Memory styles and related abilities in presentation of self

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The notion of a person's memory style (elaborated in Sehulster, 1988) was investigated as it relates to the presentation of self. A memory style is defined as a combination of a subject's (perceived) ability in verbal memory, autobiographical memory, and prospective memory, as measured by the Memory Scale (Sehulster, 1981b). In addition to filling out the Memory Scale, 325 subjects completed a 72-item questionnaire that tapped descriptions of abilities and experiences. The range of abilities and experiences was drawn loosely from Gardner's (1985) notion of multiple intelligences. Distinct patterns of self-report were observed for different memory styles. For instance, a love of listening to music was associated with the memory style that is high in both verbal and autobiographical memory but low in prospective memory; a love for numbers and mathematics was associated with the memory style that is high in both verbal and prospective memory but low in autobiographical memory. The results suggest broad individual differences in information processing. Gender differences are discussed in relation to memory styles.

We present ourselves publicly in many ways, perhaps most obviously in our various performances, professions, and hobbies, in the clothes we wear, in the music we listen to, in the television shows we admit to watching, in the car we drive, in the company we keep, and so on (Goffman, 1959). Language affords us a means for efficient and summary communication about these and other aspects of self to others: We can say directly who we are (or who we think we are), and we can support our contentions about self with evidence beyond the present moment. We offer evidence from our remembrances of the past and from statements about our plans for the future. In fact, two primary functions of our memory must certainly be to maintain and support the identity and continuity of self, both publicly and privately (Barclay & DeCooke, 1988; Brewer, 1986; Fivush, 1988; Markus, 1980).

How and what we remember, as well as much of what we say and do, fall into reasonably consistent patterns. Sehulster (1981b) asked subjects to describe aspects of themselves by filling out the Memory
Scale, a 60-item questionnaire on which subjects rated their memory abilities in several everyday situations. A factor analysis of their responses suggested that perceived memory abilities tend to cluster into three meaningful factors: (a) memory for verbal material, including trivia, names, jokes, words, plots of books, etc.; (b) memory for autobiographical material, including memories from childhood, emotional memories, smells, dreams, painful experiences, etc.; and (c) prospective memory, including memory for dates, appointments, anniversaries, for the whereabouts of personal items, etc. Sehulster (1981b) referred to these three factors as a self theory of memory, a set of beliefs that one holds about his or her memory abilities. The three factors of everyday memory relate in a general way to our orientation and functioning in time: the present (verbal or factual memory), the past (autobiographical or event memory), and the future (prospective or memory for intentions). The three factors also correspond to three very broad areas of contemporary memory research: factual or verbal memory (e.g., Bjork, 1988); autobiographical memory (for overviews, see Cohen, 1989; Conway, 1990; Rubin, 1986); and prospective memory (Harris & Morris, 1984).

On a general, everyday level, memory behavior is consistent with a person's perceptions of his or her memory ability (Sehulster, 1982a). For instance, Sehulster (1981b) demonstrated that those claiming to have a superior verbal memory performed better in a trivia contest. Sehulster (1982a) reported that persons who claimed a superior autobiographical memory had more frequent, longer, and more emotional dreams, and were more likely to recall a dream from the previous night.

In addition, different kinds of memories are experienced differently. Sehulster (1982b) showed that among the various kinds of memory experiences one could have, autobiographical memories were experienced as more vivid, more emotional, real, and certain (as opposed to the less trustworthy, emotionally neutral, verbal memories); persons claiming to have superior ability in autobiographical memory rated their memory experiences more extremely on these phenomenological dimensions.

But of equal interest are the observations that other aspects of a person's cognitive world covary with the perception of memory ability. For instance, Sehulster (1981a) showed that persons high in the verbal memory factor perceive themselves as in touch psychologically with their world, are not drift, introspective, or private. Persons who are high on the prospective memory factor also claim to be in touch psychologically, and they show a preference for the abstract worlds of geometry and logic. Persons high on the autobiographical memory
factor, on the other hand, claim to seek intense emotional relationships with others, respond to the touch of another, are excited by smells, and report intense private experiences.

Recently, Schulster (1988) explored the notion that a combination of the three factors may represent different, more global styles of remembering: ways of attending to, storing, organizing, elaborating, reconstructing and recalling different aspects of a complex world. For example, if a person claims to have a superior memory for verbal material, a deep and vivid memory for autobiographical material, but a weak prospective memory, then we will most likely recognize this person as being intelligent, in touch with his or her past perhaps, but absentminded. Such persons are probably quick with verbal material and probably remember the events in their life clearly; they can draw on a rich vocabulary and on their past to enrich their conversations or lectures with examples and experiences. But they may have forgotten to bring lunch, not remembered to mail those recommendations, or even forgotten where the car is parked that day.

Many empirical relationships between memory style and self-report/memory performance are presented in Schulster (1987, 1988). For instance, subjects who gave themselves high ratings in areas of verbal memory and prospective memory but low ratings in autobiographical memory claim to have neutral, unemotional dreams and do not often listen to music, whereas subjects who rated themselves high in both verbal and autobiographical memory, but low in prospective memory claim to enjoy music a lot, are sensitive to art, smells, other people, and so on.

