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Assigned value improves memory of proper names

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Names are more difficult to remember than other personal information such as occupations. The current research examined the influence of assigned point value on memory and metamemory judgements for names and occupations to determine whether incentive can improve recall of proper names. In Experiment 1 participants studied face–name and face–occupation pairs assigned 1 or 10 points, made judgements of learning, and were given a cued recall test. High-value names were recalled more often than low-value names. However, recall of occupations was not influenced by value. In Experiment 2 meaningless nonwords were used for both names and occupations. The name difficulty disappeared, and value influenced recall of both names and occupations. Thus value similarly influenced names and occupations when meaningfulness was held constant. In Experiment 3 participants were required to use overt rote rehearsal for all items. Value did not boost recall of high-value names, suggesting that differential processing could not be implemented to improve memory. Thus incentives may improve memory for proper names by motivating people to engage in selective rehearsal and effortful elaborative processing.

Keywords: Proper names; Value; Memory; Metamemory.

Proper names are especially difficult to remember compared with other personal information, such as a person's occupation (e.g., McCluney & Krauter, 1997; Terry, 1994). In a typical name-learning experiment individuals are asked to study faces paired with a name and/or other personal information, such as an occupation or a hobby. After studying this information their memory is tested, often by presenting a face and soliciting recall or recognition of information learned about that person. People consistently display poorer memory for proper names than for other personal information (for a review see Cohen & Burke, 1993). Indeed, McWeeny, Young,

Hay, and Ellis (1987) demonstrated that names were more difficult to remember than occupations, even when the stimuli were identical (e.g., Mr Carpenter versus employment as a carpenter). This name difficulty has been shown in both older and younger adults using recall (e.g., James, 2004; James et al., 2012) as well as recognition memory tests (James, Fogler, & Tauber, 2008).

Several theories (for a review see Cohen & Burke, 1993) have been proposed to explain the difficulty of proper name learning, including the *sequential stage model* (Bruce & Young, 1986), the *interactive activation and competition (IAC) model* (Burton & Bruce, 1992), *Node Structure*

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Theory (NST) (Burke, MacKay, Worthley, & Wade, 1991), and the *token reference model* (Semenza & Zettin, 1988). All of these theories hold that names are harder to recall than occupations because proper names have fewer semantic associations than occupations, and this reduced connectivity impairs recall. That is, people have difficulty remembering names because the name itself does not bear any meaningful relationship with the person it represents, unlike most other personal information. For example, Fogler, James, and Crandall (2010) had participants learn visually descriptive nicknames, psychologically descriptive nicknames, or proper names for novel cartoon characters. In accordance with theories of proper name learning, visually descriptive nicknames yielded the best memory performance because these nicknames carried representative semantic information.

Given the difficulty in remembering names, any manipulation that improves memory for proper names would be of applied and theoretical importance. Further, because memory for names is important in many social situations, identifying a method to boost recall would be beneficial. In the current study we attempted to improve memory for proper names by pairing proper names with point values. This manipulation was based on prior studies that observed that high-value items were recalled more frequently than low-value items (Castel, Benjamin, Craik, & Watkins, 2002; Castel, Farb, & Craik, 2007; Castel et al., 2011; Eysenck & Eysenck, 1982). For example, Castel et al. (2002) presented numeric point values of 1 or 10 during the presentation of stimuli, or immediately after the presentation of stimuli, in order to prevent inattention to low-value items. They found that the point value had an impact on memory even when the values were presented after the item, suggesting that selective inattention to low-value items is not solely responsible for diminished recall of low-value items (but see Soderstrom & McCabe, 2011). Thus value can improve memory performance when presented before or concurrently with the stimulus. Accordingly, we hypothesised that introducing an external incentive for name learning would facilitate name recall, perhaps by changing how participants encoded and rehearsed names.

In addition to investigating whether high value would improve memory for names, a second goal of the current project was to determine whether people could accurately assess the effects of incentive on their memory for names. In order

to do this we asked participants to provide predictions of their future memory performance (e.g., see Dunlosky & Metcalfe, 2009). Specifically, we solicited judgements of learning (JOLs) to ascertain whether monitoring judgements were consistent with actual recall, by comparing memory performance with JOLs.

Metamemory refers to knowledge and awareness of one's own memory, including one's ability to predict future memory performance (for a review see Koriat, 2007). People's JOLs tend to be moderately accurate, although some circumstances produce overconfidence (e.g., Koriat & Bjork, 2005; Rhodes & Castel, 2008). According to the *metacognition modifying attention hypothesis* (Castel, McGillivray, & Friedman, 2012), individuals may use metacognition to intentionally direct attention towards high-value information. Thus we wanted to evaluate whether JOLs and actual recall were similarly higher for important information and to determine whether consistent effects were observed for proper names and occupations.

Even though metamemory judgements are generally accurate, as noted previously, there are instances in which discrepancies between JOLs and actual memory performance arise. Of particular relevance to the current research, Tauber and Rhodes (2010) found that JOLs made for proper names were not always accurate. They had participants study faces paired with either a name or occupation and solicited a JOL after each pair. At test, participants attempted to recall the name or occupation given only the face. Participants were generally overconfident for recall of both names and occupations, and this poor metacognitive awareness may have exacerbated the difficulty of remembering proper names. Specifically, the disparity between JOLs and recall was larger for names than occupations. In another experiment participants were permitted to control the amount of time they studied each pair. After completing an earlier study-test block, participants learned from their prior experience, and in the second study-test block they effectively devoted more study time to names than occupations, improving memory for names. However, in all of the experiments the discrepancy in recall between names and occupations persisted. Thus from this set of experiments Tauber and Rhodes (2010) concluded that poor metacognitive monitoring contributes to the difficulty in recalling proper names.

