

The role of social marketing in addressing the  
treatment of driving anger: A cognitive approach

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## Abstract

Driving anger is a topic of continued interest and is one that receives constant public and Academic attention. Anger in traffic is an emotion that has a negative impact on driver behaviour; it might distract a driver's attention from driving and cause dangerous behaviour toward the source of anger.

In response to this issue, several studies on driving anger have focused on understanding this phenomenon from different angles, including personal factors, situational factors, measurements of anger in traffic and treatment of driving anger. Surprisingly, the treatment of anger in traffic has generally been neglected. Most existing driving anger interventions, such as cognitive, relaxation, and behavioural interventions, are psychotherapeutic and target mainly high-anger drivers. While these interventions are promising, the main limitation of such an approach is not being able to target the larger community and offer wide prevention programs.

Therefore, the primary purpose of this thesis is to provide an overarching understanding of the driving anger issue in Saudi Arabia to develop social marketing interventions. To achieve this end, emotional theories will be utilized for the first time, not to use emotions to facilitate behaviour change, but rather to repress anger that could lead to undesired behaviour, such as aggression. Moreover, Lazarus' Cognitive–Motivational–Relational (CMR) model and the principles of social marketing were used to better understand anger in traffic as well as to provide comprehensive direction and structure for the intervention. A mixed methods approach was used to provide empirical investigation of the issue, and therefore the thesis was divided into three studies. First, environmental factors were explored using primary research in the form of a qualitative inquiry. Twelve drivers were interviewed in this phase to identify the type of traffic situation that is most likely to provoke anger and to investigate how they evaluated their incidents. The main finding of the first study was that the harm or disrespect caused by another road user is the main source of anger in traffic. The second study was a quantitative phase that sought to understand the personality factor and coping strategies by using an adapted questionnaire. A total of 652 respondents provided information about the common driving style in Saudi Arabia, which is impatient driving, and how this style negatively affected their driving performance.

In third study, the researcher interviewed 18 selected drivers to examine their underlying beliefs, values and attitudes associated with the developed intervention. From a driver's point of view, reducing the negative effect of environmental factors should be the key focus of the intervention.

Therefore, the treatment should depart from targeting individual level only and offer an intervention that minimise the negative effect of external factors alongside training drivers how to cope with them effectively.

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### **List of Abbreviations**

DAS	Driving Anger Scale
DSI	Driver Stress Inventory
DBI	Driver Behaviour Inventory
DCQ	Driver Coping Questionnaire
CMR	Cognitive-Motivational-Relational
WCQ	ways of coping Questionnaire

### **Publications from Thesis**

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# Chapter One

## Introduction to the thesis

### **1.1 Introduction**

This chapter provides an introduction and overview of the current thesis. The chapter is comprised of eight elementary domains. Section 1.2 describes the background of the research, identifies the knowledge gap in the literature and explains the research problems based on an extensive literature review. Section 1.3 illustrates the problem being addressed—the current traffic situation in Saudi Arabia—and the importance of understanding drivers' behaviour for the purpose of devising solutions. Section 1.4 details the overall aims and objectives, while Section 1.5 discusses the main research questions. Section 1.6 describes the main research approach, and Section 1.7 briefly discusses the main contributions of the research. Finally, Section 1.8 outlines the overall structure of the thesis.

### **1.2 Background and research problems**

According to the World Health Organisation (WHO, 2011), mass transportation has an ambivalent effect on modern life. On the one hand, it has a major positive economic impact, but on the other, road traffic injuries kill nearly 1.25 million people worldwide every year. Furthermore, WHO states that if current trends continue, road accidents could become the fifth leading cause of death by 2030 (World Health Statistics, 2015). Many governments and health professionals consider road safety issues a challenging health problem. This is also a fertile field for academic research, and this issue has been the subject of hundreds of published articles employing a myriad of viewpoints. Unfortunately, the mortality rate from road traffic accidents is much higher in Saudi Arabia than in Western countries such as the United Kingdom. About 17 people were killed every day as a result of road traffic accidents in Saudi Arabia, a rate of 27.4 per 100,000 populations. In contrast, the number of reported road deaths in the UK in 2014 was 1,775 (2.9 per 100,000 population), which puts the Kingdom of Saudi Arabia among the countries with the highest rates of traffic accidents (WHO, 2015). Researchers should therefore priorities the study of road safety in Saudi Arabia. One fundamental task in their investigation should be to reduce the number of these tragic events by studying this phenomenon from different perspectives.

On a wider (macro) level, socio-cultural factors and regulations related to traffic safety, may better explain the reason behind fatal traffic deaths. For example, economic conditions, religion, governance quality, and cultural dimensions have all showed positive and negative associations with traffic safety (Melinder 2007; Gaygisiz 2009; Gaygisiz 2010). Melinder (2007) found that the predominant religion of a country seems to have an impact on values related to safety. For instance, being a Catholic country or not seems to be just as important as being a wealthy country or not. Being a non-wealthy Catholic country leads to more traffic accidents than being a wealthy Catholic country does. Being a wealthy Catholic country, however, does seem to lead to more traffic accidents than being a similarly wealthy but non-Catholic country.

Furthermore, the transportation system can be also broken down into three components: the road environment, the vehicle and the driver (Rothengatter, 1997). The road environment refers to overall safety and is determined by the roadway's physical features such as road design, roadway signs, pavement markings and operating conditions. Vehicular factors may be mechanical failures, bad breaks or tyres or other similar problems. Human factors include inattention or distraction, fatigue, alcohol use and vision problems (Mearkle, 2009).

According to Oppenheim and Shinar (2011), two studies in the 1970s, one in the United States and the other in the United Kingdom, both identified factors associated with a large number of accidents. These two studies, which were independent of each other, produced similar results. Both identified the road user as a sole or contributing factor in 94% of crashes in the US study and in 95% of crashes in the UK study. Moreover, in Saudi Arabia, over 65% of accidents occur because of excessive speed and/or drivers violating traffic signals (Ansari et al., 2000).

Specifically, this thesis will focus on young drivers because they represent a greater risk. This is generally true across the world and remains an issue largely unsolved (Berg, 2006; Shope, 2006). In the UK, for example, there were about 163,554 reported personal injuries from road accidents in 2009. Twenty-six percent of all accidents (over 42,000) involved at least one driver aged 17 to 24 years (DFT, 2009). In addition, according to the 2012 annual statistical report of the Kingdom of Saudi Arabia (KSA), a total of 7,638 people were killed in the KSA in traffic collisions in 2012. Approximately 50% of these fatalities were under 30 years of age.

Many studies examine drivers' behaviour, each contributing from different vantage points. The literature depicts the causes of road accidents as multifactorial. Shope (2006), for example, presents an organised, comprehensive view of the factors known to influence young drivers' behaviour, including personality characteristics and the driving environment and how these factors might inform interventions aimed at reducing crashes (Figure 1-1). Moreover, from the psychosocial perspective, young drivers are exposed to many influences from parents, peers, schoolmates and workmates (Scott-Parker et al., 2009; James, 2002) on their driving attitudes and behaviours. Other studies on Saudi Arabia have attributed improper driving behaviour, such as running a red light and failing to yield, as the primary contributing causes of accidents in Riyadh (Al-Ghamdi, 2003).

What is more, Hassan (2014) has examined the factors associated with the involvement of young Saudi drivers in at-fault crashes using the structural equation modelling (SEM) approach and found that aggressive violations (pressing the brakes and gas pedal at the same time while driving) were the most significant factors affecting young Saudi drivers' (18 to 24 years) involvement in at-fault crashes, followed by ordinary violations (i.e., tailgating) and attitudes towards speeding.

**Figure 1-1 Influences on youthful driving**

*Adapted from Shope (2006)*

A factor of grave concern to road safety practitioners, particularly among young drivers, is the role of emotion in their behaviour (Herrero-Fernández 2013; Roidl et al., 2013; Nesbit et al., 2007; Mesken, 2006).

This is troubling because many road users share the roads and have to interact with other road users emotionally and physically. Thus, driver emotion and emotion regulation—in particular, anger—have emerged as critical factors in driver behaviour. Mesken (2006, p.45) reviewed the role of emotion in traffic and found that “emotions and moods may affect driving-related performance in several ways. The clearest results were shown for feelings of anger and hostility. These emotions seem to affect general task performance but are also related to the commission of violations and aggressive and risky driving”.

Driving anger is a significant safety problem, even for professional drivers (Deffenbacher, 1999). “Driving anger” and “driver aggression” have been used interchangeably in the literature and media, but they are different (Nesbit et al., 2007; Galovski and Blanchard, 2004; Lennon and Watson, 2011). Therefore, it is important to understand the difference between these terms to clarify the purpose of this research.

Driver aggression is “behaviour based in anger and/or behaviour the goals of which are to harm, intimidate, threaten, dominate, retaliate upon, frustrate, or otherwise express displeasure with another driver or user of the roadway” (Deffenbacher et al., 2004, p.116). Therefore, driver aggression is a product of high levels of anger (Lennon and Watson, 2011) and could include, but is not limited to, slow driving with the intent of blocking other vehicles, tailgating, improper passing (cutting drivers off when passing), horn-honking and flashing high beams (Galovski, 2004).

However, this thesis focuses on driving anger, which is “an emotional construct comprised of anger-related feelings and thoughts that occur while driving” (Nesbit et al., 2007, p.158; see Chapter Two for more details). This type of anger is identified in the literature as a dangerous phenomenon that commonly occurs (Nesbit et al., 2007). Almost 60% of UK motorists stated that they had experienced anger while driving in the past year (Nesbit et al., 2007).

Studies by Underwood et al. (1999) and Parkinson (2001) found that anger occurs relatively more frequently in driving situations than in non-driving situations. Eighty-five percent of the participants in Underwood’s (1999) study reported experiencing anger while driving on at least one occasion during a two-week period.

In response to this issue, the literature on emotions in traffic has dealt extensively with the relationship between anger, task performance and behaviour. Accordingly, there seems to be a great deal of evidence demonstrating the dangers of drivers’ anger. Several studies have investigated the role of anger in traffic, some of which have focused specifically on the safety aspects associated with driving anger (Underwood et al., 1999). For example, Stephens and Groeger (2006) used a driving simulator to investigate whether emotions affect driving behaviour. The authors found that those who had become angry because of traffic events accelerated more after the impeding event.

Arnett et al. (1997) investigated the role of several state and trait factors in driving behaviour and found that anger was the only emotion showing a relationship with driving speed. Participants in their study exceeded the speed limit to a greater degree when angry than when in any other emotional state. Furthermore, anger may impair performance by distracting the driver from maintaining safety or by eliciting potentially dangerous coping strategies, such as reacting aggressively to other road users (Emo et al., 2004).

Comprehensive work by Deffenbacher and colleagues (Deffenbacher, 1999; Deffenbacher et al., 2000; Deffenbacher, 2000; Deffenbacher et al., 2003) used different scales such as the Driving Anger Expression Inventory (DAX), the Driving Anger Scale (DAS) and the Drivers' Angry Thoughts Questionnaire (DATQ) to measure the effect of anger on aggressive and risky driving. The findings of these studies show that those who score highly on anger scales are more at risk of engaging in aggressive behaviour than those less likely to experience anger in traffic. Deffenbacher et al. (1994) speculate that anger may influence motivation to commit risky driving behaviours that could in turn increase the likelihood of an accident. For instance, they claim that experiencing anger while driving might predispose an individual to engage in dangerous driving behaviours such as speeding, tailgating or flashing their lights (Underwood et al., 1999).

In addition to triggering aggressive behaviour, anger can have other adverse effects on driving. One recent study (Zhang et al., 2015) used an online questionnaire to investigate the relationship between driving anger and aberrant driving behaviours. Driving anger was measured using the Driving Anger Scale (DAS), while aberrant driving behaviours were measured using a 23-item Driver Behaviour Questionnaire (DBQ).

The results showed that arrival blocking factors—traffic events that hinder driving—were significant positive predictors of all four types of aberrant driving behaviours (emotional violation, error, deliberate violation and maintaining progress violation). Moreover, anger is one of the emotions frequently experienced in our daily relationships with others (Fehr and Baldwin, 1996). Therefore, anger and its consequences appear to occur frequently on roads, both historically and currently, making this emotion an important factor to consider in improving road safety.



Although road-related anger and aggression have received considerable public and governmental attention over the past few years (Deffenbacher et al., 2002), most existing studies have been particularly interested in conceptualising the issue of driving anger and have contributed to the literature by unveiling different aspects of the issue. However, the treatment of driving anger has received little attention in the literature and more so in relationship to Saudi drivers (Deffenbacher et al., 2002; Sharkin, 2004; Mesken, 2006). More important, however, is the need to provide a comprehensive view of driving anger based on emotion theories to assist practitioners with designing and developing countermeasures for alleviating anger among drivers to reduce the negative effects of this emotion.

Existing studies emphasise the need for interventions that could reduce driving anger issues and their consequent risky behaviour. Deffenbacher et al., (2002) work is particularly important on the treatment of driving anger. These authors used a cognitive relaxation intervention on a group of 57 high-anger drivers (see Chapter Two for more details). The findings indicate that relaxation intervention seemed to lower some measures related to driving anger and lowered self-reported risky driving. However, although this approach proved efficacious, it had two main limitations. First, this approach dealt with personality factors, targeting drivers who are prone to anger, but it neglected environmental factors such as the behaviour of other drivers, which are central to the elicitation process.

Consequently, it may be that situational interventions are as important as clinical interventions in supporting drivers towards controlling their anger and maintaining safe driving. Second is the recruitment process, particularly for difficult-to-reach drivers. Deffenbacher et al.'s study was limited to undergraduate students who were given credit for participation.

Therefore, the main challenge is how social marketers can encourage difficult to reach drivers to take part in such intervention.

In considering interventions to reduce the road fatality problem, the literature showed that education, enforcement and engineering have been used extensively (Rothschild, 1999). Social marketing has attracted increased attention from scholars and practitioners as an effective tool to prevent and reduce road accidents (Smith, 2006).

With their “real world” applicability, social marketing principles (Chapter Three) are believed to be useful in promoting driving safety and changing drivers’ behaviour (Smith, 2006). Social marketing means the application of basic marketing principles to design and implement programmes and information campaigns that advance social causes such as traffic safety (Harman, 2009). This approach has been successfully used in the literature to address a range of road safety issues, such as reducing drunk driving among young drivers (Barrie et al., 2011) and reducing aggressive driving by young men in deprived areas (Tapp et al., 2013).

In this PhD study, the researcher adopted the theory of appraisal (Lazarus, 1991) and the work of Matthews et al. (1997) in coping strategies to understand the issue of driving anger in Saudi Arabia. The research then developed a social marketing intervention based on an audience-focused approach and created a guidance framework to assist in minimising the effects of driving anger. The intention is that this work will contribute to making the nation’s roads safer.

### **1.3 The research environment: Saudi Arabia**

To appreciate the context in which the present study is undertaken, the chapter will briefly describe the current driving environment in Saudi Arabia. The Kingdom of Saudi Arabia is the largest country in the Arabian Peninsula; it has a population of 30,770,375, including 8.4 million foreign residents, and its capital city is Riyadh (Central Department of Statistic and Information, 2014).

Additionally, there are about 17 million registered cars in Saudi Arabia, and it is estimated that number will increase to 27 million cars in 2030 (Al Arabiya, 2015). Saudi Arabia was selected as the research environment of this thesis because of the serious public health issue of traffic accidents as well as the fact that it is the researcher's home country. Some studies report the estimated number of traffic accidents in Saudi Arabia at about half a million per year.

This accounts for 4.7% of all deaths, exceeding the 1.7% rate in each of the United States, England and Australia (Takafi et al., 2011). King Abdul Aziz City for Science and Technology has warned that if the current increase in accident rates is not checked, Saudi Arabia may register over four million traffic accidents annually by 2030.

Road accidents in Saudi Arabia cost the country 21 billion riyals (£3.66 billion) a year (Mottet, 2006). These figures explain why WHO has classified Saudi Arabia as one of the countries with the highest levels of road accidents in the world (WHO, 2015).

Although there have been several attempts to develop road safety campaigns tackling different issues in Saudi Arabia (Khadoor, 2007), to the best of the researcher's knowledge, there are no studies investigating the driving anger issue and its consequences in the Kingdom, which speaks to the tremendous value of this thesis.

#### **1.4 Overall research aims and objectives**

The literature presents anger as the emotion with the greatest negative effect on drivers' performance (Deffenbacher et al., 2002; Mesken, 2006). However, treatments for driving anger and the available coping strategies for angry drivers have received inadequate research attention, specifically in the context of Saudi Arabia. Theoretically, there remains much to be done to understand the connections between emotion and behaviour change and the importance of understanding emotional processes in eliciting positive emotion or in controlling negative emotion (Bagozzi et al., 2002). Hence, investigating the role emotion plays in behaviour change will be a useful contribution to the social marketing literature. To address this gap in the literature, this research used appraisal theory with an aim to achieve the following chief goal.

**To establish a guidance framework to assist social marketers in minimising the effects of anger leading to traffic roads accidents.**

To accomplish this, the thesis is divided into three studies. The first two provide a comprehensive investigation of driving anger in Saudi Arabia and assess both environmental and personality factors. These two studies seek to understand the problem and provide a foundation for the development of social marketing intervention.

Study three focuses on the development and initial testing of behaviour change solutions. The third study thus provides a guidance framework for practitioners in the field of driving anger.

To provide sufficient information to address the chief goal of this research, the study seeks to achieve the following three objectives.

#### **1.4.1 Objective One: Identifying the characteristics of traffic events that provoke the experience of anger in drivers**

The existing literature emphasises that “coping must be examined within the context of a specific stressful encounter” (Folkman and Lazarus, 1985). The researcher therefore needs to first identify very clear traffic events to characterise the anger-provoking situation, which will help find the best way of coping. Hart (1991) suggested that the efficacy of some coping strategies might depend on the characteristics of the stressor being faced because coping is a dynamic construct that changes as situations change. Accordingly, a qualitative exploration in stage one of this research explores environmental stressors—specific driving situations and encounters—that enable us to identify the external factors that affect drivers’ emotions.

Achieving this objective should help ascertain how young drivers appraise these situations, which could help the researcher interpret the emotional process to circumvent the occurrence of anger. In addition, should communications be found to be useful in solving anger problems, identifying the situations might help social marketers organise their operational details. For example, if one of these situations occurs at traffic lights, advertising in areas fitted with traffic lights should help marketers reach their target. Study one (Chapter Five) investigates qualitatively the environmental stressors that cause the experience of anger on Saudi roads.

#### **1.4.2 Objective Two: Identifying the characteristics of drivers in Saudi Arabia: Personalities and coping strategies**

In the previous objective, the aim was to identify the environmental factors that trigger anger in traffic. Equally important, however, drivers differ significantly in terms of their levels of vulnerability regarding experiencing anger in traffic, both in initial appraisals and in subsequent coping strategies. Thus, there is a need to gain a thorough understanding of driving styles in Saudi Arabia in terms of the personalities and the coping strategies that drivers use.

In study two (Chapter Six), quantitative research investigates Saudi drivers to determine why some people are more prone to experiencing anger in traffic than others and their different coping strategies.

#### **1.4.3 Objective Three: Assisting Saudi drivers in preventing and managing driving anger**

Notably, the literature provides two preventive approaches to professionals seeking to prevent anger, primary and secondary prevention. The intervention using primary prevention (anger reduction) is intentionally developed to lessen the future incidence of adjustment problems in currently normal populations (Durlak and Wells, 1997). Secondary prevention (anger management) targets high-risk drivers who are already showing signs of anger by altering their appraisal of the circumstances and helping them manage their circumstances through adoptive coping skills (Kuppens et al., 2008). Moreover, in most studies on anger interventions during traffic, the focus is on anger management (secondary prevention) targeting individual drivers who are at risk (e.g., clinical intervention) and rarely addresses anger reduction prevention that considers environmental stressors (primary prevention). However, situational intervention, such as creating persuasive messages (e.g., messages displayed on billboards or electronic signs, on the radio), could be effective in reducing anger and aggression on the road (Deffenbacher, 2008). Study three therefore integrates these two approaches (primary and secondary prevention) in a social marketing intervention to maximise the effectiveness of the treatment.

### **1.5 Research hypotheses and questions**

The primary research question is: What strategies can social marketers adopt to help drivers cope effectively with driving anger? This question will be answered in greater detail using the existing literature and secondary data that will be obtained during data collection. Punch (2000, p. 22) stated that research questions aim to “bring things down to the next level of specificity, further narrowing the focus of the proposed research”. Consequently, this research seeks answers to 14 secondary questions.

This research was divided into three studies, each of which was presented in separate chapters. Chapter Five addressed objective one, which aims to understand the environmental stressors and explores the following three research questions.

1. What types of driving situations could make drivers angry?
2. Which appraisals are associated with anger in traffic?
3. How do Saudi drivers cope with anger during traffic events?

Chapter Six discusses the characteristics of drivers in Saudi Arabia (Objective Two). Seven questions arise from the literature.

4. What are the common personality styles among Saudi drivers?
5. What is the relationship between personality styles and driving performance?
6. What types of personalities have been shown to be significant predictors of anger?
7. What coping strategies do young drivers use in traffic situations that arouse anger?
8. What is the relationship between personality styles and coping preferences?
9. What is the relationship between coping strategies and driving performance?
10. What types of coping strategies have been shown to be significant predictors of anger?

Chapter Seven investigates how practitioners could prevent the experience of anger and encourage drivers to manage anger (Objective Three). From the literature and the results of studies one and two, four questions arise.

11. What are the best ways to promote a course on managing driving anger?
12. What are the barriers and facilitators that drivers may face when engaging in these interventions?
13. What coping strategies do drivers believe are most helpful?
14. Which positive messages are most persuasive in helping drivers better evaluate driving events?

## **1.6 Research approach**

This study follows a mixed-methods approach. Specifically, it adopted a qualitative research method and a quantitative research method to explore the issue in greater depth and increase the reliability of the findings.

The starting point was to identify a gap in the literature, confirming that few studies consider treatment related to driving anger, especially in the Saudi context, and thus prompting the research aims and questions. Driven by the research aims and questions, a detailed literature review aimed at understanding anger in general and anger in traffic in particular was conducted. As a result, Appraisal Theory was adopted for this research.

More specifically, the cognitive-motivational-relational model of emotions suggested by Lazarus (1991) was chosen to guide this doctoral study.

As mentioned, the work is divided into three distinct studies. The data collection started in study one with an exploration of environmental stressors by conducting semi-structured interviews with 12 drivers in Saudi Arabia. The second study involved administering adapted questionnaires, namely, the Driving Stress Inventory (DSI) and the Driving Coping Questionnaire (DCQ). The questionnaires were translated into Arabic and the responses back into English by the researcher with required modifications, as detailed in the methodology chapter. A total of 710 Saudi male drivers aged between 18 and 50 years voluntarily participated in the questionnaire, but 652 questionnaires were considered usable. The collected data were analysed using SPSS to generate results that were consequently interpreted based on the study questions. In the final study, the researcher interviewed 18 drivers who had a tendency towards driving anger to develop a social marketing intervention aimed at preventing and managing anger. More specifically, it examines three concepts (training, coping messages, positive messages) that are believed to be successful ideas for the treatment of driving anger.

## **1.7 Main contributions of the research**

The potential risk of driving anger in Saudi Arabia necessitates the provision of detailed information about the causes of anger and the available coping strategies to practitioners and policy-makers. Therefore, overall, it is hoped that this thesis makes a valuable contribution to the existing body of knowledge regarding the treatment of driving anger.

Specifically, the present study makes three practical and theoretical contributions. First, it contributes to the field of appraisal theories by forming its assumptions in a new context (driving in Saudi Arabia).

Second, it contributes to behavioural theories in a social marketing context by demonstrating the importance of understanding emotion as a way of influencing people's behaviour, not only by creating an emotion that could facilitate behaviour change but also by repressing emotion that could lead to undesired behaviour. To the researcher's knowledge, this doctoral study is the first to use Lazarus' theory in the context of changing drivers' behaviour with social marketing.

The study suggests that examining the causes of negative emotions and related factors that might result in negative behaviour may be an important step in developing effective intervention. Understanding the provocation of anger in traffic, based on Lazarus' theory, helped the researcher examine the issue in greater detail and provide recommendations to road safety practitioners.

The third intended contribution is developing a comprehensive model for treating driving anger that adds value to existing models. Throughout the empirical chapters, it was found that it is important to jointly examine personality and environmental factors to fully understand the causes of emotion and their processes. Moreover, the significance of the study for road safety agencies relies on its ability to offer recommendations that can be used to underpin a comprehensive campaign strategy that is theoretically driven by research utilising a target audience.

## **1.8 Structure of the thesis**

This work theoretically studies the issue of driving anger from two perspectives, personality and environmental factors, to develop driving anger intervention. To achieve this, the thesis is comprised of eight chapters that are structured as follows.

**Chapter One** explains the background of the research and research problems. It introduces relevant literature in the field of driving anger to identify research gaps and discusses the overall research aims and objectives of this study. It also provides background of the current traffic situation in Saudi Arabia to explain the significance of this study. **Chapter Two** provides an extensive review aimed at understanding the emotion of anger within the literature of emotion theories in marketing. Specifically, the complexity and importance of understanding the elicitation of anger from environmental and personality perspectives are explored. The cognitive-motivational-relational model of emotions (Lazarus' theory) and the transactional model of driver stress are discussed in greater detail because they form the basis of this research. The chapter then reviews strategies of driving anger treatment (clinical intervention), and the limitations of this strategy were reviewed to identify the possible roles of social marketing.



Social marketing is explored in **Chapter three** as a theoretical and practical tool to address driving anger. **Chapter Four** considered the methodological practices used in the three studies of this PhD. The outcomes of the data collection and discussion are presented in Chapters Five, Six and Seven. Specifically, **Chapter Five** uses the interview method to generate data on environmental factors to answer the questions of study one, which investigated the characteristics of traffic situations, the causes of driving anger and the consequences of anger on Saudi Arabia's roads. **Chapter Six** presents the findings of the quantitative research and identifies different personality types of Saudi drivers and their coping strategies. **Chapter Seven** details the findings of study three, which tested three concepts of social marketing intervention, and suggests a framework for driving anger reduction. Finally, **Chapter Eight** synthesizes the thesis, highlights the study's limitations and suggesting areas for future research.

## Chapter Two

### Understanding Anger in Traffic: Conceptual Overviews

#### 2.1 Introduction

The previous chapter introduced the research and provided a general overview. It discussed the rationale of the study, the originality of this doctoral thesis, research aim and objectives, and structure of the thesis. Additionally, the previous chapter identified driving anger as a road safety issue that needs to be explored in more detail to explain how anger is experienced on Saudi roads. The complexity and importance of the elicitation of anger from environmental and personality perspectives will be the scope of this chapter. Specifically, this chapter defines the phenomena by reviewing the relevant literature about both causes of anger provocation and treatment of driving anger. Chapter Two begins by reviewing the historical issue of defining anger as an emotion in the literature of psychology. The chapter then narrows the scope of the discussion to leading theories of emotion in the field of marketing. Specifically, it discusses cognitive-motivational-relational model of emotions in more detail because it forms the basis of this research. The chapter then will describe a transactional model of driver stress. The discussion will examine factors identified in the literature that might predispose a driver to cope with anger. Finally, treatment of driving anger will be reviewed to identify the possible roles of social marketing.

#### 2.1 What is anger?

People in different cultures, backgrounds and ages have personal experiences of different types of anger in their day-to-day tasks. Most people know what anger is and have experienced it (implicit), but the first hint of problems comes when writers attempt to make this knowledge explicit (James, 1884; Fehr and Russell, 1984; Izard, 2010). The main problem in defining anger is confusion (DiGiuseppe and Tafrate, 2007) arising from the fact that anger is characterised by complex causes, manifestations and consequences (DiGiuseppe and Tafrate, 2007; Lazarus, 1991a). Moreover, the explanation of anger is largely affected by different interests, theoretical orientations, and methodologies of emotion; therefore, theorists have defined anger and explained how it occurs accordingly (Berkowitz, 1993).

Within anger research, there is often an overlap with constructs of anger, aggression, hostility, irritability and hate. These negative emotions have been used interchangeably in anger studies because such studies have suffered from theoretical, conceptual and measurement confusion (DiGiuseppe and Tafrate, 2007; Deffenbacher, et al., 1996).

Spielberger et al. (1988) and DiGiuseppe and Tafrate (2007) reviewed definitions of anger from the early 1950s to the 2000s. Both found that each definition emphasised different aspects of anger. DiGiuseppe and Tafrate (2007, p. 21) described this issue well, saying, “These definitions evoke the image of the proverbial three blind men, each of whom feels a different part of the elephant and makes a different, yet accurate, description of the animal.

Each of these definitions reveals some aspect of anger”.