This report explores further the notion that memory styles indeed relate to larger, unique patterns of nonmemory characteristics. It is possible that a memory style is but a facet, a component of an individual's larger style of dealing with and constructing his or her world. This research describes patterns of perceived memory and non-memory abilities as they relate to the presentation of self; it is not conceived as an end in itself but rather with the ultimate aim of suggesting and following new paths for future behavioral research.

Memory styles

Here, as in previous research, each subject filled out the Memory Scale and, after the factor analysis, was given a factor score for each of the three factors of memory. A factor score locates a subject along each of three memory dimensions. High (positive) factor scores are obtained when a subject has consistently indicated high ratings on the memory abilities that load heavily on a factor; low (negative) factor
scores are obtained when a subject has given consistently low ratings to these abilities.

Earlier studies (Sehulster, 1981a, 1981b, 1982a, 1982b), before the conceptualization of the three memory factors as composite memory styles, reported relationships between each of the three memory factor scores in isolation and self-perceptions and actual memory performance. Later (Sehulster, 1987, 1988), when conceived as memory styles, when the three factor scores for each subject are taken in a group and the patterns of positive and negative factor scores are examined, results are interpreted in light of one of eight possible memory styles. The present study employs the second method.

A subject with three positive factors is claiming to have a reasonably good memory in the three areas of memory: verbal (V), autobiographical (A), and prospective (P), labeled VhAhPh for brevity, where h stands for high, or above 0. An individual with the opposite pattern, with three negative factor scores, is labeled VlAlPl, where l stands for low, or below 0. Placement of individuals in one of these two categories is easily determined by the signs of their three factor scores.

More interesting memory styles are indicated by the heterogeneous patterns of positive and negative factor scores. For each of the three combinations with two positive factor scores and one negative (VlAhPh, VhAlPh, and VhAhPl), there will be an opposite combination with two negatives factor scores and one positive (VhAlPl, VlAhPl, and VlAlPh). Again, the placement of an individual within one of these categories is accomplished by examining the pattern of signs of the three factor scores.

**Questionnaire: Things I Do Well**

To explore the basic question of the relationship between memory styles and other nonmemory abilities, a broad range of activities and mental states was chosen. Gardner's (1985) theory of multiple intelligences served as a source for the generation of the 72-item questionnaire entitled “Things I Do Well.”

Gardner extends traditional notions of intelligence by positing the existence of six basic dimensions of intelligent behavior. In addition to the more familiar linguistic or verbal intelligence and logical-mathematical intelligence, Gardner describes musical intelligence, spatial intelligence, bodily-kinesthetic intelligence, and personal intelligences. This last is further differentiated into intrapersonal and interpersonal intelligence. Individuals who display a degree of bodily-kinesthetic intelligence, for instance, are adept at using their body well, be it as a ballet dancer or an athlete or a sculptor, as opposed to others of us who cannot dance two steps in sequence. Some in-
dividuals may be handy with tools, good at fixing or assembling things, whereas the rest of us are all thumbs. Though intelligent in this manner, they may or may not possess any exceptional ability in the other areas of intelligent behavior. Gardner's evidence for multiple intelligences is observational and cross-cultural, with substantial support from various literatures of child prodigies, savants, and brain dysfunctionals.

It is important to emphasize here that Things I Do Well was not constructed as a test of Gardner's theory of multiple intelligences, nor is the focus of this study the association of memory style with six types of intelligent behavior. Though interesting, to be sure, these issues are tangential to my purposes. I have used Gardner's theory only as a means of generating a series of statements describing everyday activities, statements a person might use in conversation. Beyond that, nothing more.

Twelve statements were constructed from Gardner's descriptions of each of the six intelligences, yielding 72 statements. Each statement bore a reasonably obvious relationship to one of the intelligences, and if one considers each statement in Things I Do Well as a possible reflection of a subject's construction of self or self-image rather than as a substitute measure of actual ability, then at least some degree of content validity is assured (Numally, 1978). The complete Things I Do Well questionnaire is presented in the Appendix.

EXPERIMENT

METHOD

Subjects

The Memory Scale was filled out by 327 subjects (120 males, 207 females) from introductory and advanced psychology classes at the University of Connecticut at Stanford in the spring semester of 1986 and the spring, summer, and fall semesters of 1991 and 1992. As part of a separate classroom exercise a few days later, 325 subjects filled out the Things I Do Well questionnaire. Scores for both questionnaires were compiled for 320 subjects (117 males, 203 females).

Instructions

Each questionnaire, the Memory Scale and Things I Do Well, had instructions printed on the top of the first page. The Memory Scale contains 60 memory-related items. On a scale of 1 to 5 for each of the 60 items, it asks subjects to rate the first 20 statements as to how well they remember certain everyday things, such as, "I remember my dreams" [very well, fairly well, etc.]; the second 20 ask how frequently certain memory-related events hap-
pen, such as, “I leave the lights on or doors unlocked” [always, occasionally, etc.]; the final 20 items ask subjects to engage in some social comparison, such as, “I remember the names of TV, movie, and recording stars better than” [most people, some people, etc.].

The 72 items in Things I Do Well were presented in first person declarative statements. Subjects were asked to rate the degree to which the statement described them from 1 (not a good description, the opposite is true) to 5 (an accurate description of me).

RESULTS

A principal components factor analysis with an orthogonal rotation (BMDP4M) was run on the total pool of Memory Scale scores. As in previous studies, the number of factors was constrained to three; the rotated factor pattern obtained clearly confirmed the three factors reported initially in Sehulster (1981b) and elsewhere. The three factor scores, one for verbal memory, one for autobiographical memory, and one for prospective memory, were lifted from this analysis and added to a data file for the responses of those subjects who also filled out Things I Do Well.

