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BODY POSITION AND MEMORY RECALL

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ABSTRACT

BODY POSITION AND MEMORY RECALL

by Elsie Berdach

This is a study of the relationship between body position and free recall of memories. Interest in this problem stems from the advantage attributed by psychoanalysis to the lying down position for free association.

Each of 42 male undergraduates was asked to recall any memories that came to mind in a 20 minute free recall situation. Half of the Ss were tested in a sitting-up position (SU) and half in a lying-down position (LD).

It was found that 1) the mean number of memories in the age 0-3 years category was significantly greater in the LD position than in the SU position; 2) significantly more subjects in the LD condition recalled memories for the 0-3 year period than in the SU condition; 3) the mean age for all memories recalled was earlier for the LD group than for the SU group, though this difference was not significant; 4) there was no significant difference in the number of memories recalled as a function of body position.

Results are interpreted as experimental confirmation of the psychoanalytic procedure of using the lying-down position in free association and memory recall.



BODY POSITION AND MEMORY RECALL

by

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INTRODUCTION

Body position has been implicated as a variable related to recall of early memories, especially in the context of psychoanalytic method. This implication is derived from clinical observations. There have been no empirical studies of the effect of body position on recall of early memories. In the present study free recall of memories is studied under two conditions; with S sitting up and with S lying down.

Psychoanalytic Approach to Problem

Freud stressed the importance of recalling early childhood memories in the course of psychoanalytic treatment for he believed the etiology of neurosis often lay in repressed infantile memories. If the repressed memory was brought to consciousness with its accompanying affect, neurotic symptoms were often observed to disappear. (Freud, 1911, 1917, 1947) Due to Freud's stress upon the importance of recalling memories in the curing of neurotic symptoms it was decided, in the present study, to explore the relationship of body position to memory recall.

The notion that body position should affect recall of memories stems from Freud's use of the couch during the analytic session. According to Freud, the reason for the

use of the couch was to relieve muscular tension and "distracting sense impressions which might disturb the concentration of the attention upon . . . mental affairs." (Freud, 1917) From this idea, relieving muscular tension should lead to effects upon memory recall.

Other analysts have mentioned the relationship of resting to thinking and other mental phenomena. Breuer, for instance, believed the brain works with a restricted mass of energy which alternates between ideation and muscular exertion. He says, "Thus we see that in strong muscular exertion it is impossible to think continuously, that concentration of attention on one sensory sphere diminishes the functional capacity of other cerebral organs . . ." (Breuer, 1947). Braatø, another analyst, also mentions the importance of the body in the therapeutic situation. "In psychotherapy, this basic connection between respiration, emotion, and symbolic behavior is important because the restriction of breathing and emotions is predominantly implemented by rigid postures and by hypertonus in the slow-reacting postural muscles. In releasing respiration and emotion, it is therefore helpful to take all obligations away from the postural muscles. For this reason the couch is an active factor in liberating the patient." (Braatø, 1954).

Ferenczi, Reich, Lowen, and Jacobson are other analysts who have indicated the importance of the body in analysis and its relationship to mental affairs. Ferenczi used "relaxation

exercises" to overcome psychical inhibitions and resistances to association. "'There seems to be a certain relationship between the capacity in general for relaxation of the musculature and for free association.'" (In Lowen, 1958) Reich related muscle tension to defense mechanisms and to repression (1949). According to Reich, muscular rigidity explains the manner and is the mechanism of repression. "Psychic and somatic rigidity . . . are not mutual expressions of one another, but form a unitary function . . . the physiological behavior determines the psychic behavior and vice versa."

(1949) It is possible, according to Reich, to observe dissolution of a muscular rigidity which not only liberates vegetative energy, but in addition, also brings back into memory the very infantile situations in which the repression had taken effect (in Lowen, 1958). Lowen, influenced by Reich, actively uses the body in therapy indicating the relationship as, "On the somatic level there is an increase in motility, coordination and control; on the psychic level there is a reorganization of thinking and attitudes."

(Lowen, 1958) Jacobson, who has explored the relationship of relaxation to ideation on a more experimental basis has developed a technique of progressive relaxation which involves training the body musculature to relax in order to overcome physical and psychical tensions (1938). He has implied muscular tensions are directly related to ideation imagery, and recollection.

Hypotheses Leading to Present Study

From the foregoing discussion, the present study was aimed at determining if 1) lying down leads to recall of earlier memories, and 2) if lying down leads to recall of more memories.

PROCEDURE

Experimental Conditions

Two conditions were used. One consisted of having S recall memories while in an upright, sitting position. The other condition consisted of having S recall memories while in a supine, reclining position. In the reclining condition, the legs were raised at the knees, the weight of the body was upon the back, and the neck and back were at a 30° angle to the floor. In the upright position S sat as if in an upright chair with the neck and back perpendicular to the floor. Aside from body position the two conditions were identical.

