Introduction

While for a long time, safety and security policies have been controlled within the framework of penal law, more recent evolutions show that governments are developing new alternative ways to ensure a safe and secure environment (Schuilenburg and Peeters 2015). As crime prevention and social control strategies have become more popular, the concept of nudging could provide useful insights in this field. The nudging approach, which stems from the emerging behavioral research domain, suggests that it should be the aim of policy makers to guide people into making the most positive decisions. In this view, policy makers are considered as 'choice architects' who regulate the environment in which individuals make decisions (Alemanno 2012). Nudges have gained widespread recognition through the book 'Nudge' (2008) by Richard Thaler and Cass Sunstein, who describe nudging as 'any aspect of choice architecture that alters behavior in a predictable way without forbidding alternatives or significantly changing economic incentives' (Thaler and Sunstein 2008, p. 6).

To be qualified as a nudge, it is indispensable that the intervention fully preserves freedom of choice without using any material incentives or disincentives such as taxes, subsidies or a fine (Sunstein 2015). This implies that there always has to be an easily available escape clause for the nudged individual. However, the suggested freedom of choice has been criticized extensively. Wertheimer (2014, p. 10) indicated that there is never a complete freedom of choice as we 'always choose from among a limited set of options.' In this light, Hausmann and Welch (2010) suggest broadening the definition of nudges because according to them, rational agents are not only responsive to economic incentives. The authors define nudges as 'the ways of influencing choice without limiting the choice set or making alternatives appreciably more costly in terms of time, trouble, social sanctions, and so forth' (Hausmann and Welch 2010, p. 126).

Since the first experiment with nudging, the etching of the image of a black housefly in urinals in the men's rooms at Schiphol Airport in Amsterdam, proved to be a major success (Thaler and Sunstein 2008), nudges are frequently used in various domains. Examples can be found in the health sector, where healthy food is placed at eye level in order to nudge people to choose meals low in calories (Thorndike et al. 2012), or in the traffic sector, where the narrowing of the distance between white stripes on the road nudges drivers to limit their speed (Lindhout and Reniers 2017).

Two groups of nudges can be identified, reflecting different underlying brain processes: automatic thinking (system 1), which is associated by fast and instinctive processes, and reflective thinking (system 2), which is characterized by deliberate and conscious processes (Hansen and Jespersen 2013). System 1 nudges have an impact on the automatic thinking or the non-conscious part. Putting food on eye level or narrowing the distance between the stripes on the road are examples of this kind of nudge. System 2 nudges focus on the slow and reflective way of thinking or the conscious processes, such as the alarm that goes off when one is not wearing a seatbelt in the car (Kahneman 2011; Lindhout and

Reniers 2017; Thaler and Sunstein 2008). Additionally, seen from the point of view of the person who is nudged, nudges can be transparent or non-transparent. Nudges such as stickers of footprints placed on the ground leading to a sink or garbage bin are transparent as both the nudge itself and the intention behind it are noticeable by the individual. The inclusion of defaults in a registration form for organ donation is a non-transparent nudge as the intention of the means by which the behavioral change is persecuted is not directly noticeable by the person who is nudged (Lindhout and Reniers 2017).

It can be stated that this nudging approach overlaps with techniques of crime prevention. Reference can be made to Crime Prevention Through Environmental Design (CPTED) approach which has the aim to prevent crime and fear of crime by manipulating the social and physical environment (Cozens et al. 2005). Additionally, nudges can be considered as a form of Situational Crime Prevention (SCP), which has the aim to reduce the opportunities of crime by increasing the risks and difficulties associated with it (Clarke 1995, 1997). Based on the assumption that criminals weigh their costs and benefits before they act, SCP aims to hardening the target and reducing the rewards of crime by changing the physical environment (Clarke 1997). While CPTED and SCP are both grounded in the rational choice theory and target a criminal's ability to make rational choices, nudges are based on the principle that some of the choices that people make are irrational (i.e., not consciously calculated). By manipulating the choice architecture, (system 1) nudges seek to influence the unconscious choices of people. However, (system 2) nudges can also be used to provoke criminals into thinking about the consequences of their decisions before they act. Sharma and Kilgatton (2015), for instance, suggest that theft from shops might be reduced if retailers displayed signs showing how savings made from reductions in losses due to shop-theft, would be donated directly to charity. Additionally, while it is one of the key principles of the nudging approach to preserve full freedom of choice, some of the most effective situational interventions within the CPTED and SCP frameworks involve the removal of choice (Sidebottom and Tilley 2017). For instance, the removal of accessible cash boxes on buses in the United States have led to the near disappearance of bus robberies in the 1960s (Chaiken et al. 1974).

In the current study, system 2 nudges are used to provoke cyclists into thinking about the consequences of their decisions. By implementing contextual cues, it is the aim to reduce the number of opportunities for bicycle theft and increase the efforts for criminals. Due to the unavailability of official police statistics, the number of bicycle thefts before and after the nudging experiment is unknown. While these data cannot be included in the evaluation of the nudging approach, changes in cyclists' preventive locking behaviors will be assessed by carrying out observations. First, an overview of earlier experiments with nudges in the field of security will be provided. Additionally, the methodological approach of the current study will be presented. After the presentation of the results, the most remarkable conclusions are discussed. At the end of the paper, some limitations of the current research and recommendations for future studies will be presented.