the recall-new than in the recall-own task, $t(29) = 6.17$, on the basis of the 30 subjects (out of 48) in the three experimental groups who plagiarized in both tasks.

Combined analyses. As in Experiment 1, several global comparisons were made across tasks. In the first one, the rate of plagiarism was examined by using a 3 (task) × 2 (item type) × 3 (generation pattern) ANOVA. Although the probability of plagiarism increased across task, this difference was not significant, $F(2, 84) = 2.37$, $MS_e = 1.18$. There was an overall difference due to item type, $F(1, 42) = 7.68$, $MS_e = 3.37$, with the plagiarism rate higher with orthographic (13.2%) compared with semantic (7.8%) materials. Finally, there was a significant difference across generation pattern, $F(2, 42) = 4.75$, $MS_e = 3.37$, and a Newman-Keuls test revealed that the single group (14.8%) was significantly different from both the whole (8.3%) and quarter (8.3%) groups.

The second analysis examined correlations between the number of plagiarized responses in each pair of tasks. Correlations were computed separately for semantic and orthographic groups of subjects. None of the correlations within either subgroup of subjects was significant; they ranged from −.01 to .25. That this was the same as that found in Experiment 1 again suggests an independence across tasks in plagiarism probabilities.

The third analysis addressed the source of plagiarized responses. Combining the results across the three tasks, 110 words originated from the preceding person, 86 from the succeeding person, and 73 from the nonadjacent person. There was a significant difference among position, $F(2, 84) = 6.49$, $MS_e = 0.96$, and a Newman-Keuls test revealed that the preceding position was significantly different from each of the other two, with no difference between succeeding and nonadjacent positions. This replicated the outcome of Experiment 1.

The last analysis examined the normative frequency of plagiarized responses. Only semantic groups were considered because no association norms exist for orthographic categories. The median normative rank for all generated responses was 11, while the median rank for plagiarized responses was 8 (from recall-own and recall-new tasks only). The mean rank of 8.87 for plagiarized responses was significantly different from the expectation of 11, $t(59) = 2.29$. As in Experiment 1,

Table 2
Percent of Items in Each Confidence Rating Category for the Recall-Own and Recall-New Tasks in Experiments 2 and 3

	Confidence rating		
Task	Positive	Somewhat sure	Guess
	Experiment 2		
Recall own			
Correct (own) items	94.4	4.4	1.2
Plagiarized items	25.3	26.6	48.1
New items	24.5	19.4	56.1
Recall new			
Correct (new) items	89.8	8.3	1.9
Plagiarized items	51.4	38.7	9.9
	Experiment 3		
Recall own			
Correct (old) items	90.4	8.2	1.4
Plagiarized items	0.0	0.0	100.0
New items	10.4	20.6	69.0
Recall new			
Correct (new) items	83.8	11.6	4.6
Plagiarized items	30.3	45.5	24.2

subjects selectively plagiarized responses with a relatively higher normative frequency.

Experiment 3

Experiments 1 and 2 demonstrated that individuals were susceptible to inadvertent plagiarism in a social context, while generating oral responses in alternation with others. Will subjects also plagiarize information presented in a visual mode? In Experiment 3, subjects interjected their own, original responses at certain points in a series of visually presented exemplars.

Method

Subjects. Twenty-one subjects from Introductory Psychology classes at Southern Methodist University participated in the study on a voluntary basis, with extra course credit given as an incentive.

Materials. The same semantic categories from Experiments 1 and 2 were used again. The subjects were shown 12 exemplars from each category, which represented the odd-numbered frequency ranks between 1 and 23, inclusive, from the Battig & Montague (1969) norms. The odd-ranked items were selected in order to provide the subjects with a sufficient pool of "missing" members (even-ranked exemplars) to fill in during their turns at generation.

Procedure. Subjects were tested individually. They received a stack of 3 × 5 cards at the start of the experiment and were told that the stack contained 12 members from each of four different categories, with all members from a category appearing consecutively. Each category block was preceded by the category name on a separate card. Only one member of a category appeared on each card. After the first three members of a category, there was a blank card on which the subjects were instructed to write their own, original exemplar. The subjects were instructed to turn over the cards one at a time, placing them face down in front of them. After writing a response, they were to continue turning over cards, one at a time, and to write another new exemplar on the next blank card they encountered. They were also told not to look forward or backward to check items and to avoid generating an exemplar that had already been presented. For each category, every fourth card was blank.