One early attempt to define anger focused on one aspect of it, which is physiological indices. Ax (1953, p. 441) defined anger as “nearly resembled that of a combined epinephrine and norepinephrine reaction”. This definition reflects the logical positivist influence within scientific psychology that avoids internal cognitive or affective constructs. However, the definition fails to separate anger from similar emotions such as fear (DiGiuseppe and Tafrate, 2007). Other researchers take a strong cognitive stance and define anger entirely as cognition. For example, Averill (1982, p.128) explained that “anger ensues primarily when the frustration is occasioned by the actions for another person, actions which are appraised by the angry individual as unjustified or at least avoidable”. However, Berkowitz and Harmon-Jones (2004) argued that although particular appraisals can enhance the anger experience, the unpleasant experience of a given situation probably is one of the fundamental sources of anger arousal. Spielberger et al. (1983, p. 162, Spielberger et al., 1985, Spielberger et al.,

1988) proposed a more comprehensive definition of anger from a phenomenological construct view. They stated that, “The concept of anger usually refers to an emotional state that comprises feelings that vary in intensity from mild annoyance and aggravation to fury and rage, and that is accompanied by arousal of the autonomic nervous system”. For reviews of anger emotion, see Averill, 1983; Spielberger et al., 1983; Spielberger et al., 1985; Spielberger et al., 1988; Berkowitz, 1993; and DiGiuseppe and Tafrate, 2007).

Although, Russell and Fehr (1994, p. 186) believed that “the concept of anger is not well characterized from the classical perspective. Instead, its membership is graded, its borders are fuzzy, and its subcategories fail to form a true class-inclusion hierarchy”. However, in this thesis, precisely defining what it meant by driving anger or “road rage” is essential before moving on to further considerations. Accordingly, the term can be defined as the propensity to become angry behind the wheel. It extrapolates the general concept of anger into specific driving contexts, being conceptualised as a frequent and intense tendency to become angry when driving (Deffenbacher, et al 1994, 2003). Furthermore, the exact causes of this propensity to anger are not yet well defined among psychologists—a factor that is further discussed in the next section. Nevertheless, at this juncture, suffice it to say that such anger could arise from either an appraisal of impeded goal pursuit or threat to oneself caused by another agent, and is accompanied by behaviour that motivates preemptive or retaliatory action.

Finally, as definitional clarity has important implications for assessment and treatment (DiGiuseppe and Tafrate, 2007; Spielberger et al., 1988). Hence, in moving towards a working definition of anger for this work, the next section will examine anger within wider theories of emotion in marketing literature.

## **2.2 Theory of emotions in marketing**

The development of emotion theories within psychological literature has affected marketing. Despite the long discussion about the nature of emotion in psychology, considerable efforts have showed the important role of emotion in marketing activities (Nyer, 1997; Bagozzi et al., 1999; Huang, 2001; Johnson and Stewart, 2005; Watson and Spence, 2007; Hume and Sullivan, 2010). Studies of consumer emotion attempt to measure the existence of positive and negative emotions in response to exposure to advertising. The common method of measuring such activity is the self-rating scale in which customers are asked to rate the degree to which they have experienced different emotions in response to a particular advertisement (Oliver, 2010). Other scholars have investigated how specific products and services generate different emotions (Richins, 1997). Still other researchers (Oliver, 1993) focused on learning more details about the relationship between consumption emotions and satisfaction.

The study of emotions in the context of marketing has borrowed three major theories from psychology: categories theory, dimensions theory and cognitive appraisals (Havlena and Holbrook, 1986; Watson and Spence, 2007). The next three sections will describe these theories and explain their implications on consumption emotion studies. The aim is to identify the best theory to achieve the aims of this thesis.

### **2.2.1 Categories theory**

This theory clusters emotions around exemplars and examines their different consequences on consumption-related behaviour. For simplicity, proponents of this approach conceived of emotions as derived from a relatively small number of basic emotions placed on a scale from weak to strong. These emotions are discrete entities believed to reflect a unique pattern of subjective experience, physiological response and expressive behaviour (Izard, 1977; Oliver, 2010).

For example, happiness, hope, compassion, pride, anger, guilt, anxiety and sadness are categories; both annoyance and rage fall within the anger category, although the former is considered relatively mild anger whereas the latter can be described as intense anger (Lazarus, 1991a; Watson and Spence, 2007).

In consumer behaviour, marketers are significantly influenced by the work of Izard (1977) and Plutchik (1980), who viewed emotion from a biological point of view. The theories Izard (1977) and Plutchik (1980) proposed increased the significance of the role of emotions in an organism's chances of survival (Richins, 1997). Both Izard and Plutchik developed measurement tools to measure basic emotions in humans. Izard proposed 10 fundamental emotions that are universally associated with facial expressions: interest, joy, surprise, sadness, anger, disgust, fear, contempt, shame and guilt. He developed a Differential Emotions Scale (DES) to measure these ten primary emotions that consists of thirty adjective components (three for each emotion). Plutchik and Kellerman (1974) developed the Emotions Profile Index to measure eight emotions. Although the categorical approach might be useful in measuring consumer emotions towards products or services (Paunksnienė and Banytė, 2012), this approach does not explain the causative factors of emotions or why emotion groups have different behavioural effects (Watson and Spence, 2007).

Therefore, it cannot explain either why anger will be felt in traffic or what the consequences might be, both of which are crucial in developing an intervention for driving anger (Deffenbacher, 2013). Finally, this viewpoint has been criticised because human beings may often experience more than one emotion at the same time.

In fact, individuals frequently state that they experience mixed emotions (Chamberlain and Broderick, 2007). Hence, this approach does not suit the aims and nature of this research.

### **2.2.2 Dimensional theory**

In contrast to the categories approach, a considerable amount of literature has been published to simplify the representation of affective responses by identifying a set of common dimensions of affect that can be used to distinguish specific emotions from one another (Johnson and Stewart, 2005; Stewart et al., 2007; Oliver, 2010). The dimensions approach uses two fundamental dimensions: first valence, which represents a pleasantness/unpleasantness continuum, and secondly, level of arousal (Fujimura et al., 2011).

In simple terms, this approach distinguishes between a dimension of affective valence (i.e., direction) and a dimension of affective arousal (i.e., intensity) (Bagozzi and Pieters, 1998). Russell and Mehrabian's (1977) Pleasure-Arousal-Dominance (PAD) model and Watson and Tellegen's (1985) circumplex model are dimensional models of emotion that have been used in the context of consumer behaviour. Dimensional theories have shown some usefulness in predicting consumers' responses to store atmosphere (Donovan et al., 1994) and service experiences (Hui and Bateson, 1991). However, dimensional approaches propose only a simple description of emotional response without considering the causes and consequences of emotion (Johnson and Stewart, 2005). The failure to capture the full range of emotions experienced by consumers is a factor that critics have cited against dimensional theory (Lazarus, 1991b).

The shortcomings of dimensional approaches and categories theory have encouraged researchers to propose an alternative theory that can give a subjective experience of emotion.

As a result, appraisal theory has been developed.

### **2.2.3 Appraisal theory**

To overcome the limitations of other theories of emotion (categories theory and dimensional theories), psychologists have offered a comprehensive description of the emotion process (Lazarus and Folkman, 1984; Smith and Ellsworth, 1985; Scherer, 1988; Roseman et al., 1990; Roseman and Smith, 2001; Ellsworth and Scherer, 2003).

Consequently, appraisal theories have become the dominant approach to account for the elicitation and differentiation of emotion. The cognitive appraisal approach attempts to explain the cognitive process of emotions by stating that people interpret environmental stimuli according to their well-being (Lazarus and Folkman, 1984; Lazarus, 1991a; Lazarus, 2006). That is to say, its central concept is that emotions are produced by a unique psychological appraisal made by the way people evaluate and interpret their surroundings, which means a different emotional response (or no emotional reactions at all) might occur for different people to the same episode or incident (Scherer, 1988; Roseman, 1991; Roseman and Smith, 2001). These theories not only predict which profiles of appraisal under which situations elicit emotion but also which type of emotion is expected to occur and how these evoked emotions affect behaviour (Lazarus, 1991a; Scherer, 2001b).

For example, if a driver has an accident while he or she is using mobile phone, a guilt emotion may be experienced, whereas if the same driver has an accident for which another driver is responsible and it does not involve a high level of threat, anger might occur (Arnold, 1960; Frijda, 1986; Lazarus, 1991a; Roseman and Smith, 2001).

Appraisals theorists suggest various components of cognitive appraisal that they believe to be most important; for example, Roseman (1991) has proposed that a combination of five appraisals (motive consistent/motive inconsistent, appetitive/aversive, agency, probability and power) explain which of 16 unique emotions will be experienced in any given situation.

While Watson and Spence (2007) suggest four appraisals, Smith and Ellsworth (1985) propose six components, and Scherer (1988) believes there are as many as nine (Nyer, 1997; Bagozzi et al., 1999; Ellsworth and Scherer, 2003).

The differentiation between the various proponents of cognitive models of emotion can be explained by understanding the different schools of thought about what underlies this central appraisal (Ben-Ze'ev, 1994).

Frijda (1986) and others believe that this appraisal is a motivational response to the relationship, whereas Lazarus (1991a) builds his theory on an evaluation of a person-environment relationship (Ben-Ze'ev, 1994). According to Lazarus (1991a, p. 125), "the appraisal process is always about person-environment relationships depending on coping and motivation".

Appraisal is about integrating personality and environmental variables into a meaningful relationship based on the relevance of events for a person's well-being.

Nevertheless, the appraisal approach has been criticised by Berkowitz and Harmon-Jones (2004) because of their limitations of the determinants of anger. They argue that experiencing strong displeasure at an event is one fundamental source of anger arousal. The role of appraisals components is to boost the intensity of anger and its likelihood reaction; appraisals can determine when anger can be provoked, but also enhance the unpleasant feeling of a given situation. They support their argument with several studies that found anger could be experienced even without the presence of appraisals components.

The ability of appraisal theories to offer rich descriptions of the causes and consequences of emotions helps researchers identify the range of possible emotional reactions through combinations of all the appraisal dimensions. Although this controversial argument between emotions theorists about under which conditions anger is aroused is fundamental for the field, what is important for this research is to follow a theory that can differentiate between negative emotions and explain why a particular emotion was provoked.

For example, in a congested situation, a driver is more likely to experience displeasure; however, both anger and anxiety or even sadness might occur. By using theories of appraisal, researchers should be able to predict which particular negative emotion might be experienced in a given situation. For these reasons, appraisal theory is the most frequently used emotion theory in research that seeks to determine the cause and consequences of emotion in traffic (Mesken, 2006).



Within the context of marketing, appraisal theories have significant applications in consumer behaviour studies (Nyer, 1997; Bagozzi et al., 1999). Several studies investigated the relationship between some aspect of the appraisals and emotion and found consumers' appraisals were indeed able to predict their emotional responses (Dalakas and Vassilis, 2006; Stewart et al., 2007). For example, Nyer (1997) examined the role of three appraisal components (goal relevance, goal congruence and coping) in predicting the experience of three emotions, anger, sadness and joy, and whether consumers' emotional responses significantly predict certain behaviour.

He concludes that cognitive appraisals have a significant influence on consumption emotions and that these emotions are good predictors of intention to engage in word of mouth. In a similar study, Soscia (2007) explored the relationships among appraisals (goal congruence/incongruence and agency), consumption emotions (gratitude, happiness, guilt, anger, pride and sadness) and post-consumption behaviours (positive and negative word of mouth, repurchase intention and complaint behaviour). Her research confirmed that these emotions are elicited by these three appraisals and certain emotions are significant predictors of specific types of post-consumption behaviours, such as repurchase and word of mouth intention. In another study that set out to determine tourists' emotional responses towards destinations, Hosany (2011) found that appraisals of pleasantness, goal congruence and internal self-compatibility were the main determinants of love, joy and positive surprise.

Within the traffic domain, several studies have used appraisal theory to understand drivers' behaviour. Parkinson (2001) used the appraisal component of other-blame to compare anger in driving and non-driving contexts. He found that appraisals of "other" accountability were stronger in driving than non-driving situations. Shamo-Nir and Koslowsky (2010) used the cognitive model of coping with stress as a possible explanation for the influence of stress on drivers' reaction. They conclude that drivers who displayed aggressive driving behaviour showed higher levels of stress than drivers who did not. Mesken et al. (2007) predicted that the combination of three appraisal components (goal congruence, blame and threat) affects the occurrence of anger, anxiety and happiness in traffic. The results showed that the most frequently occurring emotion was anxiety, followed by anger and happiness.

For this work, the interaction between drivers and traffic events creates a dynamic context during which drivers may experience various negative emotions. Therefore, understanding the antecedents of emotional responses to a traffic encounter is very important because emotional responses negatively influence drivers' behaviour. This research examines the arousal of driving anger to interrupt this process and prevent risky behaviour. Of the many appraisal theories, the work of Lazarus most clearly specifies the relationship between the appraisals and the resulting emotion (Nyer, 1997). Therefore, this approach is chosen for the current research. A more detailed discussion of Lazarus' theory will be presented next.

### **2.3 Cognitive-motivational-relational model of emotions**

Lazarus' early research in the 1950s led him to conclude that the stimulation and effect of stress were dependent on how different individuals appraised and coped with what is happening (Lazarus, 1991a). In addition, the process of coping is a powerful mediator of the emotional process and a main construct of emotion theory (Lazarus, 2003) because "the relationship between emotion and coping in stressful encounters is bidirectional, with each affecting the other". In skeleton form, "The appraisal process generates emotion. The appraisal and its attendant emotions influence coping processes, which in turn change the person-environment relationship. The altered person-environment relationship is reappraised, and the reappraisal leads to a change in emotion quality and intensity" (Folkman and Lazarus, 1988b, pp.466-467).

According to the theory, six appraisal components determine emotion. These components are divided into two categories based upon their constituent components: primary appraisal and secondary appraisal. The former is related to an event's relevance for goals and identity, whereas the latter is related to how someone responds to an event or to the process of coping.

The components of primary appraisal are goal relevance, goal congruency and type of ego involvement. The goal relevance of an event determines whether an event will elicit any emotion, i.e., a goal-irrelevant event will not elicit any emotion. The positive or negative emotions elicited by an event depend on goal congruence, i.e., a goal-congruent event will elicit positive emotions, while a goal-incongruent event will elicit negative emotions.

For example, congestion, slow moving cars and road construction are all goal-incongruent events that could trigger negative emotion.

Finally, aspects of the event that are relevant to a person's identity such as those that affect self-esteem or moral values are type of ego involvement.

With regard to secondary appraisal process, individuals consider three components: blame or credit, coping potential and future expectations. Blame or credit is determined by whether another person or "the self" is held responsible for the event. The extent to which a person believes anything can be done about the situation is referred to as coping potential. Finally, whether a person expects the situation will be resolved favourably or unfavourably is referred to as future expectations. If for example a driver is stuck in congestion but an electric sign shows that the road ahead is clear, negative emotion might be lower because the driver expects better results in future.

The theory orders the appraisal components in such a way that they proceed from general decisions about whether there will be an emotion (goal relevance) to whether the emotion will be positive or negative (goal congruence or incongruence), slowly narrowing down to a specific discrimination between one emotion and another. As the options are narrowed, only one emotion becomes possible in this context. As an illustration, which emotion occurs depends on the unique combination of these six specific appraisal components.

This attribute of Lazarus theory is very beneficial for distinguishing anger from other negative emotions that could be experienced in traffic because anger can be defined by a specific combination of appraisals (Lazarus, 1980; Folkman, 1984; Lazarus, 1988a; Lazarus, 1988b; Folkman and Lazarus, 1990; Lazarus, 1991; Lazarus, 1993; Lazarus, 2003; Lazarus, 2006).

To the researcher's knowledge, there are apparently neither studies investigating the causes and consequences of anger on Saudi roads nor identifying and measuring typical coping strategies used by Saudi drivers. There are also few studies that examine the use of social marketing in reducing anger-related (poor) driving behaviour. Therefore, because anger takes on a specific meaning in specific context (Russell and Fehr, 1994), considerable attention will be devoted to appraisal components of anger in traffic domain and of course how to deal with anger.

### **2.3.1 Appraisal components of anger**

So far, this chapter has explained the theoretical background of emotion in general by pointing out the relevant theories to this research. However, the prior discussion did not address emotion process for each distinctive emotion. Moreover, appraisal theorists assumed that in a given situation, an individual may elicit a set of appraisals and that distinct appraisals are linked to the experience of specific emotion (Lazarus, 1991a; Frijda, 1986; Roseman and Smith, 2000; Kuppens et al., 2007). The focus will hereafter be on explaining the determination of appraisal components generally associated with anger and how these components are linked to different types of traffic situations.

During the past 30 years, considerable research has been concentrated on identifying those patterns that lie at the basis of the experience of specific emotions (Kuppens et al., 2008). In the case of anger, Kuppens et al. (2007) reviewed the literature and found that four appraisals have been systematically related to anger. These are goal obstacle, other accountability, unfairness and threat to self-esteem. Clore et al. (1993, p. 69) proposed that “disapproving of someone else’s blameworthy action and being displeased about the related undesirable event” is the specific formulation of anger. He concluded that these two attributes differentiate anger from similar emotions such as frustration and reproach. Frustration is experienced when someone is displeased at an undesirable event but does not have someone to blame, whereas reproach can be experienced when the individual disapproves of someone else’s blameworthy action.

Lazarus (1991a) had a similar principle, but he approached it in a different way. He believed that to distinguish anger from other negative emotions, four appraisal components must be activated for anger to occur. Firstly, a personal goal must be at stake in an encounter to generate emotion. Secondly, an individual determines the situation is harmful and inconsistent with what the person wants, and then any negative emotion can be generated. Thirdly, individuals appraise the transaction as an assault on self- or social-esteem. Finally, someone must be accountable for the harmful actions, which could have been controlled. Table 2-1 describes the appraisal components of anger.

**Table 2-1 Appraisals of Anger**

Redacted due to copyright

*Adopted from Lazarus (1991a)*

Before detailing the appraisal components of anger, it is helpful to remind the reader about one important aim of this research that is relevant to this discussion. This research aims to find out what types of driving situations could make the driver angry as well as what appraisals are associated with these traffic situations. Hence, the purpose of the next sections is to review the appraisal components of anger suggested by Lazarus and examine how these appraisals can be linked with different traffic situations that have been found in the literature to give a meaningful relationship. Because the first component (goal relevance) is applicable to any emotion and is not specifically for anger, the next paragraphs will discuss only the three appraisals that are central components of anger.

### ***2.3.1.1 Goal incongruence***

The appraisal of goal-blocking or goal-incongruence is an important component to elicit anger and aggression (Frijda, 1986; Lazarus, 1991a; Roseman and Smith, 2001; Kuppens and Van Mechelen, 2007). Goal incongruence refers to the degree to which an event is inconsistent with what the person wants (Lazarus, 1991a). This attribute has been adopted in different terminologies by appraisal theorists. Those terms include frustration (Averill, 1983), perceived goal obstacle (Ellsworth and Smith 1988), goal obstructiveness (Scherer, 1988), motive inconsistency (Roseman et al., 1990) and undesirable event (Ortony, 1990).

A general meaning of these forms refers to an appraisal of an event that obstructs a goal attainment by putting the goal or need satisfaction out of reach, delaying its attainment or requiring additional effort (e.g., traffic jam). For simplicity, it is an interruption of a planned activity (Scherer, 2001a).

The intensity of anger depends heavily on the importance of a particular goal for an individual; therefore, the more severely the goal is hampered, the higher the intensity of anger (Clore et al., 1993). Several studies investigating the causes of anger found that aversive experience is an important cause for anger. For example, Weber (2004) interviewed 400 participants to investigate causes of anger by asking them to remember instances when they were angry. The 27% of the participants stated that frustration (e.g., goals that cannot be achieved) was one cause of expressing anger, which is a similar finding to a study by Averill (1983).

To put this discussion in the context of traffic, there are different purposes for driving, but arriving at the destination at a specific time and maintaining safety are the main goals for most drivers (Michon, 1986; Cnossen, 2000). Safety in this sense could include maintaining safe for the driver and his/her passenger(s), self-esteem and the car. Hence, an interruption of that goal-directed behaviour such as poor visibility, poor road conditions and impediments due to other traffic is most likely to release strong negative affect (Michon, 1986; Matthews, 2002).

Furthermore, several researchers have used the driver anger scale (DAS) (Deffenbacher et al., 1994) to examine the types of situations that provoke anger among drivers (Deffenbacher et al., 1994; Lajunen and Parker, 2001; Sullman, 2006; Sullman et al., 2007; Yasak and Esiyok, 2009). The DAS includes 33 traffic events that are likely to provoke anger. Participants in these studies were instructed to rate how angry they would become if they came across each situation on a six point Likert scale (0 = Not at all to 5 = Very much).

These studies found that “progress impeded” is one common situation that causes drivers to become angry across various samples. Progress impeded is a traffic event that relates to impeding traffic flow and/or forcing drivers to reduce their speed to wait unnecessarily or to change direction because of another road user. An example is “someone in front of you does not start when the light turns green” (Deffenbacher et al., 1994).

Additionally, congestion was identified in the literature as a common source of frustration and aggression in traffic (Hennessy and Wiesenthal, 1997; Shiner, 1999). These types of traffic event can be seen as goal incongruence because they are appraised as blocking the drivers' goal, which is to reach the destination at a specific time.

Another situation that has been identified for DAS is reckless driving, when another driver breaks common traffic laws or acted in an extremely dangerous fashion. In the language of Lazarus' theory, these types of traffic events can be also seen as goal incongruence because they are appraised as blocking the drivers' goal, which is to reach the destination safely.

Supporting this is an investigation into causal factors associated with anger while driving by Underwood (1999), who found that near-accidents frequently provoked feelings of anger, particularly when the driver felt that he/she was not at fault. This finding is consistent with the appraisal components of goal blocking and blaming others, which will be discussed later in this chapter.

### ***2.3.1.2 Threat to self-esteem***

The relationship between threatened self-esteem and anger has been investigated in the literature and has been widely recognized as a common source of both anger and aggression (Miller, 2001). Self-esteem is generally defined as "the value people place on themselves" and how we feel about it (Pruessner and Baldwin, 2015, p.285). Kernis (2003, p.1) explained the importance of self-esteem for people.

Self-esteem is an important psychological construct because it is a central component of individuals' daily experience; it refers to the way that people feel about themselves, which reflects and affects their ongoing transactions with their environment and the people they encounter in it.

Lazarus (1991) identified six types of ego-involvement to which a person may be committed:

(1) self- and social esteem, (2) moral values; (3) ego-ideals; (4) essential meanings and ideas; (5) other persons and their well-being; and (6) life goals. These types of ego-involvement will predict the specific type of emotion felt.

Appraising one's situation as an assault to one's self-esteem is an important antecedent of anger and aggression (Kernis et al., 1989; Lazarus, 1991a; Kuppens and Van Mechelen, 2007). Additionally, the impact of threats to self-esteem on driving anger can be explained by the view that "their car is their world, so if you threaten their car, you threaten them" (cited in Schreer, 2002). Subsequently, angry drivers responded defensively with violence against the source of the threat to maintain their self-esteem and to educate and punish the offender (Kuppens et al., 2007; Miller, 2001).

Traditionally, psychologists have believed that low self-esteem is a major predictor of anger and aggression. Equally, inflated self-esteem also leads to aggressive driving behaviour (Baumeister et al., 1996, Schreer, 2002). Moreover, few studies have investigated the role of inflated self-esteem as a predictor of aggressive driving using self-report questionnaires like DSA (Schreer, 2002, Edwards et al., 2013, Przepiorka et al., 2014). They differ in terms of methodology and samples, but we can draw three important conclusions from them.

First, the level of self-esteem and its stability are the main predictors of anger and aggression. Second, inflated but unstable self-esteem predicted hostile driving behaviour better than low self-esteem. Finally, self-esteem is only one of many factors that affect driving behaviour. However, none of these studies investigated the relationship between self-esteem and the subscales of DSA; instead, they examined the relationship between the level of self-esteem and the overall score in driving anger scale. Therefore, it is not yet clear whether there is a correlation between certain types of situation and the level of self-esteem, which requires further investigation. Identifying the type of traffic situation that is more likely to be appraised as insulting self-esteem will add important knowledge to the treatment of anger in traffic. For example, it is expected that hostile gestures by another driver, intended to insult and challenge the recipient, might activate this appraisal component.

### ***2.3.1.3 Other-Blame***

Lazarus (1991, p.222) argued that in contrast with the traditional frustration-aggression hypothesis (Berkowitz 1989), blame is a main appraisal component of anger. The angry person locates accountability in an external agent and decides that the person who caused the injury could have refrained from doing so.



Thus, he suggested that the best shorthand description of the provocation to adult human anger is “demeaning offense against me and mine”.

A driving environment is shared between road users, so it is easier for the driver to perceive other drivers as the source of the goal thwarting (Mesken, 2006; Donkor et al., 2014).

Moreover, Weiner (1985) showed that if the action of an “other” was perceived as intentional and controllable, more responsibility would be attributed to the other, which in turn might cause more anger and negative responses. Therefore, the concept of blame helps us distinguish anger from other negative emotions such as anxiety, guilt, shame, sadness, envy and jealousy (Lazarus, 1991). This is because the frustration of a goal may be followed by any mentioned negative emotion; for example, if someone has an important appointment and notices that he or she has a punctured wheel, a likely emotion is anxiety. However, if the incident is blamed on oneself, a likely outcome is guilt, shame, or anger at oneself. If he or she believes someone else is responsible for this and that person could have acted differently, a likely result is outwardly directed anger.

Moreover, Averill (1983, p.1150) emphasises that “more than anything else, anger is an attribution of blame”. The “responsible agent” for an offence can be oneself, another person or a situation. A dangerous traffic event on the motorway can, for instance, be caused by another driver’s reckless behaviour, heavy rain, bad road conditions, or lack of attentiveness (Mesken, 2006).

Furthermore, Parkinson’s study (2001) supports the important role of blame in the provocation of anger, especially in the context of driving. He found that appraisals of otherblame occurred more clearly on the road than off the road. Power and Hill's (2010) finding also supports Parkinson’s conclusion. They explored the stability of appraisal across stressful situations. Attributions of blame showed the lowest cross-situational consistency, indicating that appraisals of other-accountability are more clear in some situations than in others.

Although previous studies provide useful explanations of the appraisal components of anger, the literature cited can be challenged on two important points. First is the question proposed by Kuppens et al. (2008), who asked which appraisal should be seen as most defining for anger.

Therefore, this research will explore Lazarus' (1991) claim that other-accountability is the core appraisal of anger and that the best shorthand description of the provocation to adult human anger is "demeaning offense against me and mine". The second point is the validity of the previous studies in different cultures such as Saudi Arabia. Most of these studies were conducted in western countries, and appraisal and ways of expressing aggression can be expected to vary from culture to culture (Özkan et al., 2010).

Mesquita and Frijda (1992, p. 187) reviewed the literature on cultural variations in emotion and found some evidence for this claim. In particular, they argued that, "the conspicuous presence or absence of a given type of emotion in a given group may be due to a particular enhanced or diminished appraisal propensity in that group". They gave an example of blame attribution to support this argument, pointing out that among both Utku and Malaysian cultures, the tendency of "other accountability" appears to be weak or absent. Consequently, low incidences of anger have been reported from these two nations. Furthermore, Thontowi et al. (2014) recently asked students in high school in Indonesia to recall an event that made them most angry.

The results did not support the conclusion that goal obstruction is central in eliciting anger. Instead, the experience of displeasure (e.g., trust has been violated) in the aversive situation appeared to evoke the emotion of anger.

Additionally, the types of traffic situations that make drivers experience anger in western countries might not be replicated in Saudi Arabia. In fact, Parker et al. (2002) investigated a range of situations on the road that provoke anger in three European countries, Britain, Finland and the Netherlands, using the Driver Anger Questionnaire. The findings revealed that the levels of anger provoked by the five main categories (impeded progress, fast and reckless driving, direct hostility, inconsiderate driving and impatient driving) varied between countries. Therefore, it is important to identify specific driving situations in Saudi Arabia that are most vulnerable to be interpreted as eliciting anger (Kuppens et al., 2008).

Taking these elaborations into account, the first study of this research will use the appraisal components of anger suggested by Lazarus as a basis to investigate anger among Saudi drivers.

This investigation will include a study of the context of anger by identifying the most common traffic situations that provoke anger in Saudi Arabia as well as exploring the key appraisal component of anger.

Finally, much of what has been discussed in this section has focused on the environmental aspects of anger appraisal. However, as was previously pointed out, individuals appraise their situations based on their own motives, values and personality. Therefore, the next section will review the effect of differences in personality on anger appraisal. Table 2-2 applies appraisal components of anger to traffic situations to make sense of it.

**Table 2-2 Applying Lazarus' theory to traffic**

Goal relevance	If the traffic situation activated this goal, then any emotion will be generated.
Goal incongruence	If the traffic situation is inconsistent with this goal (goal blocking), then any negative emotion is possible, including anger.
Type of ego-involvement	If the driver appraised the traffic situation as an assault to his/her self-esteem, then anger will be activated.
Blaming	If the other driver is accountable for traffic situation and he or she could have controlled the harmful actions, then anger occurs.

## **2.4 Personality differences in the experience of anger**

Studies have shown that drivers differ tremendously in their vulnerability to experiencing anger in traffic, both in initial appraisal and in subsequent coping strategies, depending on their personality characteristics or traits (Lennon and Watson, 2011). Some drivers may show a negative appraisal of an adverse traffic event, whereas others are more flexible (Power and Hill, 2010; Desmond and Matthews, 2009; Kuppens and Tong, 2010). Therefore, the adopted coping strategies are influenced by drivers' qualities and capacities (Parkes, 1986). For example, an anger-prone driver may see traffic congestion as an impediment and therefore could indulge in risky behaviour, but the same situation might not bother a different driver. Hence, personality traits need to be identified to determine individual differences in the experience of anger.