The current set of experiments aimed to determine whether assigned value can improve memory for proper names. We first investigated the influence of value on name learning and then examined possible factors that may contribute to its impact. Throughout the experiments we included measures of metamemory to investigate how predictions of future memory performance relate to actual memory performance. Our experiments lend support for several theories of name learning and provide a potential method to facilitate name recall.

EXPERIMENT 1

In Experiment 1 we manipulated the point value for face–name and face–occupation pairs. Specifically, half of the stimuli were assigned a point value of 10 and half were assigned a point value of 1. Based on prior work (e.g., Castel et al., 2002), we predicted that participants would exhibit better memory for high-value compared to low-value items. Moreover, enhanced memory for high-value names and occupations may potentially eliminate the recall disparity between these types of items.

In addition to manipulating the value of each to-be-remembered item we also solicited JOLs for names and occupations, asking participants to anticipate the likelihood that an item would be recalled at a later test. Based on prior findings (Tauber & Rhodes, 2010) we predicted that participants' JOLs would be overconfident and insensitive to the difficulty of remembering names. In addition, consistent with previous research examining the impact of incentives on JOLs (Ariel, Dunlosky, & Bailey, 2009; Koriat, Ma'ayan, & Nussinson, 2006; Soderstrom & McCabe, 2011), we anticipated that high-value items would receive higher JOLs than low-value items. We also predicted that JOLs for names and occupations would be similarly influenced by value.

Method

Participants. Participants included 32 individuals (18 women) at Colorado State University ($M = 21.19$ years). Participants received \$10.00 as compensation.

Materials. A total of 28 male faces were presented; each face was paired with a word that could function as either a name or an occupation (e.g., Mr Cook vs cook; Mr Singer vs singer). These stimuli were identical to those used by Tauber and Rhodes (2010). The 28 faces were taken from a standardised material set developed by Minear and Park (2004), and were modified to include only the head and a small portion of the neck. All faces were displayed on a white background, and faces ranged in age from approximately 18 to 80 years. Responses to the first and last two studied pairs were not included in the analyses to minimise primacy and recency effects.

Each face was displayed with either a name or occupation presented below it (e.g., Mr Fisher or fisher), and below each name or occupation, a point value of either 1 or 10 was displayed. The stimuli were counterbalanced between participants such that each word appeared equally often as a name or occupation and equally often with a high or low point value.

Procedure. On each trial, a face along with a name or an occupation and a point value of either 1 or 10, was displayed on the screen for 8 seconds. The order of presentation of the faces was pseudo-random and fixed for all participants.

Participants were instructed to maximise their scores on the future memory test by recalling as many high-value items as possible. However, participants were also instructed that recalling any item (even 1-point items) would enhance their score. After studying a pair, participants were given 4 seconds to write down a JOL predicting how likely they were to remember the name or occupation, given only the face at test. During the JOL phase, the face and point value were presented with a scale from 0 “Not likely at all” to 100 “Very likely”. An inter-stimulus interval (ISI) of 500 ms followed each prediction slide. This process—study, JOL, and ISI—continued for a total of 28 faces. Next the process repeated for the same 28 pairs, so as to provide the participants a second opportunity to study the stimuli. This repetition procedure was implemented because of the inherent difficulty of the task (cf. Tauber & Rhodes, 2010).

Following the study phase participants performed a 3-minute filler task by solving arithmetic problems. Finally, during the test phase participants viewed each face presented alone for 10 seconds. They were instructed to recall the

name or occupation that was paired with that specific face. Participants wrote their responses on an answer sheet and were instructed to include “Mr” if they recalled a name. Participants’ responses were assessed based on the percentage of items that were correctly recalled.

Results

JOLs did not substantially differ based on whether they were solicited during the first phase or second phase and were combined throughout all analyses. Names were only regarded as correct if “Mr” was included in the response. An alpha level of .05 was used for all statistical tests.

Recall. We first examined the effect of value (high versus low) and item type (name versus occupation) on the percentage of items correctly recalled by using a 2×2 repeated-measures analysis of variance (ANOVA). Means are displayed in Figure 1. Results revealed that there was a significant main effect of item type, $F(1, 31) = 42.96, p < .001, \eta_p^2 = 0.58$, such that fewer names ($M = 26.82, SE = 3.08$) were recalled than occupations ($M = 46.88, SE = 4.18$). Additionally there was a marginal effect of value, such that high-value items ($M = 39.84, SE = 4.26$) tended to be recalled more frequently than low-value items ($M = 33.86, SE = 3.13$), $F(1, 31) = 3.15, p = .086, \eta_p^2 = 0.09$.

Importantly, a reliable interaction between value and item type was present, $F(1, 31) = 5.00, p = .033, \eta_p^2 = 0.14$. For low-value items, more occupations (47%) were correctly remembered than names (21%), a difference of 26 percentage points, $t(31) = 6.50, p < .001, r = 0.76$. Similarly, for high-value items, more occupations (47%) were correctly remembered than names (33%).

