Personality Differences in Spontaneous Personality Inferences at Encoding

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In this article, a method is described for studying personality differences in the spontaneous encoding of complex information about others, and is illustrated in a study of authoritarianism (F). Two sets of sentences were developed in pretesting. In the first set, events suggested a consensual disposition for each sentence actor to either high F (HF) or low F (LF) subjects. In the second set, events suggested a different consensual disposition to HF and LF subjects. Then 77 HF and LF subjects read both sets of sentences for a “memory study.” Consensual dispositions and semantic associates to the actors were used to cue recall. For the first set, there was a significant interaction between subject type, sentence type, and cue type. LF dispositions were more effective retrieval cues for LF than for HF subjects. Subjects had very little accurate awareness of having made trait inferences. No significant effects were found for HF cues alone or for the second sentence set. Results indicated that HF and LF subjects differ in their spontaneous social inferences about others and have little awareness of making these inferences. Implications for integrating trait and cognitive approaches to personality are discussed.

The interactionist approach to personality emerging from recent debates over personality traits (Magnusson & Endler, 1977) has taken several forms. Most research has been at a macrolevel, and demonstrates that the expression of traits is conditional upon situational variables, producing statistical interactions between traits and situations. Crowne and Marlowe’s (1964) work on the need for social approval, and Christie and Geis’ (1970) work on Machiavellianism provide numerous examples. More recent macrolevel research indicates that traits predict the individual’s active selection and even creation of different situations (dynamic interactions). Snyder’s (1979) work on self-monitoring, Swann’s (1983) research on self-esteem and self-verification, and research on self-consciousness (Turner, Scheier, Carver, & Ickes, 1978) describe some of the macrolevel processes involved. At this macrolevel, the smallest unit of analysis is the individual’s response or action.

More microlevel analyses break the production of behavior itself into multistage processes (e.g., attention, encoding, storage, retrieval), and examine effects of individual differences at particular stages. These may be measured with personality inventories more typically used to cue traits at the macrolevel, such as anxiety (Sarason, 1980), locus of control (LeFcourt, 1976), and depression (Alloy & Abramson, 1979). Or they may use measures developed with specific relevance to the process under investigation, such as attributional style (Anderson, Horowitz, & French, 1983; Ickes & Layden, 1978), the need for cognition (Cacioppo & Petty, 1982), and Higgins & King’s (1981) measures of construct accessibility. Finally, some programs investigate the cognitive structures upon which these processes depend (e.g., Cantor & Mischel, 1979; Markus, 1977).

It is frequently difficult to link the macro- and microlevels of analysis because traditional personality trait measures at the macrolevel are usually characterized by their specific content, rather than by their relevance to particular processes. And microlevel measures that focus on particular cognitive processes or structures often use relatively impoverished content. The ideal situation for empirically linking these levels of analysis would be to have paradigms for the study of microlevel processes and structures, which use materials with rich, clear macrolevel content. As Kihlstrom (1981, p. 133) has pointed out, when process or stage analyses of individual differences use relatively meaningless task materials, generalizing back to the content-laden macrolevel personality traits becomes extremely difficult. Achieving this ideal is rare, because of constraints imposed by the tasks used to study these processes. The largest meaningful stimulus units are typically single words (e.g., as in Kail & Levine’s, 1976, use of the release from proactive inhibition paradigm to study encoding processes, or Bem’s, 1981, use of clustering in free recall to study sex role schemata). This severely limits the complexity and specificity of the content used in such microprocess studies.

Therefore, paradigms which can use complex meaningful materials with clear relevance to macrolevel traits, and which nevertheless examine a single stage of information processing, are particularly valuable. Winter and Uleman (1984; Winter, Uleman, & Cunniff, 1985) have recently developed such a para-
This study was done in two parts. First, sentences were developed describing simple human actions, which subjects high and low on authoritarianism explained in terms of different dispositional attributions to the actors in the sentences. Then, other high and low authoritarian subjects' cued and noncued recall of these sentences were tested. We predicted that high authoritarians' dispositional attributions, from the first part of the study, would be effective retrieval cues for the high, but not for the low authoritarians, in the second part of the study, and vice-versa for low authoritarian cues.

Method

The study consisted of two parts: development of the sentence stimuli and the recall experiment itself.