Broadly speaking, an individual's appraisal of a situation appears to be influenced by psychological vulnerability (e.g., level of trait anger), personal resources and abilities (e.g., uncontrollable or controllable event) and commitments and values (e.g., safety) (Lazarus and Folkman, 1984; Gulian et al., 1989b). Consequently, personality traits should be considered causal factors that interact to determine anger responses in traffic situations (Matthews et al., 1991). For example, drivers with high levels of trait anger can be expected to show heightened vulnerability to experiencing anger, which would be reflected in greater anger across different potentially provocative situations (Deffenbacher et al., 1996).

Psychological vulnerability is distinguished within the psychology of emotion by differentiating between trait anger as a type of personality and state anger as a transient mood (Nesbit et al., 2007). Trait anger is considered a personality trait that is constant across different situations (Spielberger et al., 1988). Trait anger is commonly defined as a person's tendency to experience intense states of anger frequently (DiGiuseppe and Tafrate, 2007; Spielberger et al., 1988). In contrast, state anger is "a transitory emotional-physiological condition consisting of subjective feelings and physiological activation" (Deffenbacher et al.,

1996, p. 131). Lazarus (1991a, p.47) clarifies the difference by stating that "for the trait we say someone is an angry person; for the state we say someone is feeling or reacting with anger at a particular time and place".

Spielberger et al. (1988) highlight the imperative for assessing anger to distinguish between the intensity of the experience of anger as an emotional state and individual differences in anger-proneness as a personality trait. This approach also enables social marketers to identify and understand their target audience.

Whether general trait anger and driving anger are related is a subject of discussion by scholars of psychology. Several studies support the famous slogan "a man drives as he lives" (Tillmann and Hobbs, 1949, p. 329), which implies that drivers might show cross-situational consistency of personality traits in driving as well as in their everyday behaviour (Lajunen and Parker, 2001; Summala et al., 2014).

They believe that personal behaviour is consistent across a wide range of events, and driving behaviour is not an isolated behaviour but rather is associated with other aspects of people's lives (Junger et al., 2001; Hatakka et al., 2002). Wang et al. (2013) more recently concluded that personality could significantly predict behaviour even if the effects of situational factors were controlled. Matthews et al. (1991) drew a similar conclusion. They examined the relationship between three driver stresses (aggression, dislike of driving and alertness) and the major dimensions of personality (extraversion, neuroticism and psychoticism). They found that individual differences in driver stress are associated with general personality. In particular, neuroticism was positively correlated with aggression and dislike of driving. Interestingly, they also found that driver stress factors are stronger predictors of drivers' behaviours (e.g., accident and conviction) than are the major dimensions of personality.

On the other hand, Herrero (2013) questioned whether "we drive as we live" or "we are transformed behind the wheel". He measured the association between personality traits of general anger and driving anger. Although the result revealed that the correlation between the traits was significantly positive, he concludes that the stimulation that causes anger is different on and off the road, suggesting that driving anger is different from but related to trait anger.

Moreover, work by Deffenbacher and his colleagues (Deffenbacher et al., 1994; Deffenbacher et al., 1996; Deffenbacher, 1999; Deffenbacher, 2000; Deffenbacher, 2013) contends that driving anger is one type of anger and is conceptualised as a personality trait related to trait anger, but also to situation-specific anger that is related to feelings and thoughts that happen during driving (Nesbit et al., 2007).

Matthews' (2002) work supports this argument (see Section 2.5). He suggests that drivers may have unique personalities in traffic that reflect their underlying core beliefs about the importance of driving as an activity. Several studies support that measuring anger using the driving anger scale (DAS) (for instance, Deffenbacher et al., 1996) is more applicable within a driving environment when compared to general trait anger (Tay and Watson, 2002; Sullman, 2006; Sullman et al., 2007; Yasak and Esyok, 2009; O'Brien et al., 2014).

Therefore, although there is a similar pattern between trait anger and driving anger, it is very important to investigate the special characteristics of angry drivers in traffic to acquire greater understanding of those who are more at risk. Exploring such personalities should help the researcher understand how external stimuli are interpreted in the light of the driver's motives and beliefs (Lazarus, 1991; Matthews, 2002). The next section will establish the theoretical framework for this debate on the role of personality in understanding driving anger.

## **2.5 A transactional model of driver stress**

Matthews et al. (Gulian et al., 1989a; Gulian et al., 1989b; Dorn and Matthews, 1995; Matthews et al., 1996; Matthews, 2002; Emo et al., 2004; Matthews, et al., 2005) examined the role of stress in driving and developed what is called the transactional theory of driver stress and fatigue. The model was inspired by appraisal theory (Lazarus, 1991a), which sees stress as a product of an interrelationship between stressors in the environment (e.g., cutting off) and personality factors (e.g., aggressiveness) (Lennon et al., 2011).

This ecological relationship between a person and his or her environment will determine how external factors are interpreted, which in turn influences cognitive stress processes (Öz et al., 2010). The available choice of action to manage the situation (coping process) is also an important component of the cognitive process that mediates the effects of driver stress vulnerability on both subjective outcomes (e.g., anxiety and anger) and performance outcomes (e.g., tailgating or speeding) (see Figure 2-1).

**Figure 2-1 A transactional framework for driver stress**

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*Adopted from Matthews (2012)*

For example, this model describes an aggressive driver as someone who is more prone to aggression (personality) who tends to appraise environmental stressors (e.g., a risky manoeuvre by another driver) as hostile and intended to impede his or her progress. Therefore, he or she is more likely to adopt a confrontational coping strategy and retaliatory behaviour (e.g., tailgating the “offending” driver) (Lennon et al., 2011). This underscores the significance of understanding both the driving environment and drivers’ personalities in potentially angering situations.

#### ***2.5.1.1 Driver Stress Inventory (DSI)***

Matthews et al. (1996) developed the Driver Stress Inventory (DSI), a refinement of the Driver Behaviour Inventory (DBI; Gulian et al., 1989a). DSI measures an individual’s vulnerability to commonplace stress reactions in traffic situations. Matthews et al. (1996) intended to improve and extend work on the DBI to develop a more comprehensive questionnaire to help researchers understand the bigger picture of driver stress. Development included important enhancements. Firstly, two new scales have been added to measure both thrill-seeking and fatigue.

DBI had only three scales (aggression, dislike of driving and alertness, which was renamed hazard monitoring in DSI). Secondly, items in DBI were concerned primarily with stress symptoms and outcomes, but the inventory neglected the importance of cognitions such as beliefs about the self and other drivers.

Thus, items were added to fill this gap. Finally, the reliability of the alertness scales was not satisfactory; therefore, new items relating to active hazard monitoring were added to improve it (Gulian et al., 1989a; Matthews et al., 1997; Matthews et al., 1998).

DSI consists of 48 items (see Appendix one) covering five driver stress factors. The aggression scale has 12 items that include the driver’s reaction of irritation, impatience, and behavioural aggression, particularly when the driver’s progress is impeded by other drivers.

For example, one question is, “Do you lose your temper when another driver does something silly?” Dislike of driving has also 12 items related to anxiety, unhappiness and lack of confidence. A question in this section is, “Does it worry you to drive in bad weather?” Fatigue proneness has 8 items describing symptoms of tiredness.

For example, one statement is, “I become inattentive to road signs when I have to drive for several hours”. Hazard monitoring has 8 items related to increased concentration for potential hazards. For example, one question in this section is, “Do you usually make an effort to look for potential hazards when driving?” Thrill-seeking has 8 items defined by items that describe enjoyment of danger. A statement in this section is, “I would like to risk my life as a racing driver” (Gulian et al., 1989b; Dorn and Matthews, 1995; Desmond and Matthews, 2009). The first three factors of the DSI predict different types of subjective state disturbance during driving that relate to anger, anxiety and fatigue symptoms, respectively. Finally, the reliability of DSI scales has been validated in three samples: a UK working sample, a UK student sample and a US student sample. The reliability of these scales was promising, ranging from .73-.87 in UK samples and from .69-.85 in the US sample (Matthews et al., 1997).

Numerous studies have been conducted to identify the link between driver stress and various driving-related criteria using DSI. For example, Matthews (2002) found that self-reported accident involvement can be predicted by a high score on the aggression and thrill-seeking scales and a lower score on the hazard monitoring scale.

Another important finding was that aggression, thrill-seeking and low dislike of driving relate to convictions for offences such as speeding and to higher self-reported violations (Matthews, 2002). Furthermore, higher rates of unintentional errors and lapses were associated with high aggression, thrill-seeking, dislike and fatigue proneness and low hazard monitoring (Rowden et al., 2011).

In general, the aggression scale was the strongest predictor of higher accident involvement, speeding and dangerous driving convictions. It is plausible that behaviour linked to aggression reduces driving safety (Matthews et al., 1999).

Furthermore, Andrews and Westerman (2012) investigated the effect of age on driver stress in the UK. They found that younger drivers reported higher levels of aggression and thrillseeking, while older drivers showed higher levels of hazard monitoring. Likewise, practitioners could use DSI as a useful tool for targeting at-risk drivers in road safety campaigns. However, cultural differences may affect drivers’ behaviour, so duplication of the findings needs to be done in caution.



Several studies that used DBI have reported that factors of driver stress vulnerability generalise across different cultures (Lajunen and Summala, 1995; Matthews et al., 1999; Kontogiannis, 2006; Dorn and Gandolfi, 2007; Öz et al., 2010). However, it is questionable to what extent such findings can be duplicated in Arab countries in general and in Saudi Arabia in particular. For example, Al-Maena (1997) attributed the high number of car accidents in Saudi to the lack of any coherent "driving culture" in that nation, since drivers of many different nationalities are on the roads who have come from different driving systems and have different characteristics; furthermore, it is populated only with male drivers. Therefore, describing the current driving culture in Saudi Arabia in terms of their driver stress vulnerability seem to be essential to understand the link between driving culture and anger, if there is any. Study two (see Chapter Six) will take on this task.

What has been covered so far was a dynamic process of emotion and how interactions between an individual and the environment will generate emotions, particularly anger. Moreover, considerable literature has focused on the ways individuals cope with difficulties they encounter in their day-to-day lives (Scheier et al., 1986). The next section therefore will identify the crucial role of coping in the emotion process.

## **2.6 Coping Strategies**

Generally speaking, coping in the literature refers to a set of behavioural, cognitive and emotional responses used in dealing with stressful situations (Nicholls et al., 2007). Additionally, researchers in coping have taken two different approaches to understanding this concept, coping as style and coping as process (Parkes, 1986).

Research in coping style conceptualizes coping as a disposition or trait that characterises an individual's responses to stressful situations and remains relatively fixed across time and circumstances (Compas, 1987; Carver et al., 1989). This approach of coping assumes differences in personality have influenced coping preferences and a person's coping responses are relatively consistent across situations (Scherer and Brodzinski, 1990). However, these studies pay no attention to the nature of particular stressful transactions on the adaptation of coping (Parkes, 1986). These may partly reflect the ways of coping preferred by individuals because they are consistent with personal values, beliefs and goals.

On the other hand, Lazarus and Folkman (1984, p. 141) emphasised the importance of studying interactions between the person and environmental variables as predictors of coping behaviour. Accordingly, they defined the coping process as consisting of “cognitive and behavioural effort to manage specific external or internal demands (and conflicts between them) that are appraised as taxing or exceeding the resources of the person”. This processoriented approach in coping gives a significance to the psychological and environmental context in which coping take place.

Furthermore, Lazarus (1991b) explained how coping affects the emotion process. He believed that coping processes alter the person-environment relationship either in reality or in its appraised meaning, both of which, in turn, change the prior emotional state. To explain this, two general coping dimensions have been identified: problem-focused coping and emotionfocused coping.

The first aims to change the person-environment relationship that causes the problem by acting on the environment or oneself; whereas the second functions to alter only the way in which the relationship is attended to or interpreted by a reappraisal of the relational meaning of what is happening.

For this reason, coping strategies change as the event unfolds and also differ from one encounter to another, which is an empirical definition of what is meant by a process (Lazarus, 2006).

Moreover, Lazarus (1975) clarifies the function of coping strategies as whether “(a) to reduce or eliminate the experience of the anger itself (b) or to lower the probability that the event provoking the anger will recur in the future” (Whitesell et al., 1993).

Several psychological studies have supported the effectiveness of studying coping as process. For example, Connor-Smith and Flachsbart (2007) conducted a meta-analysis to examine the relationship between personality and coping. They found that although personality strongly predicts coping styles, personality also affects coping strategies by facilitating use of specific strategies or influencing the nature and severity of the situation. However, they also emphasise the importance of situational factors such as the nature and severity of the problem in predicting coping strategies.

Hart (1991) examined how adolescents cope with different types of anger-provoking situations and found that emotional outcomes of experiencing anger are mediated by individual differences in coping as well as the adopted coping strategies influenced by the contextual factors. Moreover, in a systematic review, Nicholls and Polman (2007) examined the evidence for both perspectives of coping in sport (coping as style and coping as a process), revealing that the most of research in the review suggests that coping is both recursive and dynamic and that athletes do not have preferred coping styles, but their coping attempts fluctuate based upon their appraisal of the situation and previous coping efforts.

Coping as a process has been increasingly utilized as a conceptual approach in understanding coping in various disciplines, including strategies associated with sport (Nicholls and Polman, 2007, Uphill and Jones, 2007), coping with English as a foreign language (Suliman and Tadros, 2011), coping by police officers (Kirmeyer and Diamond, 1985), coping with Driver Stress (Gulian et al., 1989b), coping with cancer (Dunkel et al., 1992), public transport drivers coping with stressful events (Kühlmann, 1990) and coping with job loss (Caplan et al., 1989; see Nicholls and Polman, 2007). In all, forty-six papers support the coping process perspective.

This research is rooted in the cognitive-motivational-relational model of emotions, which emphasises the importance of examining coping within the context of a specific stressful encounter as well as identifying what the person actually does, not what the person usually does (Folkman and Lazarus, 1985). Therefore, this thesis will adopt this theoretical orientation on assessing coping in traffic, which will be detailed in Section 2.6.3.

### **2.6.1 Factors influencing coping in traffic**

Numerous studies that explored coping in traffic suggest that several moderators influence the way drivers deal with conflict in traffic. For example, Andrews and Westerman (2012) investigated the effect of age on coping style in UK. They found that younger drivers reported higher levels of confrontive coping strategies, while older drivers showed higher levels of task-focused coping. In the same vein, a relationship exists between two factors—experiences and number of hours driving—and coping strategies.

Dorn and Gandolfi (2007) found a positive correlation between reappraisal coping and both experiences and number of hours driving, indicating the more years of driving or the more hours drivers spent, the more likely they positively re-think about the situation. Importantly, the sample in this study was company car drivers, so this might not be the case with other drivers. Nevertheless, although this might suggest that younger drivers are more at risk, they could be trained by increasing their coping repertoire to enable them to cope effectively with varying traffic situations.

Several driver stress inventory (DSI) scales (section 2.5.1.1) effectively predict subjective stress response (Emo et al., 2004). For instance, those who score high in aggression are more likely to use confrontational coping strategies when interacting with other drivers by tailgating and frequent overtaking because they negatively appraise the behaviour of other drivers (Matthews et al., 1998). Moreover, drivers high in measures of dislike of driving tend to use emotion-focused strategies such as self-criticism when dealing with traffic stress, which could result in increased worries about the traffic environment. The hazard monitoring dimension primarily reflects a coping style that aims to prevent threats by searching for danger. Thus, hazard monitoring correlates with coping through task focusing (Matthews et al., 1998; Matthews, 2002).

Kontogiannis (2006) investigated the relationship between driver stress and coping strategies of a Greek sample of company employees and found that women scored higher than men in reappraisal. They “learn from the past and attempt to feel better and maintain temper” when dealing with slow moving cars. On the other hand, men scored higher in confrontive coping and “relief of anger through risk taking” when dealing with the same situation.

The same study also identified the importance of the intensity of the stress on the choice of coping mechanisms. Kontogiannis examined the effect of the level of frustration felt in two hypothetical road scenarios. The results revealed that those drivers who experienced high levels of frustration in a slow moving car scenario were more likely to use confrontive coping than those who rated low frustration. However, this study has two limitations. First, the study asked participants to choose a type of coping and rate the level of frustration of hypothetical road scenarios, not real traffic incidents. Second, the study limited the traffic scenario to only two situations, so it would be difficult to draw a strong conclusion on such findings.

However, rarely in the literature has the relationship between the scales of DSI and different coping styles been examined while taking the influence of particular traffic events into account. Therefore, would these correlations between DSI scales and coping exist if coping was assisted as a coping process? Study two (Chapter Six) should be able to answer such questions.

Likewise, researchs have found that coping mechanisms are affected by cultural background. Cultural variations in coping preferences have been discovered as a function of nationality (Tweed and DeLongis, 2006; Bhagat et al., 2009). Several studies compare samples from different countries on the basis of a coping measure with the assumption that cultural divergences in coping may exist. Oláh (1995) investigated the difference between youth from European countries (Hungary, Italy and Sweden) and Asia (India and Yemen) in terms of their coping strategies in stressful circumstances. The results showed that European youth prefer to cope by forcing or modifying the stressor to be in line with what one wishes (e.g., problem-focused). By contrast, youth from India and Yemen prefer to cope by using emotionfocused responses reflecting the inclination to adjust oneself to stay in line with the demands of the environmental stressors.

Moreover, Wahass and Kent (1997) examined cultural differences between UK and Saudi schizophrenic patients in employing coping mechanisms with their symptoms. Using a semistructured questionnaire, patients were asked to indicate how they generally coped when experiencing auditory hallucinations (coping style). Interestingly, the result revealed that patients from both cultures had several coping mechanisms that varied between cultures. The majority of Saudi patients used strategies associated with their religion such as prayer and reading the Koran (Islamic Holy Book). UK patients were more likely to use distraction (e.g., watching television) or physiologically based approaches such as engaging in sport.

Since research has confirmed that coping strategies differ across cultures (Cross, 1995), it can be assumed that common coping strategies utilized by Saudi drivers would differ from those used by other people of nationalities. This is because Saudi Arabia has a unique situation with regard to traffic safety problems. First, it has a substantially high number of road crashes compared to other countries of the Gulf region. In addition, it is the only country in the world where females are not allowed to drive (Hassan, 2014).

Although Matthews (2002) mentioned that the DSI and DCQ seem to generalize across different cultures and have been proven effective tools for evaluating driver stress, most studies have been conducted in western cultures. Consequently, the findings of prior studies may not apply to Arab countries and to Saudi drivers in particular, who may differ from other populations in their perceptions of stress (Henrich et al., 2010). Thus, there is a need to contribute to the current understanding of driver stress by including a sample from a region of the world that has not been previously studied to gain a nuanced understanding of Saudi drivers coping that is specific enough to guide prevention and intervention efforts. This is the intention of this work.

All in all, Lazarus (1999) emphasised the significance of examining interactions between person and environmental variables as predictors of coping behaviour. Based on this discussion, age, cultural differences, gender, experiences and number of hours, DSI factors, source of stress and situational factor are all critical variables to consider when assessing coping in traffic.

### **2.6.2 Coping in Saudi Arabia**

In general, investigations of coping in Saudi Arabia are still in their infancy. A few studies in Saudi Arabia have investigated coping strategies in various domains. For example, AlSowygh (2013) determined that active coping, planning, religion and acceptance were the axiomatic coping styles most dental students in Saudi Arabia used when facing academic distress. Iqbal and Kokash (2011) explored the faculty perception towards occupational stress using the Faculty Stress Index (FSI). They identified four common strategies that most faculty members use in dealing with occupational stress: exercises, spirituality, time management, and spending time with family.

Another study by Alsentali (2009) to identify coping style in response to stressful situations in sport contests by using an adapted questionnaire from sport psychology literature showed that coping style is a function of perceived control of the event. Athletes tended to use high approach coping style such as, "I focused on an appropriate solution," when appraising the situation with high control.

On the other hand, they tended to use a high avoidance approach such as, “I walked away from the situation” under conditions of low perceived control. (For other studies in coping, see Panter, 1992; Al-Rowais, 1996; Elsheshtawy and Elez, 2011; Raheel, 2014).

Although coping literature is extensive, driver coping behaviours in Saudi Arabia have never been assessed or discussed before, nor has the impact of these strategies on driving behaviour. In addition, it is unclear whether findings from other life domains also apply to the driving context. This research aims to fill this gap and make a novel contribution to the existing literature on coping by including a sample from a region of the world that has not been previously studied.

### **2.6.3 Measurement of coping**

The different perspectives of coping (coping style and coping strategies) that have been identified in the literature influence the measurement tools. Accordingly, self-report questionnaires that measure coping vary in terms of how much emphasis is placed on personbased or situational-based coping.

These assumptions shape the instructions and the wording of the instrument because the former approach ask the participants to indicate what they usually do when handling a stressful situation (coping style), whereas the later ask individuals what coping strategies they used in specific situations (coping process) (see Skinner et al., 2003). This section therefore will review coping measurement tools derived from a transactional model of stress (Lazarus, 1999) to identify the most suitable tool for this work.

#### ***2.6.3.1 Ways of coping questionnaire (WCQ)***

One of the most widely used measurements of coping is the Ways of Coping Questionnaire (WCQ) (Folkman and Lazarus, 1988). Folkman and Lazarus (1988, p. 5) stated the Ways of Coping Questionnaire was “designed to identify the thoughts and actions an individual has used to cope with a specific stressful encounter”.

The WCQ was used to identify coping strategies. It contains 66 items rated on a Likert-type scale from 0 (does not apply or not used) to 3 (used a great deal), including both cognitive and behavioural coping strategies.

The instrument is categorised into eight subscales (see Table 2-3). The scale identifies the extent to which respondents used each item (Folkman and Lazarus, 1988). Because the WCQ is based on the coping process approach, it asks participants to recall a specific stressful encounter and respond to the questionnaire based on that situation.

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*Adapted from Folkman and Lazarus (1988)*

The WCQ has proven effective in measuring how people cope in a variety of disciplines (Scherer and Brodzinski, 1990). However, developing a traffic-specific measure of coping is essential to increase its applicability to the traffic domain.

The modification could include three changes: (a) adding traffic-specific items, (b) deleting irrelevant items (e.g., I jogged or exercised) and (c) rewording existing items to increase traffic relevance. Luckily, this work has already been done in the literature.



### ***2.6.3.2 Driver Coping Questionnaire (DCQ)***

Matthews et al. (1996) developed the Driver Coping Questionnaire (DCQ) to measure typical coping style with demanding events encountered on the road. It includes 35 items (see Appendix two) rated on a Likert-type scale from 0 (not at all) to 5 (very much). The DCQ identified five coping styles applicable to driving, each consisting of seven items: confrontational coping, task-focused coping, emotion-focused coping, reappraisal and avoidance. Confrontational coping strategies involve several behaviours that might be considered dangerous (i.e., “Relieved my feelings by taking risks or driving fast”). Emotion-focused is a negative strategy by which the driver blames him- or herself for difficulties he or she encounters or over-criticising his or her performance (for example, “Criticised myself for not driving better”). Task-focus strategies involve active attempts to enhance safety when driving is difficult or demanding (for example, “Made sure I kept a safe distance from the car in front of me”). Reappraisal is related to positive evaluation of driving experience (for example, “Felt that I was becoming a more experienced driver”). Finally, with an avoidance strategy, the driver attempts to ignore the stressor by distracting him- or herself with something unrelated to the situation. Avoidance is associated with reduced attention to the driving task (for example, “Cheered myself up by thinking about things unrelated to the drive”). The reliabilities of these scales vary from .72 to .84 in the UK sample (Matthews et al., 1996).

Matthews et al.'s (1996) study indicated that confrontive and emotion-focused coping were maladaptive coping styles associated with more negative outcomes. They identify a link between confrontive coping and violations, errors and loss of safety. They also revealed that use of emotion-focused strategies such as self-criticism might potentially distract the driver.

Additionally, Machin and Plint (2010) confirmed that confrontive coping is a predictor of greater speeding. Therefore, it is essential to examine the correlation between these coping strategies and driving performance in Saudi Arabia to gain great understanding of coping in the Kingdom.

DCQ seems applicable for this study because it was inspired by the Lazarus model (Matthews, 2002) and was developed specifically for driving contexts. However, DCQ has been used to assess coping style rather than coping process, that is to say, DCQ instructions ask participants to use their experiences to indicate how much they usually engage in each of the activities regardless of the situation, which measures their coping style in general. Therefore, there is a need to adjust DCQ's instructions to follow Lazarus' theory and base it on a particular scenario to indicate how much they actually engage in each of the activities (coping strategy). More details about the development of the questionnaire will be discussed in the methodology chapter (Section 4.8.1).

### ***2.6.3.3 Religious coping***

Lazarus' final work on coping (Lazarus and Lazarus, 2006) indicated that religion can play an important role in the coping process, but he concluded that this claim still needed further research. Religious coping is expected to be commonly used in Muslim countries such as Saudi Arabia when dealing with stress, so such a strategy needs to be considered.

In the case of Islam, the teaching of the Qur'an and the words of the Prophet Muhammad, peace be upon him, represent both cognitive and behavioural ways and solutions for how to control anger. An example of these teaching is the concept of forgiveness. The Qur'an mention the meaning of forgiveness more than 40 times in different verses, including encouraging pardoning and excusing faults as well as turning away from a sin or misdeed (see verses 42:40, 2:187) (Rye et al., 2000). Another lesson from the life of the Prophet Muhammad, peace be upon him, is changing one's position, such as sitting if one is standing or walking if one is sitting. Another suggestion is to wash and pray (Miryan and Azadboni, 2011; Ashy, 1999). Harandy et al. (2009) studied how Iranian women with breast cancer cope with such a stressful situation.

They found that spirituality is the primary source of psychological support among participants, and almost all participants attributed their cancer to the will of God. finally, to what extent religious coping will be used in driving will be discussed in this thesis.

## **2.7 Driving anger interventions**

Thus far, this chapter has examined studies related to anger process in traffic domain. Appraisal components of anger, environmental stressors, individual differences and coping strategies refine our knowledge about driving anger and how to deal with it. Although several studies have identified the negative effect of anger on drivers' behaviour, little research addresses the treatment of driving anger (Deffenbacher et al., 2002; Sharkin, 2004; Mesken, 2006). Therefore, this section assesses interventions that are available for preventing or/and managing anger problem in roads. The limitations of such an approach will be discussed at the end to examine the role of social marketing with this regard.

### **2.7.1 Primary and secondary preventions**

First, this study will use the appraisal theory of emotions to examine the actions available within its framework. Lazarus (1991) identified two preventive approaches available to professionals, primary and secondary prevention. In primary prevention (anger reduction), the effort is made to eliminate or reduce the sources of anger or prevent its occurrence. That is to say, the intervention is intentionally developed to lessen the problems of future incidence in currently normal populations (Durlak and Wells, 1997). Primary prevention seeks to identify and reduce the sources of anger, which can be related to traffic environment (e.g., other drivers' behaviour) or factors extraneous to driving such as work stress or family issues (Gulian et al., 1989b). This approach can be reactive by dealing with existing anger-induced factors or proactive by preventing driving anger from becoming a problem (Schabracq et al., 2003). Secondary prevention (anger management) is targeted at high-risk drivers who are already showing signs of anger by altering their appraisal of the circumstances and helping them manage their circumstances through adoptive coping skills (Kuppens et al., 2008).

As will be seen later in this section, most anger reduction interventions centre on treatment (secondary prevention) rather than prevention (primary prevention), but both approaches are needed to maximise the effectiveness of the intervention (Deffenbacher, 2016).

Therefore, primary and secondary prevention will be discussed to identify their roles in lowering driving anger.

### ***2.7.1.1 Primary prevention***

Durlak and Wells (1997) suggested useful categorical breakdowns of primary prevention mental health programs for children and adolescents that could be adapted to fit a driving anger context. They believe that two major dimensions characterise primary prevention: the level of the intervention and the level of segmenting the populations for intervention. In terms of the level of intervention, programs' design can differentiate between person- and environment-oriented or could complement each other.

To make sense of these two orientations, Matthews (2002) reviewed the practical implications of the transactional model of driver stress. He found that studies in this regard can be categorised as either interventions offering services towards targeting stressors (e.g., poor road conditions) or stress management and training-based interventions that may be variously directed towards personality without attempting any major environmental change. However, he also emphasised that interventions offering solutions to stress problems complement more person-focused solutions that seek to train safety-promoting cognitions or styles of taskprocessing that are resistant to stress (Wymer, 2011).

In the traffic environment level, several aspects should be considered for anger tolerance. For example, road design could be a factor in generating anger and confrontive coping. When drivers are impeded by construction work, for instance, typically they feel rushed and pressured in their driving. Thus, road designers could tackle the issue by designing roads that maintain traffic flow and by keeping drivers informed of the reasons for delay (Matthews, 2002). It could be argued, however, that it is the driver's beliefs about what is a reasonable rate of progress that interact with actual delays to create frustration (Matthews, 2002). However, as was already discussed, driving anger is really an interaction between the individual and the larger social and physical traffic environment. Therefore, social marketing strategies must take this social reality into account to develop more effective social marketing strategies (Wymer, 2011). Consequently, identifying the personality of Saudi drivers and external sources of anger in traffic is essential for this thesis. Studies One and Two fulfil this requirement.

Such investigation should help the researcher develop an intervention that mitigates driving anger by dealing with an existing driving anger problem and preventing driving anger conditions from becoming a problem.

