



# Distracted driving on the job: Application of a modified stages of change model



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## ABSTRACT

Stage-based interventions have been tested and found to be successful in helping people adopt healthy and safe lifestyles. The safety stages of change model, a modified version of Prochaska's transtheoretical framework, shows how workplace safety behavior can progress through five stages: pre-contemplation, contemplation, other-directed action, self-directed action, and maintenance. In this study, we explored the potential application of the safety stages of change model to study the use of cell phones and other electronic communication devices among employees prohibited from using them while driving on company business. About 18% of the study sample was made up of pre-contemplators and contemplators who should be considered a priority for interventions designed to reduce distracted driving in occupational settings. We used a series of discriminant function analyses to predict stage assignment based on a number of psychosocial factors related to employees' attitudes, decisional balance, self-efficacy, and normative beliefs. Even though interpretation of the results was complicated by partial misclassification of cases, the study succeeded in identifying what specific factors may facilitate progression to more advanced behavioral stages among employee drivers. Practical implications are discussed as a blueprint for future stage-based as well as non-staged safety improvement interventions in the workplace.

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## 1. Introduction

### 1.1. Driver distractions

The use of cell phones and other electronic communication devices (ECD) while operating a vehicle is a safety concern. In the United States, cell phone use accounts for 14% of all police-reported crashes and fatalities where the driver was distracted at the time of the crash (NHTSA, 2015). If there were no U.S. drivers talking on the phone, an estimated 22% of all crashes, or 1.3 million crashes per year, could be prevented (Farmer et al., 2010). However, underreporting of driver distractions in police investigated crashes has been noted as a limitation affecting our understanding of the issue (Asbridge et al., 2013; Griswold and Grembek, 2014; NSC, 2013).

Recognizing the burden of distracted driving, employers have begun implementing safety policies restricting employees from using ECDs while driving. The Federal Government, by far the largest U.S. employer with nearly 2 million civilian workers, banned

text messaging while driving on government business (Executive Order No. 13,513, 2009). There is anecdotal evidence that distracted driving policies have become more common in the private industry as well (Dinkelacker, 2005; Swedler et al., 2015). However, this relatively new approach to promoting workplace safety has not received much research attention.

From a workplace safety perspective, ECD use while driving represents an identifiable hazard, for which control measures ought to be developed. Organizational policies restricting the use of ECDs while driving is an example of administrative tools, which according to hierarchies of hazard controls, are typically considered among least effective ways to reduce the risk associated with a hazard (Hale and Borys, 2013a; Reason et al., 1998). More effective hazard control methods, including technology that allows detecting and blocking of a cell phone signal in a moving vehicle, have only recently become available to employers. While there are no viable alternatives to completely eliminate, substitute, or engineer ECDs out of driving on company business and also in the absence of enforceable government regulations and industry standards applicable to this safety issue, employers' reliance on administrative measures seems to be justified, if not unavoidable.

Administrative controls aimed at improving occupational safety are known to bring about meaningful behavioral changes. Lipscomb (2000), a review of intervention research conducted in

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manufacturing settings, found that policy changes alone and in combination with other elements (e.g., education, monetary incentives, enforcement) were effective in increasing workers' use of safety goggles. A prospective cohort study of nearly 2000 employee smokers established that smoke-free workplace policies resulted in reduced cigarette consumption and increased cessation rates (Bauer et al., 2005). These examples also illustrate that evaluation studies of administrative interventions are frequently designed to consider policy compliance as the preeminent measure of success. This is based on the expectation that having a policy in place will ultimately result in compliance. Rules and standards are fundamental in any effective safety management system. However, there is no shortage of evidence that even in top-down systems, where compliant behavior is expected and non-compliance leads to adverse consequences, the rules are not always obeyed (Hale and Borys, 2013b; Weichbrodt, 2015). Hale and Borys (2013b) describe several individual, organizational, activity-related, and rule-related reasons for violating safety policies in the workplace.