Subjects

Forty-two male subjects¹ participated in the experiment, 21 in each body position. The mean age of the Ss in the LD² group was 19.3 and in the SU group 20.1, not a statistically significant difference ($t=1.1$). The age range

¹A pilot study done in which 3 female Ss were used seemed to indicate that females were less able to recall memories than male Ss, perhaps due to E being female, and they seemed to be more defensive. For this reason it was decided to use male Ss.

²LD refers to the lying down condition and SU to the sitting-up condition.

of the Ss was 17 to 28 years of age. The Ss were from an introductory course in psychology. They signed-up for an experiment in "memory recall" for 1/2 hour credit on a posted sign-up sheet for psychological experiments. They were randomly assigned to either of the two experimental conditions when they appeared for the experiment.

Physical Arrangements

The experiment was done in a small, 10 foot by 10 foot, soundproof room. When S arrived for the experiment he entered the anteroom, also 10 feet by 10 feet, where he left his coat and books. A table and chair were the only furniture in the anteroom. The door to the experimental room, separating it from the anteroom, was closed during the experiment. In both rooms during both conditions there was uniform lighting. In the experimental room, the light was from two neon overhead lights.

The materials present in the experimental room consisted of the lounge chair in which S was seated during the experiment, (the chair was in either the upright or lounge position when S entered the room depending upon the condition for a given S; a stool in back of the chair; a table on which was placed a tape recorder; and a chair for E to sit on during the experimental session.

The lounge chair used in the experiment was made of canvas with a wooden frame. The canvas was tied to the frame with rope. Two side boards were present on either side of the face to block vision to either side and keep the head steady with the face forward. These boards were approximately 2 inches away from actual skin contact. When the chair was in the lounge position, the back of the chair was at 30° angle to the floor. The knees were raised so that the legs were elevated, similar to a T.V. lounge chair. When the lounge chair was in the upright position, the back and neck were at a 90° angle to the floor. The S was forced to sit straight. S's feet could touch the ground when in the upright position.

The position of the furniture was such that the lounge chair faced in the direction of the entrance door, but to the side of it. The left wall was 5 inches away from the left side of the subject; when in the upright position, the wall which S faced was 3 feet in front of him. The right wall was 7 feet to the right of the subject. E sat against this wall and 3 feet in back of S. The tape recorder was in front of E and out of the eye reach of S, as was E, during the session, (See diagram 1).

A tape recorder was used to record the responses of Ss. (Before S entered the room E recorded his number, position, number of the tape and side of tape for playback purposes.) The microphone was not visible to S when in the