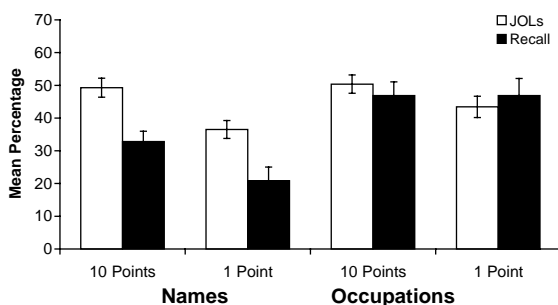


Figure 1. Mean percent (\pm standard error) of JOLs and actual recall for high- and low-value names and occupations in Experiment 1.

However, critically, for high-value items the difference in recall was narrowed to 14 percentage points, $t(31) = 3.42, p = .002, r = 0.52$. Further, a direct comparison of recall for high and low-value names also indicated that high-value names were recalled reliably more often than low-value names, $t(31) = 2.86, p = .007, r = 0.46$. Thus incentive differentially increased memory for names and succeeded in nearly diminishing the size of the proper name recall impairment in half.

Judgements of learning. Another 2×2 repeated-measures ANOVA was conducted on JOLs as a function of value and item type (see Figure 1). There was a significant main effect of value, $F(1, 31) = 15.52, p < .001, \eta_p^2 = 0.33$, such that high-value items received higher JOLs ($M = 49.82, SE = 2.78$) than did low-value items ($M = 39.96, SE = 2.79$). Further, there was a significant main effect of item type, $F(1, 31) = 10.89, p = .002, \eta_p^2 = 0.26$, such that occupations received higher JOLs ($M = 46.89, SE = 2.56$) than did names ($M = 42.88, SE = 2.56$). These main effects were qualified by a significant value by item type interaction, $F(1, 31) = 4.35, p = .045, \eta_p^2 = 0.12$. For low-value items, JOLs for occupations were significantly greater than JOLs for names, $t(31) = 3.03, p = .005, r = 0.48$. However, for high-value items, JOLs for names and occupations were not significantly different, $t < 1$. Thus JOLs were sensitive to the name difficulty for low-value items, but not for high-value items. Individuals predicted that they would recall high-value names and occupations at similar levels.

Comparing JOLs and recall. In order to compare memory predictions with actual recall, a three-way repeated-measures ANOVA was conducted on JOLs and recall as a function of the measure (JOLs or recall), value, and item type. Because measure-specific effects are already reported above, we only report the additional relevant comparisons between JOLs and recall. First, the main effect of measure approached significance, $F(1, 31) = 3.58, p = .068, \eta_p^2 = 0.10$, such that participants’ JOLs ($M = 44.89, SE = 2.49$) were numerically greater than their actual memory performance ($M = 36.85, SE = 3.34$).

The marginally significant main effect of measure was qualified by a significant two-way interaction between measure and item type, $F(1, 31) = 23.02, p < .001, \eta_p^2 = 0.43$. Tests of simple main effects revealed that, for names, there was a significant difference between JOLs and recall, $t(31) = 3.67, p = .001, r = 0.55$, such that JOLs

($M=42.88$, $SE=2.55$) reliably exceeded recall ($M=26.82$, $SE=3.08$). In contrast, for occupations, JOLs ($M=46.89$, $SE=2.56$) and recall ($M=46.88$, $SE=4.18$) were statistically equivalent, $t < 1$.

Discussion

Results from Experiment 1 showed that high-value names were recalled more often than low-value names. Thus incentives improved memory for proper names. Although names were still recalled less frequently than occupations, the inclusion of value cut the recall disparity in half. A different pattern was apparent for occupations. In particular, both high- and low-value occupations were recalled at similar rates, suggesting that such value effects are not ubiquitous.

Inspection of JOLs revealed that participants were overconfident of their memory for names, but were well calibrated (i.e., mean JOLs corresponded with mean recall performance) for occupations, consistent with Tauber and Rhodes (2010). JOLs were also sensitive to the value manipulation, with high-value items receiving higher JOLs than low-value items, consistent with prior work (e.g., Ariel et al., 2009; Koriat et al., 2006; Soderstrom & McCabe, 2011). Interestingly, participants predicted that occupations would be recalled more than names for low-value items, but that names and occupations would be recalled at similar levels for high-value items. Participants thus correctly acknowledged that value would boost memory for names. We return to this observation in the General Discussion.

EXPERIMENT 2

A key finding from Experiment 1 was that value influenced recall of names but not occupations. One possibility is that under conditions in which the meaningfulness of studied items differs substantially, high value promotes effortful semantic elaboration for *meaningless* items, whereas high value does not especially influence *meaningful* items. Because occupations already have extensive semantic associations, little change in additional elaborative processing for occupations would be expected with higher incentive. Given the difficulty of remembering names, in order for participants to maximise their scores it would be beneficial for participants to take advantage

of the semantic associations for *all* occupations regardless of value. Note, however, that under conditions in which all items have similar meaningfulness, high-value items are expected to be recalled more than low-value items, as has been observed in prior research (e.g., Castel et al., 2002, 2011).

To test this argument, in Experiment 2 we used meaningless nonwords for both names and occupations to determine whether value would similarly influence names and occupations when their meaningfulness was held constant. Additionally, we could ascertain if simply labelling an item as an occupation contributed to our observed effects. Consistent with previous literature positing that the superior recall of occupations is due to their inherently greater number of semantic associations (e.g., see Cohen, 1990; Cohen & Burke, 1993), we predicted that the discrepancy in recall between names and occupations would disappear with nonword stimuli, as these items have no pre-existing associations. Further, we predicted that higher incentives should lead to additional elaborative processing of both nonword names and nonword occupations because the stimuli are equally meaningless. Thus we predicted that value should impact nonword names and nonword occupations similarly, and that simply classifying something as an occupation would not make it more meaningful. In Experiment 2 we also solicited JOLs. We anticipated that participants' JOLs would be overconfident and that they would be sensitive to the value manipulation in the same manner as recall.

