

SOME EFFECTS OF FLOWER/NONFLOWER TABLE  
CENTERPIECES ON PSYCHIATRIC PATIENT AND STAFF BEHAVIOR

210

by

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A MASTER'S THESIS

submitted in partial fulfillment of the

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MASTER OF SCIENCE

Department of Horticulture

KANSAS STATE UNIVERSITY

Manhattan, Kansas

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Richard H. Mattson  
Major Professor

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PATIENT AND STAFF BEHAVIOR<sup>1</sup>

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ABSTRACT

A six-week study investigated the behavior of patients and staff following the introduction of fresh flower and non-flower (candle) centerpieces into the dining room of a private psychiatric hospital. Combined patient/staff data show that more subjects initially chose the centerpiece tables than the control tables. The number of patient/staff occupancies (joining or leaving) was significantly ( $\alpha=.08$ ) more at candle than at flower or control tables. Patient time spent at candle tables was significantly ( $\alpha=.02$ ) longer and number of patients at candle tables significantly ( $\alpha=.10$ ) greater as compared than to control tables. Patient response at flower tables was intermediate between candle and control tables. Staff number and time remained the same at all dining room tables.

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## LITERATURE REVIEW

This study was designed to investigate the hypothesis that plant materials have pleasing and stimulating effects on human behavior. Specifically, this paper explores behavioral patterns of patients and staff as they may be affected by the introduction of plant material into the dining room of a private psychiatric hospital.

Due to the environmental impact of increasing industrialization and urbanization, a large amount of research has emerged attempting to assess the effect of the physical environment on human behavior. While it has been suggested that exposure to the natural environment is a component of mental and physical health (3,4,7,11,16) relatively little research has specifically measured plant-man interactions.

Some indirectly related studies investigating this relationship are generally referred to as "wilderness" studies. Shafer and Mietz (17), exploring people's motivation for experiencing the wilderness, found aesthetic experience to be the most important factor with emotional experiences closely following. Calvin (2) also found aesthetic quality to be a primary factor in determining environmental preferences. However, Sonnenfeld (18), when eliciting environmental preferences, found that perception of a pleasing natural environment is largely dependent on former experiences. He found cultural, sexual, and age differences. Craik (5) views environmental preferences in terms of role theory and expectations, whereas Kates (13) stresses the symbolic significance of different aspects of the environment as being determining factors in preference. Driver (6) suggests that people retreat to the wilderness

to escape the stress of urban living. Iltis (11) believes that many humans are genetically primed to live most comfortably in a natural habitat of varied green landscape.

Plant material has been viewed as a possible therapeutic tool (1,8,9,20,21). Mehrabian (15) contends that potted plants and flowers contribute to the pleasure dimension, complexity, and novelty of a room. Talbot et al (19) reported that the introduction of flowering plants into the dining area of a state psychiatric hospital was followed by a significant increase in vocalization, time spent at table, and amount of food consumed. Talbot offers three possible explanations for the effects of plants on humans: 1) the human perceptual apparatus is specifically primed for plants as direct positive stimulus objects, possibly implying Dubos' (7) and Iltis' (11) theories involving genetic adaption; 2) plants are aesthetically pleasing and perceptually stimulating aspects of the environment, as Mehrabian (15) suggests; and 3) plants engender nurturance from humans thus establishing a dependency relationship involving responsibility for another living thing. (1,8,10,14)

At the initiation of this study it was hypothesized that: 1) subjects would notice the positive stimulus of flowers and would occupy flower tables first; 2) flowers produce a more pleasing and stimulating environment than non-flowering centerpieces or no centerpieces; and 3) staff would be more attuned and responsive to the presence of flowers than patients. Our intent was to test these hypotheses.



