Appetite 96 (2016) 636–641

Contents lists available at ScienceDirect

Appetite

journal homepage: www.elsevier.com/locate/appet

Pre-exposure to food temptation reduces subsequent consumption: A test of the procedure with a South-African sample

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ARTICLE INFO

Article history:
Received 29 May 2015
Received in revised form
25 September 2015
Accepted 21 October 2015
Available online 24 October 2015

Keywords:
Food security
Obesity
Poverty
Tempting food
Pre-exposure procedure
South Africa

ABSTRACT

It has been suggested that the consumption of unhealthy Westernized diet in a context of poverty and resultant food insecurity may have contributed to South-Africa's status of the third fattest country in the World. Considering that a number of South-Africans are reported to have experienced, or are still experiencing food insecurity, procedures which have been shown to reduce the consumption of unhealthy food in higher income countries may be ineffective in South-Africa. We thus tested the robustness of the so called pre-exposure procedure in South-Africa. We also tested the moderating role of childhood poverty in the pre-exposure procedure. With the pre-exposure procedure, a respondent is exposed to a tempting unhealthy food (e.g. candy) in a context that is designed such that eating the food interferes with a task goal. The typical result is that this procedure spills over and reduces consumption of similar tempting food later on. An experimental study conducted in a South-African laboratory showed that the pre-exposure effect is robust even with a sample, where food insecurity prevails. Childhood poverty did not moderate the effect. This study proves that behavioral procedures aimed at reducing the consumption of unhealthy food would be valuable in less rich non-Western countries. Further testing of the robustness of the pre-exposure effect is however recommended in other poorer food insecure countries.

1. Introduction

Two decades after the entry of Western fast-food chains in South Africa, Birrell (2014) reports that a once skinny teenager, named Thando grew into "a 5′5" man weighing almost 17 stone (i.e., about 170 kg). Thando now struggles to find clothes to fit his inflated body and complains that seats are becoming too small for comfort". Thando feels that his situation is exacerbated by the common belief in South Africa that "if you have a one-pack big belly, like a beer belly, you must have lots of money, but if you have a six-pack, there is something wrong" (Birrell, 2014).

Thando is not the only person with an obesity problem in South-Africa. The arrival of Western fast-food restaurants and the introduction of Western diets in low and middle income countries, such as South-Africa have triggered the current health epidemic (Popkin, Adair, & Ng, 2012). Western diet is defined as "high intakes of refined carbohydrates, added sugars, fats, and animal-source foods" (Popkin et al., 2012, p. 8). The Lancet report of 2014 (see vol. 384, p. 766–781) shows that South-Africa is the world's third fattest nation with about two-thirds of the population being overweight. Despite being one of the wealthiest countries in Africa, about 14% of the population struggles with food insecurity daily (Koch, 2011). Popkin et al. (2012) contend that food insecurity, low education and many issues associated with poverty are some drivers of obesity. These factors, they further note, increase the vulnerability to the appeal of westernized diets, which offer a good calories/price deal but are poor in essential nutrients.

As high-calorie food consumption and obesity is also one of the major health threats in wealthy Western countries, behavioral scientists have studied factors that drive the overconsumption of high-caloric food and have explored and found procedures to reduce its consumption. Because South-Africa differs in many respects from the populations in which such procedures have been designed, it remains an open question as to whether the procedures shown to enhance resistance to unhealthy food in richer well-fed

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http://dx.doi.org/10.1016/j.appet.2015.10.024
0195-6663/

populations would be of any significance in poorer populations experiencing food insecurity.

In this paper we tested the effectiveness of the pre-exposure procedure, which has been shown to reduce the consumption of unhealthy tempting food. The common finding is that the consumption of tempting food is reduced after exposure to it on either pictures or physically (Geyskens, Dewitte, Pandelaere, & Warlop, 2008). In a Western country, the pre-exposure procedure has, for example, been tested using Belgian sample (de Boer, de Ridder, de Vet, Grubliauskiene, & Dewitte, 2015; Geyskens et al., 2008; Grubliauskiene & Dewitte, 2014). Considering that South-Africa's population has relatively lower SES than Western countries, and the prevalence of food insecurity can create a stronger temptation to consume unhealthy food, this paper tests whether the pre-exposure procedure is applicable with a South-African sample.

The paper is organized as follows. We first review the relevant literature by introducing the need and dynamics of the pre-exposure procedure. We then test the pre-exposure procedure with South-Africans. We end the paper with a discussion on the policy implications and avenues for further research.

2. Literature review

2.1. The pre-exposure procedure

People in developed, as well as developing countries are increasingly confronted with unhealthy, yet highly tempting foods, such as ice cream, various pies, burgers, potato chips, chocolates, pizzas, fried chicken, candies, etc., which they often disproportionately consume (Brownell & Horgen, 2004; Kroese, Evers, & De Ridder, 2009) and may contribute to the alarming worldwide obesity epidemic among adults and children (Popkin et al., 2012).