### 1.2. Stages of change

Cogent arguments have been made that for behavioral interventions to be effective, their design needs to focus on identifying homogeneous segments within a population and approaching those segments with messages tailored to their unique characteristics. Prochaska's transtheoretical model of change describes stages by which people alter problem behaviors or acquire protective behaviors (Prochaska and DiClemente, 1982). The model describes behavioral modification as a process that unfolds gradually and involves progression through a series of five stages: pre-contemplation, contemplation, preparation, action, and maintenance (Prochaska et al., 1992). Individuals at the pre-contemplation stage are not concerned or aware of their risk and generally have no intention to change behavior. Contemplators may be considering change because they recognize that a problem may exist, but have not yet mapped out a course of remedial action. At the preparation stage, individuals are ready to change behavior, but have not taken any steps toward achieving that goal. Action, characterized by first behavior change attempts, is followed by maintenance, in which individuals consistently avoid risk-taking behavior and practice to avoid relapse. Prochaska et al. (1994) asserts that a six-month period is what most people would use to plan and execute behavior changes.

Practical applications of the transtheoretical model have been discussed in various contexts, including machining work (Stuart, 2014), organizational safety culture (Hudson, 2007), and impaired driving (Rider et al., 2006). The transtheoretical model has been instrumental as a foundation for interventions aimed at changing safety-related behavior in the workplace. Eleven staged and 13 non-staged interventions were compared to examine their efficacy in increasing workers' awareness of and complaints related to musculoskeletal symptoms (Whysall et al., 2006). Workers exposed to the staged interventions received messages and tools that were tailored to their level of readiness to change behavior. In the study, the staged interventions proved to be more efficacious than non-staged ones in raising risk awareness and promoting desired behavior change in a short term (4–6 months post intervention).

### 1.3. Safety stages of change

A modified version of the transtheoretical model incorporating motivational considerations has been proposed to design safety improvement interventions in occupational settings (Geller, 2001; Pettinger, 2000). The safety stages of change (SSOC) model distinguishes between three types of behavior: other-directed,

self-directed, and automatic (Geller, 2001). A behavior is believed to be other-directed when it is initially learned. Other-directed behaviors depend on external guidance or motivation. With consistent practice, an other-directed behavior can become self-directed if the person sees it as desirable, beneficial, and easy to adopt. Unlike other-directed behaviors, self-directed behaviors are internally motivated. For instance, if commercial fleet drivers are using seatbelts because it is the law or part of their workplace safety policy and would not wear them otherwise, that behavior is other-directed. If, on the other hand, drivers wear seatbelts regardless of the policy (e.g., they perceive themselves as safe drivers or they believe it is the right thing to do), that behavior would be considered self-directed. If a particular behavior is practiced over and over, it may become automatic or, in other words, a habit (Geller, 2001).

As proposed in Pettinger (2000), work safety behavior can progress through the following stages:

- *Pre-contemplation* – Employees are not aware they are doing something risky.
- *Contemplation* – Employees are aware of the risks but are still engaging in the risk-taking behavior.
- *Action (other-directed and self-directed)* – Employees consistently perform the desired safe behavior but still need to think about the correct procedures. If employees are performing the safe behaviors consistently, but need external direction to maintain it, they are at the *other-directed* action stage. If employees are performing the safe behavior consistently and no longer require any external motivation, they are in the *self-directed* action stage.
- *Maintenance* – Employees practice the safe behavior without consciously thinking about it.

The modified version, while preserving many key characteristics of its predecessor, places no emphasis on preparation for action and, furthermore, does not specify how long it takes one to change behavior. Prochaska's claim that a six-month period is what most people in the contemplation stage would use to plan and execute lifestyle changes has become a notable point of contention among behavioral health scientists (Povey et al., 1999). Our effort to explore the applicability of the new model to distracted driving was partly done to get around this controversy by attempting to establish *what*, rather than *when*, behavioral intentions to avoid ECD use while driving lead to action. Differentiating between internally and externally motivated behaviors in the action stage is another characteristic that sets the SSOC model apart from its predecessor. Pettinger (2000) postulates that acquisition of safe behaviors on the job is initially driven by external factors such as written and tacit codes of conduct. External influence is no longer needed when safety consciousness – an intrinsic motivator – becomes the primary reason why individuals perform their job safely. However, Pettinger also acknowledges that some workplace safety behaviors may never become internally motivated if they are perceived as undesirable or too difficult to perform, in which case some level of external motivation through either praise or punishment will always be needed.

### 1.4. Psychosocial influences of behavioral change

Research on the transtheoretical model has determined that stage assignment is influenced by several factors, and each of these factors plays a unique role in facilitating stage-to-stage movement. Decisional balance, or weighing the pros and cons, can influence pre-contemplators to ponder the benefits and costs of changing behavior before they move up to contemplation. Decisional balance can also encourage contemplators to start preparing for

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