### *2.7.1.2 Segmenting the populations*

The second major dimension in primary prevention distinguishes between three ways of segmenting the populations. The first approach, universal prevention, targets and offers service to all members of the population (in our case, all Saudi drivers). However, the main issue with this strategy is that it neglects needs and differences between individuals, which is one of the main concepts of social marketing (see Chapter Three). Furthermore, the overall cost of such prevention can be high. In a second strategy, the intervention targets those drivers who are in transition position—drivers who have just obtained their driving licences—and those drivers who are already on the road but have a low propensity to anger while driving. The challenge with this group will be in the evaluation stage: How could the intervention be measured if the conditions and consequences of anger do not exist yet (Bloom and Gullotta, 2003)?

The final strategy for selecting target groups aims at those who become very angry in traffic and are involved in aggressive behaviour and who thus might put themselves and others at risk. Deffenbacher et al. (2005, p. 6) characterised high anger drivers in series of studies.

They found that high anger drivers compared to low anger drivers have “a) more driving situations elicit or trigger anger, b) more frequently, c) more intensely, d) engage in more aggression, e) express their anger while driving in less positive, adaptive ways, f) experience more negative consequences or outcomes stemming from their anger while driving” (Deffenbacher et al., 1996; Deffenbacher, 1999; Deffenbacher et al., 2000; Deffenbacher et al., 2002; Deffenbacher, 2013). It is also true that the third group could be included in a secondary intervention because they already show some signs of anger and need some sort of treatment (Deffenbacher et al., 2000).

This research focuses on those drivers who are victims of driving anger and might be in danger of performing aggressive driving behaviour. Therefore, this work requires a clear definition of different audiences in the population to design the intervention accordingly.

Study Two in this thesis provided a comprehensive description of characteristics of Saudi drivers with respect to their propensity to become angry to identify those drivers who is at risk. In Study Three such drivers are interviewed to develop a social marketing intervention (see Chapter Four).

### ***2.7.1.3 Secondary prevention***

When professionals observe signs of driving anger and much of the damage has already been done, the task then changes from primary prevention to secondary prevention, or treatment in which professionals must teach drivers therapeutically appropriate coping skills (Lazarus, 1999). The literature describes various anger management techniques that educate drivers about the nature of driving anger and train them in specific techniques for reducing psychological symptoms of anger and fostering relaxation. The interventions can be applied separately and in combination, depending on the nature of the intervention. Three interventions in particular (relaxation interventions, cognitive interventions and behavioural interventions) have been used in driving domains.

#### **1. Relaxation interventions**

Relaxation skills are an intervention strategy that develop skills with which the angry driver can actively reduce emotional and psychological arousal and thereby alleviate the arousal component of anger. Additionally, this calmness and control may free the driver to lower his or her baseline level of arousal and employ other coping skills (Deffenbacher, 2013).

Deffenbacher (2013) proposed five coping skills commonly used for relaxation: relaxation without tension (i.e., focusing on and releasing muscle tension in a specific area such as the stomach or shoulders), breathing-cued relaxation (i.e., relaxing more with each of three to five deep breaths), cue-controlled relaxation (i.e., relaxing to the repetition of some words such as “relax” or a phrase like “calm control”), relaxation imagery (i.e., visualisation of a specific personal relaxation experience) and unobtrusive tension release of a key muscle area (e.g., tensing and releasing the stomach or shrugging the shoulders three times).

Deffenbacher et al. (Deffenbacher, 2000; Deffenbacher, 2002) have conducted a driving anger intervention using relaxation coping skills (RCS) on a group of 18 undergraduate students who identified themselves as high anger drivers. Driving anger was measured by a driving anger scale (DAS) and a daily driving log (number of anger experiences, the most angering traffic incidents, intensity of anger and engagement in aggressive behaviour). The measurement was conducted three different times: pre-treatment, post-treatment and four week follow up.

The intervention was comprised of eight group sessions conducted by two therapists. Participants were provided with self-managed relaxation rationale and training in applying the previous coping skills. Participants were required to visualise specific personal driving-related frustrations. After they experienced anger for 20-30s, the therapist assisted them in relaxing with two relaxation coping skills. The procedure was repeated several times using different coping skills. Findings indicated that relaxation intervention led to greater driving anger reduction on slow drivers, discourteous drivers and traffic obstructions. However, the main limitation of this study is the absence of generalization of the findings because it investigated only undergraduate students (Glancy and Graham, 2005).

## **2. Cognitive interventions**

Anger develops on the roads in part as a function of the ways drivers appraise and construct events on the roads. Drivers might make hostile appraisals of wrongdoing and attribution of blame, consequently having thoughts and images of revenge. Cognitive intervention focuses on recognising and shifting these anger-engendering cognitive biases and process. The underpinning theoretical assumption is that since the driver can appraise and process traffic incidents in less rigid, demanding and inflammatory ways and respond with more realistic and task-oriented cognition, then anger will be reduced and other cognitive and behavioural skills will be more readily employed (Deffenbacher, 2013, 2016). Deffenbacher (2013) suggested several strategies for cognitive intervention with angry drivers:

- redirection of attention by shifting it to something unrelated to driving such as an important meeting;
- letting go and ignoring; encouraging the driver to cognitively distance from the situation;
- acceptance and realistic expectation; understanding that drivers might encounter difficulties on roads to help the angry drivers—if not like—then accept difficult traffic situations;
- perspective-taking; angry drivers tend to label negative traffic situations in highly negative ways (e.g., horrible) and thus react accordingly even in everyday situation. The therapist helps drivers evaluate their way of appraisal and asks them to realistically evaluate the negative incident; and

- replace revenge with forgiveness; because of the high levels of interaction with other drivers on roads, angry drivers think others' poor behaviour is purposeful and thus seek to punish the offender. Cognitive interventions help drivers think that poor behaviour generally results from human error and uncontrollable events, which will help them forgive mistakes.

Cognitive therapy (CT) treatment intervention was applied to driving anger in a study by Deffenbacher (2000). The intervention was delivered in nine weekly 1-hr small group sessions (n=5-8) by an advanced student therapist. It was designed to explore and change thoughts and behaviours that create anger in traffic. It supports drivers in exploring the biased information processing and distorted beliefs that engender driving anger and forms of anger expression. Drivers identify the errors in these cognitive processes and develop calmer, more logical and reality-based cognitive responses that are rehearsed in and between sessions (Deffenbacher, 2002). The intervention helps drivers express their anger differently, reporting significantly negative anger expression and significantly greater positive, prosocial anger expression. Indeed, when Del Vecchio and O'Leary (2004) and Glancy and Graham (2005) analysed interventions to examine the effects of anger treatment, they found that the most promising results for driving anger reduction were the impressive effects of cognitive behavioural therapy (CBT) and cognitive (CT) treatment interventions.

### **3. Behavioural interventions**

Behavioural interventions are parallel in most respects to cognitive therapy, but they have a different conceptual focus. The aim is to change drivers' behavioural reactions as opposed to cognitive thoughts (Deffenbacher, 2013). Deffenbacher (2013) suggested several strategies for behavioural interventions with angry drivers:

- distracting behaviour; attention is distracted from the situation not cognitively but by behavioural action such as turning on the radio;
- disengaging and focusing on safe driving; the driver is encouraged to back away from a frustrating incident and purposefully slow down, change lanes or pull the car off the road; and
- avoiding sources of anger; purposefully avoiding environmental stressors such as traffic jams by planning ahead or leaving extra time. Some drivers might continually engage in angry provocation situations because they typically feel rushed and pressured in their driving.



Therefore, time management strategies may be helpful in countering driver anger in individuals who do not manage their time well (Sharkin, 2004).

A behavioural skills intervention has proven to be effective with angry drivers (Deffenbacher, 2011). The intervention followed procedures described by Deffenbacher (2000; 2002 in relaxation interventions section) except that drivers were instructed to explore behaviours that increase anger and change it with positive behaviours that could reduce anger in traffic.

### **2.7.2 Limitations of current treatment approach**

Most studies of treatment of driving anger support the effectiveness of psychological interventions, and it seems that such an approach is promising in reducing the experience of anger in traffic and its consequences. However, two main limitations should be noted.

First, despite the psychological debate about the application of these three interventions (Del Vecchio and O'Leary, 2004; Glancy, Saini 2005), most studies of anger interventions in traffic focus on teaching angry drivers coping skills (secondary prevention) (Deffenbacher, 2016).

However, these studies rarely address primary prevention levels that aim to minimize vulnerability to driving anger or prevent its occurrence. Therefore, having a framework that includes both prevention approaches and integrates personality and environmental factors could be a valuable contribution to the literature. Study Three (Chapter Seven) will fill this gap and move from just training drivers to use safe coping to more comprehensive intervention.

Second, this research must investigate how Saudi drivers who are high in driving anger will participate in such interventions. Recruiting the target audience is a significant challenge for practitioners (Nichols et al., 2000). Employing social marketing strategies could enhance recruitment and decrease peoples' barriers to recruitment (Lauderdale and Gallagher, 2003).

Chapter Seven provides answer for such issues.

## **2.8 Summary**

This chapter has reviewed the literature to understand driving anger, specifically, theories of emotions used by marketers, appraisal theories of anger, common traffic situations causing anger, the role of specific personality in the experience of anger, the importance of coping in emotion process, and the treatment of driving anger.

To sum up, the review utilises a cognitive-motivational-relational model of emotions to understand anger. The basic assumption of this theory is that anger will be experienced in traffic under these conditions: Traffic events must be incongruent with what the driver is aiming to achieve, the driver evaluates the incident as harmful to self or injuring his or her self-esteem, and other drivers must be responsible for this unpleasant outcome. This assumption will be examined in Chapter Five by identifying and analysing common traffic situations that trigger anger in Saudi Arabia. Equally important, the evaluation of the situation and adopted coping mechanisms are influenced by drivers' vulnerability to anger such as aggression. Therefore, Chapter Six examines driving anger in Saudi Arabia by identifying the common personality styles among Saudi drivers and their relationship with anger and driving performance. Finally, the current driving anger treatment focuses primarily on individuals and neglects the role environment could play in solving the driving anger issue. Therefore, Chapter Seven will develop a more comprehensive intervention that utilise different strategies.

## Chapter Three

### The Role of Social Marketing in Behaviour Change

#### **3.1 Introduction**

Chapter Two provided contextual background of the study. It reviewed the literature to provide a comprehensive understanding of the underpinning theories about anger. It also explored the limitations of existing intervention strategies designed to reduce anger-related issues, which suggests a need for a wider ranging and more flexible approach that could maximise the positive effects of any intervention. Therefore, social marketing is now explored as a theoretical and practical tool to address driving anger. Social marketing initiatives focus on changing behaviour to increase the well-being of individuals and/or society. It centres on understanding customers' motivations to change by conducting a formative study to enable more effective responses to and communications with customers. Social marketing is flexible in that it could be applied to different segments within the target audience who might be in different stages of awareness and responsiveness about an issue or behaviour (Peattie and Peattie, 2009). Other benefits associated with a social marketing approach will be reviewed in this chapter.

This chapter will first define social marketing and its development during the last four decades. It will then discuss relevant benchmarks that distinguish social marketing from other behaviour change approaches. The chapter then will explore the literature regarding both the importance of emotion in changing people's behaviour to determine the significance of this research and the use of a social marketing approach along with other strategies in the field of road safety. At the end of the chapter, a summary of the material presented is provided.

#### **3.2 Definition of social marketing**

Social marketing is a subject that suffers from significant misunderstandings about its nature and scope (Gordon et al., 2013). The first difficulty in defining social marketing is how to identify with and organise the great variety of existing approaches to it. Dann (2010) reviewed and discussed over 54 definitions of this discipline, some that are broader and others that are narrower in their content, but most definitions have certain similarities.

These confusions about social marketing in academia could be attributed to the fact that the discipline has no clear academic home, since studies of social marketing have been conducted in many different disciplines, including health sciences, education, business administration, marketing, communications and psychology (Truong et al., 2014). Therefore, different philosophies and backgrounds might affect understanding and application of a social marketing approach. The next section will discuss several common social marketing definitions.

In the early days of social marketing, the field was based largely on the translation of ideas and practices from mainstream commercial marketing (Peattie and Peattie, 2003). For example, one of the most commonly cited definitions is offered by Kotler and Zaltman (1971, p. 5), who believe that social marketing is “the design, implementation and control of programs calculated to influence the acceptability of social ideas and involving considerations of product planning, pricing, communication, distribution and marketing research”. However, opponents of this definition (Peattie, Peattie 2003; Hastings 2007; Spotswood et al., 2012; Gordon et al., 2013) have argued that this definition has narrowed and restricted the discipline to the use of the traditional 4Ps (product, price, place, and promotion) as a basis for developing and judging social marketing interventions. The field could fail to exploit some of its biggest strengths when sticking to a 4Ps framework.

Andreasen (1995b, p.5) considered social marketing “the application of commercial marketing technologies to the analysis, planning, execution, and evaluation of programs designed to influence the voluntary behaviour of target audiences in order to improve their personal welfare and that of their society”. This definition illustrates four essential features of social marketing that will be discussed later in the chapter. What is important here, however, is that ten years later, Andreassen (2006) contended that “social marketing is a much more mature and integrative discipline. Therefore, to see social marketing simply as “commercial marketing in the public sector” is to fail to recognise the way it has grown and integrated social, political and behavioural sciences into its development” (French et al., 2010).

The European Social Marketing Association (ESMA), the Australian Association of Social Marketing (AASM) and the International Social Marketing Association (iSMA) proposed a definition of social marketing that considers the purpose and role of social marketing beyond marketing principles.

Social Marketing seeks to develop and integrate marketing concepts with other approaches to influence behaviour that benefits individuals and communities for the greater social good. Social Marketing practice is guided by ethical principles. It seeks to integrate research, best practice, theory, audience and partnership insight, to inform the delivery of competition sensitive and segmented social change programmes that are effective, efficient, equitable and sustainable (ISMA, 2013).

This definition applies marketing concepts such as offerings, value creation, systematic processes and stakeholders in influencing behaviour while integrating other approaches to deliver social progress. The idea is that social marketing is not confined to only using marketing concepts. The field is one approach within a broader array of forms of intervention that encompasses but is not limited to behavioural economics, social psychology, community engagement, health promotion and social design (French and Russell-Bennett, 2015).

This definition is quite relevant for this work because it connotes a wide range of applications of social marketing from an individual level (e.g., clinical intervention) to a social level. Furthermore, it does not neglect the main principles of marketing such as customer oriented and the exchange principle, which will be discussed in the next section. Moreover, it is important to differentiate social marketing from other traditional social change programs such as education and policy change. Therefore, the next section will discuss the suggested benchmarks that distinguish social marketing programs from other social change programs.

### **3.3 The benchmark criteria and principles of social marketing**

Academics and practitioners have developed several benchmark criteria to differentiate social marketing approaches from other behaviour change tools (French and Russell-Bennett, 2015). *Social Marketing Quarterly*, the *Journal of Social Marketing* and the UK's National Social Marketing Centre (NSMC) have used a benchmark criteria derived from the work of Andreasen (2002) to distinguish social marketing papers and case studies from other forms of social intervention and to clearly define social marketing practice.

Additionally, most reviews used suggested benchmarks as criteria in their inclusion studies. Therefore, these criteria will be used as the foundation of the discussion to articulate the role of social marketing in addressing treatment of driving anger.

#### **3.3.1 Benchmark one: Behaviour change**

The ultimate objective of social marketers is to influence specific behaviours, not just knowledge, attitudes and beliefs (NSMC, 2011). Changing people's actual behaviour is the bottom line of all social marketing programmes (Andreasen, 1995a). Some have suggested that the wording of this benchmark should be changed from "behavioural change" to "behavioural influence" (French and Russell-Bennett, 2015) because social marketing seeks not only to change behaviour but also to influence citizens to perform one of four behaviours: (1) adopt a new behaviour (e.g., recycling); (2) refuse unwanted behaviour (e.g., starting to smoke); (3) change a current behaviour (e.g., increasing health activities); or (4) relinquish an old undesirable behaviour (e.g., using the phone while driving) (Kotler and Lee, 2008).

Spotswood et al. (2012) argue that social marketing should not limit itself to behaviour change and should also focus on changing ideas, attitudes or language. This claim arises from the fact that early social marketing focused on the promotion of new ideas, as Wiebe (1951 p.

679) expressed with the foundation question of social marketing: "can we sell brotherhood and rational thinking like soap?" Additionally, idea and attitude changes could be in some cases a necessary first step towards bigger positive individual and community behaviour change, since ideas or worldviews might influence behaviours.

The literature has shown that drivers are more likely to become involved in aggression and risky behaviour when they experience anger in traffic. Chapter Two advocated appraisal theory to investigate the underlying reasons for anger, proposing that anger is the product of the evaluation between the individual and the environment. This transaction creates an opportunity to stop the process of anger and ultimately prevent being involved in aggressive behaviour. In other words, the aim is to influence the way drivers evaluate their traffic events and encourage them to cope effectively with it to prevent dangerous actions. Social marketing purists might say that these are not appropriate goals because no behaviour change is specified.

However, this example supports Spotswood et al. (2012) in their argument about the importance of not limiting social marketing to behaviour change and including ideas or attitudes that are the first step to behaviour change. In this case, although changing aggressive behaviour is the result of the intervention, the aim is to influence the process that leads to this behaviour.

Another interesting question is whether the target audience should voluntarily change unwanted behaviour or whether social marketing could also include involuntary behaviour change. Andreasen (1994) contended that social marketers seek to influence people to change behaviour, but ultimately, people do have the choice not to do so. Contrary to this view, Donovan (2011) and French (2011) have argued that restricting social marketing to always being grounded in voluntary change could limit social marketers to embracing available intervention strategies such as the “nudge” theory. Indeed, it is more important to focus on the effectiveness of interventions regardless of whether they are voluntary or involuntary.

The treatment of driving anger based mainly on a combination of cognitive and behavioural techniques requires using full attention because coping refers to voluntary behavioural, cognitive and emotional responses towards stressors under the individual’s control and conscious effort (Lazarus and Folkman, 1984). On the other hand, involuntary behaviour change could be making decisions on the environment that affect the welfare of others. In the driving context, this would include eliminating and/or controlling environmental factors that cause anger such as traffic jams and other drivers’ behaviour so that anger might not be experienced and ultimately no aggression would result (Nicholls and Polman, 2007).

### **3.3.2 Benchmark two: Research—Customer orientation**

This benchmark focuses on consistently using customer research to understand target audiences. The aim is to fully understand their lives, attitudes and current behaviours using a mix of data sources and research methods. Additionally, customer research is used to pre-test the programme materials and ideas before final implementation and monitor ongoing implementation of the programme (Andreasen 2002; NSMC, 2011).

Kotler and Lee (2008) emphasised that the most fundamental principle social marketing has taken from the private sector is customer orientation, which aims to understand the target audiences' attitudes towards the desired behaviour. Social marketers believe that formative research with the target population is essential for three reasons: first, to provide vital information on population subgroups and their social cultural environment, which is important in making decisions about what segments of the population to target and how; second, to create a tailored marketing mix (or intervention mix) that meets the needs and desires of the clientele; and third, to evaluate a proposed social programme before it begins by testing it on the selected population (Andreasen, 1995a).

The customer-centric approach of this PhD is in itself a good example of this philosophy. The first and the second studies (Chapters Five and Six) seek in-depth information about drivers' views and behaviours with regard to experiencing anger on Saudi roads. Study Three translates the findings into different concepts to test them with a specific target audience.

### **3.3.3 Benchmark three: Segmentation**

Market segmentation is probably the most important and most established concept in marketing. It “involves dividing the total market into groups of individuals that are more like each other than they are like individuals in other groups” (Donovan and Henley, 2010, p. 35). The process of customer orientation starts with conducting market research about the target audience to explore their views and attitudes. This process enables social marketers to look at the audience and identify manageable sub-groups that share similar views, values and behaviours and can be influenced in similar ways (French, 2010).



Hastings and Domegan (2013) suggested four useful criteria a professional can use to segment the population into potential target markets: demographic, psychographic, behaviour and benefit approaches. With demographic segmentation, the market is divided into segments based on variables such as age, gender, income, occupation and socioeconomic status. In this case, the main target for this research is young male drivers in Saudi Arabia because this group was identified as at risk of experiencing anger and being involved in aggressive behaviour. This will be confirmed or reconsidered after analysing the data in Study Two (Chapter Six).

Moreover, those drivers who are high in trait anger and have the personality of aggression are more prone to driving anger as was discussed in a previous chapter. Therefore, psychographic methods show potential in understanding the determinants of behaviour and ultimately target the right group that has the potential to make an impact on the problem. Furthermore, populations can be segmented according to their proximity to a particular behaviour or perceptions thereof. In a driving context, this might involve plotting the population in terms of their coping strategies when dealing with conflict in driving. For example, confrontive and emotion-focused coping were maladaptive coping styles associated with more negative outcomes. Thus, drivers who use such styles should be considered. Finally, although the benefit of lowering anger might be obvious (i.e., maintaining safety), the benefit different drivers are seeking might be something different. Therefore, understanding benefits could generate useful segmentation variables.

The segmentation process in this research was assessed in Study Two (Chapter Six). A questionnaire will be used to characterise Saudi drivers who are more prone to anger and aggression in traffic. Accordingly, this sup-group will be the subject of the last study in which several concepts and development of the intervention will be tested.

#### **3.3.4 Benchmark four: Exchange**

In marketing, exchange is defined as an exchange of goods, services, resources or values between two or more parties with the expectation of some benefits that will satisfy needs. It is the means by which the twin goals of customer satisfaction and profit can be achieved (Peattie, Peattie 2003; Gordon, 2011).

In translating this concept to social contexts, social marketers tend to provide information, tangible products or other incentives for the target audience to change their behaviour. Alternatively, the exchange can be achieved by emphasising the result of adopting new behaviour. For example, drivers will receive psychological benefits of peace of mind and maintain safety in return for managing their anger (Peattie and Peattie, 2003).

A key factor in developing a powerful exchange proposition is reducing the cost and increasing the benefits of the new behaviour. Smith (2006) argues that people change not only because they are well informed or forced into action, but also because they get something they value in return. Most important is to ensure that the target audience values what is offered by the intervention (Smith, 2006; French, 2011).

This fundamental process can be done throughout customer research (benchmark two). A social marketer analyses the benefits associated with target behaviours and the costs of adopting and maintaining a new behaviour to develop interventions that maximise benefits and minimise costs (NSMC, 2011).

Exchanging goods and services with paying customers for profit is a conceptually and practically simpler process than the exchange process in social marketing contexts (Wood, 2008). Normally, the situation in social marketing involves a cognitive exchange in which the target audience is fully aware of the reward. For example, rewards could be offered in return for participating in driving training (Spotswood, et al., 2012). However, Peattie and Peattie (2003) argue that although such an example is considered a direct exchange, it is done with the aim of changing behaviour, but not “in exchange” for changed behaviour. Therefore, drivers in this case are encouraged to take driving course in the hope that they will improve their driving style. However, even though a driving course may be successful in training and informing drivers about driving skills, there may be no behavioural change at all (Wood, 2008).

Moreover, Spotswood, et al. (2012) raised the following question: “Should social marketers use implicit (rather than explicit) behaviour change techniques?” They argue that although many textbook definitions of social marketing imply the need for a fully aware exchange, this limits the potential to influence social good by overly focusing on cognitive exchange.

For example, offering football club memberships to young drinkers to get them off the streets could be a valued offer that is clear to the customer, even though the offer cannot be considered direct. Consequently, specifying the behavioural goal is essential in this process to enable social marketers to offer something of value to drivers and persuade them to substitute bad behaviour with better behaviour. In the case of driving anger, the ultimate behavioural goal is encouraging drivers to adopt safe coping strategies such as task focus and reappraisal coping. Hence, professionals need to identify compensatory elements that balance the sacrifices angry drivers may make to manage their anger and offer innovative ways to encourage voluntary and involuntary exchange. For example, one goal that guides people's responses to acts of anger is restoring self-esteem, especially for young drivers who are under pressure from their friends (Miller, 2001).

Therefore, one can ask about the better benefit young drivers may gain by not acting aggressively. Safety, calmness, peace and religious benefits might be the answers. Study Three (Chapter Seven) will discuss this issue in more detail.

### **3.3.5 Benchmark five: Marketing mix**

The process of choosing an appropriate intervention design to fit the particular behaviour has been one of the most challenging steps for social marketers. Traditionally, the 4Ps of social marketing have been widely used as the main model because they provide a simple, accessible and useful framework for practitioners (Kotler and Lee, 2008). The framework creates attractive benefit packages (products) while minimising costs (price) wherever possible, making the exchange convenient and easy (place) and communicating powerful messages through media relevant to and preferred by target audiences (promotion) (Andresson, 2002).

As noted, the predominance of the four Ps marketing mix in social marketing perhaps relates to Kotler and Zaltman's (1971) definition, which explicitly or indirectly mentions each component (Gordon, 2012). However, a systematic review of social marketing's effectiveness revealed that many interventions that meet most criteria of social marketing used other approaches such as training people or policy change (Stead et al., 2007).

Moreover, Spotswood et al. (2012) argued that in an age in which social marketing interventions are so wide ranging, the social marketing 4Ps can no longer encompass a wide range of activities and practices in different contexts. For instance, social marketing is believed to entail pragmatically choosing techniques that appear promising for a particular context. This practical realism is a strength associated with an applied field such as social marketing, contending that if evidence proves an approach is working, why not consider using it (Spotswood et al., 2012)?

French and Russell-Bennett (2015) argue that the 4Ps framework focuses on the individual to change his or her behaviours, whereas a social marketing approach could be used in multiple levels of practice, with upstream and downstream levels at opposite ends of an intervention continuum and the midstream level being in the middle. Accordingly, the next sub-sections discuss the 4Ps and their applications and limitations to social marketing.

### ***3.1.1.1 Product***

Kotler and Lee (2007, p. 195) described product in social marketing as “the desired behaviour and the associated benefits of that behaviour. It also includes any tangible objects and services developed to support and facilitate the target audience’s behaviour change”. They recommend social marketing planners conceptualise and design the product strategy on three levels: core product, actual product and augmented product. The core product is the benefits customers will experience when they adopt the behaviour, benefits they see as most valuable to them (e.g., prevention of injury of self and others). Actual product is the particular behaviour the social marketer is promoting to achieve the benefits identified as the core product (e.g., do not drink and drive). Augmented product is any tangible objects and services the social marketer promotes along with the desired behaviour (e.g., free taxi rides).

However, in practice, public service professionals find this model very difficult to apply (Wood, 2008). For instance, Smith (2009, p. 99) regards a product in social marketing as “a unique tool used by marketing to achieve the goal of behaviour change”, which is similar to the third level, augmented product. He argued that telling people about the benefits of performing the behaviour or what they need to do to obtain that benefit is just education—it is not marketing. Deciding which level is the “product” alters how practitioners think about price, place and promotion in fundamental ways.

When, for instance, we make the “prevention of injury of self and others” a social marketing product, we default to the message solution. When we define a product as behaviour (“do not drink and drive”), we default to pricing, placing and promoting “messages” to convince people not to drink and drive. But if we define a product as a tool to help people not drink and drive, we arrive at products like “free taxi rides”.

Peattie and Peattie (2003) criticised the appropriateness of the term “product” for various social marketing interventions and suggested changing this concept to a “proposition”. They explained that social marketers cannot produce the behaviour “actual product” because they do not own it and thus cannot transfer it to the recipient. They may facilitate it, but it is the target adopter who ultimately "produces" the behaviour. Likewise, to see the components of the campaign, “augmented product” as the product is also misleading, since the benefits to the target adopter largely come from the behaviour, not from the components of the campaign itself. For example, it can be difficult to define a clear product if the behavioural goal is to encourage young people to never start smoking. What social marketers are offering to their targets are "propositions" such as “prevention of injury for self and others”.

For this work, the desired behaviour is to control driving anger and prevent the experience of driving anger to receive benefits such as calmness, peace and, most importantly, prevention of accidents. The tangible objects and services that might be developed to support and facilitate this desired behaviour could be both positive coping strategy and clinical sessions. Smith's (2009) definition above is more appropriate here because clinical sessions (particularly their contents) are used by marketing to achieve the goal of behaviour change.

Furthermore, although these ideas are seen as a tool for behaviour change (Smith, 2009), the bundle of benefits discussed earlier may not proceed directly from them. For example, drivers are encouraged to engage in training sessions to learn coping skills; therefore, safety and religious reward are not the benefits of participating in the training, but rather benefits of applying the skills.

Social marketers need to identify the benefits of attending training sessions to promote training (e.g., reduce insurance cost). On the other hand, when promoting positive thinking and coping skills, the benefits might be safety and calmness.

Accordingly, it is very important to clearly define the products the campaign is offering and the associated benefits of each product. Study Three (Chapter Seven) discusses this issue in more detail.

### ***3.1.1.2 Price***

“The price of a social marketing product is the cost that the target audience associates with adopting the new behaviour. Cost may be monetary or non-monetary in nature. They may be costs associated with exiting the old behaviour as well as entering the new one” (Kotler and Lee, 2007, p. 230). Accordingly, the role of social marketing intervention is to change the perceived cost/benefit ratio (Peattie, 1999). It has been argued, however (Eagle et al., 2013), that to determine financial price in commercial marketing, the underpinning calculations are based upon costs plus profit, which is not always the case of most social marketing programs.