Stimulus Development

On the basis of reviews of the literature (e.g., Cherry & Byrne, 1978; Dillehay, 1978) and examination of Byrne's (1974) balanced authoritarianism (F) scale items, 60 sentences were written in which we expected the actor's actions to suggest different dispositional inferences to subjects high (HF) and low (LF) on Byrne's balanced F scale. These sentences were pretested on a sample of 16 HF and 17 LF volunteers, selected from the top (>7) and bottom (<15) quartiles of the 629 introductory psychology students at New York University (NYU) during 1982-83 (mean = -4.58, SD = 15.9). The scale was administered as part of a larger battery of scales during the first 2 weeks of each semester.

Small groups of subjects were given an hour to work on booklets containing two randomly ordered lists of these 60 sentences. After each sentence in the first list, subjects were instructed to write "a judgment about why the event probably occurred, given the little information you have." Instructions preceding the second list of these same sentences asked them to "describe what kind of a person the subject of the sentence is...in two or three words."

Two raters rated the first list's causal attributions on a 4-point scale ranging from completely dispositional (4) to completely situational or nondispositional (1) (see Miller, Smith, & Uleman, 1981). On a subsample of 574 sentences, they showed 97.7% agreement, with 85% of the disagreements only one scale point apart. These were resolved through discussion. Mean ratings were computed for each sentence, as a measure of the likelihood that people infer dispositional causes for the sentence event when explicitly asked for attributions. We sought sentences with high likelihoods. Mean ratings are shown in Table 1 for the sentences finally selected.

The trait terms generated for each sentence in the second list were content analyzed (e.g., Uleman, 1972) for dispositional themes that differentially characterized either HF or LF subjects. In this analysis, we ignored the attributions subjects made in the first list. As a descriptive index, 2 x 2 chi-squares' p values were calculated for each potential trait term, to summarize its differential frequency in the two groups of subjects. These are shown in Table 1 for each sentence and dispositional cue selected for the recall study. We sought sentence cues with high differential frequencies and hence low p values, and which also seemed to be semantically unrelated to any of the other sentences selected.

Note that two kinds of sentences emerged from this phase of the pretesting: those with a single dispositional cue that was most frequent in intentional attributions by either HF or LF subjects, and those with two dispositional cues, one most frequent for HF and the other most frequent for LF subjects.

Up to this point, most sentence actors were designated by proper names (e.g., Carol). We next substituted occupational roles for these names. The roles we chose had strong semantic associates established...
Table 1
Stimulus Sentences and Their Dispositional and Semantic Cues, Causal Ratings, and Cue Strengths