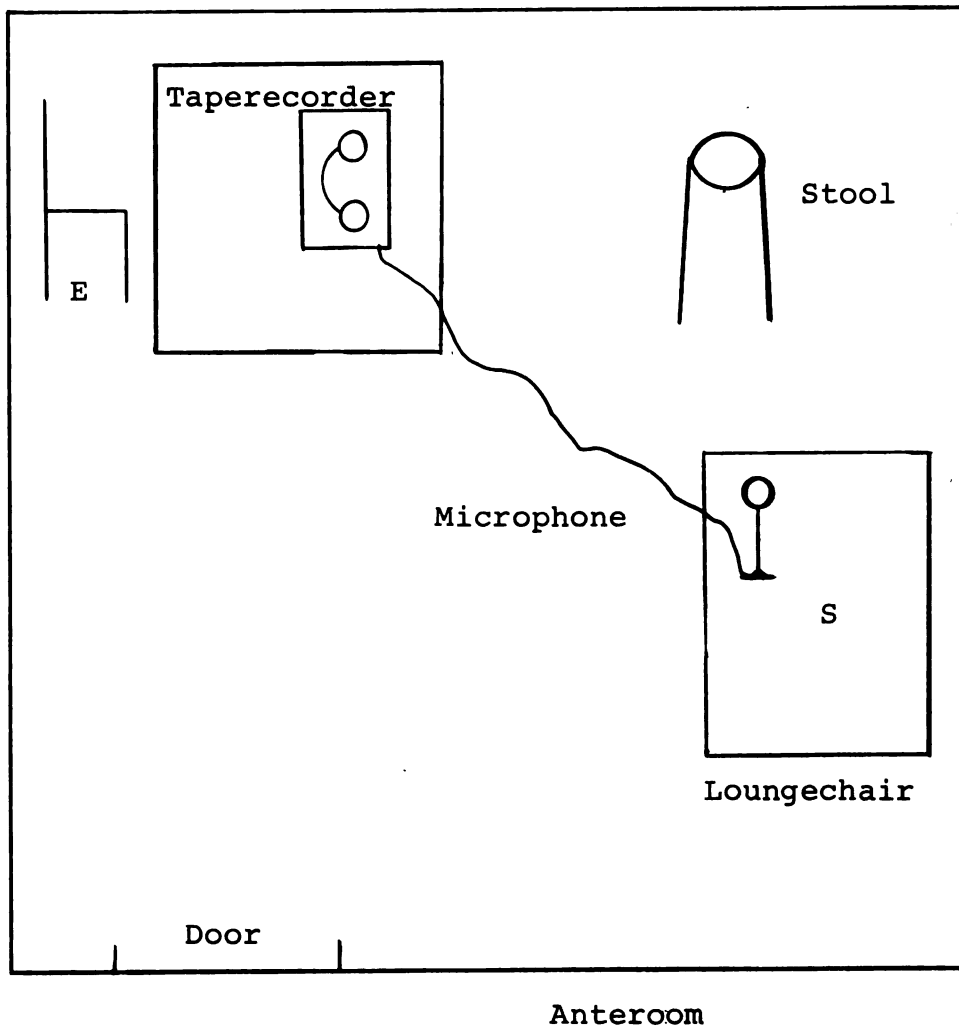


Diagram 1. Diagram of the experimental room. Loungechair on the right side, E in upper left, taperecorder on the table. (Scale: $\frac{1}{2}$ " = 1')

experimental chair, being mounted on the right side of the chair on the side of the headboard away from S, but it was clearly visible when S entered the experimental situation. The particular tape recorder used gave a low hum when running.

Task of Subject

When S entered the experimental room he was seated in the chair. E faced S while reading the instructions for the experiment. The instructions were as follows:

This is an experiment in memory recall. What I would like you to do is to put your head back, relax, and tell me any memories that come to your mind. You can be as detailed or as general as you want; and there does not have to be any particular order to the way in which you tell me your memories, there is no right or wrong way to doing this, just say what comes to your mind.

After or before each memory that you tell me, please mention how old you were at the time when the event which you are remembering occurred. It is very important for me to know how old you were for each event that you remember.

I am going to sit in the corner, in the chair, don't pay any attention to me. What you say is being recorded. I will tell you when time is up.

Now to summarize, you are to relax and tell me about any memories that come to mind. For each memory that you report, tell me the age at which the event occurred. If you are not sure, guess.

Do you have any questions?

After the instructions were read, E walked to her seat and turned the tape recorder on with a concomitant comment to S such as "OK," "Go ahead," or "Alright," to indicate he could begin to respond. E made no other comments until the end of the session. The session lasted for 20 minutes, at which time E made a comment again, such as

"OK," "That's fine," or "Fine," to indicate the session was over and the tape recorder was turned off at that point.

After the 20 minutes of free responding, additional data was obtained from each S by verbally asking him questions. He was first asked about his reactions to the experiment by a phrase such as, "Any reactions to the experiment?" Any reactions mentioned were written down by E. Other data concerned the S's age, major, class, where he was raised, what he was doing before coming to the experiment, if he was sleepy during the experiment, and if he was comfortable in the chair. During the session his behavior was recorded and he was rated by E on a five point scale for degree of nervousness, 1 being low and 5 being high. After the session S was asked to rate himself on nervousness on the same scale and his response was recorded.³

After all data was collected, S was given a slip indicating he had participated in an experiment and thanked for his cooperation by E.

Recording of Responses

A memory was defined as any event recalled, or any experience which S mentioned as a memory. Memories could be separated from one another by the fact that S related an age for each event. If S did not report an age, thus himself

³Much of the data collected after the session was not amenable to analysis. Some of E's qualitative impressions, however, were derived from talking with the Ss after the session.

separating one memory from another in his flow of thoughts, a memory was defined as a change in content area talked about even though no obvious break in the verbalization occurred. Another indication of what was a memory for S was a break in his thoughts evidenced by a period of silence. Examples of the content areas talked about as memories include: the first day of grammar, junior, or high school, the first day of college, teachers (of various grades remembered,) plays or sports in school, vacation trips taken, walking alone, playing with friends, births of siblings, deaths, injuries, girl and boy friends, feelings about certain events such as getting a new bike, being scolded by parents, being left alone by brothers, and other events that happened to S or experiences he had. In some cases one content area such as a trip or an injury or a football game were related in great detail. However, the main content area determined a memory rather than the details given. For instance, if S took a trip he might mention the weather, where he ate, where he stayed, the exact route taken, what was seen, and so forth, and these would all be considered as details of one memory centering around the theme of "trip." In this way memories varied in duration of time spent in relating them due to the amount of detail given within one memory.

As A was recalling memories, it was possible to write down the ages that he mentioned in the order that the ages were given for each memory. If no age was given to

the memory, some word about the content area of the particular memory could be written as an indicator to later ask S about the particular memory. After the session was over S was asked about the memory given without an age and he could then re-recall the memory and add the age. It was thus possible to classify almost all memories into given age categories. Those that could not be classified because they were of no particular event, but rather something that happened over a series of years, were classified as "general." Other memories where no age at all could be ascertained were classified as "unknown." The latter two categories were later subsumed under the classification of "unknown age."