As in many situations, social marketing programs do not involve a monetary cost to the target adopter, but rather other costs such as time, fear or psychological barriers (Peattie, 1999). To attend clinical sessions, for instance, drivers have to sacrifice their time, show commitment and perhaps spend some money for fuel, parking or entering the sessions. However, the price of controlling anger might be something different; for example, drivers might sacrifice the test of revenge and being in control of the situation to maintain safety and avoid aggression. Moreover, group attributes such as direct peer pressure also play an important role in driving aggressive (Leung et al., 2011; Tapp, et al., 2013), so drivers need to ignore this pressure to get something better. Therefore, the costs of different behaviours (i.e., attending training or managing anger) need to be identified first to minimize their effect.

### ***3.1.1.3 Place***

“Place is where and when the target market will perform the desired behaviour, acquire any related tangible objects, and receive any associated service” (Kotler and Lee, 2007, p. 243).

For example, augmented product elements in social marketing programs such as taxi rides have to be physically distributed effectively to potential users—taxis should be easily accessible at a convenient time for the target audience.

Peattie and Peattie (2003) suggested redefining this term as “accessibility” because unlike a one-off transaction that occurs in a supermarket, behaviour change may occur on a daily basis. Additionally, social marketing is more similar to services marketing in that the key issue is accessibility. Therefore, the key questions in accessibility are how, where and when human interactions and participation take place.

For driving anger, social marketer could influence drivers on both off-road and on-road. Consider, for example, a clinical intervention to train drivers to manage anger. Social marketers are encouraged to think about three aspects from customers’ perspectives: how accessible the course is for the target audience in terms of parking, for instance; where the sessions will take place, which should be geographically convenient for the target audience; and when it will take place, meaning which day and the time of the day. Furthermore, persuasion messages (e.g., road signs) might make a direct and real-time impact on the behaviour. However, because where and when anger will take place cannot be anticipated exactly because it occurs in a private and personal space, a combination of several strategies (off-road and on-road) that are integrated based on formative research is more likely to be successful.

#### ***3.1.1.4 Promotion***

“In the social marketing context, promotion is the means by which behaviour change is promoted to the target audience, for example advertising, media relations, direct mail and interpersonal” (Gordon 2012, p. 123). Promotional activities could embrace advertising, public relations, face-to-face selling, entertainment media, printed materials, promotional items, signage and special events and displays (Grier and Bryant, 2005). The main question is how to identify the best way to communicate with drivers (off-road and on road). For example, social media seem to be popular platforms among young people in Saudi Arabia, so this might be a good way to reach the target audience. On the other hand, radio could be used to send messages about the programme, but is this the best method? Study Three uncovers all this important information.

The literature showed some evidence that social marketing communication based campaigns can indeed have positive effects on road safety when conducted over an extended time period (Smith, 2006; Donovan and Henley, 2010).

Nevertheless, rarely was a communication strategy deployed to persuade high trait anger drivers to control driving anger (Deffenbacher, 2016). Therefore, this work creates social marketing communication materials based on cognitive intervention strategies (e.g., redirection of attention and letting go and ignoring) and safe coping strategies such as task focused (see Chapter Two) to lower driving anger.

It is important to emphasize here that this thesis is based on appraisal theory, which is based on a person's evaluation of the relationship between situations and his or her beliefs (Lazarus, 1991). Thus, these messages aim to attack this relationship because "the logic is that if the individual learns to process things in less demanding, inflammatory, aggressive ways and think about them in more realistic, calm, problem-oriented ways, then anger will be lowered" (Deffenbacher, 2016, p. 4). Therefore, threatening drivers with the consequence of driving anger (e.g., getting angry could cost one's life) or the danger of aggressive behaviour (e.g., tailgating) is not intended with these messages, although it is worth examining this in future studies.

Moreover, these communication activities usually are combined with supportive strategies such as professional training and community-based activities (Grier and Bryant, 2005). Donovan and Henley (2010) emphasise that communication campaigns must be co-ordinated with other strategies on the ground to facilitate behavioural change. Therefore, running sessions to train drivers how to cope effectively with driving anger will be the main on-the-ground programme.


All in all, the 4Ps framework undoubtedly plays a role in developing social marketing strategies. However, because of its limitations for encompassing all types of behaviour, academics have proposed a new way of mixing social marketing interventions to influence the target behaviour (French and Russell-Bennett, 2015). For example, the social marketing benchmark criteria developed by NSMC (2011) suggests labelling this benchmark "methods mix" instead of "marketing mix" to include a different model and framework.



They proposed four primary ways of influencing behaviour: inform and educate, support, design and control (ESDC) (see Table 3-1). A comprehensive intervention strategy often integrates several of those tactics to address specific behaviours.

**Table 3-1 Intervention mix**

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*Adapted from NSMC (2011)*

Although the 4Ps framework is useful for marketing clinical sessions and encouraging drivers to participate, it is not as simple as assuming drivers will be able to manage anger in traffic just because they are well trained. The issue is more complicated than that. The literature for example identifies congestion as an external factor that provokes anger, so authorities need to take it into account when planning road design. This model will be used in Chapter Eight to sum up the available strategies to tackle the issue of driving anger.

### **3.3.6 Benchmark six: Competition**

In social marketing, competition is the current or preferred behaviour of the target segment (NSMC, 2011). For example, the preferred behaviour for an angry driver might be an aggressive reaction towards the source of anger because seeking retaliation or revenge works in most anger events as a tool to restore one's ego and identity (Miller, 2001). In this case, competition might not be only between the actual behaviour (confrontive coping vs. taskfocused coping), but also between the processes of evaluating the situation (aggression vs. managing anger), which Peattie and Peattie (2003) called a "battle of ideas".

Peattie and Peattie (2003) emphasised that in social marketing, competition is better thought of as a "battle of ideas" that can come from four sources.

1. “Commercial counter-marketing—the promotion of behaviours by commercial firms that are in direct opposition to that of the social marketer.
2. Social discouragement—these ideas include social values or norms that are in opposition to those being promoted by social marketer.
3. Apathy—the individual’s lack of interest or concern for behaviour change.
4. Involuntary disinclination—refers to the reasons, both rational and irrational, that prevent an individual from adopting a behaviour change.” (Noble and Basil, 2011, p.137).

To make sense of these four sources, driver behaviour will be taken as an example. First, car companies are important competitors because some emphasise speed and style more than safety in their advertisements. Second, young passengers could encourage their friends to indulge in risky driving such as speeding (peer pressure). Third, the driver has no interest in taking a training course: “Why bother?” Fourth, psychological vulnerability (e.g., level of trait anger) is an important reason why some drivers are more prone to experience anger than others. Consequently, the role of the social marketer is to conduct a competition analysis to understand what competes for the time and attention of the audience and to develop strategies to minimise the impact of competition (French and Russell-Bennett, 2015).

### **3.3.7 Benchmark seven: Theory**

Social marketing is not a theory in itself. Instead, it is a structure approach of behaviour change that borrow different theories and models from other disciplines to identify determinants of behaviour change and thereby develop appropriate intervention strategies (Brennan and Binney, 2010; Truong et al., 2014). Moreover, French (2012) suggested including this benchmark as an essential criterion in social marketing. Social marketers encouraged following behavioural theories to enable greater understanding of target audiences and the factors that influence them and their actions (NSMC, 2011).

Additionally, professionals use theories and/or models for various purposes, including audience research and segmentation, intervention development and message formation promotion (Truong et al., 2014).

Furthermore, a review of the effectiveness of social marketing interventions in influencing individual behaviour (Gordon et al., 2006) suggested that theoretical framework, combined with consumer research to help translate theoretical constructs into acceptable and persuasive interventions, is an important pre-requisite for effectiveness. A review of social marketing doctoral dissertations and theses completed between 1971 and 2013 (Truong, Garry et al., 2014) revealed that of the theories and models that were reported upon, the Theory of Planned Behaviour and Reasoned Action was utilized most fluently. Other theories and models that are also most widely used in social marketing (Truong, et al., 2014) include social cognitive theory, health belief model, stages of change model, and diffusion of innovation theory.

The majority of social marketing theories focus on influencing an individual to change his or her behaviour and do not always address the environment in which a particular behaviour takes place (Brennan and Binney, 2010, Wymer, 2011). The main theoretical area of interest in this thesis is appraisal theory of emotion, which takes into consideration personality and environmental influences. This research contributes to the social marketing literature by proposing using a transactional model of emotion for understanding behaviour to identify the absent connection between emotion and behaviour. Therefore, the next section will address this issue in more detail and emphasise the importance of emotion and the subsequent use of emotion-based theories in developing social marketing solutions.

### **3.4 The role of emotions in social marketing**

Many published studies identify emotion as one of the more important factors in specific consumer responses to marketing stimuli and consumer behaviour in general (Allen et al., 1992; Johnson and Stewart, 2005; Curtis, 2011). Indeed, Richins (1997, p. 127) notes, “The importance of emotions in the sphere of consumer behaviour has been firmly established”. The role of emotion in marketing has been discussed in more detail in Chapter Two (see Section 2.3).

However, this section emphasises the fundamental role of emotion within behavioural change studies to explore its relevance and effectiveness in changing drivers' behaviour.

First, researchers in the field of behaviour change (Ogden, 2012; Mazzon and Carvalho, 2011) have criticised traditional theories of human behaviour such as the Health Belief Model and the Theory of Planned Behaviour for not adequately accounting for the role of emotion. To address this, they advocated for the inclusion of affect in the models and argue that the connection between emotions and behaviour is stronger and more direct than other factors such as attitudes (Bagozzi et al., 2002).

Fishbein et al. (2001) identified eight factors that should be considered within the finite set of variables in any behavioural analysis: intention, environmental constraints, skills, anticipated outcomes, norms, self-standards, emotion and self-efficacy. Particularly, emotion is one of the most important and under-researched factors in behaviour change.

Moreover, from a psychologist's point of view, Lazarus (1991, p. 4) strongly believed that "It is inconceivable to me that there could be an approach to the mind, or to human and animal adaption, in which the emotions are not a key component. Failure to give emotion a central role puts theoretical and research psychology out of step with human preoccupations from the beginning of recorded time". Likewise, Fowlie and Wood (2008) believed that people generally change their behaviours for emotional rather than rational reasons and usually require personal support. However, this is by no means to underestimate the importance of other factors in behavioural change process, but rather emphasises the role emotion could play in such processes. The discussion of the importance of emotion in human behaviour encourages social marketers to consider emotion an important factor in their interventions (Henley et al., 1998; Hastings, et al., 2004; Hastings, 2007; Brennan and Binney, 2010; Antonetti et al., 2015).

Therefore, despite controversy about whether social marketers should elicit negative or positive emotional appeals to change people's behaviours (Lopez and Snyder, 2009), considerable studies in the literature of social marketing and health promotion strategy have started focusing on changing behaviour through the influence of emotionally motivated aspects of human behaviour and using advertising appeals as an intervention strategy to encourage or discourage behaviours (Lennon et al., 2010; Brennan et al., 2014; Antonetti et al., 2015).

The matter of persuading people to engage emotionally in preventive health behaviour has been a matter of concern to social marketing.

Therefore, scholars have proposed models and frameworks to explain the effectiveness of negative appeals. These include the fear drive model (Janis and Feshbach, 1953), the parallel response model (Leventhal, 1971), protection motivation theory (PMT) (Rogers, 1975) and the extended parallel process model (Witte, 1992). The assumption underpinning these models is that individuals exposed to fear appeals are persuaded and take the recommended action (Antonetti et al., 2015).

These models, particularly Protection Motivation Theory (PMT), are used extensively in social marketing literature (Brennan and Binney, 2010). Several studies have shown the effectiveness of fear and other negative emotional appeals such as guilt and shame as message strategies on persuasion (Ojala, 2007; Curtis, 2011). In the context of AIDS prevention, for instance, Marchand and Filiatrault (2002) found that fear appeals had a greater impact on behavioural intentions than purely rational message strategies.

Harman (2009) investigated the appropriate level of fear that needs to be induced to change young males' driving behaviours. The results showed that a high threat advert on television made participants change the channel. This indicates that a high level of fear might not be effective for young drivers, although the study acknowledged the positive contribution of high threat adverts to Irish road safety in general. However, a review of the role of fear appeals in improving driver safety shows inconsistent findings, especially in young males (Lewis, 2007). Therefore, the effectiveness of such an approach might be determined by several factors (e.g., age, gender and type of situation).

Hence, the question is whether negative emotion such as driving anger can be lessened by threatening drivers about the consequences of anger in traffic. Further research is needed to determine the role of fear in the treatment of anger in traffic.

According to Brennan et al. (2014), social marketing researchers study emotions from two views: emotion as dispositions influencing behaviour (i.e., antecedent to behaviour) and emotion as a consequence of social marketing or behaviour change strategy. In both focuses, the principal effect investigated is that of emotional engagement with the social marketing message, concept or ideas.

They emphasise that it is important for social marketing research to identify which is which before constructing research to ascertain the effectiveness of any intervention. The literature clearly shows that the role of most social marketing interventions based on an emotional model is to evoke and generate certain emotions (e.g., fear) to change behaviour. In contrast, this research aims at understanding the provocation of anger to develop an intervention strategy that could help drivers manage anger in traffic.

Chapter Two recommended that appraisals theory of emotion be a starting point to identify consumers' emotional responses in various activities. Additionally, these theories offer a more widely applicable and sophisticated method to explain the elicitation of emotions. Few studies in social marketing use appraisals theory to understand how to elicit the intended emotion. For example, a study conducted by Bagozzi and Moore (1994) used Lazarus' theory of emotion to develop a theory of persuasion for public service advertisements (PSAs).

They studied the role of emotions in illustrating the effects of public service advertisements on a person's decision to engage in helping child abuse cases. The research consisted of two professionally prepared test ads. The first was based on negative emotional appeal (anger, sad, fear and tension), and the second was based on rational appeal. Subjects were 143 undergraduates and were randomly assigned to either an emotional or rational appeal condition. After exposure to the ads, subjects were asked to describe the strength of their emotional reaction to the child abuse advertisement on a 7-point scale. They were also asked about the likelihood that they would help abused children.

The fundamental finding in their research was that negative emotions functioned as positive motivators and actually enhanced the decision to help. Additionally, the researchers suggested that negative emotions could have positive effects on behaviour under certain circumstances. They also revealed that the stronger the negative emotion, the stronger the empathetic response.

They encouraged other researchers to extend the approach to other social behaviours because the results seemed promising.

Nevertheless, these theories have not been thoroughly studied in social marketing literature, and social marketers have yet to systematically adopt models that include emotions (Andreasen et al., 1997; Mazzon and Carvalho, 2011; Antonetti et al., 2015).

This research contributes to social marketing literature by using appraisal theory not only to use negative or positive emotional appeals to change behaviour, but also to provide a comprehensive understanding of a particular emotion's usefulness in altering maladaptive outcome behaviour. This new theoretical approach may also provide a way of understanding anger-related issues such as violence towards children.

### **3.5 Influencing drivers' behaviour: Strategies and lessons**

Modifying risky behaviour is the ultimate aim of most road safety interventions. Traditionally, education and enforcement have been used extensively in reducing road injuries or crashes. Education includes messages of any type that attempt to inform and/or persuade a target to behave voluntarily in a particular manner but do not provide, on their own, direct and/or immediate reward or punishment (Rothschild, 1999; McKenna, 2010). The main aim of education intervention is to create awareness about existing benefits and teach people how to drive safely.

Law, in contrast, aims to dictate behaviour through government and other powerful authorities that must be obeyed and followed by citizens, such as ticketing non-seatbelt users and lowering drivers' blood alcohol concentrations (Engström et al., 2003; Smith, 2009). Social marketing tends to sit between soft approaches such as education and hard approaches such as enforcement and regulations to offer something of value for the target audience (Bird and Tapp, 2008).

The potential of social marketing to improve road safety is unique because the priority of this approach is to influence and change behaviour by addressing lack of motivation in performing the suggested behaviour, which education, on its own, does not do because it is only concerned with increasing knowledge about the issue or the behaviour. Nevertheless, each of these three intervention approaches incorporates corresponding tactics. Theorists in social marketing (Rothschild, 1999) suggest integrating those tactics to address specific behaviours to ensure more effective intervention (Smith, 2009). The next paragraphs will identify lessons learned from these three approaches and examine the implications for this work.

### **3.5.1 Education approach**

Several studies have shown that education approaches could help achieve behavioural change, particular for drivers' behaviour (Snyder et al., 2004), but others (Duperrex et al., 2002) have claimed that there is a lack of evidence of the effectiveness of safety education for particular groups (e.g., low-income groups). Despite this disagreement, one particular intervention within the education approach of interest to this study is training skills programmes. The role of training to create safer driving has been extensively tested, but some road safety practitioners contest the effectiveness of such programmes (Tapp et al., 2013). McKenna (2010) reviewed road safety education interventions and contended that although educational interventions seem to be a plausible strategy to improve drivers' behaviour, it remains uncertain to what extent driver education programmes are effective in preventing road traffic injuries or crashes. Indeed, the evidence indicates that they are in large part ineffective. (Roberts and Kwan (2001) and Ker et al. (2005) found similar results.) In contrast, other studies yielded results that are more promising about the effectiveness of such a strategy (Tapp et al., 2013).

Engström et al. (2003) conducted an extensive review of international drivers' education that included more than 300 different references and concluded that the acquisition of traffic experience under supervision and safe circumstances will lead to a decrease in young novice drivers' involvement in accidents.



For this research, clinical interventions (Section 2.7.1.3) have proved to be effective in reducing driving anger (Deffenbacher, 2013). Nevertheless, several lessons from the literature need to be considered. Notably, the challenge in attracting the highest aggression drivers is appearing to be problematic (Tapp et al., 2013). Moreover, education strategy alone may be effective for targeting certain behaviours in easy-to-reach groups, but it may not convince high-risk groups such as novice drivers to maintain safety (Christie, 2001). Some education programs fail to achieve their aims because the intervention may focus on the wrong variable.

For example, education interventions frequently focus on vehicle control skills, which are often not the key issue (McKenna, 2010). This emphasises the importance of identifying the most effective coping strategies for the drivers to be included in the intervention.

Another important aspect is the duration of the programme. Literature showed that short duration programmes may have little opportunity to improve driving skills and compete with individual habits (Williams, 2006). Therefore, facets of duration such as the length of a session, the number of sessions and time between sessions need to be designed to accommodate different groups.

### **3.5.2 Law and enforcement**

Enforcement is an equally important effective and sustained countermeasure for road safety. Considerable evidence has been presented in the literature about the benefits of using law and enforcement to control three issues: alcohol use, seat belt use and speeding (see Engström et al. (2003) for a full review). However, three important lessons could be drawn from previous studies. First, certain groups of young drivers and males are harder to influence via law, especially drivers who are more sensitive to the reward of thrills and sensation (Castellà and Pérez, 2004). Second, increasing awareness and knowledge of new laws prior to their implementation can produce even better results and acceptance. Third, laws alone are not effective; enforcement of the laws is also needed (Engström et al., 2003).

For identifying driving anger, testing the level of trait anger in traffic (e.g., DAS) as a compulsory element in the driving test might be useful (Divera and Colin, 2007).

Additionally, the presence of enforcement seems to help eliminate or at least reduce overt aggressive driving because most drivers are reluctant to engage in aggressive driving acts in the presence of a police officer, especially when these behaviours also constitute driving violations (Shinar, 2007).

An interesting study by McCartt et al. (2001) that evaluated the potential of enforcement campaigns targeting aggressive driving revealed a promising role of enforcement. The campaign lasted six months and consisted of a series of three-week enforcement and publicity “sub-theme” campaigns focusing on a specific traffic offense commonly associated with aggressive driving. Each theme was also tagged with a catchy phrase. For example, the campaign to encourage the use of flashers or turn signals was titled the “Flasher Patrol”, and weaving, cutting in and out of traffic, and speeding were labelled “Basket Patrol”.

In addition, the programme targeted tailgating, ramp meter violations, stopping in an intersection and causing gridlock, running a red light or a stop sign, failing to use a turn signal, failing to yield right-of-way, shouting, honking, flashing lights or making hand gestures, and weaving and cutting in and out of traffic.

Evaluation of the campaign’s effectiveness consisted of tracking violation and accident records in Milwaukee (the campaign site) and in areas not exposed to the campaign. Accidents in the six-month period of the programme dropped by 12.3 percent in the target area compared to only 2.2 percent in the comparison area. Running red lights declined at the targeted intersections from 6.5 percent during the pre-programme period to 4.9 percent during the mid-programme period, while it increased at the comparison intersections from 2.9 percent to 12.7 percent. However, this is not necessarily the case for all enforcement programs. Another study (Stuster, 2004) evaluating other enforcement campaigns failed to find any reductions in aggressive driving violations. Therefore, the success of the Milwaukee programme might be attributed to its intensity, focus, coverage and combined use of enforcement and information dissemination (Shinar, 2007).

In Saudi Arabia, the Ministry of Interior is responsible for issuing and enforcing traffic laws, which are available publicly through its website. Despite having strict traffic regulations, Saudi drivers report a high rate of risky driving behaviours, and many drive without a license.

A study by El Bcheraoui et al. (2015) to identify Saudi driving habits (a total of 10,735 participants) with regard to wearing seat belts, exceeding speed limits and using a handheld cell phone while driving found that 81.2%, 65.7%, and 89.7% reported using a cell phone, not following speed limits, and not wearing a seat belt, respectively. They attribute disregard of traffic laws to lack of adequate enforcement.

### **3.5.3 Social marketing**

The effectiveness of a social marketing approach in changing health behaviours such as tobacco use and physical activity has been thoroughly documented (Stead et al., 2007; Evans et al., 2007). Four systematic reviews (Stead et al., 2007; Luca and Suggs, 2010; Thornley and Marsh, 2010; Janssen et al., 2013) including more than 90 studies support the importance of using such an approach.

Surprisingly, only three of these studies examined crash reduction, particularly alcohol-related crashes. This might be because other road safety interventions did not meet their inclusion criteria and hence were not considered social marketing interventions. However, general lessons from these reviews are useful for this research.

Thornley and Marsh (2010, p. 23) identified some of the lessons that apply most precisely to this work, systematically reviewing what works in social marketing to young people and highlighting a broad set of factors and features for successful interventions:

- a youth-centred approach with strong youth involvement using methods and channels that appeal to youth, including technology and new media;
- appropriate campaign messages that empower youth by using strong, emotional, positive messages that are strategically designed and integrated;
- application of commercial marketing success factors including branding, high exposure to the marketing intervention, and “counter-marketing” to challenge competitors and promote positive alternatives;
- applying theory to the design of social marketing programmes and undertaking extensive formative research and robust evaluation; and

- a comprehensive approach that is multi-faceted and long term informs policy and is well resourced and funded. Both national and local linkages are important, as are collaborations and partnerships with key organisations.

In a road safety context, the literature showed that a social marketing approach has been used successfully in tackling road safety issues such as alcohol-related driving fatalities (Smith, 2006).

A systematic review (Kubacki et al., 2015) evaluating social marketing interventions to minimize harm from alcohol consumption published between January 2000 and May 2014 found that the most commonly targeted behaviours are reduction of drunk driving and increased use of designated drivers.

The interventions were found to be largely effective in changing behaviours. The authors claimed that for social marketing effectiveness to be achieved, more social marketing benchmark criteria should be used. Moreover, they contend that to consider an intervention social marketing, all six benchmark criteria should be evident, although this is debatable (Stead et al., 2007).

Another interesting programme called “Road Crew” (Rothschild et al., 2006) sought a 5 percent reduction in alcohol-related crashes. The intervention offered 21- to 34-year-old single, male, blue-collar workers in rural areas with high school educations or less who most often drink beer a ride to the bar, between bars and back home throughout the evening instead of letting them drive themselves while drunk. The idea was inspired by focus group discussions during which participants suggested that older, luxury vehicles could be used to take people to the bars, from bar to bar, and back home for a nominal fee. This shows the necessity of conducting formative research with the targeted audience to achieve a successful intervention. The programme showed promising results; as of 2008, Road Crew had given more than 97,000 rides, prevented an estimated 140 alcohol-related crashes, and saved an estimated six lives (NSMC Showcase, 2010; Glassman, et al., 2010).

Papakosmas and Noble (2011) examined the role of parents in the formation of young drivers' attitudes towards driving. They aimed to inform social marketing strategies about how parents' driving behaviours influence their children's driving behaviours to target parents at first glance. One relevant recommendation is that an effective social marketing strategy is central to targeting parents of younger children, aiming to educate and raise awareness that their children are watching their driving behaviours from a very young age. This could be applicable to the relationship between parents and their children in terms of dealing with stress and anger in traffic. Indeed, Bianchi and Summala (2004) examine the relationship between parenting and teen driving in terms whether parental driving style (e.g., aggression) predicts that of their children. They found a significant correlation between fathers and daughters in aggressive violations, but not between fathers and sons. Further investigation of this is required.

Moreover, the National Social Marketing Centre (NSMC, 2011) launched three successful road safety campaigns. One was a community-based, culturally integrated programme aimed to increase the use of child safety restraints in motor vehicles. Mothers of young children in those communities were targeted because they tended to be responsible for supervising their children and were seen as authority figures within the community.

The programme used a mix of methods to encourage parents to use child seat, including:

- free traffic safety and child safety seat training workshops;
- a subsidised car seat purchase scheme;
- community liaisons, including local mothers and a policewoman; and
- community engagement activities such as health fairs and child safety seat demonstrations.

The programme evaluation showed that use of safety restraints increased from a baseline of 21 per cent to 73 per cent three years after the programme's launch. Practitioners should employ a combination of strategies and methods derived from formative research to ensure a successful intervention because single component programmes delivered in isolation tend to be less successful (e.g., training only) (Thornley and Marsh, 2010).

Finally, although the effectiveness of social marketing in changing behaviour issues is empirically well supported, there is relatively little literature about the effectiveness of social marketing initiatives to address the treatment of driving anger. Moreover, the current interventions on tackling driving anger (see Chapter Two) is similarly limited in scope because they are only based on psychotherapeutic background and targeted high anger drivers. Furthermore, evidence of the effectiveness of education and enforcement on risky behaviour is relatively absent and disputed. Therefore, there is a need for a constant and cohesive strategy to address the issue of anger in traffic. Such a strategy should be developed through a combination of customer focuses and strategy to bring about environmental and policy changes.

Social marketing will serve as an appropriate approach to change drivers' behaviour by facilitating exchange, conducting formative research, segmenting and targeting, understanding and analysing drivers' perception of the issue, exploring the benefits drivers seek from expressing anger in traffic and managing anger and identifying the barriers that might prevent the target audience from managing anger and developing strategies for both individual and environmental levels. Therefore, the goal of this thesis is to examine the role of social marketing in addressing the treatment of driving anger and to provide guidance for implementing such campaigns.

### **3.6 Summary**

Chapter Three has reviewed the literature about social marketing definitions, seven benchmark criteria of social marketing, the role of emotion in behaviour change and approaches to road safety interventions. The purpose of these efforts is to evaluate to what extent the social marketing approach can be used in addressing the treatment of driving anger and to make theoretical contributions in emotion research in the behaviour change literature.

Social marketing as an approach to road safety is currently widely practiced internationally. However, the role it plays in managing the consequences of negative emotion in traffic has not yet been fully understood. Furthermore, social marketing professionals and researchers have tended to use emotions as an important factor of behaviour change, but current practice is limited to using it to deal with a problem by creating an emotion such as fear.

In contrast, this research goes in the opposite direction because it aims to deal with a preexisting emotion. There is therefore a need for more primary studies using emotion theories in developing social marketing solutions.

Finally, the seven benchmarks identified here will be discussed in the Conclusion (Chapter Eight) to determine whether this research is considered to be within the social marketing discipline and to ensure that most, if not all, benchmarks are met.

## Chapter Four

### Research Design and Philosophy

#### 4.1 Introduction

This chapter clarifies the research methodology used in this thesis to examine the role of social marketing in addressing the treatment of driving anger in Saudi Arabia. This chapter starts by describing the philosophical approach underpinning the research and discussing the epistemological perspective, including the justification for the adoption of a pragmatic philosophical approach. The methodology section explains the importance of using mixed methods in this study, justifying the particular selection of the sequential explanatory design in conducting mixed methods research.

The chapter then explains how the data for the three studies in this research were collected. The first study adopts a qualitative approach to explore situational factors that might trigger anger on Saudi roads; Study Two quantitatively investigates individual differences and coping strategies drivers use in dealing with road conflicts; the last study involves interviewing those drivers who were identified as at risk in Study Two to develop an effective social marketing intervention.

#### 4.2 Research philosophy

It is important to consider different research paradigms and matters of ontology and epistemology when undertaking research (Flower, 2009). Collis and Hussey (2009, p. 73) define a research paradigm as “a philosophical framework that guides how research should be conducted”. They highly recommend that researchers in the early stages of their studies should adopt one philosophical issue that supports their work, and they indicate that the failure to do so can have a serious effect on the research design and the quality of the findings. Easterby et al. (2008) explain this importance based on two points: First, it can help the researcher clarify the overall research design and thus refine and identify the methods to be used. Second, it can help the researcher recognise the limitations of particular methods and therefore become innovative and creative in selecting appropriate research methods.



The researcher must base his or her methodology on a framework that constructs different conceptualisations of the hierarchical levels of the research.

Consequently, Crotty's framework (1998), which outlines the four basic elements of any research process, has been adopted. Figure 4-1 illustrates the four elements.

**Figure 4-1 Hierarchy of the four basic elements of any research process**

*Adapted from Crotty (1998)*

### **4.3 Epistemological perspective**

This section describes epistemological views of the best ways of inquiring into the nature of the world (Eriksson and Kovalainen, 2008). It is worth reviewing some definitions of the term "epistemology" to understand the concepts underlying it.

