

The mirror, as a self-awareness enhancing tool, which can modify food consumption behaviours

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Abstract

Many health problems are linked to obesity and being overweight, however there is little evidence that the diet industry is actively helping people to lose weight. Additionally, some weight-loss plans have even caused medical harm such as fatigue, hair loss, dizziness, and other negative symptoms (National Institute of Health, 1992). Moreover, there is a clear relationship between the physical environment and food consumption. As research by Melin and Gotestam (1981) stated minor changes in the physical environment can promote therapeutic changes in eating behaviour. Therefore, environmental manipulation and altering design elements may affect food consumption. In addition, weight loss programs are difficult to apply due to time constraints, motivational issues or cost.

In this study the researchers aimed to investigate the design of the physical environment by including a mirror and considering its relationship to food consumption. The sample consisted of 30 females from Jeddah City, Saudi Arabia. The Paired T-test was employed to assess consumption time before and after the implementation of the mirrors. Firstly, the researchers measured the food before and after consumption. Secondly, they measured time spent consuming food. In addition there was an observation of eating behaviours. The results found the presence of the mirror made the participants eat less and spent more time adjusting and modifying their behavior such as eating quickly and chewing food. Self-awareness seems to be crucial in instigating a change of eating behaviour. The practical applications of this study are potentially wide reaching and should demonstrate the benefit of using mirrors to encourage a healthier society and help people changing the bad eating habits and lose weight. There is a high statistical difference ($P=0.001$) between eating time in front of the mirror and without the mirror.

Keywords: Mirror, Food consumption, self-awareness, interior design, behavior.

1. Introduction

In modern society there is a global obesity epidemic. This is developing in tandem with an increase in the variety, availability and salience of food in the environment. The eating disorder obesity appears to be rising across all socioeconomic groups and educational levels.

Obesity is an excessive accumulation of body fat and is a real threat to health. Moreover, obesity is associated directly or indirectly with a wide variety of diseases such as hypertension, non-insulin-dependent diabetes mellitus (NIDDM), gallbladder diseases, cardiovascular diseases (CAD) and certain types of cancer (Monteiro *et al*, 2001). Obesity has been associated with increased mortality (Berrington de Gonzalez, *et al*, 2010). In Saudi Arabia adults were either overweight or obese with a prevalence of 35.1% and 43.8%, respectively (Al-Baghli *et al*, 2008).

It is clear that modern society stigmatizes obesity (Heatherton & Baumeister, 1991). In particular, Western culture appears to disparage and ridicule obese people. Numerous research studies have discovered that diets are rarely successful at achieving permanent weight loss (Heatherton *et al.*, 1991; Polivy & Herman, 1983). Generally, women have been found to be more susceptible to eating disorders than men. Therefore, society needs to develop a solution for this concerning trend in behaviour. So what can society do? Where do you start to make a change from a negative to a positive body image? It may be time to clean your mirror to improve your reflection and change bad eating habits. Self-awareness seems to be crucial to instigate a change of eating behaviour.

Self-awareness is central to every human and is one of the first elements of the self concept to emerge. Yet on a day-to-day basis we are often unaware of this component. We are not born with self-awareness. Research has shown that self-awareness begins to become evident at about one year of age. To measure and test self-awareness, psychologists use the mirror test which was developed by Gordon Gallup in the 1970s. Over our lives self-awareness is woven into the fabric of our identity and has an effect on how we behave.

Duval and Wicklund proposed Self-Awareness theory in 1972. This theory suggests that when human beings are self-conscious, we associate our current behavior to our own internal standards and values. Moreover, we evaluate ourselves objectively (Duval and Wicklund, 1972). Duval and Wicklund believed that people are more likely to align their behavior with their standards when made self-aware of their actions. People will be negatively affected if they don't live up to their personal standards. People are not usually self-focused but various environmental cues and situations can cause people to focus on themselves. Examples of these self-conscious situations include gazing into a mirror, being in front of an audience, or being videotaped or recorded. (Sentryz and Bushman, 1998). In recent years, it has become more common to consider body image as a cultural phenomenon and a contributing variable because body image has been shown to relate to cultural values (Grogan, 2007; Heinberg *et al*, 1995).

Neuroscience research has demonstrated that your prefrontal lobes mediate self-awareness. Looking at yourself in a mirror increases activity in these brain regions. There have been numerous research studies conducted into the mirror and its role in relation to exercise and food consumption. Being self aware can act as a catalyst to feeling secondary emotions, these can be positive, such as pride, and can contribute to maintaining self-esteem (Silvia and O'Brian, 2004). Ehrenburg interviewed a small number of female university students studying contemporary dance and discovered that the mirror can mean different things for different students. One student indicated that the mirror enabled her to focus on her performance. Conversely, another student indicated that looking in the mirror instigated negative thoughts about her body or performance (Ehrenburg, 2010).

