



## RELATIONSHIPS BETWEEN SENSATION SEEKING AND EMOTIONAL SYMPTOMATOLOGY DURING SMOKING CESSATION WITH NICOTINE PATCH THERAPY

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**Abstract** — This study explored relationships between the sensation-seeking trait and the development of emotional symptomatology during smoking cessation with nicotine transdermal patches. Twenty-five subjects were evaluated before they stopped smoking, on Day 8, Day 30, Day 90, and Day 120. Initial motives for smoking and the sensation-seeking personality trait were tested as possible predictors for the development of specific mood disturbances. Our subjects scored very high on sensation seeking, consistent with previous results on smokers. This may also be due to the well-known tendency of high sensation-seekers to be willing to try new experiences. The sensation-seeking trait did not predict the issue of cessation. However, it was related to emotional deficit (anhedonia, affective blunting), tiredness, and a lack of energy, before and during smoking cessation. Two different interpretations of emotional deficit are proposed. © 2000 Elsevier Science Ltd.

**Key Words.** Smoking cessation, Sensation seeking, Emotions.

Various social, familial, and individual risk factors may predispose the individual to nicotine dependence. Of these, personality factors making individuals susceptible to the rewarding properties of nicotine may play a crucial role. There is strong evidence that vulnerability to nicotine dependence is a function of a high initial sensitivity to nicotine, which produces reinforcing consequences that lead to chronic use (Pomerleau, 1995; Pomerleau, Collins, Shiffman, & Pomerleau, 1993). These strong reinforcers of tobacco dependence include regulation of mood and improvement of cognitive function. They can be controlled by smokers probably because they directly modulate nicotine availability to the dopaminergic and cholinergic systems (e.g., Clarke, 1991; Levin, 1992; Vezina, Hervé, Glowinski, & Tassin, 1991). Personality factors related to this sensitivity may then have a major effect determining who starts, continues, and quits smoking. Two of the most explored personality factors are sensation seeking and extraversion traits. Their relationships to alcohol, tobacco, and illegal drug use may be due to their biological and psychophysiological determinants: low monoamine oxidase (MAO) and overreactive dopaminergic systems in Zuckerman's theory (1994, 1995); cortical arousal in Eysenck's theory (1967, 1980). The general hypothesis is that sensation seekers are chronically underaroused and seek stimulation to activate these systems. In our previous studies, we have suggested that high sensation seekers are particularly sensitive to the stimulant properties of nicotine, and are thus particularly likely to become dependent smokers. These properties may be especially reinforcing for high sensation seekers who are also vulnerable to depression (Carton, Jouvent, & Widlöcher, 1994a, 1994b). We have shown that the search for stimulations, especially through psychoactive substances, may be used to counterbalance depressive tenden-

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cies, and particularly emotional deficits such as anhedonia and affective blunting (Carton, Jouvent, Bungener, & Widlöcher, 1992). Studies exploring sensation seeking have clearly shown that it is strongly related to smoking behavior. Longitudinal studies using the Minnesota Multiphasic Personality Inventory (MMPI) scales have shown that smoking initiation is associated with impulsiveness, sensation seeking, hostility, and rebellion (Barefoot, Smith, Dahlstrom, & Williams, 1989; Lipkus, Barefoot, Williams, & Siegler, 1994). Lipkus' consistent longitudinal study showed that sensation seeking assessed in men and women at college was predictive of the onset and maintenance of smoking 20 years later in both sexes. These findings did not depend on sex, suggesting that these personality variables had the same influence on smoking initiation and cessation in both men and women. In early studies focusing on sensation seeking, a positive correlation with smoking was reported for men only (Zuckerman, Bone, Neary, Mangelsdorff, & Brustman, 1972; von Knorring & Orelund, 1985). Subsequent studies showed an association for both sexes (Kohn & Coulas, 1985; Thieme & Feij, 1986). The first comparison study by Zuckerman and Neeb (1980) showed that women who smoked moderately or even only occasionally, scored higher on sensation seeking than nonsmoking women. An effect for men, but not for women, was found by Golding, Harpur, and Brent-Smith (1983). In 1990, Zuckerman, Ball, and Black (1990) found a relationship between sensation seeking and smoking status in both sexes. Similar results were reported in France, smokers of both sexes scoring higher on sensation seeking than their nonsmoking counterparts (Carton et al., 1994a).

Thus, there is considerable evidence that the sensation-seeking trait constitutes a risk factor for the development of smoking dependence and possibly for relapse during attempts to quit. It is clear that smoking abstinence impairs mood and cognitive performance, and that this impairment is a relapse factor in attempts to stop smoking (American Psychiatric Association, 1994; U.S. Department of Health and Human Services, 1988).

This article presents results that form part of a large study designed to assess relationships between a history of depression, sensation seeking, and the development of psychopathological and cognitive deficits during smoking cessation using standard nicotine replacement therapy. Preliminary results on cognitive impairment assessed using event-related potentials have been presented elsewhere (Le Houezec, Carton, & Jouvent, 1996). No difference was found in the level of sensation seeking between subjects with and without a history of depression. This article therefore focuses independently on the results concerning sensation seeking. The purpose of this study was to analyze relationships between impairment of mood and the sensation-seeking trait during attempts to stop smoking using standard nicotine replacement therapy. We hypothesized that this trait would be related to the occurrence of specific emotional troubles during cessation: anhedonia, affective blunting, and lack of activation. We also investigated the previous motives for smoking, as predictors for the development of specific emotional troubles. We tested whether there was a relationship between stimulant smoking and the development of affective blunting, and between sedative smoking and the development of anxious symptomatology.

## M E T H O D

### *Subjects*

The sample consisted of 25 smokers: 13 women (mean age 34, *SD* 5.2) and 12 men (mean age 33.4, *SD* 6.4) covering a large socioprofessional status spectrum. They were

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