To curb the overconsumption of unhealthy food, interventions are needed. One of the proposed interventions is to restrict the consumption of unhealthy food. This intervention has usually been guided by Metcalfe and Mischel's (1999) hot/cool theory, which posits that food temptations activate a 'hot', impulsive system. As people impulsively succumb to the temptation, the 'cool' and rational system, which represents long-term health goals, is rendered powerless. With this notion, the exposure and access to tempting foods, especially among the youths have been restricted. Unhealthy foods have been substituted in vending machines with healthy ones (French, Story, Fulkerson, & Gerlach, 2003; Hagger & Luszczynska, 2013). These restrictions do not only render the somewhat "forbidden fruit" more enticing, but these types of interventions, especially made in homes and school environments may succeed only as long as the restriction holds. More so, there may be inability to resist temptation in environments where restrictions are absent. Self-regulation skills may therefore, be needed in this case (De Vet et al., 2013).

An approach which enhances the development of self-regulation skills in the presence of tempting food is the pre-exposure procedure. It is in accordance with Trope and Fishbach's (2000) counteractive control theory, which stipulates that exposure to food temptation, helps rather than hurts the resistance to unhealthy food temptation. According to this theory, the presence of a temptation activates the chronic food restriction goal, which in turn facilitates adaptive self-regulation (Fishbach, Friedman, & Kruglanski, 2003; Kroese et al., 2009). Further developments of the procedure relaxed the requirement that a chronic food restriction goal was already present (e.g., de Boer et al., 2015; Dewitte, Bruyneel, & Geyskens, 2009; Geyskens et al., 2008; Grubliauskiene & Dewitte, 2014).

The adapted pre-exposure procedure, which is the focus of this paper, exists in two phases. In the first phase, respondents are (physically) exposed to a tempting food in a context that discourages its consumption, thereby effectively installing a temporal food restriction goal. For instance, the respondents have to engage in a consumer knowledge task, where they have to associate candy wrappings to various flavors. In this task, respondents typically do not eat the candies as consuming would ruin the purpose of the task. The researcher however does not explicitly restrict them from eating the candies.

In the second phase, the respondents move on to a taste test of similar (but not identical) tempting food and can consume the food as much as they wish. The common finding from the experiments is that those who had been exposed to temptation in the previous phase eat less during the taste test, than those who had not been exposed to temptation (Dewitte et al., 2009). Interestingly, this pre-exposure seems to suppress the effect of marketing factors known to boost consumption, such as appealing scents of food or consumption convenience (Geyskens et al., 2008). Another interesting feature of the pre-exposure procedure is that it seems to be independent of the presence of a health goal, a feature which makes the effect amenable for exploitations in populations with a weaker food regulation goal (e.g. men, Grubliauskiene & Dewitte, 2015, 2014; and childrenbib_Grubliauskiene_and_Dewitte_2014). The effect has also been shown to be amenable in a school context and exerts its effect after a day's delay (de Boer et al., 2015).

While the pre-exposure procedure has worked in all these contexts, we question its applicability in South-Africa, where poverty and food insecurity prevails. The next section discusses the socio-economic situation in South-Africa, to conceptually assess the applicability of the pre-exposure procedure.

2.2. Can the socio-economics of South-Africa warrant the effectiveness of the pre-exposure procedure?

Looking at economic factors, such as gross domestic product per capita, architectural and technological infrastructure, it is evident that South Africa is an upper-middle-income country. When one however looks at social indicators, such as food security, life expectancy, infant mortality and the fact that the poorest one-fifth of South Africans have an average purchasing power similar to those of citizens in the world's poorest countries, South Africa resembles a low-income country (Van der Berg, 2014). Consequently, about 14% of South African citizens struggle with food insecurity (Koch, 2011).

Food security, Oldewage-Theron, Duvenage, and Egal (2012) stipulate, embodies the concepts of food availability (in sufficient quantities on a consistent basis); food access (sufficiency of resources to acquire suitable foods for a nutritious diet); and food use (proper use based on the right application of basic nutrition and care). Even though nationally there is adequate food supply in South Africa, high level of poverty in many households prevents access to appropriate food supply and nutritious diets (Koch, 2011). In 2011, 20.2% of South-Africans lived in extreme poverty (food poverty line below which people are unable to purchase enough food for an adequate diet) and 45.5% lived in moderate poverty (poverty line below which people can afford an adequate diet but would have to sacrifice food to purchase non-food items) (Social Development, 2014).

The households living in extreme poverty are inevitably left with the choice of consuming a monotonous diet consisting mainly of staple starches, such as maize meals, potatoes chips (French fries) and bread with very limited amounts of proteins, fruit and vegetables. The consumption of mainly carbohydrate-based diet with little dietary variety accounts for the current relationship between higher obesity rates and low-income levels in South Africa (Oldewage-Theron et al., 2012). When children grow up in