Within each category, items were presented in order of decreasing normative frequency (increasing normative rank) in order to simulate a natural emission order and to reduce the probability that the presented items would duplicate those generated earlier by the subjects. The order of the four categories in the pack of cards was randomly determined for each subject.

Immediately after the subject finished, the cards were removed, and a recall sheet was provided. As with Experiment 2, each subject recalled his or her own four responses, as well as four new responses, for each category. Subjects rated their confidence in each response by using the same scale used in Experiment 2. All tasks were self-paced.

Results and Discussion

Generation. Ten subjects (out of 21) plagiarized responses from the presented items. The 13 repetitions accounted for 3.9% of the total number of responses, across all subjects. The rate of cryptomnesia is significantly different from chance (1.6%; Gruenewald & Lockhead, 1980), $t(20) = 2.25$, and is close to that found with similar materials and procedure in Experiment 1 (3.6%) and Experiment 2 (5.0%, semantic groups only). This is in marked contrast to what Gardiner et al. (1977) discovered in their comparison of oral (1.4%) versus written (0.3%) repetition rates in an episodic task. There was only *one* self-plagiarism produced across all subjects.

Recall own. When recalling their own responses, 9 of 21 subjects plagiarized list items, producing a total of 13 responses, or 3.9% of all responses. This was significantly different from chance, $t(20) = 2.15$. Fifteen subjects intruded new exemplars while attempting to recall their own, for a total of 29 responses, or 8.6% of the total responses. This difference between plagiarized and new responses was significant, $t(20) = 2.69$, and the opposite of that found in Experiments 1 and 2. The confidence ratings, in Table 2, mirror that found in Experiment 2. Subjects were considerably more confident in the accuracy of their correctly recalled responses compared with either plagiarized items, $t(8) = 5.95$, or new items, $t(14) = 3.05$.

Recall new. For the recall-new task, 16 of 21 subjects plagiarized at least one of the responses from the initial list. They generated a total of 33 plagiarized responses, or 9.8% of all responses across subjects. This plagiarism percentage was greater than expected by chance, $t(20) = 4.09$. Subjects were significantly more confident in the accuracy of their correct (new) responses compared with their incorrect (intrusion) responses, $t(15) = 2.45$. Furthermore, subjects who produced plagiarized responses in both the recall-own and recall-new tasks ($N = 7$) were significantly more confident in the accuracy of those produced during the recall-new task, $t(6) = 3.31$; this result is similar to that found in Experiment 2.

Combined analyses. In the global analyses, the difference in plagiarism across tasks was significant, $F(2, 40) = 7.19$, $MS_e = 0.93$, and a Newman-Keuls test confirmed that the recall-new task was higher than each of the other two. The correlations of the subjects' cryptomnesia rates comparing each pair of tasks were all nonsignificant, ranging from .02 to .26. As in Experiments 1 and 2, there appears to be independence across tasks in the rate of plagiarism.

With respect to the frequency level of plagiarized responses, the overall median frequency rank of items provided to the subjects was 12. Those items plagiarized in the recall-own and recall-new tasks had a median rank of 8. The mean rank of 9.48 differed significantly from 12, $t(46) = 2.45$, suggesting that subjects plagiarize items that are relatively higher in normative frequency.

General Discussion

The outcome of this series of investigations clearly supports the existence of unconscious plagiarism and shows that it is persistent across a variety of tasks, contexts, materials, and generation conditions. Recently experienced information can be inadvertently plagiarized shortly after the initial experience.

The percentage of plagiarized responses consistently exceeded the repetition percentages of 1.4 (Klee & Gardiner, 1976) and 1.6% (Gardiner et al., 1977) for episodic recall tasks, as well as the 1.6% (Gruenewald & Lockhead, 1980) and 0.4% (Experiment 1, control group) for semantic recall tasks. Cryptomnesia occurred whether the information was absorbed in an oral (Experiments 1 and 2) or a written (Experiment 3) format; this supports informal reports of cryptomnesia in both auditory (Jacoby & Kelley, 1987; Reed, 1974; Taylor, 1965) and written (Daniels, 1972; Meerloo, 1964) domains. Cryptomnesia is more prevalent when subjects generate from orthographic compared with semantic categories (Experiment 2), which is contrary to Johnson et al.'s (1982) finding that subjects have better source memory for orthographically based (first-letter) than semantically based associations.

