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Using three-phase theory-based formative research to explore healthy eating in Australian truck drivers

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ABSTRACT

In Australia, fruit and vegetable consumption is lower than recommended while discretionary foods (i.e., foods high in fat, sugar, and salt) are eaten in excess. Long-haul truck drivers are a group at risk of unhealthy eating but have received limited attention in the health literature. We aimed to examine long-haul truck drivers eating decisions in order to develop theory-based and empirically-driven health messages to improve their healthy food choices. Drawing on the Theory of Planned Behavior, three-phased formative research was conducted using self-report surveys. Phase 1 ($N = 30$, $M_{age} = 39.53$, $SD_{age} = 10.72$) identified modal salient beliefs about fruit and vegetable (FV) intake and limiting discretionary choices (DC). There were nine behavioral and seven normative beliefs elicited for both FV and DC; while nine and five control beliefs were elicited for FV and DC, respectively. Phase 2 ($N = 148$, $M_{age} = 44.23$, $SD_{age} = 12.08$) adopted a prospective design with one week follow-up to examine the predictors of FV and DC intention and behavior. A variety of behavioral and control beliefs were predictive of FV and DC intention and behavior. Normative beliefs were predictive of FV intention and behavior and DC intention only. Phase 3 ($N = 20$, $M_{age} = 46.9$, $SD_{age} = 12.85$) elicited the reasons why each belief is held/solutions to negative beliefs, that could be used as health messages. In total, 40 reasons/solutions were identified: 26 for FV and 14 for DC. In summary, we found that specific behavioral, normative and control beliefs influenced FV and DC eating decisions. These results have implications for truck driver's health and provide formative research to inform future interventions to improve the food choices of a unique group who are at risk of unhealthy eating behaviors.

1. Introduction

Only 5.5% of Australians consume fruit and vegetables (FV) as recommended by the Australian dietary guidelines; this figure drops to 4.5% for Australian men (Australian Bureau of Statistics, 2013). Consuming an unhealthy diet has many negative health consequences including increased risk of chronic diseases (Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004). Consuming a healthy diet, on the other hand, provides many health benefits and may also reduce consumption of unhealthy, nutrient-poor foods (Fulton, Cardwell, McKinley, & Woodside, 2011; He, Nowson, Lucas, & MacGregor, 2007; Williams, 2010). In Australia, the National Health and Medical Research Council has devised evidence-based guidelines for healthy eating (NHMRC, 2013). These include the recommendation that individuals "Enjoy plenty of vegetables including different types and colours, and legumes/beans, and enjoy fruit" (pg. 36; 'FV intake') and "Limit intake of foods containing saturated fat, added salt, added sugars …" (pg. 67 'limiting DC'). For adults aged over 19 years, these guidelines recommend five serves of vegetables and two serves of fruit each day, while limiting discretionary food to one serve or less each day (NHMRC, 2013).

Despite the benefits of consuming a nutritionally balanced diet, the NHMRC (2013) recognises that certain groups are at higher risk of unhealthy eating. These groups include people of lower socio-economic status and males, with factors such as employment, education, and lifestyle implicated as contributing to these groups being at risk (NHMRC, 2013). Other risk factors associated with unhealthy eating include the availability of facilities that may influence food preparation, as well as affordability of and access to nutritious foods (NHMRC, 2013). One group that encompasses many of these risk factors and has received limited attention in the health literature is truck drivers; in particular, long-haul truck

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drivers.

In Australia long-haul truck drivers (henceforth referred to as truck drivers) may be defined as people driving a ≥12 tonne truck, who drive in excess of 200 km in one working period and where the working period is predominately spent driving (Stevenson et al., 2010). It is suggested that truck stops, often the main source for truck drivers to access meals, offer limited healthy food options, like FV, while offering a large selection of discretionary foods (Whitfield-Jacobson, Prawitz, & Lukaszuk, 2007). Given the risk factors previously identified, it is not surprising that the minimal literature has found truck drivers to be an unhealthy population, especially regarding their diet and weight (Apostolopoulos, Sonmez, Shattell, Gonzales, & Fehrenbacher, 2013; Whitfield-Jacobson et al., 2007). Thus, there is a need for research to explore factors that influence the eating decisions of Australian truck drivers.

Some environmental factors influencing the diet of truck drivers have been identified (e.g. availability, parking regulations, and work schedules); however, no research has applied a systematic examination using a theory-based approach to investigate this issue from an individual perspective (Apostolopoulos et al., 2013; Whitfield-Jacobson et al., 2007). Adopting such an approach is important to determine the cognitive mechanisms underpinning the eating behavior for this at-risk group (Epton et al., 2015). Furthermore, taking a rigorous, targeted approach allows the development of theory-based and empirically-driven health messages that can inform future interventions to curb unhealthy eating and improve healthy eating of Australia's truck drivers.