Method

Participants. Participants included 32 people (26 women) from the Scripps College community ($M=20.19$ years). Participants received a candy bar of their choice for their participation.

Materials and procedure. Experiment 2 was similar to Experiment 1, with one exception. The key difference in Experiment 2 was the type of words that were used for the names and occupations. These stimuli were pronounceable nonwords (e.g., daubner, monid, talmer) based on the nonword names and occupations used by Bruce, Burton, and Walker (1994) and by Cohen (1990). The words included in this experiment were specifically designed to be non-English words, to contain no actual word substrings, to

be relatively easy to pronounce, and to be distinct from one another. These nonwords should have no pre-existing semantic associations because the participants would never have seen the words previously. Thus they should be equally meaningless as names and as occupations. During the instructions participants were informed that they would see a face paired with a name or with a novel occupation. The procedure exactly followed that of Experiment 1.

Results

Spelling errors were expected, as participants had no previous exposure to the nonwords. Participants' recall responses were deemed correct even if one spelling mistake was made. However, we note that a stricter standard of scoring also produced the same pattern of results. As in the previous experiment, responses were only scored as correct if they were correctly designated as an occupation or name.

Recall. A 2×2 repeated-measures ANOVA on the percentage of items correctly recalled as a function of value and item type revealed that there was no difference in recall between nonword names ($M = 13.54$, $SE = 2.92$) and nonword occupations ($M = 16.67$, $SE = 2.80$), $F(1, 31) = 1.63$, $p = 0.211$, $\eta_p^2 = 0.05$ (see Figure 2). Additionally there was a significant influence of value on both names and occupations, $F(1, 31) = 4.48$, $p = 0.042$, $\eta_p^2 = 0.13$, such that high-value items were recalled more ($M = 18.75$, $SE = 3.76$) than low-value items ($M = 11.46$, $SE = 2.27$). Finally, value and item type did not interact, $F(1, 31) = 1.29$, $p = 0.265$, $\eta_p^2 = 0.04$.

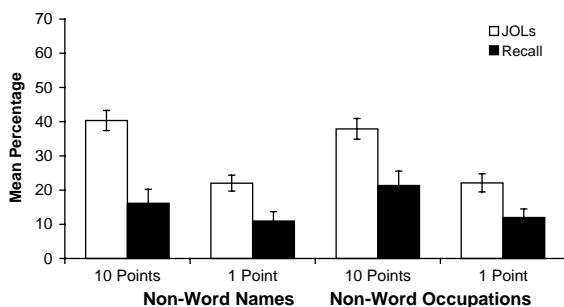


Figure 2. Mean percentage (\pm standard error) of JOLs and actual recall for high- and low-value nonword names and nonword occupations in Experiment 2.

Judgements of learning. A 2×2 repeated-measures ANOVA on JOLs as a function of value and item type displayed a similar pattern of results as for recall (see Figure 2). JOLs did not differ between names ($M = 31.18$, $SE = 2.36$) and occupations ($M = 30.00$, $SE = 2.37$), $F(1, 31) = 1.72$, $p = 0.199$, $\eta_p^2 = 0.05$. However, JOLs did significantly vary based on value, $F(1, 31) = 41.92$, $p < 0.001$, $\eta_p^2 = 0.56$, such that high-value items received higher JOLs ($M = 39.11$, $SE = 2.91$) than low-value items ($M = 22.07$, $SE = 2.40$). Value and item type did not interact, $F(1, 31) = 1.55$, $p = 0.222$, $\eta_p^2 = 0.05$.

Comparing JOLs and recall. To ascertain the relationship between JOLs and actual recall a $2 \times 2 \times 2$ three-way repeated-measures ANOVA was performed as a function of measure (JOLs or recall), value, and item type. Results indicated a significant main effect of measure, $F(1, 31) = 28.18$, $p < 0.001$, $\eta_p^2 = 0.48$, such that JOLs ($M = 30.59$, $SE = 2.32$) exceeded actual memory performance ($M = 15.10$, $SE = 2.58$). There was also a significant interaction between measure and value, $F(1, 31) = 7.96$, $p = 0.008$, $\eta_p^2 = 0.20$, such that value impacted JOLs and actual recall to different degrees. Tests of simple main effects revealed that, for JOLs, there was a significant impact of value, $t(31) = 6.47$, $p < 0.001$, $r = 0.76$, with high-value items given higher JOLs than low-value items. In comparison, for recall there was a more modest (but still significant) impact of value, with high-value items recalled more than low-value items, $t(31) = 2.12$, $p = .042$, $r = 0.36$.

Discussion

In Experiment 2 all of the items were nonwords in order to equate the semantic associations of names and occupations. Under these conditions names and occupations were recalled equally well. In addition, value influenced recall of both names and occupations, consistent with prior research demonstrating superior memory for high-value items when all of the items share similar levels of meaning (e.g., Castel et al., 2011). Hence these results in combination with Experiment 1, confirm our assertion that value influences recall when the meaningfulness of the stimuli is equated (Experiment 2), but that value need not influence recall when the meaningfulness of the stimuli is not equated, with meaningless items (i.e., names) displaying an

effect of value but with meaningful items (i.e., occupations) being less sensitive to value (Experiment 1). Thus the absence of an effect of value on occupations in Experiment 1 was likely due to the difference in the meaningfulness of the stimuli, with occupations possessing more semantic associates compared to names. This conclusion is in accord with theories that names inherently possess fewer semantic associations than do occupations (e.g., Burke et al., 1991), which we elaborate on in the General Discussion.