## MATERIALS AND METHODS

This study was conducted in the dining room, used by both patients and staff, of a private psychiatric hospital. The staff consisted of psychiatrists, psychologists, social workers, activity therapists, nursing staff, and administrative personnel. The patient group does not represent any specific diagnostic category but is comprised of those patients able to dine alone or with other patients unattended by staff members. Patients and staff are interspersed throughout the dining room but traditionally eat at separate tables to afford staff a lunch time break. The staff/patient ratio was approximately two to one. The food was served cafeteria style.

The study was divided into three phases of consecutive two-week periods during which observations were made on Monday, Wednesday, and Friday from 11:30 A.M. to approximately 1:15 P.M.

Based on data from a previous study, during which tables were ranked in order of their occupancy over a five day period, three general areas of popularity were assigned in the dining room; high, medium, and low popularity. The independent variable was stratified (divided equally) among the three preference areas. Three six-chair tables of comparable popularity were chosen from each section for observation. Two observers were seated at a centrally located table, visible but not obvious to the subject group.

The first and last two weeks served as a control during which baseline data was collected. At the beginning of the second two weeks the independent variable, consisting of three levels of stimuli, was intro-

duced: fresh cut flower centerpieces, non-flower centerpieces (candle-sandscape), and control (no centerpiece).

The fresh flower centerpieces were spherical designs approximately thirty centimeters in diameter composed of red, white, and pink carnations; white and yellow chrysanthemums; and red roses. The non-flowering centerpieces were similar sized glass containers holding a large diameter candle on top of a multicolored sandscape design. The three treatments were stratified with in the high, medium, and low preference areas of the dining room totaling nine experimental tables.

Four measures of patient/staff behavior were used: 1) ranking of initial choice of tables; 2) number of table occupancies (subjects joining or leaving tables); 3) total number of patients/staff occupying each table; and 4) total amount of time patients/staff occupied each table.

Initial preference rank was obtained by numbering the tables one through nine in order of their occupancy. Total number of patients and staff occupying each table was tabulated by recording the number seated at five-minute intervals. Total time of table occupancy was evaluated by adding the five-minute intervals during which the table was in use. Number of occupancies (joining or leaving) was tabulated by the differences in numbers at intervals of observation.

Analysis of variance was calculated with an IBM 370/158 computer using an AARDVARK program. Mean separation was calculated using Duncan's multiple range test.

## RESULTS

### COMBINED PATIENT/STAFF RESPONSE:

Initial Perception of Flowers: As patients and staff entered the dining room they selected tables in the same order of priority during pre- and post-treatment weeks. However, when centerpieces were placed on tables a different seating preference occurred. (See Fig. 1) Both types of centerpieces influenced the subjects' table choice but the candle tended to be more popular than the flowers.

Socialization Effect: Patient and staff occupancies (joining or leaving) at candle tables significantly ( $p \leq .08$ ) increased as compared with flower and control tables (Table 1).

### PATIENT RESPONSE:

Pleasantness of the environment was measured by the patient number and length of time spent at the dining room tables. As shown in Table 1, the number of patients occupying the candle tables is significantly ( $p \leq .10$ ) greater than those of the control tables. A similar effect occurred in total length of time the tables were occupied. The total length of time patients spent at the candle tables was significantly ( $p \leq .02$ ) greater than that at the control tables. Patient number and length of time spent at flower tables were intermediate between the candle and control.

### STAFF RESPONSE:

In contrast to patient behavior of eating in relatively small groups and in less than 30 minutes, the staff eating in this psychiatric hospital

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Fig. 1 Average ranking of initial choice of candle, flower and control tables (most popular ranked 1 to least popular ranked 9).