<table>
<thead>
<tr>
<th>Sentence</th>
<th>Rating</th>
<th>Dispositional cue</th>
<th>$\chi^2(1, n = 30-33)^*$</th>
<th>$p$</th>
<th>Semantic cue</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-cue HF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. The architect loved the excitement of military parades.</td>
<td>3.32</td>
<td>Patriotic</td>
<td>4.21</td>
<td>.02</td>
<td>Buildings</td>
<td>20</td>
</tr>
<tr>
<td>2. The sailor stole six circus tickets for the orphans.</td>
<td>3.00</td>
<td>Loving and kindhearted</td>
<td>8.00</td>
<td>.01</td>
<td>Sea</td>
<td>20</td>
</tr>
<tr>
<td>3. The carpenter set aside his doubts and followed the president's</td>
<td>3.37</td>
<td>Submissive and unsure</td>
<td>7.06</td>
<td>.01</td>
<td>Wood</td>
<td>24</td>
</tr>
<tr>
<td>orders.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. The dirty child put the bread under her coat when no one in the store</td>
<td>3.24</td>
<td>Sneaky, criminal</td>
<td>4.57</td>
<td>.05</td>
<td>Toys</td>
<td>6</td>
</tr>
<tr>
<td>was watching.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. The decorator often imagined terrible accidents, when her husband</td>
<td>3.03</td>
<td>Distrustful</td>
<td>5.59</td>
<td>.02</td>
<td>Interior</td>
<td>14</td>
</tr>
<tr>
<td>drove the car.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. The veterinarian enjoyed several active sexual relationships at the</td>
<td>3.69</td>
<td>Fickle and thoughtless</td>
<td>5.56</td>
<td>.01</td>
<td>Dogs</td>
<td>26</td>
</tr>
<tr>
<td>same time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single-cue LF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>7. The butcher threw away his book on evolution and bought a Bible.</td>
<td>3.18</td>
<td>Religious</td>
<td>4.01</td>
<td>.05</td>
<td>Meat</td>
<td>44</td>
</tr>
<tr>
<td>8. The plumber spent hours looking for animal and flower shapes in the</td>
<td>3.37</td>
<td>Aristic dreamer</td>
<td>8.53</td>
<td>.01</td>
<td>Pipes</td>
<td>28</td>
</tr>
<tr>
<td>passing clouds.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. The mountaineer usually bought novels with happy endings.</td>
<td>3.76</td>
<td>Unrealistic optimist</td>
<td>4.76</td>
<td>.05</td>
<td>Climber</td>
<td>19</td>
</tr>
<tr>
<td>10. The receptionist told her parents she was living with her boyfriend.</td>
<td>3.14</td>
<td>Honest &amp; open</td>
<td>4.50</td>
<td>.05</td>
<td>Telephone</td>
<td>21</td>
</tr>
<tr>
<td>11. The barber organized a boycott of the X-rated movie.</td>
<td>3.39</td>
<td>Self-righteous moralist</td>
<td>4.74</td>
<td>.05</td>
<td>Hair</td>
<td>29</td>
</tr>
<tr>
<td>12. The reporter slapped her daughter several times, whenever she left</td>
<td>3.06</td>
<td>Harsh &amp; abusive</td>
<td>4.57</td>
<td>.05</td>
<td>Newspaper</td>
<td>21</td>
</tr>
<tr>
<td>her clothes on the floor.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Double-cue†</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. The deliveryman addressed his letter to The President, White House,</td>
<td>2.69</td>
<td>Respectful citizen</td>
<td>6.09</td>
<td>.02</td>
<td>Milk</td>
<td>26</td>
</tr>
<tr>
<td>Washington, D.C.</td>
<td>2.71</td>
<td>Political activist</td>
<td>5.60</td>
<td>.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. The electrician made obscene gestures as the President’s car drove</td>
<td>3.06</td>
<td>Rude &amp; disrespectful</td>
<td>4.21</td>
<td>.05</td>
<td>Wires</td>
<td>37</td>
</tr>
<tr>
<td>by.</td>
<td>2.87</td>
<td>Immature show-off</td>
<td>10.24</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Professor Williams listened to the student’s explanation, but still</td>
<td>2.87</td>
<td>Strong-willed &amp;</td>
<td>6.15</td>
<td>.02</td>
<td>Teacher</td>
<td>14</td>
</tr>
<tr>
<td>gave her an F.</td>
<td>3.12</td>
<td>stubborn</td>
<td>4.75</td>
<td>.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. The secretary invited the man she had just met at the party to come</td>
<td>3.62</td>
<td>Fair &amp; open-minded</td>
<td>3.86</td>
<td>.05</td>
<td>Typist</td>
<td>19</td>
</tr>
<tr>
<td>home with her.</td>
<td>3.71</td>
<td>Promiscuous slut</td>
<td>3.86</td>
<td>.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. The dentist went to church when the stock market dropped 50</td>
<td>3.31</td>
<td>Friendly, assertive</td>
<td>9.31</td>
<td>.01</td>
<td>Tooth</td>
<td>40</td>
</tr>
<tr>
<td>points.</td>
<td>3.29</td>
<td>Depressed or afraid</td>
<td>3.86</td>
<td>.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. The pilot reported his neighbor to the police for smoking marijuana.</td>
<td>3.12</td>
<td>Greedy fool</td>
<td>8.96</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. The blacksmith turned his neighbor in for washing his car during</td>
<td>3.33</td>
<td>Honest citizen</td>
<td>4.57</td>
<td>.05</td>
<td>Airplane</td>
<td>49</td>
</tr>
<tr>
<td>the water shortage.</td>
<td>3.12</td>
<td>Noisy</td>
<td>4.57</td>
<td>.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. The cook read the newspaper while her children fingerpainted on the</td>
<td>3.25</td>
<td>Worried citizen</td>
<td>6.00</td>
<td>.02</td>
<td>Horses</td>
<td>19</td>
</tr>
<tr>
<td>wall.</td>
<td>3.35</td>
<td>Over-anxious</td>
<td>5.93</td>
<td>.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.35</td>
<td>Careless and uncaring</td>
<td>8.13</td>
<td>.01</td>
<td>Food</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>3.35</td>
<td>Tired and listless</td>
<td>7.57</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: HF = high authoritarianism; LF = low authoritarianism. Causal ratings varied from entirely nondispositional (1) to entirely dispositional (4).
* Chi square and $p$ values for frequencies that HF versus LF subjects used that disposition. † % of pretest sample ($n = 107$) who gave this as their first associate. ‡ For double-cue sentences, ratings and dispositional cue data are shown for HF and LF subjects, respectively.
PERSONALITY DIFFERENCES IN PERSONALITY INFERENCE