1. "Epistemology is concerned with providing a philosophical grounding for deciding what kinds of knowledge are possible and how we can ensure that they are both adequate and legitimate" (Maynard, 1994, p.10).
2. "The theory of knowledge embedded in the theoretical perspective and thereby in the methodology" (Crotty, 1998, p.3).
3. "What is knowledge, and what are the sources and limits of knowledge?" (Eriksson, Kovalainen, 2008, p.14).

These definitions reveal the importance of the word "knowledge", which appears in all three definitions.

Although each gives a different explanation of epistemology, most refer to a theory of knowledge and views of what can be accepted as knowledge (Lewis-beck et al., 2006).

According to Crotty (1998), the three major theories of epistemology—objectivism, constructionism and subjectivism—hold different views of the meaning and nature of knowledge. These theories all seek to answer the question: "What is the nature of the relationship between the knower and what can be known?" (Guba and Lincoln, 1994, p.108).

Objectivism assumes that reality exists; therefore, “the posture of the knower must be one of objective detachment or value freedom in order to be able to discover how things really are and how things really work” (Guba and Lincoln, 1994, p.108). Johnson and Onwuegbuzie (2004) present a simple formulation of this school of thought and contend that researchers should eliminate their biases and remain emotionally detached and uninvolved with the objects of study. Constructionism, however, rejects the objectivist assumption of knowledge and claims that “knowledge is socially constructed by people active in the research process, and that research should attempt to understand the complex world of lived experience from the point of view of those who live it” (Mertens, 2009, p. 16). There is no objective truth waiting to be discovered; instead, “there is no meaning without mind, meaning is not discovered, but constructed” (Crotty, 1998, p.3). Finally, subjectivism holds that there is “no access to the external world beyond our own observation and interpretation is possible” (Eriksson and Kovalainen, 2008, p.14).

Pragmatism, a promising line of research seeking to integrate these methods to address research questions, is becoming the choice of many researchers (Johnson and Onwuegbuzie, 2004; Morgan, 2007; Tashakkori and Teddlie, 2010). This theory grants the researcher the freedom to “study what interests you and is of value to you, study it in the different ways that you deem appropriate, and utilize the results in ways that can bring about positive consequences within your value system” (Tashakkori and Teddlie, 1998, p.30).

The researcher in this type of work employs multiple research approaches, as in this thesis, which investigates the causative factors of driving anger and drivers’ views on this issue.

Given this context and these goals, this PhD emphasises the problem over the method.

To gain knowledge about the problem, both qualitative and quantitative approaches have been used, collecting both quantitative data that relies on the epistemological theory of objectivism and qualitative data that rests on subjective theories of knowledge.

According to Weinreich (2006), social marketing researchers have demonstrated that both qualitative and quantitative approaches have positive attributes and that using a combination of them can exploit all these benefits.

A systematic review of social marketing research from 1998 to 2012 supports this claim, finding that qualitative methods have dominated social marketing research, but quantitative and mixed methods are gaining prominence (Truong, 2014). Therefore, a pragmatic philosophical stance has been adopted for this study.

#### **4.4 Theoretical perspective**

A theoretical perspective is “the philosophical stance informing the methodology and thus providing a context for the process and grounding its logic and criteria” (Crotty, 1998, p.3). However, beliefs about the nature and reality of knowledge have changed over time, and new philosophical research has emerged in response to perceived inadequacies in earlier paradigms.

For hundreds of years, positivism stood as the only research paradigm, as scientists drew heavily from the natural sciences. Positivism posits that reality is independent and experience is the only legitimate source of knowledge. The positivist paradigm originated from the natural sciences and is designed to test hypotheses generated from theory using measurement tools for observable social realities. This paradigm assumes that the social world has an objective existence, that the researcher is independent and that observable, measurable phenomena yield valid knowledge. Positivism is based on values of reason, truth and validity and focuses exclusively on facts gathered from direct observation and experience and empirically measured using quantitative methods (e.g., surveys, experiments, statistical analysis) (Guba and Lincoln, 1994; Crotty, 1998; Lewis-beck et al., 2006; Easterby-Smith et al., 2008).

However, during the Industrial Revolution, researchers turned their attention to the social sciences, which led to the development of the second philosophical research stream: interpretivism or social constructivism (Collis and Hussey, 2009; Mertens, 2009).

Crotty (1998, pp.66) explains that interpretivism “emerged in contradistinction to positivism in attempts to understand and explain human and social reality”. The basic assumptions guiding this theoretical paradigm are that researchers socially constructed knowledge and therefore should endeavour to understand the complex world of lived experience from the point of view of those who live it (Mertens, 2009). Research should be qualitative and rely as much as possible on participants’ views of the subject studied (Creswell, 2008).

Recently, however, social sciences researchers have increasingly used mixed-methods designs (Ivankova et al., 2006). Consequently, the debate about the philosophy of knowledge continues in the literature on mixed-methods and multi-paradigm research (Creswell, 2010).

Broadly speaking, multi-paradigm research is done from three different meta-theoretical positions: paradigm incommensurability, paradigm integration and paradigm crossing (Schultz and Hatch, 1996). The incommensurable stance holds that paradigms are too different to be mixed (Creswell, 2008). They offer wholly different ways of understanding the world, and there is no higher set of values and logic by which their relative merits can be easily or objectively compared. As Coe (2012, p. 8) succinctly states: “either you believe the world exists independently of our knowledge of it, or you do not; there is no middle way.”

Paradigm integration stands in sharp contrast to the incommensurable stance and holds that it is “possible to assess and synthesize a variety of contributions, thus ignoring the differences between competing approaches and their paradigmatic assumptions” (Schultz and Hatch, 1996, p. 532). Paradigm crossing tries to balance these extremes and acknowledges both the contrasts and the connections of these two paradigms (Hoque et al., 2013). The researcher in this position “recognizes and confronts multiple paradigms, rather than ignoring them as in the integrationist position, or refusing to confront them in the incommensurable position” (Schultz and Hatch 1996, p.533).

The priority in this thesis is that the results “should be judged in terms of their usefulness, workability and practicality and that these are the criteria of their truth, rightness and value” (Reason, 2003, p.104). What is important to this research is answering the research questions with the best available methods.

The methods follow the research questions to gain the best opportunities to obtain useful insights. Mixed research solutions are the best approach to achieving this aim (Johnson and Onwuegbuzie, 2004b).

Pragmatism is commonly regarded as the philosophical partner of the mixed-methods approach (Denscombe, 2008). Denscombe (2008, p.271) asserts that pragmatism “provides a set of assumptions about knowledge and inquiry that underpins the mixed methods approach and distinguishes the approach from purely quantitative approaches that are based on a philosophy of (post)positivism and from purely qualitative approaches that are based on a philosophy of interpretivism or constructivism”.

Additionally, Teddlie and Tashakkori (2003, p.21) emphasise three principles of pragmatism.

1. “Pragmatism supports the use of both qualitative and quantitative research methods in the same research study and within multistage research programs.
2. Pragmatist researchers consider their research question to be more important than either the method they use or the paradigm that underlies the method.
3. Pragmatism presents a very practical and applied research philosophy”.

Although pragmatist researchers emphasise the research question they ask over the methods they use, “researchers should collect multiple data using different strategies, approaches, and methods in such a way that the resulting mixture or combination is likely to result in complementary strengths and non-overlapping weaknesses” (Johnson and Onwuegbuzie 2004a, p. 18).

#### **4.5 Methodology**

Crotty (1998, p.3) defines methodology as “the strategy, plan of action, process or design lying behind the choice and use of particular methods and linking the choice and use of methods to the desired outcomes”. As informed by the theoretical perspective, this study required a methodological approach that would ensure the assumption of both objectivism and subjectivism regarding the perceptions of the participants. Furthermore, Denzin and Lincoln (1994) explain that the adoption of the research methodology may depend on the aim of the study and the nature of the questions being asked.

Therefore, based on the pragmatic paradigm and the range of measurements required during the study, the methodology is based on a mixed-methods approach.

Mixed methods can be defined as “the type of research in which a researcher or team of researchers combines elements of research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the purpose of breadth and depth of understanding and corroboration” (Johnson et al., 2007, p.119). Generally, researchers use the mixed-methods approach in their studies for different reasons, including the following:

1. “To improve the accuracy of their data;
2. To produce a more complete picture by combining information from complementary kinds of data or sources;
3. As a means of avoiding biases intrinsic to single-method approaches (i.e., as a way of compensating specific strengths and weaknesses associated with particular methods; and
4. As a way of developing the analysis and building upon initial findings using contrasting kinds of data or methods” (Denscombe, 2008, pp.78-79).

The popularity of the mixed-methods approach has increased steadily in social marketing research as a consequence of the challenges in demonstrating the effectiveness of social marketing interventions (Truong, 2014). The measure of the success of an intervention tends to be qualitatively reported by most social marketing practitioners; however, Weinreich (2006) argues that “both types of research are necessary to assess the full extent of the program’s impact upon the target audience”. She also stated that “qualitative research can point out successes that may have occurred on a more human scale through anecdotes about how the social marketing programme made a difference in someone’s life”, while a “quantitative population survey will provide an indication of whether the programme realized its objectives in raising awareness, changing attitudes and initiating behaviour change” (Weinreich, 2006, p.4).

Moreover, scholars in the field of mixed-methods research have proposed different typologies for mixed-methods designs that researchers can use in their studies (Teddlie and Tashakkori, 2003).

Typologies help researchers to decide how to proceed when designing their mixed methods studies. Typologies provide a variety of paths that may be chosen to accomplish the goals of researcher's studies. They may include particular mixed methods research designs that are most appropriate for the goals of particular research projects (Teddlie and Tashakkori, 2003, p.26).

#### **4.5.1 Connection between the three studies**

Creswell (2008) suggests a framework including four important aspects that guide the researcher towards choosing the appropriate research design: timing, weighting, mixing, and theorising.

The researcher needs to think about the timing of his or her qualitative and quantitative data collection. He or she must ask questions such as: Will the data collection process be in sequential phases? Or will the data be gathered concurrently (Creswell, 2008)? This research is comprised of three studies, so the researcher worked in three different stages. The first involved qualitative data to examine the applicability of appraisal theory to Saudi roads and to identify the sources of anger in traffic situations. The second study was quantitatively designed to explain individual differences in terms of both personality and coping strategies. The final study involved interviewing drivers (qualitative data) to formulate an intervention that can help them cope effectively with anger in traffic. Consequently, the data were collected sequentially to provide a more expansive picture of the issue and decrease the limitations of each study.

The second factor that should be considered before deciding which mixed-methods strategy to adopt is weighting, which determines which approach (qualitative or quantitative) will be given priority in a particular study. In some research, the weight might be equal; in other studies, there might be more emphasis on one than the other (Creswell, 2008). In this case, although both approaches are equally important, the quantitative approach was given priority because it mostly shaped and guided the final study.

The third factor is the matter of mixing, that is, when might the integration of data occur in the research process? The possibilities for mixing can relate to the formulation of the research aims and questions and/or the integration of the results of both qualitative and quantitative studies. Creswell (2008) explains that there are three types of relationships between data: connecting, integrating, and embedding.

Connecting in mixed-methods research means connecting the data analysis in the first phase of the research with the data collection in the second phase. In other words, the findings of the data analysis in the first stage should inform and guide the data collection in the second stage. Integrating indicates that quantitative and qualitative data are collected concurrently. In the final scenario, the researcher can embed the secondary form of data (qualitative or quantitative) within a larger study (primary database) to provide a supporting role (Creswell, 2008).

As noted throughout this research, this study is based on the transactional theory of stress, which emphasises the importance of studying both environmental stimuli (qualitative) and personality differences (quantitative) to understand emotions. Therefore, the two studies are separate yet connected in a way that provides a theoretical approach to describing driving anger in Saudi Arabia. In addition, the results of the second study (quantitative) were used to identify participants for the subsequent qualitative study and to guide development of the focus group interview questions. Therefore, Study Two is connected to Study Three because the former has provided adequate information for the final stage. The final aspect to be considered is whether there is a theoretical perspective that guides the entire design (Creswell, 2008). The issue of theoretical perspective was discussed in the previous section.

After identifying the criteria (timing, weighting, mixing, and theorizing) for this research, it will be possible to adopt a research strategy that helps achieve the aims. Creswell (2008) identified six common strategies for conducting mixed-methods research. Two strategies that suit the nature of this work are the sequential transformative strategy and the sequential explanatory strategy. The sequential transformative approach is a two-phase project using a theoretical lens. The initial phase can be either quantitative or qualitative, followed by second phase (quantitative or qualitative) that builds on the first phase. In this approach, a theoretical perspective guides the study, and it is more important than the two types of data collection.

Furthermore, the results are integrated during interpretation to better understand the problem (Creswell, 2008). A sequential explanatory strategy involves a straightforward approach characterised by the collection and analysis of quantitative and then qualitative data, and more weighting is typically given to the quantitative data.

The main strength of both designs is their straightforward nature; they are easy to implement due to their clear steps and separate stages.



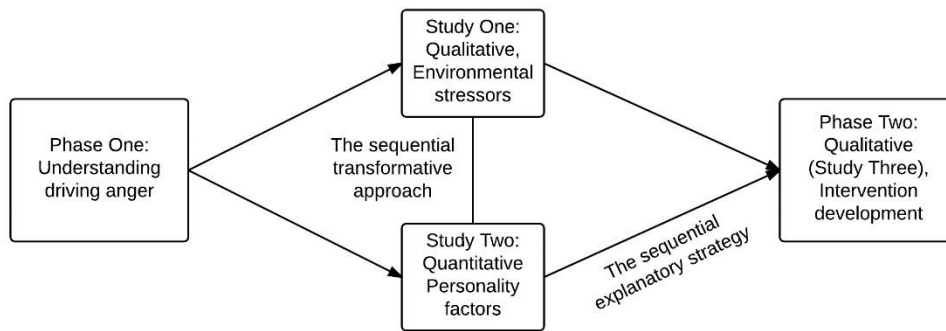
In addition, these design features make it easy to describe and report the data. However, the main drawback to both is the length of time involved in data collection as a result of having two separate stages (Creswell, 2008).

This study has two main stages, the first aimed at understanding driving anger, and involves two studies (qualitative followed by quantitative) based on a theoretical framework; both studies are equally important to clarify the driving anger issue in Saudi Arabia.

Therefore, the sequential transformative approach better serves the relationship between Study One and Study Two. On the other hand, the second stage aimed at developing a social marketing intervention based on the integrated results from the first stage (understanding driving anger).

Thus, the sequential explanatory strategy illustrates this relationship because the findings that arise in the quantitative study have refined the social marketing programme in the qualitative study. Figure 4-2 illustrates the relationship between the studies.

**Figure 4-2 Mixed-methods designs**



*By the author*

## 4.6 Methods

Research methods are “the techniques or procedures used to gather and analyse data related to some research question or hypothesis” (Crotty, 1998, p.3). A method should be consistent with the previous three processes of research: epistemology, theoretical perspective, and methodology. This research involves a combination of qualitative and quantitative approaches in three different studies.

### 4.6.1 Sampling

Sampling is “the method used to select a given number of people from a population” (Mertens, 2009, p.55). In the social and behavioural sciences, there are two sampling procedures: probability and non-probability. The former is mainly used in quantitative studies and involves selecting a relatively large number of units from a population, whereas the latter is mostly used in qualitative research and selects a small set of cases that will give the most information about a particular phenomenon (Saunders et al., 2011).

In probability samples, each case of the population has an equal probability and chance of being selected (Aaker et al., 2007), whereas in non-probability samples, a great deal of judgment is used to decide which case will provide the intended information (Bradley, 2007). Figure 4-3 illustrates the various techniques used within each strategy.

#### Figure 4-3 Sampling techniques

*Adapted from Saunders et al. (2011)*

Generally, mixed-method sampling strategies involve selection of units using both probability and non-probability sampling strategies to adequately explore the phenomena of interest. More specifically, Teddlie and Yu (2007) reviewed the literature related to mixed methods and proposed five types of typologies for mixed-methods sampling:

1. basic strategies that involve combining quantitative and qualitative sampling;
2. sequential sampling, in which the sampling from the first phase informs the second phase;
3. concurrent sampling, in which quantitative probability and qualitative purposeful sampling are combined as independent sampling procedures or jointly;
4. multilevel sampling, in which sampling occurs at two or more levels or units of analysis; and
5. sampling using any combination of the foregoing strategies.

This study lends itself to using a combination of basic and sequential sampling strategies because the first phase (understanding anger—Studies One and Two) examine the environmental stressors in traffic, which required in-depth understanding and investigating individual differences of both driving styles and coping strategies. This phase used a questionnaire to recruit large number of drivers (quantitative). Furthermore, the third sample was selected because there was a need to interview certain drivers who were operationally defined based on the primary data obtained via the questionnaires. Therefore, the information from Study Two was required to draw the sample for Study Three (Kemper et al., 2003), which is the meaning of sequential sampling procedures. Each technique will be described in the next sections.

#### **4.7 Study One: Qualitative approach—Environmental stressors**

The core purpose of this study is to facilitate understanding of the emotion of anger in the driving domain due to external stressors. The initial stage explores the types of traffic situations that cause Saudi drivers to become angry while driving as well as the reasons for becoming angry in these scenarios.

In addition, the research explores the reactions of drivers after they experience the emotion of anger. This study poses three questions as a precursor to designing an intervention to address driver anger.

1. What types of traffic events cause drivers to experience anger?
2. Why do drivers become angry during these types of traffic events?
3. How do drivers cope with anger during traffic events?

These questions were qualitatively investigated using semi-structured interviews. Qualitative data take the form of words; they are associated primarily with research methods such as interviews, documents, and observation. The main strength of this approach is the richness and detail it generates and the fact that the data are based in reality; however, the data might be less representative because they are based on a small number of cases (Denscombe, 2007). The semi-structured interview method was deemed appropriate for addressing the research purposes of this study.

Although there was a set of questions to be covered during the interviews, additional questions were required to explore other areas and encourage respondents to elaborate on the issues being discussed. This is typical of the semi-structured interview (Saunders et al., 2011).

As is mentioned in the literature, most studies use the Driving Anger Scale (DAS) to identify different types of traffic situations that trigger anger (Deffenbacher et al., 1994; Sullman et al., 2007; Sullman et al., 2014); however, this study has progressed beyond this scale for several reasons. The DAS was developed in western countries, so using it might limit the variety of traffic situations that cause drivers in Saudi Arabia to become angry. EOS Gallup Europe (2003) study revealed significant differences between drivers in different countries in what they consider irritating behaviours.

For example, Japanese drivers were much more tolerant than Australian drivers of other drivers driving in an open inside lane and then at the last minute cutting across lanes into the congested exit lane. They were also much more tolerant of drivers who drive in the passing lane when the outside lane is free. On the other hand, Japanese drivers were the least tolerant of all of double parking, while Australians were the most tolerant (Shinar, 2007). Moreover, the interview method allows the researcher to discover more about the incidents and to ask questions to clarify important information, thereby allowing greater detail to be recorded.

Likewise, understanding environmental stressors is only one aim of this study. It also aims to explore the appraisal components of anger and coping strategies because it is equally important to investigate these issues. However, the DAS is concerned only with the type of traffic incident. Consequently, interviewing drivers allows them to express their experiences in the ways in which they perceive them and to provide rich and detailed information about the issue.

#### ***4.7.1.1 Sampling***

Owing to restraints related to time, money, and accessibility, a cross-sectional convenience sampling strategy was employed to recruit volunteer participants for this study. This means that “the persons participating in the study were chosen because they were readily available” (Mertens, 2009, p.325).

Accordingly, the researcher looked for the most convenient area in terms of reduced time and effort as the venue for conducting the interviews. Although convenience sampling is widely used in business and behavioural science research (Bryman and Bell, 2011; Gravetter and Forzano, 2015), it has a number of weaknesses, the main one being that it is impossible to generalise the findings because the researcher does not know which population the group represents. However, the researcher attempted to ensure that the sample was reasonably representative by selecting drivers from different age groups (Gravetter and Forzano, 2015).

Furthermore, issues of representativeness were considered less important in this stage because the combination of data from the second and third studies should support the results of the first stage and minimise potential problems related to this weakness.

Accordingly, the researcher visited coffee shops in Riyadh to find potential candidates for the interview. The researcher conducted semi-structured interviews in April 2013, with 12 male drivers (six individually and six in a focus group) in Riyadh. The men were aged between 18 and 40 years (mean age = 22 years), and all had at least two years of driving experience.

#### ***4.7.1.2 Interview procedure and data preparation***

At the beginning of each interview, the researcher introduced himself to the participants, briefly introduced the research, and outlined the research aims.

Permission to record the interviews was asked for, and participants were reminded that the information collected would be treated in confidence. The researcher asked three main questions derived from the literature (Lazarus & Folkman, 1984). The first, which aimed to collect information about the traffic events that characteristically made respondents angry, was “Can you describe the most angry traffic event that you have experienced in the past?” After the respondent described the event, the researcher asked several questions about the incident, such as who was involved and whether there were passengers.

The second question was designed to investigate why the driver became angry in the situation; in other words, how the driver appraised the event in its context: “Why did you become angry in this situation?” This question was the most difficult because people are not always able to identify their perceptions of a situation. Most respondents merely repeated the scenario; thus, the researcher had to encourage the interviewees to think more deeply about the situation.

The researcher also asked additional questions such as “How would you appraise this event?” and “What does it mean to you?” to identify the types of appraisals that play an important role in eliciting anger in traffic situations. The final question was used to identify the thoughts and actions of drivers when dealing with specific angry encounters: “What did you do when someone made you angry?”

All semi-structured interviews were audio-recorded to secure the collected data and guarantee all the data were traceable. A native Arabic speaker transcribed all 12 interviews, and fonts of different colours were used to distinguish between the speakers in a group interview. A full transcript of each interview (about 40 pages) was provided to the researcher.

For accuracy and to capture nuances, the researcher reviewed each transcript several times while listening to the original audio recording. In preparation for the analysis, the researcher read through all the data to obtain a general sense of the information and to reflect on its overall meaning. The data were first assigned to the interview questions as an outline to facilitate the process of analysis.

#### ***4.7.1.3 Qualitative data analysis***

A great deal has been written about qualitative data analysis procedures, and there are differences in how such procedures should be systematically used (Denscombe, 2007). Creswell (2008) suggests a linear and hierarchical approach to qualitative data analysis (see Figure 4-4). This approach was adopted to obtain meaningful ideas from the data. The previous section discussed the first three steps in this model; the coding process will be discussed now.

**Figure 4-4 Data analysis procedures**

*Adapted from Creswell (2008)*

Qualitative data in the form of transcripts were subjected to a textual analysis. In fact, the process of analysis occurred during the collection of the data, as both are interrelated and interactive processes (Tesch, 1990). During the interview, the researcher analysed the data that had been gathered and recorded some general themes, which proved helpful in shaping the final report.

The expectation was that if the data collected in Arabic were translated into English at this level of the analysis, the context and deeper meanings of words would be lost. Hence, the data collected from the Saudi drivers were analysed by maintaining the original language and then drawing conclusions in the qualitative data analysis phase. In the final stage, the required information was translated into English while omitting any irrelevant conversations.

The semi-structured interview data were analysed and coded manually. First, categories were identified, and subsequently these categories were attached to meaningful chunks of data. The sources for the names of the categories were mainly derived from a combination of terms used in the existing theory and literature, as well as terms that emerged from the data (Saunders et al., 2011). The data were organised initially based on the research questions. The first question was coded based on different types of traffic situations identified in the literature (hostile gestures, illegal driving, police presence, progress impeded, discourtesy, and traffic obstructions). However, other types of traffic situations were looked for wherever they appeared in the data.

The second question was coded based on Lazarus' theory of anger (goal incongruence, threat to self-esteem and blaming). Although the researcher already had an idea of the expected reasons, he remained open to inclusion of unexpected reason. For the third question, certain themes emerged from the data. The final categories for all questions are presented in Chapter Five.

To ensure the reliability of the coding process, two more coders who are bilingual (Arabic and English) went through the passages to determine whether they could use the same or similar codes. The remaining steps in the analysis model will be discussed in the results chapter.

#### **4.8 Study Two: Quantitative study (personality and coping strategies)**

The second study was designed to obtain a thorough understanding of driving styles in Saudi Arabia in terms of drivers' personalities and coping strategies to complete understanding of driving anger in Saudi Arabia. A cross-sectional study design was used to obtain the quantitative data.

This means that the data “take the form of numbers; they are associated primarily with strategies of research such as surveys and experiments and with research methods such as questionnaires” (Denscombe, 2007, p. 254).

Study Two used the questionnaire tool, which is one of the most widely used quantitative data collection techniques. Each respondent was asked to respond to the same set of questions, providing the researcher with an efficient method of collecting responses from a large sample prior to conducting quantitative analysis (Saunders et al., 2011). In addition, a quantitative approach improves understanding of the relationship between variables that describe Saudi drivers in terms of both driving style and coping strategies.

However, the main weakness of the quantitative approach is that it affects human behaviour by removing the event from its real-world setting and ignoring the effects of variables that have not been included in the model (Weinreich, 2006).

Nonetheless, the mixed methods approach expands on the understanding from one method to another and confirms the findings from different data sources. Additionally, participants were asked to respond to the coping questionnaire based on a particular context (traffic situation), which could increase the reliability and validity of the data.

As mentioned, the primary aim of Study Two is to investigate drivers' styles in terms of both personalities and coping. Consequently, the following objectives were investigated.



#### **4.8.1 Validity and reliability of the questionnaires in a Saudi context**

One important aspect that has been debated among researchers is the credibility of research findings, which is usually referred to as validity and reliability. The former is “the extent to which the research findings accurately reflect the phenomena under study,” while the latter “refers to the absence of differences in the results if the research were repeated” (Collis and Hussey, 2009, p.64).

The researcher needs to ensure that a valid instrument is used that demonstrably measures what it is intended to measure (Pidgeon and Yates, 1968); for example, with regard to the validity of a questionnaire, the researcher must ensure that the questions are not ambiguous and that the participants understand exactly what the researcher is striving to achieve (Clive, 1990). Therefore, one aim of this study is to validate the Arabic versions of the Driver Stress Inventory (DSI) and the Driver Coping Questionnaire (DCQ) among a sample of drivers in Saudi Arabia.

##### ***4.8.1.1 Questionnaire content***

This study adopted the Driver Stress Inventory (DSI) and the Driving Coping Questionnaire (DCQ) (Matthews et al., 1996) because they are the most appropriate tools for achieving its aim. They are specifically written for a driving context and have been validated in different studies. Most importantly, both questionnaires have been derived from a transactional model of driver stress, which proposes that stress is a product of the transaction between environmental stressors and the individual. The questionnaire (see Appendix one) included a mixture of closed- and open-ended questions, with closed-ended questions predominating. Most questionnaire items were pre-coded, and coding manuals were developed for the openended questions.

The questionnaire was divided into four sections. The demographics section elicited information regarding age and education level and items relating to driving experience: number of years a licence had been held and driving frequency. Accident involvement and convictions for speeding or careless and dangerous driving within the last three years were also measured.

Accidents were classified as minor—less than £500 damage to vehicles and no medical treatment—or major—either someone required medical treatment or there was more than £500 damage to the vehicle, or both. The number of hours spent driving each week was used as a measure of workload.

The next section required participants to complete a driver stress inventory to measure an individual's vulnerability to stress reactions during driving. The DSI (48 items) measures five dimensions of driver stress on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree), including thrill-seeking, aggression, dislike of driving, hazard monitoring and fatigue Proneness (Matthews et al., 1996; Matthews, 2002; Matthews et al., 2005; Desmond and Matthews, 2009).

A brief text in the third section asked drivers to think of occasions during the last year when driving was difficult, stressful or upsetting. This was followed by four items to measure the appraisal components of anger and the level of anger intensity. Participants were asked to rate each item (intensity of anger, harm to the self, threat to self-esteem and other accountability factors) on a five-point Likert-type scale. To ease distinguishing between those who described the situation previously and those who did not for analysis purposes, they were asked: "Have you experienced the above situation?" If the answer was "No", the participant was excluded from the analysis.

Finally, the DCQ was completed for the described scenario. The DCQ (35 items) was designed to identify the coping dimensions applicable to driving: confrontive coping, taskfocussed, emotion-focussed, reappraisal and avoidance. The five coping scales each have seven items. Participants were instructed to use the described scenario to indicate how much they actually engage in each activity on a scale from 1 (not at all) to 5 (very often).

#### ***4.8.1.2 Questionnaire development***

A pilot test of the original questionnaire was conducted with 10 Saudi students who are familiar with English to remove any inconsistencies and confirm the suitability of the content, cultural appropriateness, structure and design of the questions and the questionnaire. Their main concern was the length of the questionnaire.

They suggested changing the scale from the Visual Analogue Scale (VAS), which is not common in Saudi Arabia, to the five-point Likert scale statements (1 = strongly disagree; 5 = strongly agree) to facilitate both ease of use for the respondent and ease of scoring for the experimenter.

As a result of this change, some items have been amended to be applicable to the Likert scale.

For example, “Does it worry you when driving in bad weather?” was changed to “I worry when I drive in bad weather”. Another important change was that the DCQ instruction asks participants to use their experiences to indicate how much they usually engage in each activity that measures, their coping style in general.