Finally, with regard to metamemory, high-value items received higher JOLs than did low-value items (Ariel et al., 2009; Koriat et al., 2006; Soderstrom & McCabe, 2011)—for both names and occupations. Also, nonword names and nonword occupations were predicted to be recalled at similar levels. Nevertheless, JOLs were consistently overconfident compared to actual recall, concordant with a variety of prior work (e.g., Koriat & Bjork, 2005; Tauber & Rhodes, 2010).

EXPERIMENT 3

Experiment 2 demonstrated that value had a similar effect on recall of names and occupations when nonword stimuli were used. We suggest that incentives encouraged differential processing of high-value items. Differential encoding or retrieval processes are proposed to contribute to value effects (e.g., Castel et al., 2002; Loftus & Wickens, 1970). Specifically, when value is presented during the encoding phase, as it is in the present experiments, participants might selectively rehearse high-value items to the exclusion of low-value items. This may be a similar process to the proposed selective rehearsal mechanism in the item-method directed forgetting literature, whereby to-be-remembered words are rehearsed to the exclusion of to-be-forgotten words (for a review see MacLeod, 1998). Additionally, individuals may engage in deeper processing of these incentivised items, creating new semantic associations for the previously meaningless words.

To determine whether the higher incentive indeed led to differential rehearsal in the prior experiments, for Experiment 3 we required individuals to carry out maintenance rehearsal, repeating an item aloud throughout the rehearsal period. We reasoned that this controlled rehearsal would impair any selective rehearsal that might have been used in the prior experiments by dividing attention and by engaging a uniform study

strategy. Alternatively, if differential rehearsal is not involved, or if the effects of value are due to demand characteristics, incentive should continue to influence recall despite controlled rehearsal. We anticipated that incentive would not influence recall for either names or occupations because all items were being processed by rote. Consequently the name/occupation difference would not be diminished. We continued to assess JOLs to determine whether restricted rehearsal leads to similar results for memory predictions and actual recall.

Method

Participants. Participants included 32 people (22 women) from the Scripps College community ($M = 20.91$ years). Participants received a candy bar of their choice for their participation.

Materials. The stimuli and experimental set-up were identical to those described for Experiment 1.

Procedure. The procedure was similar to that used in Experiment 1, with several key differences. Instead of studying the presented pairs silently, the participants were instructed to first read the point value aloud once and then to repeat the name or occupation aloud for the remainder of the study duration, lasting 8 seconds. The requirement to read the point value aloud verified that the participant attended to the point value on every trial.

Results

Recall. A 2×2 repeated-measures ANOVA was conducted on the percentage of items recalled as a function of value and item type (see Figure 3). Overall the level of recall was similar for high-value items ($M = 34.90$, $SE = 3.19$) and low-value items ($M = 35.16$, $SE = 3.24$), $F < 1$. Further, people recalled fewer names ($M = 30.99$, $SE = 3.07$) than occupations ($M = 39.06$, $SE = 3.07$), $F(1, 31) = 7.83$, $p = 0.009$, $\eta_p^2 = 0.20$. In addition, value did not interact with item type, $F < 1$. Thus when rehearsal strategy was restricted, value did not influence recall performance, yet names still were recalled less often than occupations.

Judgements of learning. A 2×2 repeated-measures ANOVA was conducted on JOLs as a

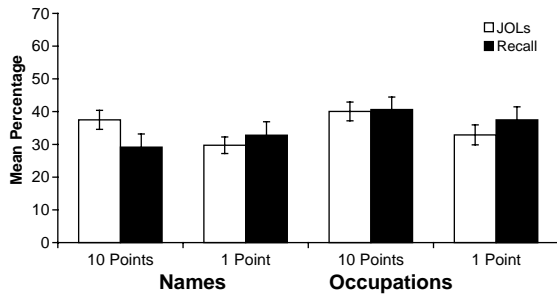


Figure 3. Mean percentage (\pm standard error) of JOLs and actual recall for high- and low-value names and occupations in Experiment 3 that implemented restricted rehearsal.

function of value and item type (see Figure 3). Unlike recall performance, for JOLs there was a significant main effect of value, $F(1, 31) = 24.85$, $p < 0.001$, $\eta_p^2 = 0.45$. Individuals gave higher JOLs for high-value items ($M = 38.78$, $SE = 2.83$) than for low-value items ($M = 31.32$, $SE = 2.69$). Additionally there was a significant main effect of item type, $F(1, 31) = 9.94$, $p = 0.004$, $\eta_p^2 = 0.24$, such that people gave higher JOLs for occupations ($M = 36.48$, $SE = 2.85$) than for names ($M = 33.62$, $SE = 2.53$). There was no significant interaction between value and item type, $F < 1$.