A stopwatch was used to time the 20 minute period of free recall. It was possible to make note of each 5 minute period during the notation of the ages of the memories being given by S. This allowed for four 5 minute periods to be ascertained from the total 20 minutes with the number of memories given for each 5 minute period recorded separately.

Tape recordings of the sessions were listened to by E. This allowed for a recheck of the original ages and number of memories noted. Scorer reliability for the age of memories recalled was determined by having two independent judges score the tapes. Reliabilities for 7 Ss on age of memories were .61, .83, .89, .91, .92, .96, and .99. Almost perfect agreement was obtained concerning the number of memories per S.

RESULTS

Mean Age of All Memories Recalled

The mean age of the total number of memories recalled by the LD group was 11.7 years. The mean age for the total number of memories recalled by the SU group was 13.12 years. The difference of 1.42 years was not statistically significant, ($t=1.52$) although in the predicted direction. The mean age recalled by each group was based on the mean age of recall for all memories for each subject within the group.

Table 1.--Mean age of all memories and the earliest memory recalled in LD and Su conditions.

	LD	SU	t
Mean age of all memories recalled	11.7	13.12	1.52
Standard Deviation	2.85	3.02	
Mean age of earliest memory recalled	3.9	4.9	1.39
Standard Deviation	2.32	2.53	

Earliest Memory Recalled

The mean age of the earliest memory recalled for each S in the LD group was 3.9 years. For the SU group it was 4.9 years. The difference of 1 year was not statistically

significant, ($t=1.39$) but the trend was in the predicted direction (Table 1). The findings of other studies indicate the earliest memory recalled is usually in the age range from 3.04 years to 3 years 8.5 months using means or medians (Dudycha, 1941).

The whole age closest to the median age of recall for the earliest memory was 3 years. Of the 42 Ss, 17 fell below and 25 above this age when using their earliest memory. Using age 3 as a cutting score, a χ^2 analysis was done in a 2 x 2 design to test for the contingency between the LD and SU conditions and number of Ss with memories at or below 3 and above 3 years of age. Of the 17 Ss remembering before age 3, 5 were in the SU group and 12 in the LD group, a significant difference. The χ^2 was significant at the .05 level ($\chi^2 = 4.84$, 1 df). In the LD condition a greater number of Ss recall memories before age 3.

Analysis by Age Categories

The memories recalled were grouped into 5 age ranges; birth to 3 years old, 4 to 7 years old, 8 to 11 years old, 12 to 15 years old, and 16 and above. The difference between the groups in mean number of memories recalled was tested separately for each age classification. A statistically significant difference was found in the age range of birth to 3 years, ($t = 2.46$, $p = .02$), which was in the

predicted direction. The effect of body position appears most marked in the early period (Table 2). The LD group recall more memories before age 3 than the SU group.

Both groups show a trend of increased number of memories recalled as age is increased except for one reversal in the SU group which recalled more memories for age range 8 to 11 than for 12 to 15 (Table 2).

Table 2.--The mean and total number of memories recalled as a function of age category.

Age Range	Number of Memories		
	LD	SU	t
Birth to 3 years old			
Mean	1.2	.29	2.46*
Total	25	6	
Standard Deviation	1.55	.57	
4 to 7 years old			
Mean	5.33	3.95	1.02
Total	112	83	
Standard Deviation	5.19	3.47	
8 to 11 years old			
Mean	5.52	4.57	.73
Total	116	96	
Standard Deviation	4.21	4.06	
12 to 15 years old			
Mean	6.19	4.1	1.74
Total	130	86	
Standard Deviation	4.65	2.39	
16 years and above			
Mean	6.71	7.48	.32
Total	141	157	
Standard Deviation	9.04	6.18	

*Significant at .02 level with 40 degrees of freedom.

Distribution of Memories Over Time

It was of interest to see when, during the 20 minute session, the earliest memory was recalled. It was found that 28 of the 42 Ss recalled the earliest memory within the first 5 minutes of the session. (The 20 minutes were divided into four 5 minute periods.) It was also found that the earliest memory was the first memory recalled in 17 of the 42 Ss. Of the 28 Ss recalling the earliest memory in the first 5 minutes, 15 were in the LD group and 13 in the SU group. The 14 Ss not recalling the earliest memory in the first 5 minutes were evenly distributed in the second, third, and fourth 5 minute periods. Of those 14, 6 were in the LD group and 8 in the SU group (See Table 3).

Table 3.--Placement by five minute segments of earliest memory recalled during 20 minute session.

Placement in Time of Earliest Memory Recalled	LD	SU
During first 5 minutes	15	13
During second 5 minutes	2	4
During third 5 minutes	2	2
During fourth 5 minutes	2	2
	N = 21	N = 21

In both groups there was a decline in the number of memories over time. Both groups had more memories in the first 5 minute period than any subsequent 5 minute period.