in previous research (see Winter & Uleman, 1984), and that their associates appeared to be semantically unrelated both to the sentence predicates and the dispositional cues developed earlier. Table 1 lists the semantic associates for the sentence actors, and the percentage of another sample of 107 NYU introductory psychology students which gave that semantic associate to the occupational role.

Thus, the sentences in Table 1 were selected because pretest subjects gave primarily dispositional attributions to them; there were consensus dispositions given differentially by HF and/or LF subjects, and these were semantically unrelated to the sentence actors or the other sentences. In addition, their dispositional implications are roughly balanced for positive and negative affect, within sets. These 12 single-cue and 8 double-cue sentences were next arranged into blocks of two sentences each, such that the average dispositional cue's strength (indexed by chi square) within each block matched the other blocks as closely as possible. Table 1 lists the sentences by these blocks, so that Blocks 1 through 3 (Sentences 1 and 2, 3 and 4, 5 and 6, respectively) are HF; single-cue sentences; Blocks 4 through 6 are LF; single-cue sentences; and Blocks 7 through 10 are double-cue sentences. These sentence blocks were then used to create separate Latin square designs for the recall study for single- and double-cue sentences.

Recall Study

Subjects. One hundred seven volunteers from introductory psychology were selected from the extreme quartiles of the class on Byrne's balanced F scale (>6 and < -17; resulting mean = -8.64, SD = 22.9), which was given in class during the first 2 weeks of the 1983 fall semester as part of a battery of scales. As part of the recall study, they took the F scale a second time. Although the correlation between the two administrations, which were separated by 4 to 6 weeks, was quite high (r = .90, p < .0005), there were several subjects whose scores changed considerably (M = -10.36, SD = 21.66). Therefore, to create roughly equal groups of extreme subjects, they were included in the final analysis only if their second F scale scores exceeded 0 (n = 38, M = 13.76, SD = 7.71) or were less than -22 (n = 39, M = -33.15, SD = 9.20). Note that these cutoff scores are lower than those used for stimulus development. In terms of the 990 subjects tested over three semesters, scores over 0 are in the top 41% and scores below -22 are in the lower 18%.

Procedure. Groups of 6 to 15 HF and LF subjects were presented with the two sets of stimulus sentences—single cue and double cue—one sentence at a time for about 5 s each, using a Carousel slide projector. Subjects were initially instructed to study each sentence "carefully, because your memory for it will be tested later. After the sentences, there will be a series of anagrams . . . As we go along, there will be instructions for each part of the study. At the end, we have a questionnaire about your experiences and observations."

About half the subjects were then shown the 12 single-cue sentences, whereas the other half began with the 8 double-cue sentence set. Within each sentence set, the sentence slides were shown in a different random order to each group. Subjects were not told how many sentences would appear in each set. Immediately after the last sentence in the first set, all subjects were asked to write down whatever thoughts you may have had as you read and tried to remember the last sentence. This open-ended awareness probe was scored for the presence of personality or dispositional terms. The probe was followed by a 2-min anagrams task shown on slides, to permit short-term memory decay, and then by the distribution of cued-recall sheets for the first sentence set. Subjects had 10 min to recall as many sentences as possible.

After a brief pause, subjects were told that the first part of the study was complete, and that the second part was "very similar except that the sentences and anagrams are different." The procedure for presenting the second sentence set was the same, except the awareness probe was omitted. After 10 min for recall of the second set, subjects filled out two open-ended questions and a series of 10-point rating scales on how often they had used several possible strategies for memorizing and recalling the sentences, including use of visual imagery, word associations, and personality impressions, and finally the balanced F scale for a second time.

Cued-recall sheets. The cued-recalled sheets for the 12 single-cue sentences contained 12 lines: two preceded by HF dispositional cues, two by LF dispositional cues, four by semantic cues, and four by no cue. There were three different versions of this recall sheet, corresponding to three different Pairings of cue type (dispositional, semantic, and none) and sentence block produced for each sentence type (HF and LF) by rotating blocks through cue types in a Latin square design. The cued-recall sheet for the eight double-cue sentences contained two HF dispositional cues, two LF dispositional cues, two semantic cues, and two blank lines. There were four different versions of this recall sheet, corresponding to four different Pairings of cue type and sentence block produced by a Latin square design. Within each half of the group recall sessions, recall sheet versions were randomly distributed to subjects, within the constraint of obtaining roughly equal cell means.

