



# A discrete mathematical model for addictive buying: Predicting the affected population evolution

I. García<sup>a</sup>, L. Jódar<sup>b</sup>, P. Merello<sup>b</sup>, F.-J. Santonja<sup>c,\*</sup>

<sup>a</sup> Departamento de Comunicación Audiovisual y Publicidad, Universidad del País Vasco, Spain

<sup>b</sup> Instituto Universitario de Matemática Multidisciplinar, Universidad Politécnica de Valencia, Spain

<sup>c</sup> Departamento de Estadística e Investigación Operativa, Universidad de Valencia, Spain

## ARTICLE INFO

### Article history:

Received 20 September 2010

Received in revised form 2 December 2010

Accepted 3 December 2010

### Keywords:

Addictive buying

Compulsive buying

Discrete mathematical model

Modeling

Multivariate statistics

## ABSTRACT

This paper deals with the construction of a discrete mathematical model for addictive buying. Firstly, identifications of consumers buying behavior are performed by using multivariate statistical techniques based on real data bases and sociological approaches. Then the population is divided into appropriate groups according to the level of overbuying and a discrete compartmental model is constructed. The future short term addicted population is computed assuming several future economic scenarios.

© 2010 Elsevier Ltd. All rights reserved.

## 1. Introduction

Although addictive buying is not specifically described in DSM-IV [1], uncontrolled problematic buying behavior has been studied by psychologists and psychiatrists since the early 20th century [2]. For some people, shopping is a leisure activity, a way to manage emotions or a means of expressing their self-identity. This however can bring about adverse consequences, including guilt, excessive debt, family conflict, illegal activities, and even suicide attempts.

Some cross-sectional studies have been performed to analyse uncontrolled problematic buying behavior [2]. However, to the best of our knowledge, there are no studies that allow to predict the prevalence of this pathological behavior in the next few years. In this paper, we present a discrete mathematical model that allows us to do it. Taking into account [3] we build the model considering that social behaviors may spread from one person to another.

## 2. Method

Firstly, in order to know the addictive buying prevalence rate, two surveys have been performed. Secondly, the mathematical model is built. The information contributed by the prevalence analyses allows us to estimate some of the parameters of the model.

### 2.1. Data and sampling

The prevalence study is based on the database of two surveys performed in Vizcaya (Spain). The first one was in 2001 [4] and the second one in 2010. A total of 350 individuals aged 17 and older (341 individuals for 2001) have been selected using stratified random design to insure representation of the diverse age and gender groups.

\* Corresponding author.

E-mail addresses: [franciscosantonja@hotmail.com](mailto:franciscosantonja@hotmail.com), [francisco.santonja@uv.es](mailto:francisco.santonja@uv.es) (F.-J. Santonja).