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

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Abstract

The Transtheoretical Model constructs have been used in the development of effective tailored interventions for smoking cessation. Recent studies have suggested the existence of clusters within each stage of change, based on measures of the Pros, Cons and the Situational Temptations. The goal of this study is to replicate cluster subtypes within the Precontemplation stage of change in a secondary analysis of data from a sample of current smokers ($N=3967$). Four random samples ranging from 312 to 400 participants were selected from the Precontemplators subgroup. The cluster analyses were performed using Ward's Method on the standard scores from the three scales. Interpretability of the pattern, pseudo F test, and dendograms were used to determine the number of clusters. Four cluster subtypes were found and replicated across samples. The ten processes of change and two smoking behavior variables were used in the external validation of clusters. Statistically significant multivariate effects were found for the processes of change ($p<.05$) and the smoking behavior variables ($p<.001$) in all samples. The cluster patterns closely replicate earlier findings and provide evidence for the existence of clusters subtypes within the Precontemplation stage of change.
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1. Introduction

Smoking is widely accepted as a serious hazard to health and well-being, but regardless of this knowledge large number of people still smoke. Many studies have suggested that among smokers there are different levels of motivation and intention to quit the habit, which should be used for tailoring of intervention programs. The idea is initially proposed within the framework of the Transtheoretical Model (TTM) of behavior change (Prochaska & DiClemente, 1983; Prochaska & Velicer, 1997; Velicer et al., 2000). TTM has been used for the successful development of population-based tailored interventions for smoking cessation (Hollis et al., 2005; Prochaska, DiClemente, Velicer, & Rossi, 1993; Prochaska, Velicer, Fava, Rossi, & Tsoh, 2001; Prochaska et al., 2001; Prochaska et al., 2004; Prochaska et al., 2005; Velicer & Prochaska, 1999; Velicer, Prochaska, Fava, Laforge, & Rossi, 1999). 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 the dimensions is the temporal organizing construct of the Stages of Change (precontemplation, contemplation, preparation, action and maintenance), which represents the intention and readiness to change a target behavior. Precontemplation is the stage in which people do not plan to take any action to quit smoking in the near future, defined as the next six months. Intervention programs that rely on volunteer samples traditionally ignore Precontemplators, since they are the people with the strongest resistance and the lowest motivation for change (Velicer et al., 2005; Glasgow, Lichtenstein, & Marcus, 2003).

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). In recent years the idea of identifying subgroups within the Precontemplation stage has been explored in a number of studies (Norman et al., 2000; Velicer, Hughes, Fava, Prochaska, & DiClemente, 1995; Dijkastra & De Vries, 2000; Schmidt & Gmel, 1999; Crittenden, Manfredi, Warnecke, Cho, & Parsons, 1998). The reason for this interest is that reliable identification of such subgroups increases the number of potential interventions by a factor of 4 or 5 (Norman et al., 2000), allowing a more narrowly targeted intervention approach. Such a targeted approach is of particular interest for interventions designed for people in the Precontemplation stage, since they have the strongest resistance to change and interventions with these smokers are more likely to fail.

Several approaches have been used to distinguish between potential subgroups within the Precontemplation stage. Crittenden et al. (1998) and Dijkastra, De Vries, and Roijackers (1999) distinguished between groups in Precontemplation based on the intention to quit in some longer period than the 6 months used in the staging algorithm. Schmidt and Gmel (1999) used physical health and well-being to distinguish between clusters within the early stages. While these studies illustrate the popularity of the idea of identifying subgroups within the early stages of change, they do not attempt to identify these variables within the TTM. When the goal is to identify subgroups within the stages of change, it seems that the best approach would be to investigate such groups within the TTM framework, since the staging algorithm is an integral part of the model.

Several studies have employed Transtheoretical Model-based variables to identify subgroups. In the first empirical investigation of subtypes within the stage of change, Velicer et al. (1995) identified three