The LD group had the greatest drop between the first and second 5 minute periods. The SU group had the greatest drop between the second and third 5 minute periods. Both groups produced the smallest number of memories during the last 5 minutes of the session. The course of memory recall over time for both groups is shown in Figure 1.

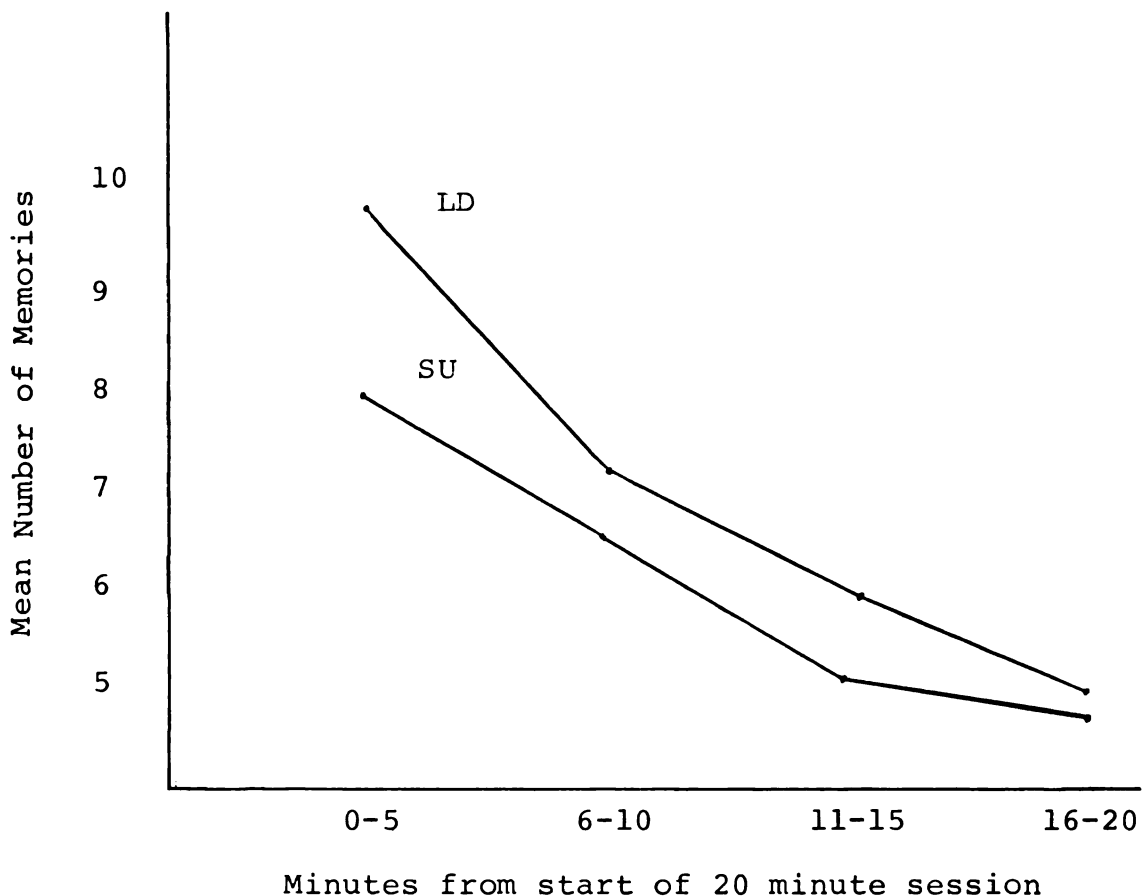


Figure 1.--Mean number of memories recalled during each 5 minute period during 20 minute free recall for LD and SU conditions.

Total Number of Memories

It had been hypothesized that the LD condition would produce more memories overall. The total number of memories recalled for the LD group was 563 and for the SU group 490. The mean number of memories per S in the LD condition was 26.81 and the mean number per S in the SU condition was 23.33. Though in the predicted direction this difference did not approach statistical significance ($t = .409$, (See Table 4)).

Table 4.--Mean and total number of memories recalled in LD and SU conditions.

Number of Memories	LD	SU	t
	N = 21	N = 21	
Total number of memories	563	490	
Mean number of memories	26.81	23.33	.409
Standard deviation	10.22	14.39	

Qualitative Impressions

A few Ss in each group closed their eyes during the session at some time. Since E was behind them it was difficult to determine exactly when S was looking downwards, when his eyes were closed, and when he was flinching. For this reason the information is not more exact. Most Ss however, seemed to keep their eyes open during the session.