The proportion of plagiarized items generally increased across the three successive tasks in each experiment. It is impossible to tell whether this increase is due to time or task because the two are confounded. Perhaps items experienced during the generation task retain residual activation in semantic memory, while their episodic tag fades rapidly. The fact that subjects' confidence of the correctness of plagiarized responses increases from the recall-own to the recall-new tasks in both Experiments 2 and 3 supports this speculation.

The most likely source of a plagiarized item is the individual speaking immediately before the subject, compared with persons in the succeeding and nonadjacent positions (Experiments 1 and 2). This selective plagiarism probably results from a moment of diminished attention just prior to the subject's participation. In research on the "next-in-line" phenomenon (Brenner, 1973; Brown & Oxman, 1978), subjects are required to take turns reading (not generating) items in a large group setting. Although subjects recall the items they read better than ones they didn't, confirming the generation effect (Slamecka & Graf, 1978), subjects' recall of items produced immediately preceding their own turn is especially poor. This deficit is most likely due to the impoverished processing of incoming information as one anticipates his or her impending participation. In support of this, Brown and Oxman (1978) discovered that the retrograde amnesia occurred only under conditions where subjects knew when they would be generating a response. When subjects didn't know if or when they would be asked to generate a response, no retrograde amnesia occurred for the preceding item. A similar effect may occur in the present design, where a word heard just before one's own generation is activated in semantic memory (Collins & Loftus, 1975) but does not register well in episodic memory because of the distraction prior to participation. Perhaps the magnitude of cryptomnesia would be decreased if the subjects did not know ahead of time exactly when they would participate.

The normative frequency of plagiarized words is relatively higher than the entire set of generated items for all three experiments. Johnson et al. (1981) found a similar effect with respect to source confusion. Subjects were significantly less accurate at identifying the correct source (experimenter or self) of high frequency, compared with low-frequency, exemplars. This also relates to the word-frequency effect in episodic memory (Underwood & Freund, 1970): High-frequency words are better recalled but more poorly recognized than are low-frequency words. This recall/recognition disparity may underlie cryptomnesia, in that subjects find the higher frequency category exemplars easier to generate (recall) but are less able to discriminate that these words have been experienced previously in the present context (recognition).

Previous studies on source amnesia indicate that it is especially likely to occur in situations of diminished information processing ability, including temporary or permanent amnesia (Schacter et al., 1984; Shimamura & Squire, 1987), senile dementia of the Alzheimer's type (Mitchell et al., 1986), slight cerebrovascular accident (Meerloo, 1964), normal aging (McIntyre & Craik, 1987), or white noise distraction (Gardiner et al., 1977). In Experiment 2, we found that increasing the difficulty of the monitoring task through either materials (orthographic categories) or generation procedure (one category exemplar at a time) increased the rate of plagiarism. The single groups showed overall higher levels of cryptomnesia than did either the whole or quarter groups. Similarly, the orthographic conditions resulted in more cryptomnesia than did semantic conditions.

Cryptomnesia is similar to certain implicit memory phenomena (Schacter, 1987), where an initial experience with a word results in a long-term activation. This shows up as improved performance on such tasks as word identification, reading speed, or fragment completion, even when subjects fail to explicitly remember earlier encounters with the particular words. In an implicit memory investigation related to the present study, Gardner, Boller, Moreines, and Butters (1973) had subjects first study a list of categorized words and then generate associates to category cues. They discovered that items studied in the first list intruded later as responses in the second task, even when subjects could not consciously recall those items from the earlier list.

Jacoby and Kelley (1987) have attempted to interpret cryptomnesia within the framework of the distinction between memory as a tool and memory as an object. Memory as a tool is used to carry out current tasks such as typing a letter or talking about the weather. Memory as an object, on the other hand, is used to reinstate a previous experience. Jacoby and Kelley speculate that trying to make memory serve both functions simultaneously is very difficult and may result in cryptomnesia. For example, with routine conversation there are numerous occasions where "...a word used by a person with whom we are conversing 'creeps' into our own comments. We do not notice the word as a repetition, rather, the word simply comes to mind more readily" (p. 315). To avoid inadvertent plagiarism would require using memory as object, continually scanning the immediately preceding verbal output so as to avoid duplication. This would obviously restrict our use of memory as tool and would make the smooth retrieval of words for the generation of conversational prose much more difficult.