The presence of a mirror can cause self-evaluation to take place. Research by Ginis *et al* and Radell *et al*., discovered that mirrors in dance studios could actually act as a hindrance to sedentary people exercising. Both research studies concluded that the mirrored wall in the dance studio could act as a catalyst to poor body image (Ginis *et al*, 2003; Radell *et al*., 2014). Furthermore, Radell, Adame and Cole, 2002 studied changes in the body image of women college ballet dancers. This study compared those dancers who trained in front of mirrors to ballet dancers who trained without mirrors. The researchers implemented the MBSRQ (Multidimensional Body Self-Relations Questionnaire) and it was concluded that dancers taught with mirrors experienced statistically significant dissatisfaction with parts of their body and the overall look of their body. Whereas the dancers taught without mirrors showed a significant increase in satisfaction with the appearance of different parts of their body. Therefore, there is a complex yet powerful relationship between people and mirrors (Radell *et al*., 2002).

Gibbons (1990) revised self-awareness theory and hypothesized that self-awareness often works to cause people to avoid certain foods. If people avoid certain foods they can avoid creating discrepancies between their internal standards and their behavior. These situations may actually help regulate and moderate eating behavior. Sentryz and Bushman, support self-awareness theory. They researched self-focusing situations and whether they influence people to avoid fatty food. In both studies, individuals in the mirror group ate less of the full-fat product than did those in the no-mirror group. This research also suggested that dieters may actually benefit from making their choices about food in a self-aware state (Sentryz and Bushman, 1998).

A study conducted by Gueguen and Charles-Sire investigated mirror exposure and the consumption of high calorific food. The mirror procedure was employed to investigate whether this would decrease a student's consumption of high fat food. Results showed a decrease in consumption when the student actually looked in the mirror before they accessed the sauces. The researchers suggested that this technique could be applied to reduce the overall consumption of refined sugar (Gueguen and Charles-Sire, 2011).

This practical application acted as a catalyst for this study. The focus of this present research is to examine how self-awareness may affect time of consumption food. It was hypothesized that the presence of a mirror significantly reduced consumption of food. Therefore would the interior design of a dining room at home result in a decrease of consumption of calorific food or not? Could the positioning of mirrors within eating establishments begin to tackle the growing obesity epidemic?

2. Methodology of the Study

Descriptive analytical and experimental methods were used in this research. Participants were 30 females from Jeddah City, Saudi Arabia aged between (18-45) in 2014-2015. These participants were randomly selected from

a larger sample of people who participant in volunteering project were similar in their eating habits. They were selected after filling in a questionnaire concerning eating habits. Women were studied as they typically report greater sensitivity to a mirrored environment than men (Fejfar and Hoyle, 2000).

This was an independent measures experiment. Each participant was tested individually and the same standardised procedure was used. The method involved measuring the food amount and calculating the time of seating for eating food before and after being exposed to a mirror. In addition, eating behaviour was observed. Each participant was given a plate with seven pieces of pizza (tomato and cheese). There was a washing out period of two weeks before the same test was conducted again with the presence of a mirror in the same group. The distance between the participant and mirror, allow them to see themselves without deep details, because in the pilot study the researchers found that some participants feel unconformable because someone was watching them while they eating because of the mirror.

Statistical analysis was conducted using Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA) Version 16, and t-test for independent data was employed to assess the differences between before and after in food consumption and time spending.

3.Results and Discussion

The result results disproved the research hypothesis that eating in front of a mirror will not affect the time of food consumption. The researchers found that the presence of a mirror made the participant eat less and spend more time eating as is demonstrated in table 1. This could be due to the fact that they watched themselves in the mirror and modified their behavior such as eating quickly and the way they chew food. In addition, the participants self-consciously adjusted their clothes and hair. This demonstrated the self-awareness effect.

Researchers counted the piece of the pizzas left in the before and after condition. They found that in the presence of the mirror participants left a half, quarter, or less in the dish. Self-awareness seems to be crucial to instigate a change of eating behavior as participants were more likely to eat more and quickly when they weren't aware of what they were doing. It was found that participants spent more time eating and chewing their food with the presence of mirror because the participant would watch themselves in the mirror and modify their behavior during eating and adjusting their clothes and hair figure 1. In addition some participants stated that they felt conformable with their stomach after the meal. This could be because they took time eating and allowed their stomach time to digest the food. Other participants feel unconformable because someone was watching them. Therefor designer or applier must pay attention to personal background.

Table: 1. Shows the test results (T) of the samples correlated (Paired Samples T test)
 In eating time in seconds before and after using the mirror

	N	Mean	Std. Deviation	T- value	df	Sig
Before	30	158,53	24,339	20,396-	29	0,001
After	30	202,00	34,093			

Table (1) shows that the mean and standard deviations for the time eating before and after the use of the mirror in seconds (202) and (158.53) respectively figure.1. Statistical analysis using t-test revealed that there is a high statistical difference between before and after the presence of a mirror (P=0.001) which disagree with the proposed hypothesis.