1.1. Theory of planned behavior: behavioral, normative, and control beliefs

The theory of planned behavior (TPB) is a social cognition model of behavioral decision-making that asserts attitudes towards behavior, subjective norms, and perceived behavioral control (PBC) predict intention, with intention and PBC predicting behavior (Ajzen, 1991). The attitude construct refers to judgements concerning the valence of behavior (Ajzen, 1991). Subjective norms are an individuals' perceptions of pressure toward a behavior exerted by important individuals or groups (Ajzen, 1991). PBC is the perceived difficulty (or ease) of performing a behavior and the extent that performing the behavior is under volitional control (Ajzen, 1991).

Despite recent criticisms of the TPB (see Sniehotta, Presseau, & Araujo-Soares, 2015), meta-analytic studies support the use of the model in predicting people's health and social behaviors (e.g. Armitage & Conner, 2001; McEachan, Conner, Taylor, & Lawton, 2011). Armitage and Conner's (2001) meta-analysis of the TPB accounted for 39% of the variance in intention and 27% of the variance in behavior. McEachan et al.'s (2011) meta-analysis reported that, averaged across health behaviors, the TPB accounted for 44% and 19% for intention and behavior, respectively. Furthermore, they found that eating behaviors are one of the most well-predicted behaviors using the TPB with the model accounting for 50% of the variation in intention and 21% of the variance in eating behavior (McEachan et al., 2011). Thus, the model provides a strong framework for understanding human behavior (Ajzen, 2015; Armitage, 2015). An important feature of the TPB is the hypothesis that the antecedents of attitude, subjective norms, and PBC are corresponding salient behavioral, normative, and control beliefs, respectively, reflecting the systems of beliefs that underpin an individual's intention and behavior (Ajzen, 1991). These beliefs can be used to develop theoretically- and empirically-based health messages that are relevant to the target group (Epton et al., 2015).

According to Ajzen (1991), behavioral beliefs are beliefs about a behavior relating to outcomes, positive or negative, and underpin an individual's attitudes. Normative beliefs refer to whether groups or individuals that are important approve or disapprove of a specified behavior, and underpin subjective norms. Control beliefs are beliefs regarding factors that facilitate or prevent undertaking a given behavior, and underpin PBC. Ajzen (2015) recommends that formative research to elicit beliefs from a sample of the target population is a necessary first step to understand and change behavior, which resonates with the PRECEDE–PROCEED model (Green & Kreuter, 2005).

A number of studies have used the TPB framework to elicit beliefs for a range of health behaviors (Cowie & Hamilton, 2014; French, Wade, & Farmer, 2013; Hamilton & Schmidt, 2013; Hamilton et al., 2012; Kane, Hyde, & Hamilton, 2015; Sainsbury & Mullan, 2011; Scott, Eves, Hoppe, & French, 2009). Previous research regarding eating behavior beliefs has found that behavioral beliefs generally relate to health consequences either positive or negative, normative beliefs are often found to be supportive of healthy eating with minimal to no perceived disapproval, and control beliefs generally suggest there are many factors that facilitate and prevent healthy eating (Middlestadt et al., 2012; Sainsbury & Mullan, 2011; Spinks & Hamilton, 2015). Although providing a useful target, it is not always the case that beliefs are utilised as the basis for subsequent intervention (Ajzen, 2015; Hardeman, Johnston, Johnston, Bonetti, & Kinmonth, 2002; Webb, Sniehotta, & Michie, 2010). The TPB can be used as a theoretical basis for the creation of health messages as well as utilizing belief-based research to test the theoretical utility of the TPB (Epton et al., 2015; Fishbein & Ajzen, 2011).

Formative research on beliefs, is necessary for depth of understanding of the behavior in a given population (Ajzen, 2015; Epton et al., 2015). In addition, formative research eliciting reasons for (or solutions to) beliefs predictive of intention and behavior allows for clear message creation specific to the sample and behavior. In sum, the evidence suggests that theoretically-based formative research, including investigating modal salient beliefs, can provide a strong theoretical framework for developing interventions for health behavior change.

1.2. The current research

Given the dearth of literature on truck drivers' eating behavior and research indicating that unhealthy eating habits are a real issue for this population, the importance of increasing healthy and limiting unhealthy eating is paramount. Drawing on the work of Epton et al. (2015), the current study adopted a three-phase approach with the aim of exploring beliefs to aid in developing health messages that are theoretically-based and empirically-derived. The target behaviors were 1) FV intake and 2) limiting DC as per the Australian Dietary Guidelines (NHMRC, 2013). The approach adopted in the current research follows the 'three-phase' approach used by Epton et al. (2015). First, modal salient beliefs (behavioral, normative, and control) are elicited from a sample of the target population using individual surveys asking open-ended questions (Phase 1). The strength of relationships between these beliefs and intention and behavior is then tested in a larger sample of the population (Phase 2). The third phase elicits the reasons for (positive), or solutions to (negative), the beliefs that independently predict intention and behavior (from a sample of the target population). This three-phase approach has been suggested as a basis for health message creation, and Phases 1 and 2 are similar to the recommendations for eliciting TPB-based beliefs, with this research having the addition of eliciting reasons and solutions to the positive and negative beliefs that are predictive of intention and/or behavior individually (Spinks & Hamilton, 2015; Sutton et al., 2003; von