

Increasing food intake of the elderly with extrinsic food-cues

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List of Abbreviations

ACQSC	Aged Care Quality and Safety Commission
ANOVA	Analysis of variance
BMI	Body mass index
LMM	Linear mixed-effects models
MSG	Monosodium glutamate
OFC	Orbitofrontal cortex
PANAS	Positive and negative affect schedule
PSE	Portion size effect
SCT	Schema congruity theory

Abstract

The prevalence of malnutrition among the elderly is high—up to 70% of aged care facility residents are malnourished in Australia and other developed countries. Malnutrition in the elderly is problematic because it is associated with poor health outcomes. However, malnutrition does not result from a lack of available food in residential aged care; instead, it is related to an inadequate intake of available food. Therefore, strategies must be developed to help aged care residents consume more food. Although the majority of previous studies that aimed to increase the elderly's food intake have focused on intrinsic food elements (e.g. manipulating the food's taste or texture), this thesis has used extrinsic cues in its investigation.

First, the literature review explored the current evidence regarding using extrinsic food cues and identified that previous research focused primarily on the ambience and environmental contexts of a dining situation (e.g. music, odour). Before the 1960s, physiological signals were believed to be the primary regulators of food intake; that is, people would consume food based solely on their hunger and stop eating when they felt full. Although there has recently been a growing focus on the role of extrinsic cues on food intake, study findings have been conflicting for several reasons. Predominantly, studies have investigated one extrinsic cue type in isolation, applied cross-sectional study designs that were unable to demonstrate causations, used unrealistic laboratory settings that did not necessarily mimic home environments and failed to account for the portion size effect (PSE) on food intake. Further, it was identified that these studies did not evaluate the use of extrinsic food cues in the aged care context.

To address the identified issues, experiments were performed to evaluate whether extrinsic food cues (auditory, olfactory and cognitive) influenced elderly residents' food intake in aged care. An experiment was conducted in a residential aged care facility in South Australia, Australia, in which 31 residents were exposed to each extrinsic food cue with no intervention during their lunch (three times over a 17-week period). The order of treatments was randomised. In the dining rooms where residents consumed their lunch, a music soundtrack was played for auditory cues, scented candles were lit for olfactory cues and informative infographics regarding health benefits were displayed for cognitive cues. There were no differences in energy intake between the different interventions and control. The amount of energy consumed was positively related to energy intake—energy intake

increased as more energy was served, which confirmed the presence of PSE. When portion size was controlled for, both auditory and olfactory cues positively increased energy intake. However, cognitive cues did not relate to dietary energy intake. These findings suggest that extrinsic food cues were effective in increasing energy intake when acting through a low-elaboration route that required less cognitive processing. In addition, these cues effectively influenced the pleasantness of dining and eating behaviours. In regard to cognitive cues, elderly consumers could possess slower cognitive processing and reduced attentional resources, which decrease their ability to engage with such cues and information. Similarly, sensory cues could be passively and reflexively received.

Overall, this thesis provides novel insights regarding how extrinsic food cues can influence the elderly's food intake in residential aged care. Extrinsic food cues could be effective for increasing elderly residents' food intake and their subsequent overall wellbeing. Such an approach is relatively simple, inexpensive and less intrusive than intrinsic food cues, which require manipulating the food itself. The findings support the practicality of using extrinsic food cues to address issues regarding malnutrition among the elderly.

Keywords: Aged care, food consumption, elderly consumers, malnutrition, extrinsic food cues, portion size effect.