Scores from Things I Do Well were factor analyzed to reduce the number of variables needed to represent the questionnaire. A usable solution of 12 factors was obtained after some preliminary exploratory analyses. The criterion for constraining the number of factors to 12 in the solution was that factors must be defined by at least two loadings over .480. Using BMDP4M, 12 meaningful factors were extracted by a principal component analysis and varimax rotation. Those statements with the highest loadings on a factor (.480) were grouped together to make 12 cluster variables or subscales of Things I Do Well. For instance, Factor 1 had Statements 3, 15, 22, 33, 51, 57, and 70 clustered together. An inspection of their content shows this cluster to be unambiguously related to perceived ability in mathematics and to interest in computers. The 12 clusters or subscales of Things I Do Well and the statements subsumed by each are listed in Table 1. Of 72 statements from Things I Do Well, 47 were used in this method of clustering.

In only one case was there any ambiguity in assigning a statement to a cluster. Statement 26, “I often associate music with my moods,” loaded above .480 on both Factor 8 (love of music) and Factor 10 (moods and experiences). This statement was grouped with the latter, on which it loaded higher, so as to avoid including a statement in more than one cluster.

The mean of the scores for the statements within a cluster was taken as a representative score for the cluster. As a check on the
Table 1. Statement clusters from "Things I Do Well"

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Statements</th>
<th>Cronbach's alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fun with numbers and computers</td>
<td>3, 15, 22, 33, 51, 57, 70</td>
<td>.819</td>
</tr>
<tr>
<td>2. Sensitive to moods of others</td>
<td>42, 48, 54, 60, 64</td>
<td>.741</td>
</tr>
<tr>
<td>3. Fun building and drawing</td>
<td>16, 28, 35, 46, 47, 68</td>
<td>.713</td>
</tr>
<tr>
<td>4. Effectiveness in arguments</td>
<td>25, 27, 37, 69</td>
<td>.672</td>
</tr>
<tr>
<td>5. Fun dancing</td>
<td>17, 32, 65</td>
<td>.817</td>
</tr>
<tr>
<td>6. Fun with sports</td>
<td>23, 29, 53, 59</td>
<td>.759</td>
</tr>
<tr>
<td>7. Spatial orientation</td>
<td>4, 13, 34, 40</td>
<td>.762</td>
</tr>
<tr>
<td>8. Love of music</td>
<td>20, 44, 56, 62</td>
<td>.708</td>
</tr>
<tr>
<td>9. Performing music</td>
<td>2, 8, 14</td>
<td>.779</td>
</tr>
<tr>
<td>10. Moods and experiences</td>
<td>6, 18, 26</td>
<td>.504</td>
</tr>
<tr>
<td>11. Ineffable experiences</td>
<td>12, 24</td>
<td>.446</td>
</tr>
<tr>
<td>12. Not into lyrics</td>
<td>38, 55</td>
<td>.469</td>
</tr>
</tbody>
</table>

Internal consistency of a cluster, Cronbach’s alpha (standardized) was calculated. These are also reported in Table 1. The last two clusters (ineffable experiences; not into lyrics) were dropped from subsequent analyses because of alphas below .500.

**Analysis by canonical correlation.**

One method of analyzing the relationship between memory style and self-perception of ability is through canonical correlation. Three variables (verbal, autobiographical, and prospective memory factor scores) made up the first set of variables in the canonical equation; 10 variables (fun with numbers and computers through moods and experiences) made up the second set. The three canonical correlations between the two sets of variables were highly significant (.563, .494, and .447; squared .317, .244, and .200); all three of Bartlett’s chi-squares were significant.

Loadings of the three memory factors on the three canonical variables are presented in Table 2. The general patterns suggest that the first canonical variable is best understood as representing verbal memory (loading = .949); the second canonical variable can be understood as representing autobiographical memory (loading = .958); the third canonical variable represents prospective memory (loading = .910).

However, a closer inspection of the patterns of signs of the loadings of the three memory factors on the canonical variables suggests that each canonical variable represents a composite memory style. The
Table 2. Canonical variable loadings for three memory factors

<table>
<thead>
<tr>
<th>Memory factors</th>
<th>Canonical variable</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Verbal</td>
<td>.949</td>
<td>-.022</td>
<td>-.315</td>
<td></td>
</tr>
<tr>
<td>Autobiographical</td>
<td>.100</td>
<td>.958</td>
<td>-.268</td>
<td></td>
</tr>
<tr>
<td>Prospective</td>
<td>-.292</td>
<td>.294</td>
<td>.910</td>
<td></td>
</tr>
</tbody>
</table>

The first canonical variable, though predominantly verbal, is loaded on positively by autobiographical memory and negatively by prospective memory. This style (VhAhPl) has shown high correlations with verbal expression, and love of music and sports (Sehulster, 1988). An inspection of the loadings for this first canonical variable and the 10 subscales of Things I Do Well, presented in Table 3, strengthens the assertion that the first canonical variable indeed represents the style VhAhPl.