Comparing JOLs and recall. To compare individuals' JOLs with their memory performance a three-way repeated-measures ANOVA was performed as a function of the type of measure (JOLs or recall), value, and item type. There was no significant main effect for measure, $F < 1$. Participants' JOLs were similar to their actual memory. However, there was a significant two-way interaction between measure and value, $F(1, 31) = 5.26$, $p = 0.029$, $\eta_p^2 = 0.15$. Tests of simple main effects indicated that JOLs for high-value items were significantly higher than JOLs for low-value items, $t(31) = 4.99$, $p < 0.001$, $r = 0.67$. In contrast, recall of high-value items was equivalent to that of low-value items, $t < 1$. Thus individuals' metamemory judgements were influenced by value even though actual recall was not.

Discussion

Results from Experiment 3 demonstrated the often-observed recall discrepancy between names and occupations. However, contrary to previous value research and to Experiment 1, high-value items were *not* recalled more frequently than low-value items, and this insensitivity to value was observed for both names and occupations. Thus

instructing participants to use overt maintenance rehearsal removed the impact of value on memory for names. We suggest that rote rehearsal prevented the execution of additional elaborative rehearsal for high-value names, and this inability to deeply process high-value names contributed to the absence of incentive effects.

In contrast to their actual memory performance, participants' JOLs were higher for high-value items compared to low-value items (e.g., Soderstrom & McCabe, 2011). Further, participants were not overconfident in their memory predictions, as JOLs and recall were similar. A direct comparison of Experiments 1 and 3 revealed that JOLs were significantly lower in Experiment 3, $t(62) = 2.70$, $p = .009$, $r^2 = 0.11$. Imposing restricted rehearsal thus reduced JOLs.

GENERAL DISCUSSION

This research examined the impact of arbitrarily-assigned point values on memory and metamemory for names and occupations under three different experimental conditions: (a) with real names and occupations, (b) with meaningless nonword names and occupations, and (c) with real names and occupations when participants' rehearsal strategies were controlled.

Results from Experiment 1 revealed that the incentive manipulation succeeded at improving memory for proper names. The discrepancy in recall between names and occupations was smaller for high-value items. Nevertheless individuals still recalled names less frequently than occupations, suggesting that, although beneficial, the inclusion of value did not completely eliminate the pervasive discrepancy in recall between names and occupations. Further, although recall of proper names was sensitive to the value manipulation, recall of occupations was not. High and low-value occupations were recalled at similar levels.

To determine whether the absence of the value effect for occupations was due to their inherent abundant semantic associations rather than their classification as occupations, in Experiment 2 meaningless nonwords were used for both names and occupations. Under these conditions the disparity in recall between names and occupations was eliminated—nonword names and nonword occupations were recalled at similar levels. Additionally, value influenced both names and occupations, with high-value items being recalled

more than low-value items. Thus simply designating an item as an occupation or name did not influence recall. Instead, consistent with existing theories of name learning, the inherent paucity of semantic associations for proper names contributed to the difficulty in name learning when compared to the ample semantic associations for real-word occupations. When these semantic associations were equated by using nonwords, value influenced both item types similarly and the discrepancy in recall disappeared.

Finally, to examine a potential mechanism underlying the incentive manipulation, in Experiment 3 we constrained rehearsal, forcing participants to rehearse all of the stimuli consistently. With controlled rehearsal, value no longer influenced recall. Thus this result suggests that, under unconstrained conditions, people selectively process high-value items (cf. Atkinson & Shiffrin, 1968; Castel et al., 2002, 2011; Cuvo, 1974; Kunzinger & Witryol, 1984; Loftus & Wickens, 1970; MacLeod, 1998). They may selectively rehearse high-value items to the exclusion of low-value items. Additionally, participants may engage in more elaborative rehearsal of high-value items, perhaps effortfully generating new semantic associations for previously meaningless items (i.e., proper names, nonword names, and nonword occupations). Alternatively, the requirement to overtly rehearse names and occupations might have interfered with participants' ability to attend to point value, and this inattention to value may have led to this result. Nevertheless participants' JOLs were sensitive to value, indicating that they did attend to value information. Finally, even when rehearsal was equated for all of the stimuli, the gap in recall between names and occupations persisted. This highlights the continued relevance of methods to boost name recall.

Further, a comparison between recall performance in Experiment 1 and Experiment 3 provides additional support for the assertion that proper names lack many semantic associations. The rote rehearsal required in Experiment 3 curtailed elaborative processing, which numerically reduced recall of occupations, but did not impact recall of names, yielding a significant interaction, $F(1, 62) = 8.11$, $p = .006$, $\eta_p^2 = 0.12$. Thus the paucity of semantic associations for names made them immune to the normally detrimental effect of preventing elaborative rehearsal.

We note that our second experiment is not the first to use meaningless items for the study of name learning (e.g., Cohen, 1990). However,

Cohen's experiments differed from the current study by combining nonwords and real words (e.g., This man is called Mr Hobbs. He is a pilot. He has a blick). We observed similar levels of recall for nonword names and occupations in Experiment 2, consistent with the results of Cohen's second experiment in which recall did not differ between meaningless names and meaningless occupations. Importantly, the current experiment yielded these results without including meaningful items also paired with the cue, ruling out the possibility that the prior effects of meaning were only observed due to the contrast in meaning between simultaneously presented meaningful and meaningless words. Therefore the current findings support the theory proposed by Cohen (1990) that proper names are more difficult to recall than occupations because names are meaningless labels with few semantic associates whereas occupations have more semantic associations.

