

# **IMPACT OF WORKPLACE PLANTS ON: Perception and use of planted space.**

**Recovery from poor attention and fatigue and used vigilance tests, including a proof reading.**

**Research conducted by Oxford Brookes University  
Sponsored by Rentokil Tropical Plants**

Interior planting has become increasingly popular in the working environment during the last 30 years, and its presence is believed to have psychological and physiological benefits. There are many claims in the literature that have not been substantiated by research. My thesis, titled Human Responses to Interior Planting, set out to establish why people need or want to have interior planting in their present-day buildings and to determine the possible psychological benefits to people of plants inside buildings.

Two separate studies were carried out:

The first study was a longitudinal case study in a hospital atrium using questionnaires and observations. This study tested the impact of interior planting on:

- a) the way in which people used the atrium
- b) people's anxiety levels
- c) people's perception of the atrium

The second study was a laboratory study to test the impact of interior planting on recovery from attention and fatigue and used vigilance tests, including a proof reading.

### **The findings from these two studies show that:**

- There were no negative findings 'with plants' in the building.
- The use of the waiting area within the atrium increased by 4.1 percent 'with plants.'
- The use of the snack bar area within the atrium increased by 2.7 percent 'with plants.'
- Both men and women displayed a preference to sit opposite the plants in the atrium (i.e. they positioned themselves where they could see the plants).
- The mean anxiety level of subjects was lower 'with plants' in the atrium than the mean anxiety level of subjects 'without plants' in the atrium.
- Correlation tests showed that perception of the atrium was highly correlated with anxiety level. In other words, the more a person liked the building, the lower his anxiety level.
- The interior planting made a huge difference to perception. Of the 20 pairs of bipolar adjectives used to measure perception, statistically significant (more positive) differences were found in 15 of the bipolar pairs. From above, this implies that the presence of interior planting might reduce anxiety levels.
- Furthermore, spacial perception was not affected by the presence of the plants. In other words, the plants did not make the atrium feel smaller or more congested in the presence of the plants. This is an important finding for anyone contemplating installing interior planting who may be concerned about the spacial implications.

- The results of the laboratory test were encouraging because subjects were more vigilant in their proofreading test after they had a break in a room filled with interior plants.

### **Detailed Notes For Slides**

Relaxed/Tense - Color theorists might claim that the atrium was theoretically relaxed, peaceful and serene without the plants. Nonetheless, subjects assessed the atrium as more relaxed and more unstressful in the presence of interior planting. Thus, interior planting has a role to play in reducing stress, even if only to reduce the impact of a perceived environmental stressor.

Cheerful/Gloomy - Subjects perceived the atrium as more cheerful 'with plants.' This gives a very positive first impression of the building.

Tidy/Untidy - Subjects perceived the atrium as more tidy 'with plants,' perhaps because the plants gave the building more order and more coherence by tying diverse, unrelated elements together. For example, the hanging baskets punctuated the node points of the space frame roof and subsequently the columns supporting the roof.

Ornate/Plain - Subjects perceived the atrium as more ornate 'with plants.' The building lacked window views and any form of wall decoration, and therefore, the plants might have provided a welcome relief from the plainness of the walls.

Welcoming/Unwelcoming - Subjects perceived the atrium as more welcoming with interior planting. This is an important finding for anyone contemplating installing plants in an entrance or in a reception area.

Interesting/Boring - Subjects found the atrium more interesting 'with plants.'

Expensive/Inexpensive - Subjects perceived the building as more expensive-looking with interior planting. This is consistent with findings about the effects of external landscaping and shows that interior planting enhances the quality and image of an interior.

Unstressful/Stressful - Subjects found the atrium more unstressful 'with plants.' This provides further evidence that interior planting has a role to play in reducing stress, even if only to reduce the impact of a perceived environmental stressor.

Colorful/Colorless - Subjects perceived the atrium as more colorful 'with plants.' In this instance, perhaps the plants enhanced the existing color scheme, which was predominantly green.

Beautiful/Ugly - Subjects found the atrium more beautiful 'with plants,' although few subjects found the atrium ugly in the absence of plants.

Pleasant/Unpleasant - While few subjects were able to say that they found the atrium unpleasant 'without plants,' subjects found the atrium more pleasant 'with plants.' This makes a very positive first impression of the building.

## **Summary of Results**

The presence of interior planting plays a role in human psychological well-being because:

- 1) Perception of an interior is more positive in the presence of interior planting.

- 2) Even with a theoretically relaxed color scheme, the atrium was still perceived as more relaxed and more unstressful with plants.
- 3) Stress might be lower because the building is perceived as more relaxed and more unstressful.
- 4) Although sound measurements were not taken, the plants did appear to make a positive contribution to sound absorption, which is consistent with Costa's research.
- 5) People perceive a building with interior planting as more expensive-looking, which may enhance the feeling of well-being. This is collateral with other research.
- 6) The atrium appeared more welcoming with plants. This is extremely important to people's first impressions of the hospital, which may affect their anxiety state.
- 7) The plants did not affect people's perception of the size of the atrium and did not make it appear congested.

The absence of interior planting in a building elicits a more negative human psychological response because:

- 1) People's perception of the building is less positive in the absence of plants.
- 2) Anxiety states might, therefore, be increased in the absence of plants, thereby creating stress.

## **Conclusions**

- 1) Human psychological responses are affected both by the presence and absence of interior planting in a building.

2) The results of this case study support the idea that interior planting positively enhances perception of interior space and supports the inclusion of interior planting in a hospital to contribute to the psychological well-being of its users. More research is needed to ascertain the appropriate level of planting for optimum effect and the effect of interior planting in different building types.

3) The results of the case study confirm that humans do respond positively to the presence of interior planting. Most findings in this study are new or, since they are firmly based on experimental method, confirm existing beliefs by a more rigorous approach. Some findings bear out other work in the field, e.g. current research by Costa and past research carried out by Laviana (1985) and Pearson (1994).

Laviana's (1985) laboratory study showed that spacial perception was not negatively influenced by the presence of planting (i.e. it did not make the area look smaller). This was confirmed by the present study. Interior planting was also shown in the present study to have a favorable effect on the perceived quality of indoor space and an impact on the human affective state. In turn, a better affective state may improve sustained attention (Rohde and Kendle, 1994, p. 44). More research is needed to determine this.

The introduction of planting in the atrium made it appear more expensive-looking, which is consistent with studies of the effects of external landscape on adjacent buildings. Studies of the Opryland Hotel and the MetroCentre echo this finding and suggest that expenditure on internal planting is more than recovered by the economic success of the respective buildings. This suggests that, from a commercial viewpoint, interior planting could prove to be a worthwhile investment - corporate image could be enhanced effectively at a recoverable cost. Therefore, it is not necessarily cost-effective to cut interior planting from building budgets.

4) In conclusion, because green plants affect some responses to buildings, they can and do make people feel good. Green plants make such responses more positive and favorable to the building and produce no unfavorable responses.

### **The Future for Interior Planting**

In undertaking this work, it was surprising to find that so little research had been undertaken given the size of the interior planting industry. Sales and turnover suggest demand and positive responses to planting, but what responses and benefits were not known. This work clearly identifies the benefits, and further, no negative responses were found. For those wishing to include interior planting, there is now research to support their case. For the more reluctant and those who see it as a soft budget to cut, this work points to tangible benefits that should see plants as an investment, not a cost. Certainly, when recognized that the workforce is an organization's greatest asset, enhancing their environment is an important consideration. Green plants are effective in humanizing the workplace and can make it feel more pleasant and secure for the workers, thereby making the workers themselves feel good.