Scoring. Recall was based on the gist of four sentence parts: actor, verb, object, and modifying phrase. Each sentence thus received 0 to 4 points. Interscorer reliability between two scorers exceeded 95%. Subjects' thoughts about the last sentence in the first set and their responses to the two open-ended awareness questions were scored (0, 1) for any mention of the actor's personality or traits, with 97% interscorer agreement on a subset of 100 responses.

Design. The design for the single-cue sentence set was a 2 x 3 x 2 x 4 factorial analysis of variance (ANOVA), in which between-subjects factors were Subject Type (2: HF and LF), block-cue Pairing (3), and Order in which the sentence sets were shown (2); within-subjects factors were Cue Type (3: dispositional, semantic, and no cue), Sentence Type (2: HF and LF), and Sentence Part (4: actor, verb, object, and phrase). The design for the double-cue sentence set was a 2 x 4 x 2 x 4 factorial ANOVA, with between-subjects factors Subject Type, block-cue Pairing, and Order, and within-subjects factors Cue Type (4: HF dispositional, LF dispositional, semantic, and no cue) and sentence part. Recall scores for the last sentence in the first set shown (which differed for each group of subjects) were eliminated from all analyses, because that sentence was given special attention by the awareness probe.

Results

Single-Cue Sentence Recall

Recall scores were subjected to an unweighted means ANOVA for the 2 x 3 x 2 x 3 x 2 x 4 design described earlier. Cell sizes varied from 4 to 8 and averaged 6.4. Our major hypothesis predicted a Subject Type x Cue Type x Sentence Type interaction. But before the effects of subjects' authoritarianism are examined, it is important to establish that spontaneous trait attributions occurred and replicated previous findings.

Replication of previous results. Recall was highest with semantic cues (48.0%), followed by dispositional cues (39.0%), and no cue (28.8%), F(2, 130) = 16.43, p < .0005. There were differences among recall of the sentence parts of actor (43.8%), object (37.7%), verb (36.6%), and phrase (36.4%), F(3, 195) = 19.96, p < .0005. The Cue Type x Sentence Part interaction obtained in previous research (Winter & Uleman, 1984; Winter, Uleman, & Cunniff, 1985) was also significant, F(6, 390) = 15.19, p < .0005. Recall of actors was better with semantic (62.1%) than with dispositional (39.5%) cues, t(76) = 6.46, p < .0005; and this was better than noncued recall (29.6%), t(76) =
2.49, p < .015. For other sentence parts, semantic-cued recall (41.8% to 44.5%) and disposition-cued recall (37.0% to 40.8%) did not differ, but both were superior to noncued recall (27.6% to 30.4%). $t(76) > 2.72$, $p < .01$. In the previous research cited, disposition-cued recall for predicate parts was significantly better than semantic-cued recall. This, and our use of the same semantic cues here, indicates relatively weaker dispositional cues were used in the present study, which is not surprising because they were selected to be relevant to only half of the subjects.

**Authoritarianism effects.** LF subjects recalled more (42.3%) than HF subjects (34.9%), $F(1, 65) = 4.67$, $p = .034$. LF sentences were better recalled (44.3%) than HF sentences (34.0%), $F(1, 65) = 19.46$, $p < .0005$. There were two significant interactions involving subjects' authoritarianism. One was the predicted Subject Type × Cue Type × Sentence Type, $F(2, 130) = 3.95$, $p = .022$. Cell means are shown in the upper half of Table 2. This three-way interaction was qualified by a five-way interaction which also included pairing and order, $F(4, 130) = 3.26$, $p = .014$.

The five-way interaction among subject type, pairing, order, cue type, and sentence type was examined by performing a Subject Type × Cue Type × Sentence Type ANOVA on each of the six combinations of pairing and order; ns varied from 10 to 15. That half of the subsamples with the most reliable three-way interactions (order 1, pairings 1 and 2; and order 2, pairing 3; $p > .09, .007$, and .14, respectively) was combined and analyzed as a single sample, $n = 35$. This Subject Type × Cue Type × Sentence Type × Sentence Part ANOVA yielded three main effects, similar to those just described, for Cue Type, $F(2, 66) = 7.18$, $p = .002$, sentence type, $F(1, 33) = 14.02$, $p = .001$, and Sentence Part, $F(3, 99) = 17.93$, $p < .0005$. There was also a Cue Type × Sentence Part interaction, $F(6, 198) = 6.81$, $p < .0005$, similar to that just described.

