Replication of subtypes for smoking cessation within the contemplation stage of change

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Abstract

Objective: Tailored interventions based on stage of change and other Transtheoretical Model constructs have been effective for promoting smoking cessation. Recent cluster analyses based on the Pros and Cons from the Decisional Balance and the Situational Temptations measures performed within the stages have suggested the existence of distinct cluster subtypes. Cluster subtypes would permit the development of tailored interventions focusing on these subtypes. This study attempts to replicate cluster subtypes within the Contemplation stage of change in a secondary analysis of data from a sample of current smokers (N=3967).

Method: Four random samples of 400 were selected from the 1734 Contemplators. The cluster analyses were performed using the Pros, Cons, and Situational Temptations. Interpretability of the pattern, pseudo-F-test, and dendograms were used to determine the number of clusters.

Results: Four distinct cluster subtypes (Classic Contemplators, Progressing, Early Contemplators, and Disengaged) were found and replicated across samples. The clusters were externally validated using the 10 Processes of change and 2 smoking behavior variables (cigarettes per day and time before first morning cigarette). Statistically significant ($p<0.05$) multivariate effects were found for the 10 Processes of change in all four samples. The cluster groups differed on 7 or more of the processes in each sample. Significant multivariate effects were also found for the smoking behavior variables in all samples ($p<0.001$).

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Conclusions: The cluster patterns closely replicate earlier findings and provide evidence for the existence of clusters subtypes within the Contemplation stage of change.
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Keywords: Stage of change; Cluster analysis; Transtheoretical Model; Tailored interventions

1. Introduction

The Transtheoretical Model of behavior change (Prochaska & DiClemente, 1983; Prochaska & Velicer, 1997; Velicer et al., 2000) is one of the influential frameworks of behavior change within which a large number of population-based interventions for smoking cessation have been successfully developed. The model has been conceptualized as involving three key dimensions: the temporal, represented by the Stages of change; the dependant variable dimension, which includes the constructs of Decisional Balance, Situational Temptations, and behavioral measures; and the independent variables dimension, which includes the Processes of change (Velicer, Prochaska, Fava, Norman, & Redding, 1998).

The best known of these is the temporal organizing construct of the Stages of Change. It represents the intention and readiness to change a target behavior. The model defines five distinct stages in the smoking cessation process (precontemplation (PC), contemplation (C), preparation (PR), action, and maintenance). Based on the stages of change construct, TTM-based programs provide interventions that are tailored to participants' readiness to change, instead of the general "one fits all" approach often employed in population-based programs (Norman, Velicer, Fava, & Prochaska, 2000). Although tailored interventions based on stage of change are a step away from the low efficacy of the one group approach, the number of interventions that can be designed is still rather limited. In recent years, the idea of designing interventions for subgroups within each stage has been explored by a number of studies (Norman et al., 2000; Velicer, Hughes, Prochaska, & DiClemente, 1995). The subtypes within each stage are determined through cluster analysis based on three constructs: Pros, Cons, and Situational Temptations. This approach increases the number of potential interventions by a factor of 4 or 5 (Norman et al., 2000).

In the first empirical investigation of the stage subtypes idea, Velicer et al. (1995) identified four distinct profiles within each of the first four stages of change in convenience sample of smokers. The subgroup with a profile most closely corresponding to the stage was labeled Classic, a profile corresponding to the previous stage was labeled Early and a profile corresponding to the next stage was designated as Progressing. A subgroup demonstrating lack of interest and detachment in the cognitive and physiological aspects of smoking and situational temptations were called Disengaged.

Five years later, Norman et al. (2000) published a replication of these finding within the first three stages, using a large representative sample of adult smokers. The study produced cluster profiles similar to the first study. In general, the two papers provided evidence for the existence of stage subtypes that can be used as a complementary typology system in the design of new tailored interventions.