The second canonical variable reflects the sign patterns of the memory style VI AhPh, though, in general, the second canonical variable is predominantly autobiographical. From previous research it has been suggested that persons of the VI AhPh style are usually female and tend to score higher on any measures of emotional sensitivity as well as on any measures of appreciation of music and dance. The high loadings for the 10 subscales on the second canonical variable in Table 2 confirm this assertion. Sensitivity to others, love of dance and music, and the tendency to link mood and experience are high loaders on the second canonical variable.

The pattern of signs for the third canonical variable indicates a memory style that tends to be positively associated with mathematical/logical/abstract thinking (Sehulster, 1981a) and negatively associated with music and emotional responsivity. Again, an inspection of Table 2 will confirm this perception.

The performing music cluster and the building/drawing cluster showed no strong relationships to any of the three canonical variables. The $F$ ratios ($df = 3, 317$) for the squared multiple correlations for these two variables and the set of the three memory factors were not significant at the .01 level. All other relationships yielded highly significant $F$ ratios.

**Analysis by multiple regression**

Ten stepwise multiple regression analyses were performed using the mean of a subscale of Things I Do Well as a dependent variable and, in the first step, gender as a predictor; this was followed, in the second
MEMORY STYLES

Table 3. Canonical variable loadings for 10 ability clusters

<table>
<thead>
<tr>
<th>Things I Do Well cluster</th>
<th>Canonical variable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Numbers</td>
<td>-.036</td>
</tr>
<tr>
<td>Sensitive</td>
<td>.057</td>
</tr>
<tr>
<td>Build/draw</td>
<td>.131</td>
</tr>
<tr>
<td>Arguments</td>
<td>.825</td>
</tr>
<tr>
<td>Dance</td>
<td>-.124</td>
</tr>
<tr>
<td>Sports</td>
<td>.393</td>
</tr>
<tr>
<td>Spatial</td>
<td>.273</td>
</tr>
<tr>
<td>Listen</td>
<td>.394</td>
</tr>
<tr>
<td>Perform</td>
<td>.210</td>
</tr>
<tr>
<td>Moods</td>
<td>.012</td>
</tr>
</tbody>
</table>

step, by the three Memory Scale factor scores as predictors. Degrees of freedom for each of the multiple regression analyses were 4, 315 for 320 subjects. Because previous analyses have shown rather strong relationships between gender and the memory factors (Schulster, 1988), the stepwise multiple regression was chosen as a means of investigating the relationships of the memory factors with gender partialled out. Then, in the second step, the relative effects of gender and the three memory factors could be evaluated. From the patterns of signs of the beta coefficients for the three memory factors, it was possible to ascertain which memory style is most appropriate for understanding the relationship between style and subscale: from the sign of the beta coefficient for gender, it was possible to ascertain whether males or females were most likely to endorse a set of statements.

1. Fun with numbers and computers. Previous research (Schulster, 1987, 1988) has suggested that perceived ability in prospective memory consistently relates to a perceived ability with numbers and a fascination with computers. Here, in the final equation, this logical/mathematical subscale showed a significant relationship with prospective memory; the beta coefficient was .293, t = 5.37, p < .001. The relationships between a subject’s verbal memory and autobiographical memory factor scores and this subscale were insignificant; the negative sign for the autobiographical memory factor suggests that the style VhALPh is most appropriate here. In both steps of the analysis, it was observed that males are more likely to claim a facility with numbers and a fascination with computers. In the final equation, the beta for gender was .181, t = 3.07, p < .002. The R of the final equation was .102. Note, too, that this analysis corroborates conclu-
sions drawn from the loadings of this cluster on the third canonical factor in the canonical correlation analysis. This third canonical variable is heavily loaded on by the prospective memory factor and follows the memory style VhAlPh.

2. **Sensitive to moods of others.** This subscale reflects one’s sensitivity to the moods of others and, as such, is a sort of interpersonal intelligence. Because the relationship between some form of emotional sensitivity and the autobiographical memory has appeared in several other guises (Sehulster, 1981a, 1987), it is not surprising that the autobiographical memory factor has the strongest relationship with this subscale (in the final equation, beta = .351, t = 7.12, p < .001). Here, too, the verbal memory factor is a significant predictor, regardless of the effects of gender (beta = .137, t = 2.66, p < .01). The relationship with the prospective memory factor was positive but insignificant, assigning the style VhAhPh to this cluster. The sign of the significant relationship between gender and this subscale suggests that females tend to rate themselves as more sensitive to the moods of other individuals (in the final equation, beta = -.321, t = -6.01, p < .001). The R was .268.

3. **Fun building and drawing.** The dexterity required to build things and to draw or sketch can be thought of as aspects of bodily intelligence. This subscale showed all positive relationships with the three memory factors, thus, the memory style VhAhPh, but only the autobiographical memory factor posted a small but significant beta (.109, t = 1.97, p < .05). However, the best predictor for this subscale was gender, with males tending to describe themselves as having fun building things and sketching (beta = .261, t = 4.32, p < .001). The final R was .065.

4. **Effectiveness in arguments.** This subscale strongly relates to a subject’s perceived verbal memory ability; in the final equation, beta coefficient = .492, t = 9.37, p < .001. Perceived ability in autobiographical memory also showed a positive and significant relationship with gender partialled out (p < .05), but when entered into the final equation, it dropped to insignificance. Perceived prospective memory ability yielded a beta that was negative but near zero. The two positive and one negative betas suggest that the memory style VhAhPl best fits perceived effectiveness in arguments. This pattern corroborates the high loadings of this subscale on the first canonical variable; the memory style assigned to the first canonical variable is VhAhPl. The correlation between gender and this subscale (r = .111, t = 1.99, p < .05) suggests that males are most likely to endorse this form of verbal expression; in the final equation, however, gender dropped below the level of significance. It is fitting that only the verbal memory
factor remained a significant predictor of effectiveness in arguments. The final R was .237.