Cryptomnesia has practical implications, particularly in the areas that demand the output of creative products. One such area is the generation of research ideas. Because of the social nature of scientific investigation, there are occasions where an idea shared informally with a colleague is inadvertently generated later by that person and claimed to be original (Bowers & Hilgard, 1986; Freud, 1901/1961; Jung, 1905; Meerloo, 1964; Taylor, 1965). Another area of creative endeavor in which cryptomnesia apparently occurs is music. Reed (1974) cites a personal experience where, as a young boy, he excitedly jumped out of bed one morning with a tune running through his head. After working for hours picking it out on the piano and transcribing it, he suddenly recognized it was the "Blue Danube Waltz." Musical cryptomnesia may account for a portion of copyright infringement cases involving songs. One of the most famous legal suits involved George Harrison of the Beatles. The song "My Sweet Lord," written by George Harrison, bore such a strong resemblance to the earlier song "He's So Fine," recorded by the Chiffons in 1962, that a lawsuit was brought against Harrison. During the trial, Harrison admitted that he had heard the earlier recording but denied that he intentionally copied it. However, "Judge Owen held that Harrison's work did infringe through what the courts felt must have been unintentional copying of what was in Harrison's subconscious memory" (Dannay, 1980, p. 681). The court acknowledged the possibility of unintentional copyright violation, or cryptomnesia, but held that persons are legally responsible for their own cryptomnesia.

Future research on cryptomnesia could follow a number of different directions. One pertinent dimension is the type of participation. All of the subjects in the present experiment were participants in the generation procedure. Would cryptomnesia occur when subjects simply observed the generation procedure? This question is intriguing in light of the discrepancy between the results of Brown and Oxman (1978), who found that observers recalled responses better than did generators, and the results of Raye and Johnson (1980), who discovered that observers had poorer source memory than did generators. This suggests that recall and source memory may be independent of each other, but recall and source identification need to be compared within one design.

Subjects' certainty of performance could also be manipulated in future investigations. In the present study, it was always very predictable. Brown and Oxman (1978) noted that as the subjects' ability to predict if and when they would be called upon to generate a response decreased, their recall of information generated also decreased. Cryptomnesia may covary with participation certainty in a similar manner.

One final dimension is the length of the retention interval. Johnson et al. (1981) found that source identification accuracy dropped substantially after a week to 10 days, although it was still above chance. Similarly, Schacter et al. (1984) discovered that source forgetting increased after a 1-week's delay but that source amnesia did not significantly change from retention tests given immediately (3%) to 1 week later (6%). With source amnesia being a closer parallel to cryptomnesia, one might expect that cryptomnesia would not change across time. But the apparent floor effect in Schacter et al.'s study makes such projections problematic. Although we found an increase in cryptomnesia across three tasks, it is indeterminate whether the increase was due to task or time. Certainly, an extension of the retention interval would create a better analogue of naturally occurring cryptomnesia, which may often involve months or years between a particular input and the subsequent, inadvertent "creativity."

References

Battig, W. F., & Montague, W. E. (1969). Category norms for verbal items in 56 categories: A replication and extension of the Connecticut category norms. *Journal of Experimental Psychology Monograph, 80*(3, Pt. 2).

Bowers, K. S., & Hilgard, E. (1986). Some complexities in understanding memory. In H. M. Pettinati (Ed.), *Hypnosis and memory* (pp. 3–18). New York: Guilford Press.

Brenner, M. (1973). The next-in-line effect. *Journal of Verbal Learning and Verbal Behavior, 12,* 320–323.

Brown, A. S., & Oxman, M. (1978). Learning through participation: Effects of involvement and anticipation of involvement. *American Journal of Psychology, 91,* 461–472.

Bousfield, W. A., & Rosner, S. R. (1970). Free vs. uninhibited recall. *Psychonomic Science, 20,* 75–76.

Collins, A. M., & Loftus, E. F. (1975). A spreading-activation theory of semantic processing. *Psychological Review, 82,* 407–428.

Cooper, L. M. (1966). Spontaneous and suggested posthypnotic source amnesia. *The International Journal of Clinical and Experimental Hypnosis, 14,* 180–193.

Daniels, G. H. (1972). Acknowledgement. *Science, 175,* 124–125.

Dannay, R. (1980). *Current developments in copyright law.* New York: Practicing Law Institute.

Evans, F. J. (1979). Contextual forgetting: Posthypnotic source amnesia. *Journal of Abnormal Psychology, 88,* 556–563.

Evans, F. J., & Thorn, W. A. F. (1966). Two types of posthypnotic amnesia: Recall amnesia and source amnesia. *The International Journal of Clinical and Experimental Hypnosis, 14,* 162–179.