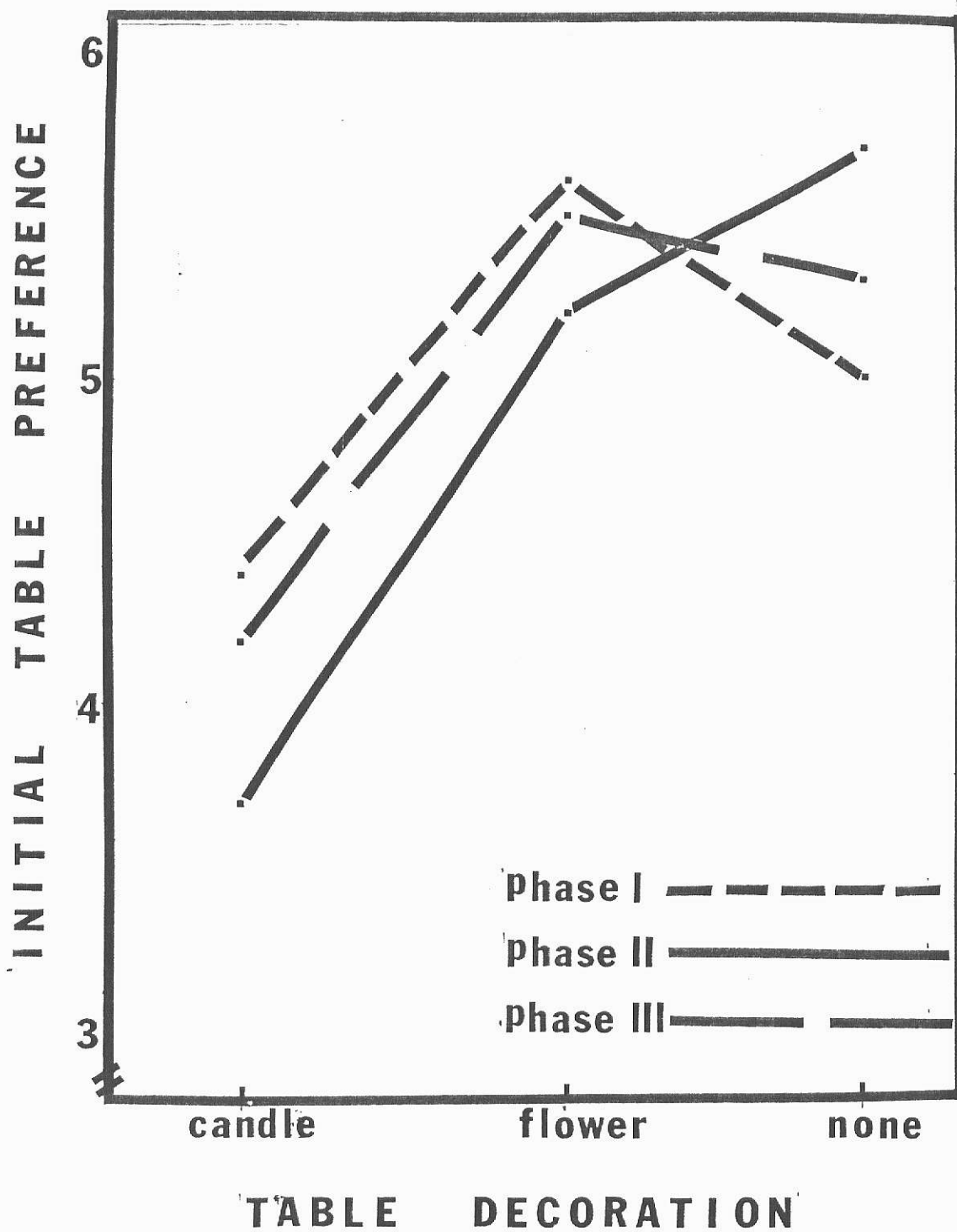


Table 1. Patient/staff seating behavior in response to flower and candle centerpieces on dining room six-chair tables.<sup>y</sup>

Phase	Treatment	Number of Occupancies (joining or leaving)		Number of Occupants		Total Time of Table Occupation (Min.)	
		Combined Patient/Staff No.		Patient No.	Staff No.	Patient No.	Staff No.
Pre-treatment Period	Candle	4.9ab	2.8ab <sup>z</sup>	5.0a		18.3ab	39.4a
	Flower	5.1ab	2.4ab	5.0a		19.4ab	41.9a
	Control	5.8a	3.3a	4.5a		25.8a	36.1a
Treatment Period	Candle	5.4a	3.6a	4.4a		29.2a	34.7a
	Flower	3.9b	2.5ab	4.3a		15.0ab	36.7a
	Control	4.1b	1.5b	4.0a		8.6b	38.1a
Significance Level		.08	.10	N.S.		.02	N.S.