5. Fun dancing: Gender is the best predictor of the enjoyment of the dance; a significant gender relationship (beta = -.477, t = -8.92, p < .001) suggests that females tend to describe themselves in these terms. Verbal memory showed an insignificant but positive relationship with this subscale; autobiographical memory carried the weight of the relationship (beta = .168, t = 3.41, p < .001); prospective memory was negative but not significant. The R was .265. The resulting memory style (VhAhPl) is one that is typically found for aesthetic pursuits (Sechuster, 1988).

6. Fun with sports: As one might suspect, the best predictor for this subscale is also gender; males tend to describe themselves with statements from this subscale (in the final equation, beta = .327, t = 5.65, p < .001). Included here are watching sports and participating in physical activity. But memory factors are also predictors: The beta coefficient for the verbal memory factor was .109 (t = 1.95, p < .05); the autobiographical memory factor also showed a positive and significant relationship with this subscale (beta = .120, t = 2.24, p < .03). The relationship with the prospective memory factor was positive, but insignificant, pointing to the style VhAhPh. The R was .140.

7. Spatial orientation: This subscale includes sense of direction, judgment of distance, and general orientation in space. In the final equation, the three significant relationships were prospective memory (beta = .297, t = 5.75, p < .001), verbal memory (beta = .120, t = 2.23, p < .03), and autobiographical memory (beta = .161, t = 3.14, p < .002). The three positives suggest that the style VhAhPh is most appropriate here: more males than females tended to describe themselves as being oriented in space (beta = .314, t = 5.60, p < .001). The R was .198.

8. Love of music: This subscale includes listening to music, collecting recordings, whistling a happy tune, and, in general, having music play an important part in one’s life. In the final equation, autobiographical memory had a beta coefficient of .331 (t = 6.42, p < .001); prospective memory had a beta of -.243 (t = -4.70, p < .001); and verbal memory had a beta of .165 (t = 3.07, p < .002). The style VhAhPl is clearly related to a professed love for music, a finding reported previously (Sechuster, 1981a, 1987, 1988), and suggested here not only by the first canonical variable, but also by heavy positive and negative loadings on the other two canonical variables. The correlation with gender was insignificant at the first step, but significant at the second (beta = -.110, t = -1.97, p < .05), suggesting that females may be more likely to endorse this cluster. The R was .196.
Table 4. Distribution of ability clusters by gender and memory component

<table>
<thead>
<tr>
<th>Memory factors</th>
<th>Verbal</th>
<th>Autobiographical</th>
<th>Prospective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>Fun with numbers and computers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building/drawing</td>
<td>Fun with sports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fun with sports</td>
<td>Spatial orientation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spatial orientation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>Sensitive to moods of others</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensitive to moods of others</td>
<td>Love of music</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Love of music</td>
<td>Music (−)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Music (−)</td>
<td>Moods and experiences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moods and experiences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not gender specific</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effectiveness in arguments</td>
<td>Performing music</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. Performing music. This subscale includes the ability to read music, play an instrument, and even compose simple tunes. Clearly, these skills are different from the listening aspect of musical intelligence listed above. Though the pattern of signs of the loadings in the canonical correlation analysis is the same as for listening to music, there are no substantial loadings. However, in the regression analysis the autobiographical memory factor showed a significant relationship with this subscale (beta = .146, t = 2.57, p < .01). The verbal memory factor showed a positive beta and the prospective memory factor showed a negative beta (both insignificant), suggesting that, as above, the style VhAhPl is the most appropriate for this subscale, a pattern discerned from the canonical analysis. There was no effect for gender and performing music. The R of the final equation was .032.

10. Moods and experiences. Here we have an expression of the degree to which a person claims to have varied moods as well as the degree to which music and past experiences are associated with mood. Predictably, this last subscale showed a highly significant relationship with the autobiographical memory factor (beta = .234, t = 4.25,
Table 5. Distribution of ability clusters by gender and memory style

<table>
<thead>
<tr>
<th>Memory style</th>
<th>Subscale</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>VhAhPh</td>
<td>Sensitive to moods of others</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>Fun building and drawing</td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td>Fun with sports</td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td>Spatial orientation</td>
<td>Male</td>
</tr>
<tr>
<td>VhAlPh</td>
<td>Fun with numbers and computers</td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td>Moods and experiences (obverse)</td>
<td>Female</td>
</tr>
<tr>
<td>VhAhPl</td>
<td>Effectiveness in arguments</td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td>Fun dancing</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>Love of music</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>Performance of music</td>
<td></td>
</tr>
</tbody>
</table>

Note. V = verbal; A = autobiographical; P = prospective; h = high, or above 0; l = low, or below 0.

...and negative though insignificant relationships with the other two. The style most related to this subscale is VlAhPl, the obverse of the third canonical variable which, described above, showed a healthy negative loading for this subscale. A significant negative relationship with gender \((r = -0.136, t = -2.45, p < .01)\) suggests that females are most likely to endorse statements from this cluster. However, in the final equation, the effect of gender drops to insignificance. The \(R = .082\).