Similarly, our results are consistent with several other theories of name learning, which converge on the assertion that proper names are difficult to remember due to their impoverished semantic associations. Specifically, our findings are consistent with Node Structure Theory (NST) (see Burke et al., 1991; MacKay & Burke, 1990), which suggests that the difficulty of learning proper names reflects decreased connectivity of lexical nodes to propositional nodes for names compared to occupations. According to this theory our use of nonwords in Experiment 2 equated the connectivity of the lexical and propositional nodes for both names and occupations, which led to the equivalent recall of nonword names and nonword occupations. Burton and Bruce's (1992) interactive activation and competition model (IAC) proposes that occupations are more easily recalled because the semantic information is shared by a greater number of individuals, whereas names are harder to recall because fewer people share that information. Again, in our second experiment when both names and occupations were nonwords there was no obvious connection to any existing lexical knowledge for either item type, and therefore names and occupations were recalled similarly. Thus our series of experiments also lends support for these existing theories of name learning.

Our findings for JOLs indicate that judgements were sensitive to value. People consistently predicted that they would recall high-value items more than low-value items, even when actual

recall did not match this pattern (e.g., in Experiment 3 when constrained rehearsal eliminated the impact of value on recall). These results are in accord with those of Soderstrom and McCabe (2011), who also reported that value influenced JOLs. Consequently, because JOLs are sensitive to the importance of recalling certain stimuli over others, according to the metacognition monitoring attention hypothesis (Castel et al., 2012) these metacognitive cues might direct people to use special strategies for important information. Thus, as is consistent with our prior assertions, people may use selective rehearsal or selective elaboration to bolster recall of high-value information in response to metamemory cues.

Participants in Experiments 1 and 2 were frequently overconfident of their memory performance. However, in Experiment 1 individuals were generally sensitive to the name difficulty, giving higher JOLs to occupations than names. Note that this finding contrasts with the findings of Tauber and Rhodes (2010). The inclusion of the manipulation of value in the current experiment makes a direct comparison between the two studies difficult. Nonetheless we speculate that the manipulation of value may have contributed to the present results. Additionally, participants did not display such overconfidence in Experiment 3. This lack of overconfidence might be because the overt rehearsal requirement divided attention, as Barnes and Dougherty (2007) have shown that dividing attention reduced global JOLs. To our knowledge the current study is the first to document the effect of constrained rehearsal on JOLs. Future studies should further examine this effect as well as investigate the underlying mechanisms.

Overall, these experiments reveal a method to improve proper name learning. In particular externally applied incentives succeeded at enhancing recall of proper names. It should be noted, however, that the applicability of this method to real-life situations is still unknown. Future experiments are needed to determine if deliberately assigning high value to important names in everyday situations similarly boosts name recall as it did in a controlled lab setting. For example, future research could examine whether emphasizing the importance of remembering certain names (e.g., of doctors, professors, lawyers, in-laws, etc.) can improve memory for these names. Our data further support existing theories of name learning which posit that proper names are more difficult to recall than occupations because names have

fewer connections in semantic memory than do occupations. Incentives can reduce the disparity in recall between names and occupations by encouraging people to adopt differential encoding and rehearsal strategies such as selective rehearsal or increased semantic elaboration for high-value names. Thus, although names are difficult to remember, actions can be taken to facilitate their recall.

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REFERENCES

- Ariel, R., Dunlosky, J., & Bailey, H. (2009). Agenda-based regulation of study-time allocation: When agendas override item-based monitoring. *Journal of Experimental Psychology: General*, *138*, 432–447. doi: 10.1037/a0015928
- Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: A proposed system and its control processes. In K. W. Spence & J. T. Spence (Eds.), *The psychology of learning and motivation: Advances in research and theory*, Vol. 2. New York, NY: Academic Press. doi: 10.1016/S0079-7421(08)60422-3
- Barnes, K. A., & Dougherty, M. R. (2007). The effect of divided attention on global judgement of learning accuracy. *American Journal of Psychology*, *120*, 347–359.
- Bruce, V., Burton, A. M., & Walker, S. (1994). Testing the models? New data and commentary on Stanhope & Cohen (1993). *British Journal of Psychology*, *85*, 335–349. doi: 10.1111/j.2044-8295.1994.tb02528.x
- Bruce, V., & Young, A. W. (1986). Understanding face recognition. *British Journal of Psychology*, *77*, 305–327. doi: 10.1111/j.2044-8295.1986.tb02199.x
- Burke, D. M., MacKay, D. G., Worthley, J. S., & Wade, E. (1991). On the tip of the tongue: What causes word finding failures in young and older adults? *Journal of Memory and Language*, *30*, 542–579. doi: 10.1016/0749-596X(91)90026-G
- Burton, A. M., & Bruce, V. (1992). I recognize your face but I can't remember your name: A simple explanation? *British Journal of Psychology*, *83*, 45–60. doi: 10.1111/j.2044-8295.1992.tb02424.x
- Castel, A. D., Benjamin, A. S., Craik, F. I., & Watkins, M. J. (2002). The effects of aging on selectivity and control in short-term recall. *Memory & Cognition*, *30*, 1078–1085. doi: 10.3758/BF03194325
- Castel, A. D., Farb, N. A., & Craik, F. I. M. (2007). Memory for general and specific value information in younger and older adults: Measuring the limits of strategic control. *Memory & Cognition*, *35*, 689–700. doi: 10.3758/BF03193307
- Castel, A. D., Humphreys, K. L., Lee, S. S., Galván, A., Balota, D. A., & McCabe, D. P. (2011). The development of memory efficiency and value-directed remembering across the life span: A