The impression of E concerning the difference between the two groups centers around what may be considered a general set which was different for each group. The SU group seemed to be concerned with the task and was problem oriented. During the process of recalling memories they expressed concern about the appropriateness of their responses. Their comments seemed to indicate they were sifting through their thoughts and choosing what they were going to say. They verbalized the thoughts they judged would be significant to E. Such comments as "I don't think this is important," or "You don't want to hear this," or "I hope this is what you want," indicated that Ss in the SU group were concerned with doing a good job. On the other hand, Ss in the LD condition seemed less concerned with the task in the sense of worrying about what was wanted by E. Rather, they seemed to enjoy reminiscing. At times they seemed surprised, delighted, curious, or wondered at the memories that occurred to them. They did not indicate through verbal comments that they were as concerned with what E wanted. They seemed lost in their thoughts and enjoying the task. Instead of a problem oriented set they seemed to be introspecting more naturally.

The Ss in the SU group often jumped hurriedly out of the chair and seemed anxious to leave the room at the end of the session. They asked what the experiment was about, often made comments about the task being difficult,

and thought the situation was unusual. In contrast, the LD group of Ss was not anxious to leave the room and often Ss remained in the chair at the end of the session. They seemed less interested in the purpose of the experiment. Instead of asking about the experiment they seemed to persevere upon the task of recalling memories, often even after standing up. The SU group, if asked, would probably have judged the task difficult while the LD group would probably have judged the task easier and perhaps even pleasant. The latter found the recalling of memories while lying down not an unusual situation.

Both groups reported the lounge chair as being comfortable. Neither group reported being disturbed by the tape recorder or by E.

DISCUSSION

Age of Memories

It was hypothesized that lying-down would lead to recall of earlier memories than sitting-up. The evidence indicates that there was a trend for memories called by the LD group to be earlier than those of the SU group. Interestingly enough, the most significant findings indicated that the period most affected by the body position was the age range before 3 years old.

The fact that the years before 3 are most affected by LD is interesting in the light of Freud's theory about childhood memories and the primary process. According to Freud (1958), before language development the primary process, (which consists of visual experiences and hallucinations), is the mode of experiencing the world for the young child. The primary process also functions in dreams. In dreams the early childhood memories are in part re-experienced when the individual becomes older. Freud further linked the primary process to motor discharges into the interior of the body (Freud, 1958 and Freud in Rapaport, 1951). It can readily be seen that some similarity exists between the lying down position when awake and the lying

down position when asleep in terms of similar muscle tensions of the body when in the reclining position. These body tensions and motor discharges into the interior of the body in turn seem related to phenomena of primary process ideation occurring. It seems that in the awake condition when lying down a change in the muscle tensions allows for the unconscious elements of the psyche to become conscious in the form of recalling the earliest experiences of childhood, originally experienced on the primary process level. On the other hand, when asleep and lying down the primary process material is revealed in the form of dreamwork. It seems that in both instances of lying-down, when either awake or asleep, the relaxation of the muscles and the change in muscle tension facilitates occurrence of primary process material.

Freud believed many memories that were recalled, and especially those attributed to ages before 2 or 3, were often "screen" memories, substitutes for other impressions which were more significant but repressed (Freud, 1958). He used the screen memories to get at the real underlying repressed experience which was causing the neurosis. Freud thus made use of these very early memories in his analysis of the patient. The present study indicates that lying down facilitates bringing more of these "screen" memories to consciousness since more memories were remembered before age 3 in the LD condition than in the SU condition. The implication for

analysis or therapy is that if "screen" memories are used to get at repressed material, lying down is more conducive to bringing into consciousness clues to repressed material than is sitting up. Primary process material is more readily accessible in the LD S than in the SU S.

The earliest memory recalled by an individual has been used as a diagnostic tool, as well as a therapeutic tool (Winthrop, 1952, Kahana, 1953, Lieberman, 1957). Kahana (1953) uses the earliest memory recalled in formulating an individual's dynamics within the psychoanalytic framework. Kahana believes that information concerning unconscious conflicts, significant traumatic experiences in childhood, and defenses against anxiety and transference reactions can be obtained from the earliest memory recalled. The present observations would agree with Kahana that much of this type of information is readily obtainable in this free responding situation of asking for early memories. However, it should be added that with Ss lying down this type of information leading to formulations concerning underlying personality dynamics seems much more readily available and easier to obtain than with S sitting-up. Since S is not concerned with what E wants from him when he is lying down, he is more likely to reveal what is important to himself. There seems to be a qualitative difference in the way in which the material is given. S, while lying down, seems less defensive than when SU and in this way cooperates in giving information about himself.