If, overall, gender (coded 1, 0) is used as a dependent variable and the three memory factor scores are used as predictor variables, the resulting regression shows relationships with all three factor scores at the .001 level of significance. The verbal memory factor showed a beta of .336, \(t = 6.63\); both autobiographical and prospective memory factors posted negative betas (−.186 and −.193, respectively). This suggests that VhAlPl is the style that best describes males in the sample; its obverse, VlAhPh, has already been described above as a female style (Sehulster, 1988).

A summary of memory factors, gender, and the 10 subscales is presented in Table 4; a summary of memory styles and the 10 subscales is presented in Table 5.

DISCUSSION

A memory style is defined here as a way of attending to, storing, organizing, elaborating, reconstructing, and recalling different aspects of a complex world. At least at this stage of conceptualization, a
memory style is based on self-perceptions of memory ability and is understood as having three memory components: verbal, autobiographical, and prospective. The basic question addressed here is, Do different "settings" on these three components and different combinations of settings relate to individual differences in other cognitive or behavioral domains in a person's everyday life?

Statements about abilities and interests in everyday life—self-perceptions—form the basis of an individual's presentation of self to others. But in this exploratory study our interest is really focused beyond the presentation of self. It is hoped that by examining the relationships between memory style and perceptions of self, we can gain insights into the different structural schemas used in coding and retrieval systems in information processing and remembering. Then, new hypotheses can be generated and the behavioral implications of the different memory styles can be addressed. One needs to know where to look first.

The canonical correlations and the stepwise multiple regression analyses show substantial relationships between a person's memory style, gleaned from an analysis of self-ratings of memory ability, and perceptions of abilities and interests, measured by the questionnaire Things I Do Well.

The first canonical variable loaded heavily on the verbal memory component and, fittingly, showed a significant relationship with perceived effectiveness in arguments. Persons who present themselves as having a good memory for trivia, names, jokes, words, etc., also tend to perceive themselves as competent in the arena of verbal combat. They claim they can pick out fine, critical points in arguments, they can express themselves clearly and effectively, they catch flaws in the logic of the speaker, and they can draw upon a large vocabulary. It is possible that one of the ways in which individuals draw the conclusion that they have a good memory for verbal material is by observing their past performances in arguments and discussions, by experiencing the ease (or difficulty) with which the right word or fact pops into mind when they need it. But because the verbal memory factor from the Memory Scale is composed of self-perceptions about recalling names, trivia, jokes, plots, words, and so on, the observation of a relationship between the verbal memory factor and a larger verbal domain in everyday life increases the possibility that there is a unique cognitive "space" for the processing, organizing, and remembering of verbal material.

It is not hard to imagine that on the basis of their self-perceptions, individuals judge themselves capable (or incapable) of performing in those professions that involve the organized presentation and effortless
recall of verbal material. Witness the effective courtroom lawyer, the engaging college professor, the glib television interviewer, the fast-talking salesperson, the ever-wise priest or rabbi: All must rely on a strong verbal memory, whether it be for legal precedent, research studies or classroom examples, quotable quotes, debatable claims, or the perfect passage from the Scriptures. Why some have a facility with verbal material and some do not is a question worthy of pursuit.

The second canonical variable was loaded on most heavily by the autobiographical memory factor. An examination of the loadings from the subscales of Things I Do Well reveals that persons who perceive themselves as having a good memory for their past, for their dreams, and particularly for emotional experiences also present themselves as experiencing an emotionally varied internal world and as being more sensitive to the emotions of others. Here, as well as elsewhere (Schulster, 1988), it was observed that persons who claim to have a good autobiographical memory also present themselves as being aesthetically sensitive and involved in the arts; be it with music, dance, painting, or film. Music has the power to arouse the emotions; here, emotionally sensitive individuals are saying that music plays an important part in their lives. Because the autobiographical memory factor from the Memory Scale is composed of self-perceptions about recalling emotional experiences from the past, dreams, childhood, and even smells, the observation of a relationship between the autobiographical memory factor and the emotional and aesthetic domain in everyday life increases the possibility that there is a unique cognitive “space” for the processing, organizing, and remembering of emotional and experiential material.

But even more interesting is the consistent finding that in addition to a strong positive association with the autobiographical memory factor, a responsivity to music shows a strong negative association with prospective memory. Why should aesthetic involvement be negatively associated with prospective memory, as if to say that for some individuals the trade-off for an enriched involvement in the world of music is absentmindedness?

One explanation comes to mind. Low prospective memory or absentmindedness is the failure to be on top of events intended to happen in the future: It may involve not remembering an anniversary or an appointment, or not remembering to lock the front door, failing to get off at the right exit on the freeway, and so on. A popular conception of absentmindedness is implied by the term itself: a vacancy in the control room, so to speak. It is also possible, however, that an important component of absentmindedness is a focus, call it a distraction, in the direction of more internal, less time-bound thoughts. Sometimes
these more internal matters are scholarly or creative and we are willing to chuckle and excuse the absentmindedness; in other cases, in the absence of creative distraction, we are more likely to dismiss the person as unreliable or emptyheaded. So, it is possible that one aspect of absentmindedness is the more internal, timeless, emotional focus that seems to go with a deep involvement in the arts.