- cross-sectional study of memory and selectivity. *Developmental Psychology*, *47*, 1553–1564.
- Castel, A. D., McGillivray, S., & Friedman, M. C. (2012). Metamemory and memory efficiency in older adults: Learning about the benefits of priority processing and value-directed remembering. In M. Naveh-Benjamin & N. Ohta (Eds.), *Memory and aging: Current issues and future directions* (pp. 245–270). New York, NY: Psychology Press.
- Cohen, G. (1990). Why is it difficult to put names to faces? *British Journal of Psychology*, *81*, 287–297. doi: 10.1111/j.2044-8295.1990.tb02362.x
- Cohen, G., & Burke, D. M. (1993). Memory for proper names: A review. *Memory*, *1*, 249–263.
- Cuvo, A. J. (1974). Incentive level influence on overt rehearsal and free recall as a function of age. *Journal of Experimental Child Psychology*, *18*, 167–181. doi: 10.1016/0022-0965(74)90098-8
- Dunlosky, J., & Metcalfe, J. (2009). *Metacognition*. Thousand Oaks, CA: Sage Publications, Inc.
- Eysenck, M. W., & Eysenck, M. C. (1982). Effects of incentive on cued recall. *Quarterly Journal of Experimental Psychology*, *34*, 489–498.
- Fogler, K. A., James, L. E., & Crandall, E. A. (2010). How name descriptiveness impacts proper name learning in young and older adults. *Aging, Neuropsychology, and Cognition*, *17*, 505–518. doi: 10.1080/13825580903477245
- James, L. E. (2004). Meeting Mr Farmer versus meeting a farmer: Specific effects of aging on learning proper names. *Psychology and Aging*, *19*, 515–522. doi: 10.1037/0882-974.19.3.515
- James, L. E., Fogler, K. A., & Tauber, S. K. (2008). Recognition memory measures yield disproportionate effects of aging on learning face–name associations. *Psychology and Aging*, *23*, 657–664. doi: 10.1037/a0013008
- James, L. E., Tauber, S. K., McMahan, E. A., Oberle, S., Martinez, A. P., & Fogler, K. A. (2012). Searching for interference effects in learning new face–name associations. *Memory*, *12*, 155–166. doi: 10.1080/09658211.649290
- Koriat, A. (2007). Metacognition and consciousness. In P. D. Zelazo, M. Moscovitch, & E. Thompson (Eds.), *The Cambridge handbook of consciousness* (pp. 289–325). New York: Cambridge University Press.
- Koriat, A., & Bjork, R. A. (2005). Illusions of competence in monitoring one's knowledge during study. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *31*, 187–194. doi: 10.1037/0278-7393.31.2.187
- Koriat, A., Ma'ayan, H., & Nussinson, R. (2006). The intricate relationships between monitoring and control in metacognition: Lessons for the cause-and-effect relation between subjective experience and behavior. *Journal of Experimental Psychology: General*, *135*, 36–69.
- Kunzinger, E. L. III, & Witryol, S. L. (1984). The effects of differential incentives on second-grade rehearsal and free recall. *Journal of Genetic Psychology*, *144*, 19–30.
- Loftus, G. R., & Wickens, T. D. (1970). Effect of incentive on storage and retrieval processes. *Journal of Experimental Psychology*, *85*, 141–147. doi: 10.1037/h0029537
- MacKay, D. G., & Burke, D. M. (1990). Cognition and aging: A theory of new learning and the use of old connections. In T. M. Hess (Ed.), *Aging and Cognition: Knowledge Organization and Utilization* (pp. 213–263). Amsterdam: North Holland. doi: 10.1016/S0166-4115(08)60159-4
- MacLeod, C. M. (1998). Directed forgetting. In J. M. Golding & C. M. MacLeod (Eds.), *Intentional forgetting: Interdisciplinary approaches* (pp. 1–57). Mahwah, NJ: Lawrence Erlbaum Associates Inc.
- McCluney, M. M., & Krauter, E. E. (1997). Mr Barber or a barber: Remembering names and occupations. *Psychological Reports*, *81*, 847–863.
- McWeeny, K. H., Young, A. W., Hay, D. C., & Ellis, A. W. (1987). Putting names to faces. *British Journal of Psychology*, *78*, 143–149. doi: 10.1111/j.2044-8295.1987.tb02235.x
- Minear, M., & Park, D. C. (2004). A lifespan database of adult facial stimuli. *Behavior Research Methods, Instruments, & Computers*, *36*, 630–633. doi: 10.3758/BF03206543
- Rhodes, M. G., & Castel, A. D. (2008). Memory predictions are influenced by perceptual information: Evidence for metacognitive illusions. *Journal of Experimental Psychology: General*, *137*, 615–625. doi: 10.1037/a0013684
- Semenza, C., & Zettin, M. (1988). Generating proper names: A case of selective inability. *Cognitive Neuropsychology*, *5*, 711–721. doi: 10.3758/BF03206543
- Soderstrom, N. C., & McCabe, D. P. (2011). The interplay between value and relatedness as bases for metacognitive monitoring and control: Evidence for agenda-based monitoring. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *37*, 1–7. doi: 10.1037/a0023548
- Tauber, S. K., & Rhodes, M. G. (2010). Metacognitive errors contribute to the difficulty in remembering proper names. *Memory*, *18*, 522–532.
- Terry, W. S. (1994). On the relative difficulty in recalling names and occupations. *American Journal of Psychology*, *107*, 85–94. Retrieved from: <http://www.jstor.org/stable/1423291>