Another approach to the earliest memory and number of memories recalled is that of Child (1940). An attempt to relate the earliest memory and the number of memories recalled before age 6 to degree of neuroticism was made by Child using a paper and pencil technique. His study stemmed from Freud's theory about the relationship of repressed childhood experiences to the etiology of neurosis. Although Child's correlations were in the predicted direction, they were not statistically significant. The present study seems to indicate that perhaps another variable could be introduced, that of body position. It may be found that high neuroticism may be related to his two measures of childhood amnesia, (age of earliest memory and number of memories recalled before age 6; if S is lying down. As Child himself points out, however, Freud did not believe that all types of neurosis were related to repression of early experiences. Further studies of the relationship between neurosis and childhood amnesia should discriminate the types of neurosis involved. There may be significant interactions of body position, childhood amnesia, and type of neurosis.

Relevance of Theories of Perception

Various theories of perception have indicated the importance of the body state and muscular tensions on perception (Freeman, 1939, Witkin, 1949, Werner and Wapner, 1952, 1957, and Allport, 1955.

Experiments have shown that there are individual differences in styles of perception (Witkin, 1949). The importance of these perceptual theories and related studies is to point to the relationship between the body tonus and muscular impulses upon phenomenal experiences. The finding that the body tonus and posture influences perception, a phenomenal experience, has been extended by the findings of the present study so that it can be said body tonus influences the phenomenal experience of memory recall. As Jacobson points out (1938), a link can be made between the original perception and the memory of the perception through the body sensations. " . . . when a sense-organ--for instance, the eyes--are active, the muscles that control them also are active, and the sensation from the controlling muscles evidently plays a useful role in vision. Accordingly it seems a matter of course that when the original experience is repeated, taking the form of imagery, the muscular experience that goes with it also is repeated. In this way the individual doubtless at least in some measure "controls" his images and thought-processes. The cultivation of this factor has been used in clinical work for the control of undesirable mental activity or over-activity." Since there are these relationships between original perception, perceptual style, imagery, and body sensations, it may be possible to find significant aspects of personality dimensions and

configurations through combining of various findings, especially when perceptual styles are linked to personality variables and these in turn to aspects of physiological functioning.

Relevance of Sensory Deprivation Studies

Various experiments in sensory deprivation have shown that limiting the sensory input produces primary process phenomena. Morgan and Bakan (1965) have shown that lying down Ss are more likely to have visual hallucinations than are sitting up Ss in a sensory deprivation condition. Lilly (1956) points out that primary process phenomena occur when stimulation is reduced in a sensory deprivation condition in a laboratory or due to natural conditions of deprivation such as being snow-bound or ship-wrecked. The importance to the present study stems from the relationship of sensory input to primary process material presenting itself to consciousness. The lying down condition in the present study reduced stimulation from the muscular senses, which led to primary process material coming to consciousness in the form of early memories, similar to the sensory deprivation studies in which primary process material also occurs with lessened stimulation. As Jacobson (1938) has shown, relaxation leads to a decrease in attention, an ego function, and it may be that reduction in this aspect of the thought process leads to the primary process material being allowed

into conscious awareness. The sensory deprivation studies and the present findings indicate that reduction of body sensations seems to be intimately tied to production of primary process phenomena.

Decline in the Number of Memories Over Time

No specific hypothesis was made in regards to the number of memories over time. Both groups showed a similar trend which was a decrease in the number of memories over time. This decrease can be attributed to perseveration upon detail within a given memory, which most Ss seemed to do after approximately the first 10 minutes, which lead to fewer memories being recalled during an equal time interval.

In terms of psychoanalytic formulations, perseveration upon insignificant details is a form of resistance (Jung, 1917, Glover, 1955, Meerloo, 1959). Freud (1958) believed resistance to be either the unconscious avoidance of painful repressed material or the conscious avoidance of "working through" problems. Since both groups showed the identical pattern of perseveration upon detail, they can be considered equal in terms of resistance either on a conscious or unconscious level.

Another possible interpretation of the decline in memories over time comes from studies in social reinforcement (Sarason and Ganzer, 1962). Since E did not regard or indicate to S if S was doing the correct thing, it may have

caused S to revert to a pattern of details in order to keep talking even though S did not produce more memories. S may not have been sure which type of memory to recall and this may have resulted in the recalling of fewer memories. From the observations made, this seems a less likely explanation than the resistance explanation since all Ss when asked reported being unaware of E and lost in their thoughts during the session. Even if they reported being aware of E at the beginning of the session, by the end of the 20 minute period they were no longer concerned with E. They did not seem to be waiting for approval or recognition. The procedure of E being in back of S, which differs from the usual face to face situation in the social reinforcement studies, may be the reason for the feeling that lack of social reinforcement was not a significant factor in the decrease in memories over time.