Freud, S. (1960). The psychopathology of everyday life. In J. Strachey (Ed. and Trans.), *The standard edition of the complete works of Sigmund Freud* (Vol. 6). London: Hogarth Press. (Original work published in 1901)

Gardiner, J. M., & Klee, H. (1976). Memory for remembered events: An assessment of output monitoring in free recall. *Journal of Verbal Learning and Verbal Behavior, 15,* 277–233.

Gardiner, J. M., Passmore, C., Herriot, P., & Klee, H. (1977). Memory for remembered events: Effects of response mode and response-produced feedback. *Journal of Verbal Learning and Verbal Behavior, 16,* 45–54.

Gardiner, J. M., Thompson, C. P., & Maskarinec, A. S. (1974). Negative recency in initial free recall. *Journal of Experimental Psychology, 103,* 71–78.

Gardner, H., Boller, F., Moreines, J., & Butters, N. (1973). Retrieving information from Korsakoff patients: Effects of categorical cues and reference to the task. *Cortex, 9,* 165–175.

Gruenewald, P. J., & Lockhead, G. R. (1980). The free recall of category examples. *Journal of Experimental Psychology: Human Learning and Memory, 6,* 225–240.

Jacoby, L. L., & Kelley, C. M. (1987). Unconscious influences of memory for a prior event. *Personality and Social Psychology Bulletin, 13,* 314–336.

Johnson, M. K., & Raye, C. L. (1981). Reality monitoring. *Psychological Bulletin, 88,* 67–85.

Johnson, M. K., Raye, C. L., Foley, H. J., & Foley, M. A. (1981). Cognitive operations and decision bias in reality monitoring. *American Journal of Psychology, 94,* 37–64.

Jung, C. G. (1957). Cryptomnesia. In *Collected works* (Vol. 1, 95–106). Princeton: Princeton University Press. (Original work published in 1905)

Klee, H., & Gardiner, J. M. (1976). Memory for remembered events: Contrasting recall and recognition. *Journal of Verbal Learning and Verbal Behavior, 15,* 471–478.

Mayzner, M. S., & Tresselt, M. E. (1965). Tables of single-letter and digram frequency counts for various word-length and letter-position combinations. *Psychonomic Monograph Supplements, 1*(Whole No. 2), 13–32.

McIntyre, J. S., & Craik, F. I. M. (1987). Age differences in memory for item and source information. *Canadian Journal of Psychology,*

41, 175–192.
Meerloo, J. A. M. (1964). Plagiarism and identification. *Archives of General Psychiatry, 11*, 421–424.
Mitchell, D. B., Hunt, R. R., & Schmitt, F. A. (1986). The generation effect and reality monitoring: Evidence from dementia and normal aging. *Journal of Gerontology, 41*, 79–84.
Raye, C. L., & Johnson, M. K. (1980). Reality monitoring vs. discriminating between external sources of memories. *Bulletin of the Psychonomic Society, 15*, 405–408.
Reed, G. (1974). *The psychology of anomalous experience.* Boston: Houghton Mifflin.
Schacter, D. L. (1987). Implicit memory: History and current status. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 13*, 501–518.
Schacter, D. L., Harbluk, J. L., & McLachlan, D. R. (1984). Retrieval without recollection: An experimental analysis of source amnesia. *Journal of Verbal Learning and Verbal Behavior, 23*, 593–611.
Shimamura, A. P., & Squire, L. R. (1987). A neuropsychological study of fact memory and source amnesia. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 13*, 464–473.
Skinner, B. F. (1983). Intellectual self-management in old age. *American Psychologist, 38*, 239–244.
Slamecka, N. J., & Graf, P. (1978). The generation effect: Delineation of a phenomenon. *Journal of Experimental Psychology: Human Learning and Memory, 4*, 592–604.
Taylor, F. K. (1965). Cryptomnesia and plagiarism. *British Journal of Psychiatry, 111*, 1111–1118.
Thorn, W. A. F. (1960). *A study of the correlates of dissociation as measured by posthypnotic amnesia.* Unpublished honors thesis, University of Sydney, Sydney, Australia.
Underwood, B. J., & Freund, J. S. (1970). Word frequency effect and short-term recognition memory. *American Journal of Psychology, 83*, 343–351.
Voss, J. F., Vesonder, G. T., Post, T. A., & Ney, L. G. (1987). Was the item recalled and if so by whom? *Journal of Memory and Language, 26*, 466–479.

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