However, if the memory style of AhPl plumbs the depths of emotional and aesthetic experience at the expense of competence in prospective memory, the obverse of this style (AlPh) boasts an enviable day-to-day organization at the expense of emotional richness and the arts. Why should this be so? It is also possible that the mind-set necessary for one to keep on top of those prospective happenings actually precludes a deep involvement in the arts. It is difficult to maintain the proper frame of mind for appreciating Brahms or Beethoven if one is constantly trying to remember not to forget tomorrow’s schedule. Have you ever been too busy to listen to music? If maintaining a structured schedule is more important than getting absorbed in the music, aesthetic involvement is not likely to happen.

One can appreciate at this juncture the need to discuss larger memory styles rather than single memory components in isolation. The results discussed above suggest that it is the specific combination of high autobiographical memory and low prospective memory components that relates to the love for music. The combination of high autobiographical and high prospective memory would not show the same relationship.

The conceptualization that a high prospective component of a memory style creates a different cognitive space has been suggested by previous work (Sehulster, 1981b) and by results here. The third canonical variable, which was loaded on most heavily (and positively) by the prospective memory factor, related most strongly (and also positively) to the self-perception of ability in mathematics and an interest in computers. This result suggests that an individual who can enter the state of mind required to follow the abstract sequences of mathematics and computer programming is also capable of entering the state of mind that successfully monitors information about prospective happenings. Perhaps the discipline necessary to stick with computer programming or with mathematics beyond simple addition and subtraction involves, among other things, the control of unwanted, distracting emotional memories and experiences. Or, to put it another way, those who are able to stick with the concentration required by computers and mathematics are able to do so because they are not distracted by emotional memories triggered, say, by a song on the radio. Recall that the love of music subscale loads highly but negatively
on the third canonical variable. Because the prospective memory factor from the Memory Scale is composed of self-perceptions about remembering anniversaries, dates, appointments, and remembering to attend to such things as locking the doors or turning out the lights or taking your umbrella from class, the observation of a relationship between the prospective memory factor and mathematical and computational domains in everyday life increases the possibility that there is a unique cognitive “space” for the processing, organizing, and remembering of prospective material.

One final issue in this report concerns gender relationships. As seen in Table 5, relationships between the content of a subscale from Things I Do Well and gender seem to determine the inclusion of gender under a particular memory style more so than any relationship between gender and the style itself. Females present themselves as more sensitive to the moods of others, whereas males profess a greater interest in sports, yet both subscales are grouped under the style VhAhPh, males present themselves as more effective in arguments, whereas females report getting more enjoyment out of dancing, yet both subscales are grouped under the style VhAhPl. That relationships between a memory style and two subscales of Things I Do Well can be strong and significant in context of significant, but opposing relationships with gender suggests that memory style and gender are probably not related in any obvious and consistent pattern. For the most part, gender is just another predictor, albeit significant in most cases. Furthermore, most of the relationships between memory factors and subscales of Things I Do Well remain unchanged in sign and level of significance whether gender is excluded from or included in the regression equation or whether memory factors are examined with gender paralled in or partialled out.

In a separate regression analysis, however, the pattern of signs of the beta coefficients suggested that VlAhPh was the style that strongly correlates with gender, females being VlAhPh and males VhAPl. How might this finding be interpreted?

It is not suggested here that females present themselves as having a weaker verbal memory or that they are less articulate or less intelligent verbally because they really are so. As for the “weaker” verbal memory, it is more likely that females are rating themselves less high on specific verbal items on the Memory Scale. The items that make up the verbal memory factor include memory for trivia, memory for jokes, names, facts, etc., the sorts of things that Tannen (1990) suggests males are more likely to use in a social setting to establish a hierarchy or pecking order. Tannen argues that females, in contrast, are more likely to try to establish a sense of community among those present
in a social setting, and, in doing so, draw from their pasts to share emotional experiences. Tannen based her conclusions on her observations of the social uses of language. If her discussion on “report talk” (factual, establishing hierarchy) versus “rapport talk” (empathetic and experiential, establishing community) has validity, and if the females and males in this sample are socially enculturated, then it should not be surprising that we observe generally high ratings in autobiographical memory and low ratings for verbal memory for females and generally high ratings in verbal memory and low ratings for autobiographical memory for males in this sample.

If females, in general, tend to present themselves as low on the verbal memory and high on autobiographical memory, and males the obverse, then, in further research, we need to investigate the mechanisms by which females come to develop the memory style of VIAh and males the other.

Following Tannen’s lead, we might speculate that females more frequently access emotional material in conversation and therefore have it better rehearsed, organized, and accessible. Males, on the other hand, more frequently access factual material in conversation and therefore have verbal, factual material more at hand. We may find that the memory style of the individual develops through the exchange of the most “valuable” or frequently needed information in that individual’s social world, be that information stock market closings, baseball statistics, historical facts, tear-jerking movies, emotional family experiences, or whatever. We need to investigate the different “values” of types of information, information which functions as social currency exchanged in a social transaction (Sehulster, 1989, p. 605). We also need to investigate the frequency with which the various contents of conversations occur and how different frequencies of content relate to gender.

Call the above the “frequent access” explanation for the formation of a memory style. Differences in the encoding of experience into memory might also be used as an explanation. Perhaps females tend to use more emotionally rich coding schemes to log experiences into memory, whereas males tend to encode experiences in a more factual, emotionally impoverished manner. This tendency to code information emotionally may also underlie a female’s presentation of self as more sensitive emotionally.