<sup>y</sup>Observations based on six days data in three preference regions of dining room.

<sup>z</sup>Mean separation for each factor by Duncan's multiple range test at significance level indicated.

dining room sat in larger groups ranging from 4.0 to 5.0 per table and spent from 36.1 to 41.9 minutes eating lunch (Table 1). Staff number and time spent at the dining room tables were not influenced by the center-pieces on the tables.

## DISCUSSION

### INITIAL PERCEPTION OF FLOWERS:

The influence of the centerpieces in terms of initial table choice is clear but not strong. This may be due to the short length of time the centerpieces were fully apparent as stimulus objects and the small number of subjects actually choosing tables at that time.

The dining room serves lunch beginning at 11:30 A.M. At this time, patients generally filter in, obtain food, and choose tables. Staff generally start arriving approximately at 12:00 noon. Thus, initial table choice is generally confined to patients between approximately 11:30 A.M. to 12:00 noon. Later, when most tables have become occupied and a larger number of subjects are in the dining room obtaining food and joining already occupied tables, the arousal level related to choosing a table is distinctly different from the 11:30 A.M. to 12:00 noon period of comparative calm.

It is possible that the clear influence of the centerpiece tables came primarily from that first period of comparative calm but then lost strength with a decrease in the number of empty tables. This produced more tension around locating a place to sit and involved more peer association factors; i.e., more choice as to table partners rather than which empty table to occupy.

### SOCIALIZATION AND PLEASING/STIMULATING EFFECTS:

Among the patient group more subjects tended to occupy the flower tables than the control tables, and total occupancy time was greater than



that of the control tables. However, contrary to the initial hypotheses, the candle tables were distinctly more influential in both cases. Candle tables were also joined or left considerably more than either flower or control tables.

Four possible explanations may shed light on the candle influence:

- 1) It was observed that on three occasions the candles were lit by subjects. Perhaps this unique possibility of active participation enhanced the attractiveness of the candles.
- 2) It is possible to view the candle preference in terms of Kates (12) ideas on environmental preferences. He stresses the symbolic significance of different aspects of the natural environment as being determining factors in preference. Perhaps candles, especially lit candles, symbolically represent intimacy for some subjects.
- 3) Prior to this experiment during lunch on dining tables, flower arrangements had been used intermittently, having been left over from a function the night before. Candles, however, had not been used. Also, the candle centerpiece as described is a unique combination of colorful sandscape and candle. These two novel factors may have been a determining force in candle centerpiece popularity.
- 4) According to Kaplan's study of the satisfaction of a gardening experience, gardening involves the information processing of recognition, prediction, control, and evaluation. She proposes that fascination, which is a product of these challenges and later rewards, is a major enticing factor. She also suggests the possibility of a developmental variable. Fascination may be related to a level of competence which is acquired with time. Flower arrangements present only the final product of a long growth and developmental process. Perhaps attraction to plants involves participating in or observation of

life cycle processes, as one could during a walk in the woods. The candle centerpieces may involve a greater fascination factor than the flowers by virtue of their unique design or fire producing possibilities.

#### PATIENT/STAFF COMPARISONS:

Contrary to the third hypothesis which states that staff would be more attuned and responsive to the presence of flowers than patients, it was the patient group who showed more response to the stimuli than the staff. However, the schedules of patients and staff differ markedly in that the staff generally arrive approximately 20-30 minutes later than many patients. Thus, the staff's choice of tables was greatly reduced. Also, most staff members have a set period of time for lunch break (approximately 45 minutes). If they choose to go to the dining room, they are likely to stay there the entire time. Patients, on the other hand, have a more flexible schedule and a "home" to return to after finishing lunch. These two facts may account for the large differences in patient and staff response in terms of length of occupancy and numbers occupying experimental tables.

