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# Sentimental relationships between lottery participation and household consumption

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ABSTRACT

This study examines the sentimental correlation of lottery prizes with household consumption via Grey relational analysis. An approximate correlation with sequential order rankings is identified. Results demonstrate that all top five lottery prizes are strongly correlated with rational addictive consumption and income categories. These lottery prizes show a relatively strong correlation with entertainment consumption and a negligible correlation with desperation consumption. Although jackpot exhibits an approximate strong correlation with alcohol consumption, other prizes show an approximate strong correlation with tobacco consumption. The top five prizes demonstrate a relatively strong correlation with restaurant, recreation, and traveling consumption, as well as a negligible correlation with food and education consumption. Lottery prizes are negligibly correlated with salary with the least sentiment.



## 1. Introduction

Lottery prizes often attract considerable public interest with increased and extended participation (Haruvy, Erev, & Sonsino, 2001; Rogers & Webley, 2001; Sharpira & Venezia, 1992; Thaler & Ziemba, 1988). Consumer participation in lottery is influenced not only by jackpot prizes for lifetime winnings, but also by medium prizes to extend participation duration (Haruvy et al., 2001; Thaler & Ziemba, 1988). In particular, lottery participation increased from 26.6% with a single prize to 37.7% with multiple prizes (Haruvy et al., 2001). Consumers increase lottery participation for large jackpot prize opportunities, but also use small prize winnings to continue toward jackpot prize winnings (Rogers & Webley, 2001; Sharpira & Venezia, 1992). Therefore, consumers voluntarily contribute to lottery prizes in which lottery sales determine the prize structures (Dale, 2004).

Nevertheless, consumers may develop irrational or rational decision making via lottery prize structures with unknown probabilities of winning toward jackpot, rollover, or low-tier prizes (Lin, Kang, & Chan, 2005; Lin & Wang, 2004; Matheson & Grote, 2004). Thus, consumers exhibit rational addictive behavior toward large jackpot prizes with increased participation (Doran, Jiang, & Peterson, 2012). Moreover, the accumulations of rollovers encourage the development of lotto mania behavior among increased numbers of participants (Beenstock & Haitovsky, 2001; Harley & Lanot, 2006; Peel, 2010). Therefore, lottery games assist in developing sentimental reactions for hope and fear via regret aversion decision making for extended participation (Statman, 2002).

Additionally, consumers determine lottery participation and duration based on prize payout rates (Pérez & Humphreys, 2011). However, consumers may determine lottery participation based on income and consumption behavior changes (Kuhn, Kooreman, Soetevent, & Kapteyn, 2011; Pérez & Humphreys, 2011). Increases in income encourage existing consumers to purchase more national lottery tickets instead of attracting new potential consumers (Pérez & Humphreys, 2011). Consumers with lottery prize winnings significantly show ownership of newly purchased cars as well as spend more on food away from home and durables excluding cars; by contrast, their counterparts significantly exhibit greater monthly expenditures, including food away from home and other expenditures, renovation expenditures, durables, and more donations to charity (Kuhn et al., 2011). From the perspective of household consumption behavior, consumer sentiment reactions may relate closely to specific expenditures for addictive, recreation, or daily necessity purchases. Addictive research hypothesis indicates that tobacco and alcohol expenditures reflect rational addiction

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sentiment (Balabanis, 2002; Kearney, 2005; Lin & Lin, 2007). Entertainment research hypothesis states that restaurant, recreation, and traveling expenditures signify entertainment sentiment (Farrell & Forrest, 2008; Garrett & Marsh, 2002). Daily necessity research hypothesis posits that food and education expenditures (i.e., basic family consumption) represent desperation sentiment in which such expenditures are necessary for maintaining basic living standards (Landry & Price, 2007; Lee & Chang, 2005).

Thus, our empirical study is motivated by rational addictive theory (Becker & Murphy, 1988), accompanied by the various household consumption research hypotheses to identify sentiment reactions from lottery participation. We further expand lottery sentiment reaction analysis from jackpot prize to low-tier prizes. We analyze the influence of multiple prize structures for lottery games toward consumer decision making and behavior. This study aims to bridge the gap between higher and lower tier prizes by identifying the likely sentiments regarding each prize amount.