**Sentence type effects.** For the full sample, there was a significant difference among sentence types, $F(2, 66) = 3.75$, $p < .0005$, and $F(3, 130) = 5.21$, $p = .0005$. The only significant difference among the three sentence types was that for HF sentences, $F(2, 66) = 3.75$, $p = .014$. In the half sample, there were no significant differences among sentence types; instead, there was a significant difference among sentence types, $F(2, 30) = 3.43$, $p = .015$. Sentence type effects were also significant in the full sample, $F(2, 66) = 4.33$, $p = .015$. This three-way interaction was also significant in the full sample and the half sample, $F(2, 130) = 3.26$, $p = .014$. In the full sample, $F(2, 66) = 3.26$, $p = 3.32$, and in the half sample, $F(2, 30) = 2.23$, $p = .015$. The main effect of sentence type noted earlier, two recall indices were calculated. The first index was simply the difference between dispositions and semantic-cued recall. This provided a measure of disposition-cued recall, relative to recall cued by neutral words unrelated to authoritarianism. The second index incorporated noncued recall as well, by first computing the advantage of cued over noncued recall (semantic minus noncued), and then by subtracting this from disposition-cued recall. Comparison of subject types on these two indices also yielded significant differences in the predicted direction, but again only for low authoritarian sentences. On the
Thus, the predicted three-way interaction with authoritarianism was significant for the entire sample (\(p = .022\)), and though qualified by higher-order interactions with pairing and order, was highly significant in the predicted directions among at least half the pairing by order conditions (\(p = .005\)). Note that these condition combinations included all pairings and orders, and that all sentences were included in each combination. This interaction was entirely because of predicted differences on the low authoritarian sentences.

**Double-Cue Sentence Recall**

Recall scores were analyzed with an unweighted means ANOVA for the 2 × 4 × 2 × 4 × 4 design described earlier. Cell sizes varied from 2 to 8, and averaged 4.8.

The only significant main effects were for Cue Type, \(F(3, 183) = 5.91, p = .001\), and Sentence Part, \(F(3, 183) = 12.68, p < .0005\). Semantic cues were more effective (63.2%) than HF disposition cues (51.9%), which surpassed LF disposition cues (46.0%) and no cues (44.2%). Phrases were recalled best (56.0%), followed by verbs (52.6%), objects (50.7%), and actors (45.9%). There were also uninterpretable Pairing × Cue Type, \(p < .0005\), Order × Cue Type × Sentence Part, \(p = .022\), and Pairing × Order × Cue Type × Sentence Part, \(p = .029\), interactions.

None of the interactions with subject type approached significance, \(ps > .20\). Therefore, these data were not analyzed further.

**Awareness**

On the 10-point awareness rating scales, subjects indicated that they made inferences about sentence actors' personalities about half the time, both when memorizing (58.4%) and recalling (59.9%) the sentences. Mentioning personality traits in the awareness probe immediately after the last sentence of the first set, and in the two open-ended awareness questions, was much less frequent: 15.9%, 14.3%, and 5.2%, respectively. In order to assess whether reported awareness was related to the actual effectiveness of the disposition cues for single-cue sentence recall, Pearson \(r\)'s were computed between these five measures and recall of HF sentences, LF sentences, and LF subjects on LF sentences. Of the 40 correlations calculated, only four reached the .05 significance level, so they may be because of chance. Awareness on the immediate probe correlated with the ratio measure of disposition-cued recall of HF sentences, \(r = .26\), for the full sample, but was not significant for LF sentences, \(r = -.03, p > .40\). Open-ended awareness of encoding strategies involving personality inferences correlated with the ratio measure of recall of LF sentences, \(r = .25, p = .015\), for the full sample, and \(+.32, p = .022\), for the LF subjects. And among the HF subjects, disposition-cued recall of HF sentences correlated with rated use of personality inferences at retrieval, \(r = .27, p = .049\).