However, this research is based on the Lazarus theory of appraisal, which emphasises that “coping must be examined within the context of a specific stressful encounter and asking people what he or she actually does which measure their coping strategies for a particular situation (as contrasted to what the person usually does)” (Folkman and Lazarus, 1980). In addition, this study is partly personality driven but partly context driven as well, so it is important to link the questionnaire to a specific event. Therefore, the researcher had to follow the Lazarus theory instructions and ask participants to use a particular scenario to indicate how much they actually engage in each activity (coping strategy). The author of the DCQ (Matthews) was asked, via email, whether this change is possible—he agreed it was.

#### ***4.8.1.3 Translation process***

The questionnaire needed to be translated into Arabic to make it more accessible to the participants. Khalaila (2013) reviewed the literature and found that researchers in crosscultural studies who intend to use Arabic speaking subjects in their investigations have several translation methods: (a) forward-only translation, (b) decentring strategy (c), backtranslation, (d) bilingual technique, (e) committee approach, and (f) pretest procedure/pilot study (Brislin, 1970).

The translation process incorporated two stages. The first involved forward-only translation, whereby the questionnaire was translated first into Arabic by the researcher and then checked by a bilingual expert. This was done for two important reasons: First, the researcher was keen to deeply understand each item in the questionnaire; second, it saved time and money.

The second stage involved a bilingual technique. Five Saudi students who understand both English and Arabic tested both the original and Arabic versions to identify items yielding discrepant responses between the two versions (Khalaila, 2013). Then five people who speak Arabic but are unfamiliar with English checked the Arabic version to determine whether it was acceptable, simple and readily understood.

The mixed technique of translation was used to linguistically validate the Arabic copy and ensure it matched the original as closely as possible. An Arabic expert checked the wording of the final version of the Arabic questionnaire. Modifications of ambiguous items due to translation errors were carried out.

Two items in the questionnaire appeared to be confusing. The first was, “I like to raise my adrenaline levels while driving”. People who participated in the checking process were concerned about the word “adrenaline” because they believed people will not know what adrenaline is or how they raise it. The translation of “adrenaline” in Arabic is the same, but in the Arabic alphabet; therefore, the researcher decided to translate its meaning so that respondents would interpret it in a way that they fully understood. The new item is, “I sometimes get a thrill out of driving”. The second ambiguous question was, “When I come to negotiate a difficult stretch of road, I am on the alert”. There is no agreement on the meaning of “negotiate a difficult stretch of road”, and participants asked what a difficult road is. Since people driving in the mountains will think about mountain roads and those who live on farms might think about unpaved roads, and so on, the researcher retained the term “difficult stretch” and let people interpret it according to their understanding.

#### ***4.8.1.4 Pilot study***

In August 2014, the Arabic version of the questionnaire was piloted online with both professional researchers and students to help identify sensitive, ambiguous and/or poorly understood questions. Twenty-two Saudi drivers were asked to complete the questionnaire and identify any issues. Mainly, some spelling mistakes and technical issues appeared in this stage, which were all modified for the final version.

#### **4.8.2 Identifying the relationship between personality style and coping preference**

Several of the DSI scales effectively predict subjective stress response (Emo et al., 2004). Those who score high on aggression scales are more likely to use confrontational coping strategies when interacting with other drivers, such as tailgating and frequent overtaking, because aggressive drivers have a tendency to negatively appraise the behaviour of other drivers (Matthews et al., 1998).

Likewise, drivers who are high in dislike of driving tend to use emotion-focused strategies such as self-criticism when dealing with traffic stress, which can result in increased worries about the traffic environment. The hazard monitoring dimension primarily reflects a coping style that aims to prevent threats by searching for danger. Thus, it is correlated with coping through task focusing (Matthews et al., 1998; Matthews, 2002).

This study has examined the associations between driving styles (DSI) and coping strategies (DCQ) to determine whether the results of previous studies can be replicated in Saudi Arabia and what implications can be drawn from the results with regard to social marketing interventions.

#### **4.8.3 Identifying the characteristics of Saudi drivers**

Researchers have sought to identify the link between both driver stress and coping preference based on various driving related criteria and by using DSI and DCQ questionnaires. For example, Matthews (2002) found that aggression, thrill-seeking and a low dislike of driving relate to convictions for offences such as speeding and to higher self-reported violations (Matthews, 2002). Furthermore, higher rates of unintentional errors and lapses were associated with high aggression, thrill-seeking, dislike of driving, fatigue proneness and low hazard monitoring (Rowden et al., 2011). In general, the aggression scale was the strongest predictor of higher accident involvement, speeding and dangerous-driving convictions. Furthermore, Machin and Plint (2010) confirm that confrontive coping is a predictor of greater speeding.

Researchers have also investigated the association between personalities, coping preferences and socio-demographic factors such as age and experience to determine who is most prone to being affected by the number of hours spent driving.

Likewise, understanding such a relationship should help researchers identify who engages in risk-taking behaviour and who should be the prime targets of driving anger intervention programs.

#### **4.8.4 Assessing the sources of stress on Saudi roads**

In the discussion of coping in Chapter Two, it was mentioned that this thesis followed Lazarus' recommendation in assessing coping, which emphasises the importance of examining coping within the context of a specific stressful encounter. Therefore, Study Two asked drivers to think about an occasion on which driving was particularly stressful during the last year. Such questions help the researcher obtain a comprehensive view of several driver stress scenarios and examine the relationship between the identified sources of stress experienced by the drivers and their personalities and coping variables to identify the most important factors that cause drivers to experience stress in general and anger in particular.

#### **4.8.5 Sampling**

Prior to conducting the survey, particular sampling issues proposed by Aaker et al. (2007) had to be taken into account.

##### ***4.8.5.1 Defining the target population***

An essential component of conducting surveys is specifying the characteristics of the population (Creswell, 2008). The population is "the universe of units from which the sample is to be selected" (Bryman and Bell 2011, p. 187). The main aim is to obtain information about the characteristics or parameters of a population. Therefore, an imprecise definition of the target population will result in research that is at best ineffective and at worst misleading (Aaker et al., 2007). For this study, the target population includes male drivers aged 18 years old and above who live in Saudi Arabia. Women were not included because they are not allowed to drive in the country. The selection of the age group is restricted by Saudi law, which requires that drivers must be at least 18 years old.

#### ***4.8.5.2 Determining the sampling frame***

The sampling frame is “a complete list of all the cases in the population from which your sample will be drawn” (Saunders et al., 2011, p.154). Although a sampling frame can be found from the census data of the Ministry of Interior in Saudi Arabia, the researcher would not have been granted permission to access this data.

In addition, more than seven million drivers in Saudi Arabia could have been included in this sample frame, which would demand a great deal of effort on the part of the researcher. It would be impractical and time-consuming to survey all the members of the population; therefore, the aforementioned sample frames are not practically possible for this study. A convenience sampling strategy was used to select the participants. (see Appendix three for population of Saudi Arabia)

#### ***4.8.5.3 Determining the sample size***

The researcher needs to decide on a suitable sample size to be able to generalise from the findings of the questionnaire (Denscombe, 2007). However, determining sample size is almost always a matter of judgment because samples that are too large may waste resources, time and money, while samples that are too small may yield inaccurate results.

Thus, a common question is how many people should participate in the research (Saunders et al., 2011). To answer this question, Saunders (2011) suggested four factors that need to be borne in mind and weighed up by the researcher when he or she is making a decision regarding the size of the sample.

1. The confidence one needs to have in one's data, that is, the level of certainty that the characteristics of the data collected will represent the characteristics of the total population.
2. The margin of error that one can tolerate, that is, the accuracy one requires for any estimates made from the sample.
3. The types of analyses one is going to undertake, in particular, the number of categories into which one wishes to subdivide the data, since many statistical techniques have a minimum threshold of data cases for each cell.

4. To a lesser extent, the size of the total population from which the sample is being drawn.

For this study, the researcher worked to a 95 percent level of certainty that offers sample data within plus or minus 3 to 5 per cent of its true (population) values; these are commonly used criteria in business and management research (Collis and Hussey, 2009).

In addition, a large sample size can assist in generating better results from factor analysis. Statisticians (Tabachnick and Fidell, 2001; Field, 2013; Comrey and Lee, 2013) have stated that 300 cases are probably adequate to run a factor analysis. In general, the accepted minimum sample size in most academic studies is 384 for a population larger than one million, with a 95 per cent confidence level for a five percent margin of error (Collis and Hussey, 2009; Saunders et al., 2011). Therefore, at least 384 questionnaires were required for this study to collect data that could be generalised to the entire population. Fortunately, the researcher was able to obtain more than 650 questionnaires (see Chapter Six).

#### ***4.8.5.4 Selecting the Sampling Procedure***

Having defined the population and established the required sample size, the researcher ideally needs to select the most appropriate technique for obtaining a sample (Saunders et al., 2011). Since there are two groups of sampling procedures, probability and non-probability, this thesis employed non-probability samples due to the difficulty of identifying all probable cases in the population (Saunders et al., 2011). Due to the inability to access a complete list of all drivers in Saudi Arabia, it would be infeasible to undertake random sampling of all the samples. Therefore, this study has utilised a convenience sampling strategy to select the participants. In the fields of business and management, the use of this strategy is common because it is a quick and inexpensive method of helping researchers obtain information and is employed in both qualitative and quantitative data collection (Lewis-Beck et al., 2003; Aaker et al., 2007; Bryman and Bell, 2011). The convenience sampling strategy applied in this study enabled access to a relatively large number of drivers from various cities in Saudi Arabia; this would not have been achievable using other sampling strategies.



However, the researcher was aware that with such a technique, the ability to generalise from the sample to the population is limited because it is unclear to what extent the sample represents all drivers in Saudi Arabia (Walker, 2010).

Furthermore, online surveys were chosen as the most practical method for data collection. The administering of surveys online gained great popularity during the twentieth century, thanks to advances in the techniques and technologies utilised in survey research.

Baltar and Brunet (2012, p.62) have proposed several strengths and potential weaknesses of online surveys, including:

1. “The flexibility to apply them in different formats or have many versions according with the respondent (e.g., language);
2. Online surveys can be administered in a time-efficient manner, minimising the period to collect and process data;
3. Respondents can answer at a convenient time for themselves;
4. Once the last questionnaire for a study is submitted, the researcher instantaneously has all the data stored in a database;
5. Online surveys can include all kinds of questions (e.g., dichotomous, multiple-choice, scales, open-ended questions);
6. Costs are lower because there are specialised online questionnaire development firms, surveys are self-administered and do not require personal interviews”.

Other weaknesses such as privacy and security issues, respondents’ lack of online experience/expertise and low response rates were all considered in the data collection process. Nevertheless, social media platforms were chosen to distribute the questionnaire. The use of social media such as Twitter and Facebook continues to increase daily, and it is becoming a valuable tool for obtaining data from respondents who live in different parts of the world (Evans and Mathur, 2005; Baltar and Brunet, 2012). Online social network tools may facilitate the recruitment process. As Brickman-Bhutta (2009) observes, online social networking sites offer new ways for researchers to conduct studies quickly, cheaply and single-handedly.

However, the main query about online methodology is the possibility of producing valid and reliable data. Adams et al. (2014, p. 130) argue that using social media to collect data “tends to be unrepresentative, often going to the researchers’ friends or to similar people. This means that the respondents come from a narrow cross-section and might not be representative”.

To ensure the validity of the sample and minimise such an effect, the researcher aimed to reach as many Twitter users as possible. Links to the questionnaire were repeatedly tweeted and posted on the researcher’s Facebook page and WhatsApp.

The researcher also sent the questionnaire link to different Twitter users (footballers, businessmen, etc.) who have many followers and asked them to pass it on to other Twitter users. In this way, an attempt was made to create a varied sample.

In addition, the questionnaire was emailed to people who were interested in road safety and to lecturers at Saudi universities who could forward it to their students. Furthermore, Fricker and Schonlau (2002) argue that although coverage error is the most widely recognised shortcoming of Internet-based surveys, the coverage differential between offline and online is quickly closing and may become immaterial in the relatively near future.

This claim is also supported by the “3rd Arab Social Media Report” (ASMR), which stated that Saudi Arabia has the third highest number of Twitter users in the Middle East, with 1.9 million users who account for over half of all active Twitter users in the Arab region (ASMR, 2013). Similarly, the total number of Facebook users in Saudi Arabia at the end of May 2013 was 7,800,000 (Top in Social, 2013).

The questionnaire was designed using the Qualtrics website (<http://www.qualtrics.com/>), a platform that allows researchers to design, customise and host their own web-based survey. The website is available through a license at University of the West of England. To respond to the questionnaire, a link (<http://goo.gl/JMNyAJ>) (see Appendix four) was distributed, mainly through social media (Facebook, Twitter, WhatsApp and LinkedIn). It was left up to people to decide whether to participate in the survey. All data have been secured on the website using an anonymous password.

This procedure attracted a total of 710 Saudi male drivers aged between 18 and 50 years who voluntarily participated in the questionnaire. Frequency distribution and descriptive analysis were conducted in SPSS for missing and out-of-range values and to check for consistency.

After data cleaning, 652 drivers remained. More details will be in Chapter Six.

#### ***4.8.5.5 Data analysis procedures***

In preparation for the data analysis, the data were downloaded from the website and input into the SPSS 19.0 software. Frequency distribution was used to identify out-of-range values. In addition, some items were reverse recoded using SPSS to align with the remaining questions.

For example, one question in aggression scale was “I am usually patient during the rush hour”, Corrections were made following these procedures: 1 "Strongly disagree" was replaced by 5; 2 was replaced by 4; 3 remained unchanged; 4 was replaced by 2; and 5 "Strongly agree" was replaced by 1 so that the higher score represented higher level of aggression. The researcher employed the following statistical techniques for analysis and interpretation of the gathered data.

#### ***4.8.5.6 Descriptive statistics***

Descriptive statistics are “normally associated with frequency distribution that help summarize the information presented in the frequency table” (Aaker et al., 2007). Mean is one of the most frequently used measures to identify summarized averages, and standard deviation (SD) is common in describing dispersion (Saunders et al., 2011). Descriptive statistics such as mean and SD were used to identify the frequency of the DSI and DCQ variables.

#### ***4.8.5.7 Factor analysis***

Factor analysis “describes a set of procedures used to reduce and summarise data” (Bradley, 2007, p.321). Field (2013) states that factor analysis can be used for several purposes: first, to understand the structure of a group of variables (latent variable); second, to construct a questionnaire to measure an underlying variable; and third, to reduce a data set to a more manageable size. A principal component of factor analysis with oblique rotation was used in this study to determine whether the variables of DSI (five variables) and DCQ (five variables) would be extracted, or if new factors would emerge.

In addition, conducting factor analysis helped construct the validity of the questionnaire for the Saudi sample (Dancey and Reidy, 2004).

#### ***4.8.5.8 Cronbach's Alpha***

The researcher tested the internal consistency of the Driver Stress Inventory (DSI) and the Driver Coping Questionnaire (DCQ) by calculating Cronbach's Alpha, the most frequently used internal consistency reliability coefficient. It is usually used to measure the consistency of response to a set of questions that are combined as scale to measure a particular concept (e.g., aggression scale) (Saunders et al., 2011).

Hence, because the questionnaire of this study used Likert scales, Cronbach's Alpha is suitable for testing the internal consistency of multiple-item scales in this study. Moreover, Cronbach's Alpha consists of an alpha coefficient with a value between 0 and 1. Values of 0.7 or above indicate that the questions combined in the scale are measuring the same thing, so this study used this standard as the benchmark (Saunders et al., 2011).

#### ***4.8.5.9 Pearson correlation***

Correlation is a statistical technique used to measure the direction and strength of the association between quantitative variables (Collis and Hussey, 2009). A positive association between two variables indicates that a high value in one variable is correlated with a high value in the second, whereas a negative relationship implies that a high value in one variable is associated with a low value in the second. The value ranges of sample correlation  $r$  lie between 1 and -1. An  $r$  of 1 shows that there is a perfect positive linear relationship among the variables, whereas if  $r$  is -1, there is a perfect negative linear correlation between the variables. An association of zero reflects the absence of any linear relationship among the variables (Aaker et al., 2007). Pearson correlation was used to examine the relationships between factors.

#### ***4.8.5.10 Multivariate analysis of variance (MANOVA)***

The use of multivariate analysis of variance (MANOVA) in the behavioural sciences has increased dramatically. Researchers use MANOVA to evaluate the mean differences between two or more dependent criterion variables simultaneously (James et al., 1985).

MANOVA was used in this study to determine the differences between age groups and DSI and DCQ variables. Differences between age groups and different sources of stress were also analysed.

#### ***4.8.5.11 Multiple and logistic regression***

Regression is used “to analyse the associative relationship between a dependent variable and one or more independent variables” (Bradley, 2007, p. 320). Regression gives researchers an indication of the ability of an independent variable to predict the outcome of a dependent variable. In this study, multiple and logistic regression were used to determine whether DSI and DCQ variables were statistically able to predict certain driver behaviours such as minor accidents, speeding and reckless driving.

Multiple regression was also performed to determine whether driving styles (DSI) and coping strategies (DCQ) contribute to prediction of anger on the road. Regression was used to understand the correlation between personality styles and anger appraisal components and to examine which appraisal components were strongly related to anger. In addition, multiple regression was used to determine the relationship between the identified sources of stress and personality (DSI) and coping (DCQ) variables.

#### ***4.8.5.12 Coding procedures for traffic scenarios***

Participants were instructed in the questionnaire to think back to stressful incidents they have encountered while driving and to respond to a related open-ended question. The reported scenarios were coded manually using classification of the sources of stress experienced by drivers (Gulian et al., 1989) (see Table 4-1).

**Table 4-1 Classification of sources of stress**

Redacted due to copyright



*Adapted from Gulian et al. (1989)*

#### **4.9 Study Three: Qualitative study (intervention test and design)**

From the primary and secondary results of this research, interventions have been developed that primarily use training and persuasive messages; consequently, focus groups were conducted based on this development. The literature shows that clinical intervention targeting angry drivers could decrease the risk of becoming angry on the roads. Therefore, this approach was adopted with suggested strategies for the recruitment process. However, clinical intervention operates outside a “real-life” context and can only target a small number of drivers.

Thus, situational interventions (on-road strategies) were added to the choices of intervention to assess effectiveness. Persuasive messages that promote positive thinking, effective coping strategies, and Quran teaching were examined in this study.

The main purpose of conducting focus groups was to determine the degree of drivers’ interest in the new intervention ideas and how responsive they would be. Specifically, the first aim was to develop persuasive marketing strategies to increase the likelihood of recruiting and retaining Saudi young drivers in a clinical intervention. The second aim was to identify the most effective and preferred coping strategy to manage driving anger.

The third aim was to investigate the most impactful messages in persuading young drivers to positively appraise their traffic situation. To achieve these goals, the following five secondary research questions were investigated.

1. What are the best ways to promote a course on managing driving anger?
2. What coping strategies do young drivers believe are most helpful?
3. Which positive messages are most persuasive in helping young drivers better evaluate driving events?
4. What will motivate people to engage voluntarily with the intervention that offers them something beneficial in return?
5. What are the barriers and facilitators driver may face when engaging in these interventions?

### **4.9.1 Concept testing**

Components of the social marketing approach can vary; however, in most of the suggested steps (Kotler and Lee, 2008; Weinreich, 2010), the process of concept testing plays a pivotal role in determining what achieves the program's objectives. Concept testing is "a variety of marketing research-based approaches employed to assess the marketability of a product or service idea prior to its actual development" (Page and Rosenbaum, 1992, p. 269).

The purpose of such an activity is to provide early feedback from the market about the perceived attractiveness of proposed materials and messages before their development has even begun and to know whether the materials one has developed will generate the desired effect (Weinreich, 2010).

Concept testing can be used at four stages: concept development, partially completed materials, alternative materials and final materials (Brown et al., 2008). Study Three covered the first two stages. Preliminary ideas about clinical interventions were tested to explore prioritising audience's desires and needs before more time, money and resources were invested in the intervention development. Additionally, a draft of coping and positive messages was prepared to pretest their effectiveness (Brown et al., 2008; see Section 4.9.7).

What is important to identify at this stage is how to test these ideas and materials. The literature describes many pre-testing methods that can be used to examine the effectiveness of the marketing materials, including both quantitative and qualitative approaches (Weinreich, 2010). Nevertheless, the focus group technique is by far the most frequently used method in new product development (Mahajan and Wind, 1992). For this study, the ideas and materials could be considered "new products", so the focus group technique was used to solicit reactions for proposed social marketing strategies (Weinreich, 2010). The next section describes this method.

### **4.9.2 Focus Group Interviews**

Focus groups or group discussions are "a technique involving the use of in-depth group interviews in which participants are selected because they are a purposive, although not necessarily representative, sampling of a specific population, this group being focused on a given topic" (Rabiee, 2004, p.655).

This method is a widely used fieldwork technique most often associated with social marketing (Weinreich, 2010). This qualitative approach provides insights and allows exploration of respondents' idea and attitudes (Hague, 1993).

Focus group interviews consist of small groups of individuals with similar characteristics who discuss a particular topic in depth (Weinreich, 2010). Morgan and Krueger (1993) state a focus group is best used when researchers are trying to test new concepts and find out more about people's motivations, exchanging opinions, feelings, attitudes and opinions about a particular topic that they usually do not talk about in their daily lives.

Therefore, semi-structured questions were agreed upon beforehand (Chrzanowska, 2002) that derive from the literature and the findings of this thesis to explore the perceptions of those drivers who score high in anger-related scales with regard to the effectiveness of suggested strategies to lower anger in traffic.

### **4.9.3 Planning**

In planning for a focus group, researchers need to decide how the data will be collected. Three issues are relevant to this process. The first concerns who will participate in the focus groups. The next determines how structured the groups will be, including the level of moderator involvement. Finally, the size of each group and the total number of groups will be determined (Morgan, 1997).

Morgan (1997) provides several rules of thumb that are commonly used by researchers. Focus group projects most often (a) use homogeneous strangers as participants, (b) rely on a relatively structured interview with high moderator involvement, (c) have six to 10 participants per group, and (d) have a total of three to five groups per project. However, these rules of thumbs are just descriptive summaries of how they are often done. There is no standard for how focus groups should be conducted because different projects might have different requirements. The next sections will address these three areas in more detail.



#### **4.9.4 Sample and segmentation**

This study utilised the sequential sampling procedures approach to identify its target (see Section 4.6.1). The questionnaire in Study Two asked participants if they were interested in participating in follow-up interviews to discuss some issues further. More than 300 participants indicated their interest in taking part in the interviews. Their email addresses were collected to enable further contact. For categorising the sample, preselected characteristics of subgroups were developed to identify those who are more vulnerable to experiencing anger in traffic and who are affected by the consequences of such emotions.

The main target audience in this intervention is drivers aged from 18-30 who live in Riyadh and have the highest score on one of the following scales: aggression, new aggression, impatient driving and confrontive coping. In addition, they have had one accident or more, have exceeded the speed limit and/or have reported driving recklessly.

Using these selection criteria, the researcher obtained 72 contacts' information (emails and mobile numbers). Prior to conducting the focus group, participants received an online invitation to attend, thanking them for taking part in the previous questionnaire and asking about their availability (time and day), their preferable place and their mobile number. Thirty people indicated their willingness to take part in focus group discussions, although only 18 people actually attended. Three groups (six in each group) were created on WhatsApp to facilitate arrangement of a day and time and to send reminders and locations to the participants.

#### **4.9.5 Topic guide**

Researchers are strongly advised to prepare a list of topics or questions to be covered in the focus group discussion (Debus, 2007). This guide serves as “a summary statement of the issues and objectives to be covered in the interviews, as ‘a road map’”, and as “a memory aid for the moderator” (Debus, 2007, p.24). A semi-structured focus group was chosen for this study because the topics for discussion were determined by the literature and the results of the previous two studies. The topic guide for this study (see Appendix five) had a typical threepart structure— introduction, main topics and closure—as suggested in the handbook for focus group research (Debus, 2007, p.25-27).

The introduction started with welcoming the participants, thanking them for taking part in the discussion and establishing ground rules. Additionally, it asked general questions about driving anger to get an overview of the topic and help participants relax. An example is, “When you think about driving anger, what do you associate with it?” The protocol was organised using three main topics: promoting clinical intervention, preferable coping strategies and effective persuasive messages. The conclusion of the protocol allowed participants to comment on how to tackle the issue of driving anger. The following phases were followed to complete its design:

1. develop an English version of a topic guide;
2. review the English version with the supervision team;
3. revise the interview topics and questions based on the feedback; and
4. translation of the English version into Arabic by the researcher.

#### **4.9.6 Moderator**

The moderator’s role in conducting focus groups is critical for gathering high quality data (Debus, 2007). The researcher prepared for this challenge by reading methodology books (Hague, 1993; Gordon, 1999; Chrzanowska, 2002; Krueger and Casey, 2009) to identify the important skills required and ensure the flow of the discussion. He also had the opportunity to experience and practice group facilitation with friends and colleagues on several occasions. The moderator must be aware of the importance of showing respect to participants, regardless of their level of education or background.

The researcher was also aware that he must communicate clearly and attempt to allow the discussion to be natural and open by behaving with courtesy, offering coffee and snacks and smiling to build a strong relationship with the participants. During the discussion, the groups often went beyond the main topics, so attempts were made to keep the discussion on the agreed-upon topics and ensure that specific information was elicited. The moderator was part of the group, and all members were influenced by one another and by the climate of the group (Gordon, 1999). One challenge the researcher was concerned about was the possibility that participants would give socially desired answers to make themselves look good to others.

The researcher made an effort to minimise this issue at the beginning of each discussion by setting ground rules, such as repeating, “There are no right or wrong answers, so please frankly tell me your own opinions” and emphasising the importance of respecting each other’s views. Finally, the researcher hired another person to help record the group discussion and take field notes.

#### **4.9.7 Conducting Focus Groups**

Three focus groups, each consisting of six of the 18 Saudi male participants, were held in Madareem Crown Hotel in Riyadh in December 2014 . The researcher rented a meeting room in the hotel for three days, which cost around £500. Each focus group lasted about one hour and a half (about five hours total). With the participants’ permission, all interviews were recorded using two digital recorders to ensure the accuracy of data collection.

The discussion started with six general questions about driving anger and confirmed some important findings from Studies One and Two.

The discussion then examined the workability of clinical interventions and how to market such ideas using the marketing mix model to increase the recruitment rate, especially for young drivers.

The next concept to test was coping strategies to identify the most effective strategy that angry drivers can use to manage anger and any barriers that prevent them from using such a strategy. Although the results of Study Two indicated that task focus (concentrating on safe behaviour) was chosen more frequently than any of the other four strategies for coping with stressful and conflict traffic situations, the researcher added three other positive strategies (reappraisal, avoidance, and Quran teaching) to enhance the discussion and connect the different strategies.

The strategies were presented to participants in individual booklets in rotating order to gain independent responses from them prior to the group discussion. The researcher instructed the interviewees to rate their responses in their booklets from 1 to 6 for each strategy, with 1 equalling very effective and 6 equalling not at all effective, to generate more discussion.

The final concept was examining the effectiveness of cognitive messages developed from cognitive intervention (Deffenbacher, 2013). Five cognitive themes were used to develop the messages, including redirection of attention, letting go and focusing, acceptance, no revenge and forgiving. The messages were presented to participants in individual booklets in rotating order. The researcher instructed the interviewees to remember a time when they had experienced anger on the road (Deffenbacher, 2013) and to rate their responses in their booklets from 1 to 5 for each message, with 1 equalling very effective and 5 equalling not at all effective. A discussion of the effectiveness of these messages was also held.

#### **4.9.8 Data analysis and interpretation**

Qualitative data analysis in this study followed the procedure described in Study One (see Section 4.7.1.3). A full transcript of each group was provided (about 43 pages). A native Arabic speaker transcribed the recordings of all three groups, and fonts of different colours were used to distinguish between the speakers in the group interview.

A classic analysis strategy was followed (Krueger and Casey, 2009) to identify the themes and categorise the findings in the transcripts. This strategy is recommended for researchers who are carrying out their first qualitative analysis (as in this researcher's case) (Krueger and Casey, 2009). Since it is systematic, a visual and concrete process in which the transcripts are cut apart into manageable chunks and then placed into themes and categories was employed.

This included the following steps.

1. Each line of each transcript was numbered to identify the location of quotes.
2. Although there were no differences between the groups, the transcripts were printed out in different colours to facilitate the process of comparison or differences, if any (group 1—green, group 2—blue, and group 3—pink).
3. Initially, the transcripts were split into five categories according to the five main topics (introduction, concept 1, concept 2, concept 3, and conclusion) (see Appendix six);
4. For each quote, the researcher addressed the following four questions, as recommended by Krueger and Casey (2009, pp.118-122),
  1. “Did the participant answer the question that was asked? If yes, go to question 3; if no, go to question 2; if don't know, set it aside and review it later;

2. Does the comment answer a different question in the focus group? If yes, move it to the appropriate question; if no, go to question 3;
3. Does the comment say something of importance about the topic? If yes, put it under the appropriate question; if no, set it aside;
4. Is it something that has been said earlier? If yes, start grouping like quotes together; if no, start a separate pile”.

Written summaries were made of each category as well as descriptions of what participants said in response to the discussion questions. The main task here is not only to make sense of the individual quotes, but also to be imaginative and analytical enough to see the relationship between the quotes and the links between the data as a whole (Rabiee, 2004).

During the analysis, the researcher needs to consider two important aspects: depth of analysis and unintended bias. A key principle in determining the depth and intensity of analysis is having a clear purpose in mind for the study (Krueger and Casey, 2009). The main aim of this study was to examine the workability of certain concepts and messages. Thus, the researcher looked for what works well to manage anger and the reasons behind it.