One other possibility presents itself, that of what Jacobson (1938) finds in progressive relaxation. He finds that as his Ss learn to relax there is a decrease in ideation and imagery. Jacobson finds that "With progressive muscular relaxation--not alone imagery, but also attention--recollection, thought-processes and emotion gradually diminish, the intensive relaxation of movement brings with it a subsidence of voluntary recollection and reflection." (Jacobson, 1938) It may be that in both conditions in the present study the Ss relaxed more as time progressed

and thus less presented itself to consciousness. This in turn reduced the memories recalled. It still seems feasible that a reduction of tension could occur in both groups, thus reducing the number of memories, and yet a qualitative difference exists in what presents itself to consciousness (Primary process material in the LD group) based upon where the sensations are coming from in the body. Jacobson finds that the neck muscles are important in relaxation, and the LD group would be more relaxed in this muscle group than the SU group. The link between muscle sensations and what presents itself to consciousness may be more complex than mere total input. Where the sensations are derived from may be a critical factor in determining the quality of the subjective experience.

Number of Memories

The second hypothesis predicted a greater number of memories would be recalled lying down than sitting up. Although the difference was in the predicted direction, it did not approach statistical significance. It seems that body position has a greater influence upon the age of the memories recalled than upon the number of memories recalled.

The results of the study indicate that body position has the greatest influence upon what is presented to consciousness and not if something is presented to consciousness. This seems to clarify in what way lying down affects the "mental affairs" which Freud talks about. It is

not related to the amount of material recalled per se, but rather to the quality of the experience, allowing primary process material to be brought to consciousness. This is the most significant aspect of the findings in regards to implications for therapy.

Suggestions for Further Research

The present study has not dealt with the difference in content of the memories given by Ss in the two different positions. Only a general overall impression concerning the qualitative differences between the two conditions was mentioned. Examining the content of the memories for affect or types of events recalled would lead to greater understanding of the way in which a change in body position affects recall. As previously mentioned, earliest memories are used within therapy and also as a diagnostic tool. If a content analysis reveals significant differences as a result of a change in body position this would have implications for both therapy and diagnosis. It may be that the reclining position, which allows relevant material to become available, may serve as a useful tool to speed up therapy. In terms of diagnosis, a speedier formulation of personality dynamics may be possible if the individual recalls memories while in the reclining position. In a therapeutic situation the subjective experience of S should be relevant and Ss lying down seem more comfortable than Ss sitting up when

recalling memories. A content analysis may shed light on which affects become more prominent in which condition, and which events are recalled more readily in which position. These findings may indicate in which way body position could be a useful tool to facilitate therapy and diagnosis.

Since in many techniques of therapy the client faces the therapist, the present study should be repeated with E and S facing one another. It would be difficult to predicate in which way this variable would affect recall, but any findings would have direct implications for therapy settings.

A recommended change in procedure involves having S tell the age of the events recalled after the session instead of before or after the memory. Having S give ages while recalling may not allow S to freely introspect. By giving the age during the session he is called upon to be task oriented and attentive to environmental demands. Eliminating this aspect of the procedure may result in more earlier memories, or an increase in the number of memories recalled. The differences between the two conditions may be magnified with this change in procedure.

The last suggestion for research concerns repeating the study using female Ss. There is no a priori reason to assume that female Ss will respond the same way as male Ss in the two conditions. Since the present study was done using male Ss and E was female, other studies should use both sexes for Ss and Es to determine how this variable is

related to memory recall and body position. Witkin (1949) has found sex differences in perception as a function of body position and it would be interesting to extend his findings to sex differences in memory recall as a function of body position.

Conclusions

The present study has clarified to some extent the way in which the psychoanalytic technique of lying-down during analysis affects "mental affairs." The present findings indicate that body position affects quality rather than quantity of material that presents itself to consciousness. It has been shown that in the lying down position S can more readily recall earliest childhood memories. Since these earliest memories are a form of primary process material it can be said that lying-down facilitates the occurrence of primary process material. It is of interest, in the course of therapy or analysis, to have the individual reveal this type of material. Support, then, is given to the psychoanalytic technique of having the individual in a reclining position during the course of therapy or analysis.

SUMMARY

The present study was an investigation to determine if 1) lying down leads to recall of earlier memories and 2) if lying down leads to recall of more memories. Interest in this problem stems from psychoanalytic theory and technique. The Ss were 42 undergraduate males between the ages of 17 and 28. Half of the Ss were in a lying-down (LD) position and half were in a sitting-up (SU) position. Responses were obtained in a free recall situation lasting 20 minutes. Support was given to the first hypothesis by the following: 1) the mean number of memories in the age 0-3 years category was significantly greater in the LD position than the SU position; 2) significantly more subjects in the LD condition recalled memories for the 0-3 year period than in the SU condition; 3) the mean age for all memories recalled was earlier for the LD group than for the SU group, though this difference was not significant. No support was found for the second hypothesis that lying-down leads to recall of more memories. Discussion mentioned: uses of memories in therapy and diagnosis implying body position may be a useful adjunct in recall situations; relevancy of studies in perception and sensory deprivation; and suggestions for further research. The

results of the present study are interpreted as experimental confirmation of the psychoanalytic procedure of using the lying-down position in free association and memory recall.

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