**Discussion**

Results with the single-cue sentences clearly supported our prediction of a Subject Type × Cue Type × Sentence Type interaction. Subjects' authoritarianism interacted with the content of the sentences and the dispositions they implied to each subject type, to determine how effective those dispositions were as retrieval cues. This occurred even though subjects had no intention or instruction to infer sentence actors' dispositions, and even though there was, at most, a weak relation between their self-reports of making such inferences and the cues' effectiveness at recall. On the basis of Tulving's principle of encoding specificity, this indicates that high and low authoritarian subjects spontaneously made different dispositional attributions from the sentences, at encoding, without intentions or awareness of having done so.

It is also possible that our effects were because of, in part, differences in retrieval processes as well. HF and LF subjects may differ sufficiently in their long-term semantic memory organization, so that the same cue words activate different retrieval pathways or networks. This explanation seems unlikely for three reasons. First, as in previous research with this paradigm, the disposition cues do not generally have as strong a priori associations to words in the sentences as the semantic cues do. Therefore, previous research showing that dispositional cues are superior or equivalent to semantic cues' effectiveness in cueing sentence recall indicates that associations between sentences and disposition cues must have been established during the experiment, for example, at encoding (Winter & Uleman, 1984; Winter, Uleman, & Cunniff, 1985). Disposition cues were not quite as effective as semantic cues in the present study, because they were selected to be appropriate for only half the subjects.

Second, Winter, Uleman, and Newman (1985) have recently shown that it is possible to vary the encoding context of sentences similar to those used here, and thereby manipulate their dispositional and causal implications. In this research, the same sentences in different encoding contexts had different implications. They showed that the implication produced at encoding was an effective retrieval cue for the sentence, whereas the other implication was not, even though the sentence itself was the same for all subjects. Because only one cue and not the context was present at retrieval, this effect must depend primarily upon encoding processes. Third, Uleman, Winter, and Newman (1985) have recently shown that a cognitive task performed concurrently with sentence encoding selectively reduces the effectiveness of only disposition cues.

Unfortunately, effects in the present study were not as robust or pervasive as we had hoped. Comparison of cell means showed HF and LF subjects' disposition-cued recall was significantly different for only the LF sentences. Why might that be so? The most apparent reason is that our sample was skewed so that our "high F subjects" were actually only moderate to high F subjects. Recall that our sample means were always negative, and that they became more negative as the study progressed from stimulus development subjects (\(M = -4.6\)), to initial selec-
tion of recall subjects (M = -8.6), to these same subjects' second F scale following recall (M = -10.4). These shifts were unanticipated and because of random changes in the subject pool. They produced groups of very LF subjects and mixed moderate-to-HF subjects for the recall study. As a consequence, results for the LF sentences were fairly clear, but HF sentence effects were not obtained. (Supplementary analyses with more extreme cutoff points failed to yield the predicted effects, because of the loss of statistical power.)

In addition, it should be noted that our use of college educated psychology students mitigated against obtaining a very HF sample. Byrne (personal communication, November 6, 1985) has noted that studies using samples that are representative of the general population obtain much higher average scores. Although no general norms are available, our means appear to be typical for undergraduates in psychology courses. For example, Byrne and Przybyla (1980) found that 119 such subjects at State University of New York-Albany averaged -9.6.

The other major limitation in our findings was the failure to obtain the predicted effects with the double-cue sentences. In retrospect, this stimulus set represented a long-shot in several ways. First, double-cue sentences were less common and harder to develop. That is why there were only eight in this set. Not only did subjects on one extreme of the F scale have to give a fairly consensual dispositional attribution, but those on the other extreme had to give a different consensual disposition, and both groups' ratings of the sentence event's cause had to be similarly dispositional. Second, the smaller set of potential sentences forced us to use several sentences with overlapping content. This reduced the likelihood of differential recall across conditions. Sentences 13 and 14 involve the U.S. President, and Sentences 18 and 19 involve reporting violations of the law. And third, there is more overlap in disposition cue meanings than we have allowed in previous research, or than is present in the single-cue sentences. Three cues refer to "citizen," which only seemed acceptable to us in the initial design because they are all HF cues. Both disposition cues for Sentence 13 are political. Both cues for Sentence 14 can mean "obnoxious." And both cues for Sentence 20 can mean "apathetic." Given this overlap in both sentence and disposition cue content, it should not be surprising that the predicted Subject Type x Cue Type interaction did not occur.