The study ran from April 6, 1977 through May 16, 1977. During the post-treatment phase the weather was improving steadily and drawing subjects outside to the patio and grounds to eat. Thus, there were fewer subjects and a different pattern as compared to the pre-treatment phase. In terms of length of occupancy measure, post-treatment eating time was significantly less than pre-treatment time ( $p < .02$ ).

It is also possible that a behavioral response was established during the experimental phase which continued into the post-treatment phase. Each phase followed the other directly.

Results of this study were different from those of Talbot, et al (19). While they found that the introduction of flowering plants into a state psychiatric hospital increased time spent in the dining room, vocalizations, and amount of food consumed, we found no significant differences between flower centerpiece and control tables. Two factors may be involved in the differing results. First, state psychiatric hospitals usually are lacking in sensory stimuli, while private psychiatric hospitals usually are not. Talbot's pilot study did not include a control for a centerpiece effect. Thus, we are not sure if subjects are responding to plants or to a new stimuli in the dining area. Our study indicates the latter. Secondly, Talbot, et al was working with predominantly chronic schizophrenics, whereas our patient group represented more varied diagnostic categories. The difference of subject groups may be a factor in the varying results.

People's relationship to plants has gone through several stages of development from early gathering of fruit and nuts for food and plant materials to build homes to later cultivation and genetically selected breeding of improved varieties for a myriad of uses. Today, people's dependence on plants remains as strong as ever.

Although this dependence functions on a psychological as well as physical level, the nature of the former is far less well understood than the latter. It is hoped that this study will help to stimulate an expanded

investigation of the subtle complexities of the relationships between plants and people.

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## APPENDIX

### IMPLICATIONS FOR FUTURE RESEARCH

During the nascent stages of investigating people-plant relationships, it is tempting to design elaborate experiments to obtain as many answers as possible within one research project. Having initiated such research in the area, I would like to contribute some thoughts on simplifying methods of investigation. !

The first hypothesis which states that subjects would notice the positive stimulus of flowers and would occupy flower tables first, measures plant material as perceptual stimuli. To reduce the number of variables, only the first thirty minutes of the dining period at which time there is the greatest amount of choice should have been used. I would initiate the use of centerpieces only in the high popularity area to further reduce the variables. After obtaining this data, I would introduce the centerpieces into the medium popularity area, obtain data, and finally introduce them into the low popularity area.

With this method, I may be able to ascertain at which point other factors begin to compete with the centerpieces as stimuli. Later, it would be interesting to use all areas of the dining room simultaneously and observe any differences. Initially, I would use one standard variety and color of flowers and later vary this to determine if responses differ with a change of flower variety or color. Additional information could be gained through a survey that would evaluate subject's perceptions of why they chose certain tables, time they entered the dining room, whether

or not they noticed the centerpieces, which they preferred, etc.

A separate experiment could be designed to investigate the second hypothesis stating that flowers produce a more pleasing and stimulating environment than non-flower centerpieces. For this experiment, I would utilize the same three phase design using the first and last two-week periods to collect baseline data while introducing flower or non-flower centerpieces on every table in the observation area. I would use the same measures of time and number of subjects and possibly with more observers, utilize other measures such as vocalizations, smiles, etc. Following a core group of people over the three phases would reduce variation even further.

Comparisons of behavioral responses in school cafeterias, nursing homes, restaurants, etc., would ascertain reactions between varying subject groups. Flowering centerpieces could be compared with a variety of alternative non-flowering centerpieces.

Secondly, research is needed to evaluate a relationship that may be established as a subject participates in or observes the growth process of plants. Questions such as the following might be asked: how would subjects respond to centerpieces composed of flowers they grew, or centerpieces they had arranged; how would one group of subjects with gardening experience respond to flowering centerpieces in comparison to a group without such experience?