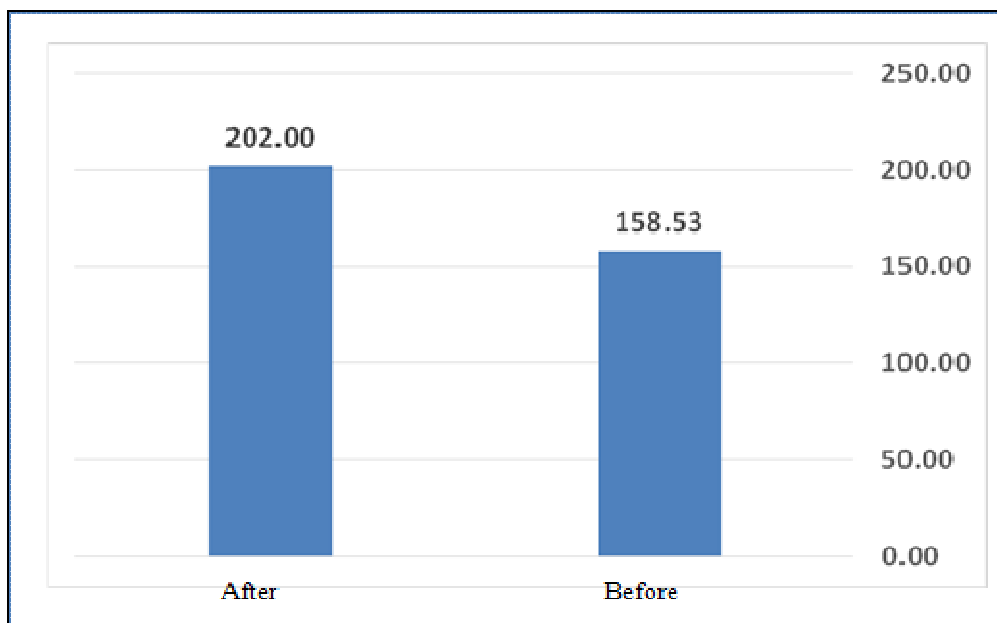


Figure 1. Shows the mean of the time in seconds before and after eating in front of the using the mirror

Results of this research suggest that mirror decoration can be used in food consumption settings to decrease unhealthy eating practices as mirrors make the unhealthy foods less tasty and thus the consumption of the unhealthy foods would be less pleasant (Jami and Himanshu ,2011).

Concurring with previous self-awareness literature by Duval and Wickland (1972) and Gibbons (1990), this research has also found that the mirror can act as a self-awareness enhancing tool. A mirror can be used as a decorative item in many food consumption settings to affect the consumption and taste perception of food.

In accordance with the previous reviewed literature by Sentyrz and Bushman (1998) and Gueguen and Charles-Sire (2011) it was found that eating a healthy or an unhealthy food in front of a mirror generates positive or negative feelings since standards of healthy eating are widely accepted. Therefore, it was found that if people consume their food in a room decorated with mirrors compared to a room without mirrors, they will attribute the positive effect of eating a healthy food internally to self and the negative effect of eating an unhealthy food to the food taste as an available external factor.

There are a number of practical applications resulting from this study. Overall, the findings demonstrate the benefit of the presence of mirrors as a self-awareness tool to encourage a healthier society and to help people lose weight. However, mirrors are not a practical solution for the interior design of a busy restaurant because the customer may eat less and spend more time in their seat. Similarly, mirrors in supermarkets may not be profitable for managers as this may create a self-focusing situation when the customer is making food choices. Mirrors may be more beneficial in the interior design of a private house. However, the position of the mirror must reflect the body of people not the food. In addition, any reflective surfaces could be used e.g. a window instead of the mirror as the researchers found in the pilot study.

Future research should use different groups of participants e.g. males and children as the researchers believe from personal experience that children may eat more because they try to copy the person in the mirror. It would be worth exploring the effects of the mirror on other age groups and in other cultures. Would there be a difference between participants from individualistic and collectivist cultures and their reliance on mirrors or their understanding of self-awareness? Also, the age, religion and lifestyle of a person would be worth exploring. It could also be interesting to consider different types of styles of mirrors and the different effects. For example, would the size, colour or shape of the mirror have an effect on whether we look into it?

4. Conclusion

The study of interior elements and its effect on eating behaviour and food consumption is still relatively immature. The researchers noted that the presence of a mirror significantly reduced the consumption of food, perhaps the use of the mirror made the participants self-conscious and aware about their eating behaviours. This in turn allowed the participants time to digest the food and think about what they were eating. This was achieved by self-awareness and concurs with current literature into the area of self-awareness theory. Looking in a mirror, resulted in a decrease of a number of behaviours like eating quickly and chewing food badly. The practical applications of this study are vast and should demonstrate the importance of interior design in relation to encouraging a healthier and slimmer society. Design scientists can use the findings of this research to help create guidelines for designers and health professionals to advocate the effects of environmental stimuli on human eating behaviour.

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