Despite existing studies on the demographic and socioeconomic analysis of lottery participation (Farrell & Walker, 1999; Garrett & Marsh, 2002; Ghent & Grant, 2007; Harley & Lanot, 2006; Ho, Lee, & Lin, 2006; Kearney, 2005; Lin & Lin, 2007; Lin & Wu, 2007; Matheson & Grote, 2004), the relationship between lottery prize structures and sentimental consumption has not been established. In contrast to previous studies focusing on the causal relationship between lottery demand and demographic background (Farrell & Walker, 1999; Garrett & Marsh, 2002; Ghent & Grant, 2007; Harley & Lanot, 2006; Ho et al., 2006; Kearney, 2005; Lin & Lin, 2007; Lin & Wu, 2007; Matheson & Grote, 2004), we propose Grey relational analysis (GRA) (Deng, 1982) to identify the approximate correlation between consumption sentiment and lottery prizes for the order rankings of sequence influences for households. A sequential relationship, ranked by orders of Grey relational grades, is identified for individual and category sentiment indices comprising rational addiction, entertainment, and desperation behavior for various prize returns. The application of GRA builds on other models in identifying the influences on lottery consumption. GRA not only provides an order relation of variables by rankings of Grey relational grades, but also identifies the latent influences of variables that are less likely to be detectable using other methods. The government and authorities may refer to the empirical results in considering the formation of strategic alliances, formulation of promotional campaigns, and designing of lottery games. Meanwhile, lottery players may refer to the empirical results in determining the sentiment indicators on lottery purchases.

## 2. Literature review and theory

Rational addictive behavior generally influences lottery consumption by individual players, and lotteries possess addictive characteristics (Chang, 2004; Moore, 1997). The total prize amount strongly affects participation in lottery consumption, whereas the increased consumption of tobacco and alcohol is associated with increased consumption demand in lotteries (Lin & Lin, 2007; Zeng, 2006). Heavier smokers also tend to purchase more lottery tickets as an addictive and compulsive behavior (Balabanis, 2002). Thus, bounded rationality exists in lottery games in which most players react more to jackpots and respond less to smaller games with higher returns (Grote & Matheson, 2006). The level of rational addiction is the major influence on lottery consumption (Chang, 2004; Harley & Lanot, 2006; Lin & Lin, 2007). Addictive products, such as tobacco, alcohol, and betel nuts, strongly influence lottery consumption (Chang, 2004; Kearney, 2005; Landry & Price, 2007). Low ticket prices similarly encourage lottery players to assume a higher risk than they otherwise would (Haisley, Mostafa, & Loewenstein, 2008).

Households may reduce their expenditure on non-addictive purchases, such as education, grocery, mortgage, rent, and other bills, to participate in lotteries (Kearney, 2005; Lee & Chang, 2005). The allocation of lottery proceeds to fund education encourages lottery sales (Landry & Price, 2007). Household expenditure on groceries and entertainment is most likely to be replaced by consumption needs in lotteries to improve the economic situation (Kearney, 2005; Lee & Chang, 2005). Therefore, restaurant expenditure negatively and significantly influences lottery sales; by contrast, tourism influences lottery sales because players seeking lottery prizes are willing to travel to increase their probability of winning (Farrell & Forrest, 2008; Garrett & Marsh, 2002).

Household income also influences lottery participation to improve economic conditions or seek entertainment (Garrett & Marsh, 2002; Ghent & Grant, 2007). Higher income households participate in lottery games for entertainment, whereas lower income households do so to improve their economic conditions (Ghent & Grant, 2007). However, income is also insignificantly related to lottery sales (Chen, Chie, Fan, & Yu, 2009). Nevertheless, income level and employment status may affect lottery consumption (Lin & Lin, 2007). A decrease in economic ability tends to increase lottery purchases and thus improve the quality of life and economic conditions (Blalock, Just, & Simon, 2007; Garrett & Marsh, 2002; Ghent & Grant, 2007).

### 2.1. Theory

Rational addictive theory, proposed by Becker and Murphy (1988), focuses on products with the potential to be addictive, including cigarettes. When making purchasing decisions, consumers consider and transform purchase price, product usage, and added value as their needs. Factors affecting the need for addictive products may include stress and income. Particularly, purchase prices are deterministic in encouraging addictive purchase behavior (Becker & Murphy, 1988). Therefore, rational addictive consumer behavior is more likely to develop predictive consumption behavior that is influenced by purchase price, product function, and product added value (Harris & Harris, 1996). Consumers with an addictive behavior toward products are more likely to be influenced by personal preferences and engage in long-term and regular consumption of addictive products (Miljkovic, Nganje, & de Chastenet, 2008).

National lottery games not only encourage consumers to double their consumption, but also induce a four-fold increase in the excessive consumption toward addiction among households (Grun & McKeigue, 2000). Lottery games with frequent advertisements are also often viewed as an acceptable gamble with accessible stores and affordable ticket prices, thus engendering the addiction behavior of consumers in which they participate in lottery games via past experiences to exert an illusion of control over their daily lives (Hardoon, Baboushkin, Derevensky, & Gupta, 2001). In the case of lottery participation, addictive consumption is common in less educated households (Grun & McKeigue, 2000; Shepherd, Ghodse, & London, 1998). Thus, lottery games induce addictive consumption in which less educated households spend more than their counterparts at an average of £2.42 per week on scratch cards or lottery tickets compared with £1.84 per week, particularly for households with an annual income of less than £20,000 (Shepherd et al., 1998). Low-income households also exhibit the highest percentage in spending more than 10% of income on lottery tickets, thus spurring addictive consumption (Grun & McKeigue, 2000).