It is hoped that further research exploring questions raised by this study will expand our knowledge of people-plant relationships.



Table 2. Patient/staff seating behavior in response to flower and candle centerpieces on dining room tables. (pre-treatment, treatment, and post-treatment phase).

Phase	Treatment	Number of Occupancies (joining or leaving)		Number of Occupants		Total Time of Table Occupation (Min.)	
		Combined Patient/Staff No.		Patient No.	Staff No.	Patient No.	Staff No.
Pre-treatment Period	Candle	4.9	2.8	5.0	18.3ab	39.4	
	Flower	5.1	2.4	5.0	19.4ab	41.9	
	Control	5.8	3.3	4.5	25.8a	36.1	
Treatment Period	Candle	5.4	3.6	4.4	29.2a	34.7	
	Flower	3.9	2.5	4.3	15.0ab	36.7	
	Control	4.1	1.5	4.0	8.6b	38.1	
Post-treatment Period	Candle	5.4	3.7	4.1	25.6a	32.1	
	Flower	4.7	1.4	5.1	10.8b	36.4	
	Control	3.7	2.3	4.1	15.0b	29.4	
Significance Level		N.S.	N.S.	N.S.	.07	N.S.	

Table 3. Patient/Staff seating behavior in response to flower and candle centerpieces on tables in the high, medium and low popularity areas of the dining room.

Preference Area	Treatment	Number of Occupancies (joining or leaving)		Number of Occupants		Total Time of Table Occupation (Min.)	
		Combined Patient/Staff No.		Patient No.	Staff No.	Patient No.	Staff No.
High	Candle	5.6	3.2	5.6	21.1	42.3	
	Flower	5.5	3.5	4.8	27.5	37.8	
	Control	5.6	4.4	3.8	30.8	25.6	
Medium	Candle	6.2	5.1	4.2	32.8	35.0	
	Flower	4.1	1.1	5.2	3.6	43.9	
	Control	4.8	1.7	4.7	13.1	37.2	
Low	Candle	4.0	1.9	3.8	19.2	28.9	
	Flower	4.1	1.8	4.3	14.2	33.3	
	Control	3.2	0.9	4.2	5.6	40.8	
Significance Level		N.S.	.001	N.S.	.003	.07	

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A six-week study investigated the behavior of patients and staff following the introduction of fresh flower and non-flower (candle) centerpieces into the dining room of a private psychiatric hospital.

It was hypothesized that: 1) subjects would notice the positive stimulus of flowers and would occupy flower tables first, as measured by ranking initial table preference; 2) flowers would produce a more pleasing and stimulating environment than non-flower centerpieces or no centerpieces, as measured by the number of subjects sitting at tables, total time tables were occupied, and number of occupancies (subjects leaving and joining) tables; 3) staff would be more attuned and responsive to the presence of flowers than patients, as measured by comparing staff/patient data.

Observations were made over three consecutive two-week periods each consisting of six days of observation. During the first and third phase baseline data were collected. The independent variables were present during the second phase.

Combined patient/staff data show that more subjects initially chose the centerpiece tables than the control tables and that occupancies (joining or leaving) were significantly ( $p=.08$ ) greater at candle tables than at control or flower tables. Patient time spent at candle tables was significantly ( $p=.02$ ) longer and number of patients at candle tables significantly ( $p=.10$ ) greater as compared to the control tables. Staff number and time remained similar at all dining room tables. This resulted because staff generally enters the dining room later than the patients and has a set period of time for lunch break.

The greater effect of the candle centerpiece may be due to one or more of four possible factors: 1) the attraction of active participation in lighting the candle; 2) the candles may symbolically represent intimacy to some subjects; 3) the uniqueness of this centerpiece and the novelty of its presence in the dining room; and 4) the lack of fascination with flowers as a final product in comparison to participation in or observation of their growth and development.