How are the codes with which we organize experiences in everyday memory learned or acquired? Are more emotional coding systems formed and organized through interactions with other individuals who organize their world emotionally? Are they modeled after significant others? Could it be, for instance, that the ways in which we
encode our experiences are shaped by a parent? Are coding systems shaped only by others of the same gender? It may be the case that males are permitted only certain kinds of emotions for public display, discussion, and encoding of experience (such as the thrill of victory, the agony of defeat, etc.), whereas the more empathetic and sensitive emotions commonly associated with females are discouraged.

Then, too, a more emotional coding system for memory could be the result of a generally more responsive emotional system. This suggestion would give the “encoding differences” explanation for the origin of memory styles a more physiological slant: Females tend to encode experiences with more emotional codes because they are more responsive emotionally, whereas males tend to encode experiences in a more factual, emotionally impoverished manner because they are less responsive emotionally. Males and females may merely be following prescriptions of the archetypes (Hill, 1992)—or the archetypes may be descriptions of reality.

More generally, the results of this study encourage the investigation of the behavioral implications of memory styles and the mechanisms by which individuals develop them.

Appendix. Questionnaire: Things I Do Well

This questionnaire is designed to elicit the pattern of your skills and attitudes. Imagine that you are saving each statement below. Does it fit you? Does it describe you? Please rate the degree to which the statement describes you with the following scale:

1. This statement is not a good description of me. In fact, usually the opposite of this statement is true.
2. This statement is not a good description of me. In fact, sometimes the opposite of this statement is true.
3. This statement does not really apply to me. Or, sometimes it does and sometimes it does not.
4. This statement sometimes describes me, but it is not always the case.
5. This statement describes me very accurately. I am usually like this.

Statements

1. I am very good at telling stories to other people.
2. I can play (or used to play) a musical instrument.
3. I can add or multiply quickly in my head.
4. I am a very good judge of distance.
5. I am sensitive to the way others stand or sit.
6. I have many different moods.
7. I am very good at writing stories.
8. I can read music.
9. I remember telephone numbers easily.
10. I can clearly visualize and draw the layout of my living room at home.
11. I often accent my speaking with hand gestures or movement.
12. I sometimes have trouble putting my feelings into words.
13. I am usually able to explain directions to other people.
14. I can write music and have written short melodies.
15. I enjoy mathematical puzzles and games.
16. I like to draw or sketch.
17. I enjoy watching dance or coordinated movement.
18. Some of my moods remind me of events in my past.
19. I have little trouble coming up with the names of objects or experiences.
20. I listen to music very often.
21. I would enjoy solving mysteries with the logical deductions of Sherlock Holmes.
22. I enjoyed geometry in high school.
23. I am athletic and usually play sports.
24. I express my feelings more with the tone of voice rather than with words.
25. I express myself clearly and effectively in an argument or debate.
26. I often associate music with my moods.
27. I am often critical of illogical arguments or presentations.
28. I prefer to draw a map for people than try to explain directions to them.
29. I often watch professional sports on television.
30. I usually have a clear understanding of why things are important to me.
31. I am always able to understand the directions that come with appliances.
32. I love to dance and have a good sense of rhythm.
33. I enjoy computers for their clean, logical, step-by-step operations.
34. I am almost always aware of north-south orientation no matter where I am.
35. I can build and have built things with my hands.
36. I am usually actively involved with what I am doing at the present moment.
37. I often pick out fine points of word meanings in an argument.
38. I enjoy the rhythm of a song, more so than the words.
39. I play (or played) chess often.
40. I always have a general sense of direction when I am traveling.
41. I enjoy acting and usually participate in school plays.
42. I am usually sensitive to the moods of others.
43. I enjoy reading fiction as much for the author's style as for the story.
44. I often hum, whistle, or sing melodies that I find enjoyable.
45. I enjoy games that are more logical than luck or speed.
46. I enjoy drawings, etchings, or fine paintings.
47. I build or used to build models (cars, airplanes, ships, etc.).
48. I can tell the moods of others by their facial expressions or postures.
49. I sometimes write poetry.
50. I like to sing (and have sung in public at times).
51. I am fascinated by numbers and mathematics.
52. I can look at an object and clearly imagine the object turned sideways, around, or from behind.
53. I am aware of the grace and timing of great athletes.
54. I can tell the moods of others by the tone of their voice.
55. I find the lyrics of a song more important than the melody of the song.
56. I have a large record or tape collection which I listen to often.
57. I seem to see patterns and relationships between numbers easily.
58. I remember vividly scenes from movies or from the theater.
59. I am physically well coordinated: Activities like gymnastics come easily to me.
60. I can tell when something is sincerely important to another person.
61. I enjoy listening to a good lecture where the points are well organized and the delivery is exciting.
62. I often associate music and songs with events from my past.
63. I enjoy science and find scientific thinking exciting.
64. I recognize faces quickly and easily.
65. I learn new dance steps easily.
66. It bothers me when others do not “put their heart” into what they are doing.
67. I have a fine sense of balance.
68. I am very handy with tools.
69. I think I have a large and rich vocabulary.
70. I enjoy playing with calculators and computers.
71. I am sensitive to the form or shape of architecture.
72. I respond to the feelings of another person, more so than to the logic of their argument.

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