Nevertheless, the results provide a clear demonstration that subjects who differ on the global personality trait measure of authoritarianism will spontaneously interpret the same behaviors differently, without instructions to interpret these behaviors or form impressions of the actors in the sentences. They probably do this at the time they comprehend and encode these behaviors, and the dispositional attributions are stored in memory along with the behavioral information on which they are based. Thus, the dispositional inferences not only become effective retrieval cues, they also become part of the memories of these behaviors and the way those memories are organized.

Awareness of having made dispositional attributions when the sentences were read, or using such attributions as retrieval cues, was only weakly and inconsistently related to recall. This is consistent with previous results (Winter & Uleman, 1984) showing no accurate awareness of spontaneous dispositional inferences, when awareness is measured after sentence recall.

More recent findings (Winter, Uleman, & Cunniff, 1985) indicate some weak evidence of accurate awareness when it is measured as it was in the present study, immediately after the last sentence is read. So awareness of making these spontaneous inferences is slight and fleeting. Our subjects probably forgot it by the time the recall task was complete.

More generally, these results demonstrate one way in which individual differences on a global personality trait measure can be linked to differences in processing complex trait-related information, at a particular stage of the information processing sequence. They show that authoritarianism affects the way information about others is encoded and stored in memory. Authoritarianism may also be related to how that information, once encoded, is combined with other information; and it may affect how those judgments are related to behavior. Research on authoritarianism and intolerance of ambiguity and cognitive complexity certainly suggests the former. And research linking authoritarian-based prejudice with discriminatory behavior supports the latter (see reviews by Cherry & Byrne, 1978, and Dillehay, 1978). But this is the first study presenting evidence which locates authoritarianism's effects on information processing as early in the sequence as initial encoding. And it provides a model for future studies of other global personality variables which should affect the spontaneous interpretation and encoding of information.

The facts that these encoding processes take place with little or no awareness, and without intentions, indicate that they are more pervasive than processes that require special motivations or instigators. At the same time, there is no evidence in these data that this lack of awareness is in any way "motivated" itself, by defensive needs for example. In fact, the research paradigm requires that intentional (and conscious) and spontaneous (and nonconscious) dispositional attributions be the same. Future research should examine the possibility that for some sentence stimuli and subject types, there may be effective retrieval cues which these subjects do not generate under intentional impression formation or dispositional attribution instructions.

Future research should also examine whether these personality differences in spontaneous inferences affect subsequent overt judgments and behaviors. Ordinarily, one would expect them to. But what might the effects of such nonconscious inferences be in situations that call for contrary judgments, or impression managing behaviors of another kind? Are these spontaneous inferences easily overridden by more intentional deliberate processes? Or do they bias such processes, to produce judgments and behaviors that either assimilate or contrast with them? Because our paradigm is relatively nonreactive and provides data relatively independent of conscious monitoring, it may be possible to adapt it to examine multiple, inconsistent layers of meaning that people ascribe to social events.

The problems of adapting this paradigm to investigate such questions should not be underestimated. Finding sentences that are reliably interpreted differently by different subject types requires a large initial pool. Our experience also suggests that larger pretesting samples for stimulus sentence selection would be highly desirable. Selecting sentences that distinguish subjects is logically similar to selecting test items in test construction, so that all of the rules of thumb regarding sample sizes relative to item numbers, and cross validation which apply there are
probably desirable here. Larger numbers of stimulus sentences would also permit more sentences per block, reducing the likelihood of the block-cue pairing effects that were so prominent in our results. Furthermore, minimizing the content overlap among sentences and cues is essential to obtaining clear results. The importance of having a fairly wide or heterogeneous range of content to which the sentences and cues refer suggests that traits with a rich and diverse empirical network of correlates—like authoritarianism—are ideal.

Finally, we hope that these results will encourage others to look for other ways to investigate the relations between the macrolevel personality content represented in traditional psychologically developed measures of personality dispositions, and the microlevel processes and structures which recent cognitive approaches to personality have begun describing, such as Mischel’s (1973) “encoding strategies and personal constructs.” There are certainly fundamental differences between the trait approach and cognitive approaches to personality (e.g., see Cantor & Kihlstrom, 1982). But that does not mean that the results of traditional trait research in personality must remain irrelevant to cognitive approaches. It seems advisable to develop methods and theories that integrate these traditions with current advances in the field. And such methods provide one way to overcome the problem recently noted by Pervin (1985) that “while current cognitive approaches to personality give lip service to individual differences . . . relevant studies are hard to come by” (p. 97).

References


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