Furthermore, a researcher must be attentive to objectivity as an important bias-limiting factor and ensure attention is paid to objectivity in qualitative analysis. To strengthen objectivity, all processes in the data analysis, were continuously reviewed until a consensus was reached between the researcher’s supervisors and the researcher himself.

#### **4.10 Summary**

Chapter Four described the research philosophy, methodology and methods employed in this study. The pragmatism research philosophy has been selected to address the study's objectives. The justification for mixed methods (quantitative and qualitative) approach has also been discussed. Moreover, the thesis is divided into three distinctive studies seeking to answer different research questions. The semi-structured interview used in Study One helped in exploring traffic situations that provoke anger and examined the component appraisals of anger. This was followed by a survey using the DSI and DCQ scales in Study Two to statistically test a correlation between personality factors, demographics information, driver behaviour, coping strategies and improving the generalisability of the research findings. Descriptive statistics, factor analysis, Pearson correlation, MANOVA and multiple and logistic regression are the statistical analysis techniques used for the survey research. In the final study, focus groups were employed based on the literature and the results of the first two studies to develop a social marketing intervention aimed at improving the treatment of driving anger. The results from and discussion of Study One are presented in Chapter Five, while the findings from the statistical analysis and the discussion are illustrated in Chapter Six. Chapter Seven presents and discusses the data obtained from Study Three.

## Chapter Five

### Environmental Factors—Findings and Discussion

#### **5.1 Introduction**

This chapter presents and discusses the findings from the semi-structured interviews conducted in the first stage of this study. The purpose was to explore different environmental stressors (traffic situations) that trigger anger within the framework of the cognitive motivational-relational model of emotions. Traffic scenarios obtained from the first question will be analysed, with a particular focus on identifying the key appraisal component of driving anger. Behaviours and thoughts elicited in response to the identified situations will be investigated, as well as factors that could have influenced reactions. All findings have been interpreted in conjunction with the development of an intervention to manage the problem of anger in traffic situations.

This study will use Creswell's (2008) linear and hierarchical approach to qualitative data analysis, introduced in Chapter Four. The data have been transcribed and are now ready for coding generation, searching for themes based on the coding, theme definition and labelling and report-writing. During the interviews, the researcher asked three questions, delineated in the previous chapter, to explore environmental factors that provoke anger on Saudi roads. Accordingly, the findings in this chapter will be divided into these three questions. Similar quotes have been grouped within each question, and general labels have been attached to each group to form higher themes.

#### **5.2 Results of the Findings**

##### **5.2.1 Question One: Can you describe the most angry traffic event that you have experienced in the past?**

This question aimed to identify the characteristics of common traffic situations that result in Saudi drivers experiencing anger. Twenty-two traffic scenarios were developed from the interview results, and these were separated for manual coding on an individual basis.

After the researcher read the scenarios several times, the main keywords for each were highlighted as part of the coding process.

First, the traffic incidents were broadly grouped into three main categories: the behaviour of other drivers, extraneous factors and traffic jams (see Table 5-1). Each category was further analysed to identify patterns and themes.

**Table 5-1 Traffic scenarios**

	Traffic scenarios	Main theme
1	The traffic light was green and was just about to turn red. I had accelerated to go through it, when suddenly the car in front of me stopped, so I had to swerve to prevent a collision. I also had to stop at the traffic light, which I could have gone through and saved time.	Behaviour of other drivers
2	I was driving in the middle lane of a three-lane road. There was a car in the right-hand lane, and we were approaching a roundabout, and he suddenly turned left, thereby forcing me to turn left as well to prevent a collision (I had planned to go straight on).	
3	I got really angry when someone cut into my lane without looking, especially because I was in a hurry and I wanted to reach my destination as soon as possible.	
4	I was waiting at a red traffic light, when someone sped up and ran the red light. He was very close to me (about to hit the wing mirror of my car).	
5	I was driving in the middle lane of a three-lane road. There was a car in the right-hand lane, and all of a sudden its driver turned left to make a Uturn, forcing me to brake harshly. Unfortunately, another car bumped into the back of my car.	
6	I was planning to turn right at the traffic light (which is permissible even at a red light), but the road was blocked with lots of cars, so I had to stop. However, the driver of the car behind me honked his horn numerous times, asking me to move!!! I could not move my car, as it was blocked in! When the road was clear, this car passed me and the driver gave me the finger!	



**Continue Traffic scenarios**

7	I was driving in the right-hand lane (which is not the passing lane), and the driver behind me flashed his headlights many times as a signal for me to move over. However, I did not move because I was not in the passing lane, and when he approached me, he opened his window, and gave me the finger!	
8	I was driving on a single-lane road when suddenly another driver pulled out, so I braked harshly and honked my horn to warn him, and he got angry and raised his hand (as if to say, "What is wrong? Why did you honk your horn?"!).	
9	I got really angry when someone hcut into my lane , and when I honked my to warn him, he started yelling!	
10	I got really angry when I was in a traffic jam and someone attempted to squeeze in front of me, showing off their driving skills, as if to say "I will show you who's best".	
11	I was driving in the passing lane; the driver behind me flashed his high beams lots of times as a signal for me to move over. There were many cars in the middle lane, so I could not move, but he insisted and kept flashing. On top of that, he was too close to my bumper (tailgating). What could I do, did he want me to fly?!	
12	A driver cut into my lane, without showing any respect either to me or to the rules of the road, and he did not use the indicator either.	
13	If I make a small, but not serious, mistake in traffic that affects another driver, and he gets angry and starts making hostile gestures.	
14	I got angry when I received a call that gave me bad news.	Extraneous factors
15	I got angry when I heard bad news on the radio.	
16	I get angry and speed up if someone has a car that is the same as mine, but better in terms of colour or extra accessories.	
17	I get angry when I have been caught by a speed camera.	
18	I get angry if I have a big argument with passengers.	

**Continue Traffic scenarios**

19	Being in a traffic jam.	Traffic jam
20	If I have to do many jobs in different places, because Riyadh is a big city and it takes hours to do few jobs, especially if I get stuck in a bad traffic jam.	
21	Anger comes after feeling stress. Here in Riyadh, we struggle with traffic jams, and sometimes other drivers cut you off in congestion, so you become angry. This always happens in congestion.	
22	What makes me angry is when someone cuts me off in congestion, especially when I am in a hurry.	

**5.2.1.1 Behaviour of other drivers**

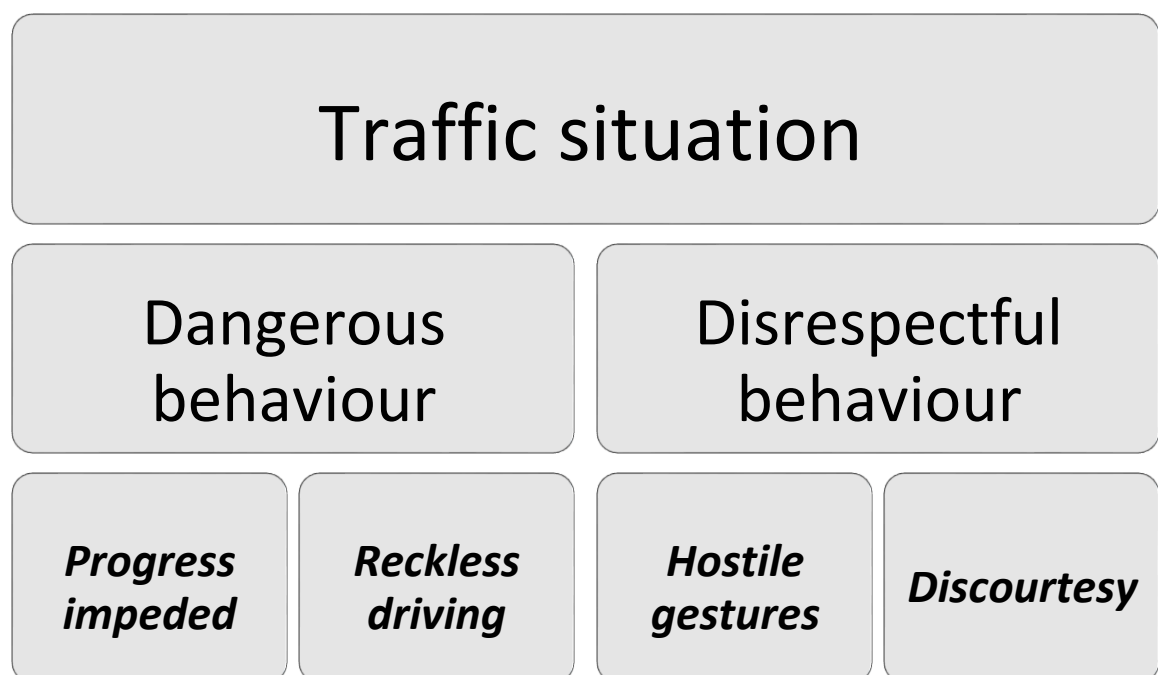
The source of anger reported most frequently was unanticipated actions by other drivers. Not surprisingly, errors by other drivers appear to be of strong importance on Saudi roads, as 13 out of 22 respondents in the present study recognised this source of anger. This finding concurs with the results of a study by Gulian et al. (1989), who used a self-reporting method to investigate the main problems and events that elicit stress on UK roads. Indeed, this finding was expected; since drivers share the road, conflict between them is likely to occur.

More important in this regard is the type of behaviours that continuously occur on Saudi roads and that might be unique to that country. Several previous studies have attempted to examine driving behaviours in Saudi Arabia. For example, when investigating drivers' behaviour at roundabouts in Riyadh, Al-Saleh and Bendak (2012) found that approximately 90% of all drivers driving through roundabouts breach at least one traffic regulation; leaving without indicating and entering the roundabout without giving way were the most frequently observed violations. Therefore, there is a need for a careful analysis of the scenarios found in this study to break them down into more specific criteria that could provide a far more detailed explanation of the types of errors made by other motorists.

Previous studies aiming to identify traffic scenarios have tended to reduce the data to categories, and each study has labelled the categories according to the findings. For example, Deffenbacher et al. (1994) identified six subscales: a hostile gesture (another driver signals anger at, or displeasure with, the driver); illegal driving (another driver breaks common traffic laws); police presence (police are present in the driving situation); slow driving (another driver or a pedestrian impedes traffic flow); discourtesy (another driver engages in discourteous, as opposed to illegal, behaviour); and traffic obstructions (events, other than another's slow driving, that frustrate or obstruct the driver). However, Lajunen et al. (1998) identified three factors, progress impeded, direct hostility and reckless driving (see also Parker, 2002; Sullman, 2007).

All these classifications and a search for new variables in the text facilitated initial identification of two main themes as illustrated in Figure 5-1. The first is “dangerous behaviour”, in which a driver experiences hazardous situations due to the actions of another driver, for example, “Someone cuts into my lane without looking”. The second is “disrespectful behaviour”, when another driver insults the driver, for example, “He gave me the finger”. Careful perusal of the scenarios identifies four possible subcategories: progress impeded, hostile gestures, reckless driving and discourtesy.

**Figure 5-1 Traffic situation classification**



### ***5.2.1.2 Progress impeded***

Any traffic events that impede traffic flow and/or force the driver to reduce his or her speed, to wait unnecessarily or to change direction as a result of the actions of another road user, are described as progress impeded situations (Deffenbacher, 2000). According to Lazarus' theory, these types of traffic events are "goal incongruent" because they block the driver's goal, which is to reach his or her destination in a specific time.

This response was expressed spontaneously within some scenarios. For example, one driver commented on his incident, which resulted in an unnecessary wait: "I also had to stop at the traffic light, when I could have gone through it and saved time". Another driver was forced to change direction to avoid a collision: "I had planned to go straight on, but he forced me to turn left". The addition of time urgency may result in a highly demanding traffic situation that is associated with anger.

One response emphasised this: "I get really angry when someone cuts into my lane without looking, especially if I am in hurry and I want to reach my destination as soon as possible".

### ***5.2.1.3 Reckless driving***

In the present study, reckless driving refers to actions by a driver that are likely to put other road users in danger and perhaps lead to near misses or even accidents. According to Lazarus, these types of traffic events are also goal incongruent because they block the driver's goal, which is maintaining safety.

The developed scenarios revealed that a common reckless behaviour among Saudi drivers was a failure to use the indicator when changing lane or unplanned manoeuvres, which makes the driver unaware of others' upcoming actions. This was shown by the frequent use of the word "suddenly" in the text.

"Suddenly the car in front of me stopped....So I had to swerve to prevent a collision".

"Suddenly he turned left, so he forced me to turn left as well to prevent a collision".

"He cut into my lane without looking".

“All of a sudden, he turned left to make a U-turn, which forced me to brake harshly”.

“Suddenly, another driver pulled out, so I braked harshly”.

“He ran a red light and he was very close to my car (about to hit the wing mirror)”.

#### ***5.2.1.4 Hostile gestures***

This refers to when another driver signals anger or displeasure, using words or actions that are aimed at insulting and challenging the recipient driver: “He gave me the finger” or “He started yelling”. According to Lazarus’ theory, these types of traffic events harm self-esteem because any aspects of the event that are relevant to a person’s identity such as those that affect self-esteem, moral values, etc., have a type of ego-involvement that is one of the primary appraisal components in determining emotion (see Chapter Two, Section 2.3.1.2).

Lack of human interaction between road users appears to be a reason for misunderstandings between them. Some drivers might be unaware of their wrongdoing, and the consequence is a possible conflict. For example, one driver stated that, “I was driving on a single-lane road, when suddenly another driver pulled out, so I braked harshly and honked my horn to warn him, and he got angry and raised his hand (like he was saying ‘What’s wrong? Why did you honk your horn?!’)”. In this case, the driver who pulled out may not have realised what his actions did to the other driver, so he could not understand why the latter honked his horn.

#### ***5.2.1.5 Discourtesy***

Motorists and pedestrians have the right to use public roads and be respected. Respectful driving behaviour such as letting others out at a junction or letting others in when in slowmoving traffic could make a difference to other drivers. On the other hand, discourtesy is engaging in disrespectful driving practices and showing no respect for other road users or for traffic laws (e.g., someone takes the parking spot another driver has been waiting for). Such behaviour has been identified as an important source of driving anger in some nations (Tay, 2007). According to Lazarus’ theory, these types of traffic events can be appraised as an affront to self- or social esteem (a type of ego-involvement).

The perception of disrespect by another driver may vary from one culture to another. In Saudi Arabia, flashing headlights or high-beams and sustained inappropriate horn-honking are associated with disrespectful public road behaviour.

“The car behind me honked his horn numerous times asking me to move!!! I could not move”.

“The driver behind me flashed his headlights numerous times as a signal for me to move over, but I did not move because I was not in the passing lane”.

Finally, it is also true that a combination of two types of these four situations could increase the intensity of anger. As one interviewee said, “Although he made a mistake that affected me, I tried to control my anger; however, once he started to yell and attacked me (verbally), I really got angry”.

#### **5.2.1.6 *Extraneous factors***

Several previous studies have examined the relationship between different sources of stress, such as work problems and driving behaviour (Rowden,2011; Matthews et al., 2011). However, few have investigated the impact of factors external to driving on experiencing the emotion of anger.

In the present study, the interview results unexpectedly indicated that factors extraneous to the driving environment may interact with drivers and consequently lead to their experiencing anger. Examples include, “I received a call giving me bad news”, “I heard bad news on the radio”, “I was caught by a speed camera” and “I had a huge argument with my passengers”.

However, it could be unclear whether these types of situations will generate anger or other negative emotions such as anxiety because the attribution of accountability is not clear. Therefore, it is difficult to interpret these findings. At the same time, an intervention should develop strategies to increase drivers’ awareness of the dangers of excessive emotional responses to daily hassles (e.g., driving fast to “blow off steam” after an argument) (Rowdena, 2011). Because this does not fall within the scope of this study, a further investigation should be conducted to examine extraneous factors that may be linked to the experience of anger in particular.

### **5.2.1.7 Congestion**

Several researchers have identified the traffic jam as one of the most stressful driving situations (Hennessy and Wiesenthal, 1999; Galovski and Blanchard, 2004). This study confirms this finding. When asked to describe a traffic scenario, the initial thought of most interviewees was being stuck in congestion and being in a hurry or waiting for long periods at traffic signals. However, it remains debatable whether congestion leads to anger and aggressive driving.

In some research (Hennessy and Wiesenthal, 1999), aggression was found to be greater in high than in low congestion conditions, but the reason for this was unclear in their study. Other studies (Underwood, et al., 1999) used a diary approach to measure drivers' anger and found no relationship between congestion and reports of anger.

Therefore, although congestion is perceived as threatening to a driver's goal of arriving at the destination on time, its link to driving anger is not yet clear. This is because goal incongruence could generate any negative emotion, for example, anxiety. Moreover, the experience of a traffic jam might increase the opportunity for anger-provoking events to occur, but it is also true that this could be because journeys in higher density traffic normally take longer to complete, thereby increasing the chance that anger will be experienced. This is perfectly exemplified by one participant's comment.

“Anger comes after feeling stress. We struggle here in Riyadh with traffic jams, and sometimes other drivers cut you up in congestion, so you become angry. This always happens in congestion”.

Another driver followed a similar theme, but he drew particular attention to the importance of time.

“What makes me angry is when someone cuts you up in congestion, especially when I am in a hurry”.

Another driver said:

“If I have to do lots of jobs in different places, because Riyadh is a big city, it takes hours to do a few jobs, especially with bad traffic jams”.

It is difficult to interpret these situations, since it is not yet clear why drivers experience anger in a traffic jam. Is it because of the situation itself or because of other factors that occur while they are in congestion? Therefore, the congestion situation and extraneous factors are blurred areas of research that require further investigation of their relationship with driving anger.

### **5.3 Question Two: Why do you become angry in a traffic event?**

This question aims to identify which appraisal component of anger (goal incongruence, threat to self-esteem or blame) is most defining of anger. It is worth briefly recalling the theoretical background to this study, which stems from Lazarus' theory of anger. The main assumption of this theory is that cognitive appraisals of situations, events or perceptions cause different discrete emotions, and each emotion has a unique appraisal structure that helps differentiate it from other emotions. For example, anger arises and is distinguished on the basis of a person's subjective evaluation of an environment on appraisal dimensions such as goal incongruence, harm to self-esteem and blaming. That is, for anger to be experienced in traffic, not only must a driver's goal have been thwarted, but his or her self-esteem must have been demeaned, accountability must have been attributed, and the responsible person must have been presumed in control of his/her actions. Accordingly, an external agent who could have refrained from causing the harm must be located for anger to be experienced on the roads (Lazarus 1993a).

Question Two was the most difficult to research because people were not always able to identify their perceptions of situations. The interviewees were encouraged to think deeply about the situation and were asked further questions, such as “How would you have appraised this event?” and “What does it mean to you?” to identify the most important appraisal in eliciting anger in traffic. Although the analysis of the text indicates that reckless and disrespectful behaviours were two commonly cited themes, the behaviour of other drivers was perceived by the participants as an important source of anger in traffic.



This can clearly be observed from their responses to this question (see Table 5-2). This finding supports the argument that other accountability is a key appraisal for anger.

**Table 5-2 Reasons for being angry in traffic**

Because I had to swerve to prevent a collision.	Someone put me in danger	Harming or demeaning offence against me and mine
Because he forced me to brake harshly.		
Because he forced me to turn left to prevent a collision.		
Because he is following the rules of traffic too closely.		
Because he forced me to break harshly, which could have damaged my car.		
Because he gave me the finger.	Someone insulted me	
Because he cut into my lane.		
Because he did not show any respect, either to me or to the rules of the road.		
Because he did not admit to his mistake.		
Although he made a mistake that affected me, I tried to control my anger; however, once he started to yell and attack me (verbally), I got really angry.		
Because I consider the lane as (mine), so I do not want anyone to take it from me.		

As has been stated throughout this thesis, the most important goal for drivers is to reach their destination safely and on time. Consequently, reckless driving by other road users, which could put the driver in danger, is an important reason behind activation of anger.

“Because I had to swerve to prevent a collision”.

“Because he forced me to brake harshly”.

“Because he forced me to turn left to prevent a collision”.

“Because he forced me to brake harshly, this could have damaged my car”.

Furthermore, threats to self-esteem on roads may constitute a source of anger. The results suggest that there are three sub-themes under ego threats: abusive language (“He started to yell and attacked me (verbally)”), obscene gestures, (“He gave me the finger”) and having one’s car blocked (“He cut into my lane”).

It is interesting that drivers can interpret the same situation differently. One participant appraised being cut off as an unsafe manoeuvre, but another driver had a different view, stating, “He cut into my lane without showing any respect, either to me or to the rules of the road”. Another said, “Someone attempted to squeeze in front of me, showing off his driving skills.”

As stated in Chapter Two, anger results from an individual’s appraisal of harm to self-esteem for which another is responsible, and the core relational theme for anger was “a demeaning offence against me and mine”. However, it appears that while this notion partially describes anger in the traffic domain, it does not capture all traffic situations that might cause anger. Harmful (any dangerous behaviour such as cutting off) and disrespectful behaviours (any behaviour that insults drivers such as giving the finger) caused by an external agent are both fundamental in provoking anger on Saudi roads. This is also consistent with studies conducted in the context of sport. Uphill and Jones (2007) found that athletes appraised an event in some way as harmful or injurious to one’s self or goals rather than as demeaning. Therefore, driving anger could be experienced in traffic due to drivers’ appraisals of having been harmed and/or insulted by another driver.

Thus, it could be concluded that the best short definition of anger in the traffic domain is a “harming or demeaning offence against me and mine”.

#### **5.4 Question Three: What do you do when someone makes you angry?**

The third question explored the impact of experiencing anger in traffic on drivers' behaviour. Notably, drivers wanted to give the impression of good behaviour when asked, "What do you do when someone makes you angry?" This is because most of the responses came from an Islamic point of view. In the holy book (the Quran), Allah (God) states that he will give a great reward to those "who restrain anger and who pardon the people". Also, the messenger of Islam has said, "I know a statement that if anyone says it then the person with anger will cool down. The person with anger should say: 'I seek refuge in Allah from Satan the outcast'". Thus, such a socially desirable effect had been expected in the present study. When the interviewee responded in such a way, the question was repeated, with an emphasis on what really happened rather than what drivers should do.

Table 5-3 clearly shows a strong relationship between aggression and anger in traffic, which is consistent with the findings of previous studies. Just over half (53%) of the participants indicated that they had been involved in different types of risky behaviour after experiencing anger in traffic, whereas the remainder of the participants think positively and prefer to maintain safer practices when dealing with anger.

"I use the headlights, horn and my hands and I might also yell at the other driver to show him my anger".

"I chased him".

"I hit the steering wheel until I calm down".

"I hit (bumped) his car".

"I speed up more until I calm down".

"I stop in the middle of the road to block it and get ready for a fight".

This creates a strong position in which to emphasise the rationale of this research and the need to study driving anger in Saudi Arabia, as well as confirming the common impression that driving anger is a genuine phenomenon worthy of further consideration.

**Table 5-3 Responses to traffic events causing anger**

Positive thinking	“I will seek refuge with God from the evil”.
	I will think positively and find some excuse for him, ‘He might be in an emergency situation’”.
	“I will think positively and not consider the event important”.
	“I hope to God that the situation does not become worse”.
	“I do not like to get involved in conflict, so I will not do anything”.
	“I will not do anything if he apologises”.
Aggressive reaction	“I will use the headlights, horn and my hands, and I might yell at the other driver to show him my anger”.
	“I will chase him”.
	“I will hit the steering wheel until I calm down”.
	“I will hit (bump) his car”.
	“I will speed up more until I calm down”.
	“I will stop in the middle of the road to block it and get ready for a fight”.
	“I will turn the radio up too loud”.

In a similar manner, a valuable finding is the fundamental impact of three external factors on the reaction of an angry driver: the passengers in the car, the driver’s experience and the identity of the offender (young or old).

The presence of parents and peers in traffic situations is a significant influence on drivers’ behaviour (Keating and Halpern-Felsher, 2008; Glendon, 2013). Parental involvement in the car remains key to reducing risky behaviour in traffic and has a calming effect on drivers.

One participant assigned the reason for his anger control to the presence of his mother: “My mother was with me, so I tried to control myself”. In contrast, the peer group plays an important role in changing young drivers’ attitudes towards road safety. This concurs with the assumption that the attitudes held by the young driver are related to his need to be accepted by his peers (Clark and Powell, 1984). One driver confirmed this when stating, “Sometimes, my passengers encourage me to become involved in risky behaviour”.

Interestingly, drivers are likely to have different appraisals of the situation, depending on their perception of the offender. One interviewee stated that:

“My reaction will be different depending on who the other driver is, if he is young and careless I might react strongly, but if he is an old man, I would not do anything”.

Indeed, this is completely in accordance with the claim that accountability will be attributed to someone who caused the injury and who could have refrained from doing so (Lazarus, 1993b). In this case, the driver might think that an old driver is not intentionally causing the harm and that he could not have acted otherwise. Accordingly, he is not blameworthy, so the driver might restrain his anger. Conversely, anger will be experienced if the driver believes that a young driver who caused the harm should not be allowed to drive; he could then be the object of anger.

By the same token, driving experience was found to be a vital factor in influencing driving anger. This agrees with Björklund's (2008) findings that novice drivers with low annual mileage reported more anger than more experienced drivers. One interviewee said that,

“In my early years of driving, I was involved in different risky traffic situations, but now I am more aware of the risks”.

Accordingly, it is possible that the identification of common types of traffic situations that trigger driving anger might be a useful source of information for road safety training to prepare drivers for such conflicts.

Finally, it has been determined that the other driver is one of the main sources of anger in traffic, but the behaviour of apology appears to enhance forgiving: “I will not do anything if he apologises”.

## **5.5 Conclusion and implications**

This study has applied Lazarus' theory to investigate the characteristics of driving anger to provide information for social marketers to develop intervention strategies. The use of appraisal theory (see Chapter Two) makes a significant contribution to behavioural change because it is a form of interdisciplinary thinking that emphasises the importance of using emotional theories in the context of such change.

The main purpose of this study was to identify the types of traffic situations that trigger the emotion of anger in the driving domain. In addition, the three appraisal components of anger (goal incongruence, threat to self-esteem and blame) have been examined to identify the key appraisal component of driving anger.

This study has found that wrongdoing by other drivers was the most fundamental source of anger in traffic in Saudi Arabia for this sample of drivers. This offence included four types of traffic incidents: progress impeded, reckless driving, hostile gestures and discourtesy. The data also confirm that other-blame was the key appraisal component of driving anger, as suggested by Lazarus' theory. Finally, the interviews identified three influential factors on drivers' responses to events: social influence (passengers and parents), driver experience and types of other drivers.

The implications of these results suggest several strategies to minimise the effect of driving anger. First, most previous studies focused solely on individual drivers, whereas the results of the present study highlight the crucial importance of three different audiences that should be considered when designing an intervention: the drivers, the person who deserves the blame (the other driver) and the passengers (if applicable). Above all, it was noted that many responders recognised that wrong actions by another driver were the main sources of anger and confirmed that the appraisal of blame was the key component of anger. Therefore, designing an intervention that aims to improve certain driving behaviours should effectively reduce anger. A crucial strategy that could be used when targeting the offender is the promotion of road courtesy. In this sense, courtesy refers to both behaviours and attitudes. Failing to signal properly, cutting off, improper passing, flashing headlights or high-beams and sustained horn-honking have all been identified as behaviours that must be targeted.

Drivers should be encouraged to share the road, consider how their actions could affect other road users, and adjust their own behaviours accordingly. Likewise, it is important to promote an apologetic attitude, as the results revealed that an apology from the offender could defuse the feeling of anger.

In addition, a combination of time pressure and being forced to drive more slowly may rapidly trigger anger. Thus, authorities should constantly devise strategies to relieve the pressure of time, such as implementing flexible working times. Redirecting the driver's attention to maintaining road safety and reminding him or her of the main goal of his or her trip appear to be important. Of particular note is the impact that congestion and extraneous factors may have on the driving environment and driving behaviour. This highlights the necessity to recognise the complexity of the driving context and for a holistic approach to road safety and associated interventions.

This study has several limitations. First are the difficulties in measuring the intensity of anger in the identified traffic situation to determine the most important type. Second, as with all methodologies, focus groups have shortcomings in that they are not representative of an entire population. Additionally, the participants' responses may have influenced those of others, although every effort was made to put participants at ease and elicit individual views. However, the researcher used both in-depth interviews with individuals and focus groups to increase the quality and usefulness of the data. Therefore, the facts that the drivers were selected from two districts in Riyadh and the small sample number mean that the results of this study should be generalised with considerable caution. Third, although the results indicate a relationship between anger and aggression, they do not show any link between anger and driving performance, such as speeding and accidents. Finally, this study has not measured demographic and driving experience variables, which may moderate the experience of anger. Therefore, the results obtained should be interpreted in conjunction with the quantitative data in the next chapter.

Finally, the focus on the effect of traffic incidents on driving anger has no means to underestimate the significance of understanding the individual. Certainly, not only do the characteristics of particular traffic incidents affect the elicitation of anger, but the characteristics of the driver evaluating the event are also important.

Therefore, the next chapter will examine these characteristics and present the results of the second study to piece together a coherent picture of this issue to assist social marketers in mitigating driving anger.



## Chapter Six

### Personality and Coping Strategies— Findings and Discussion

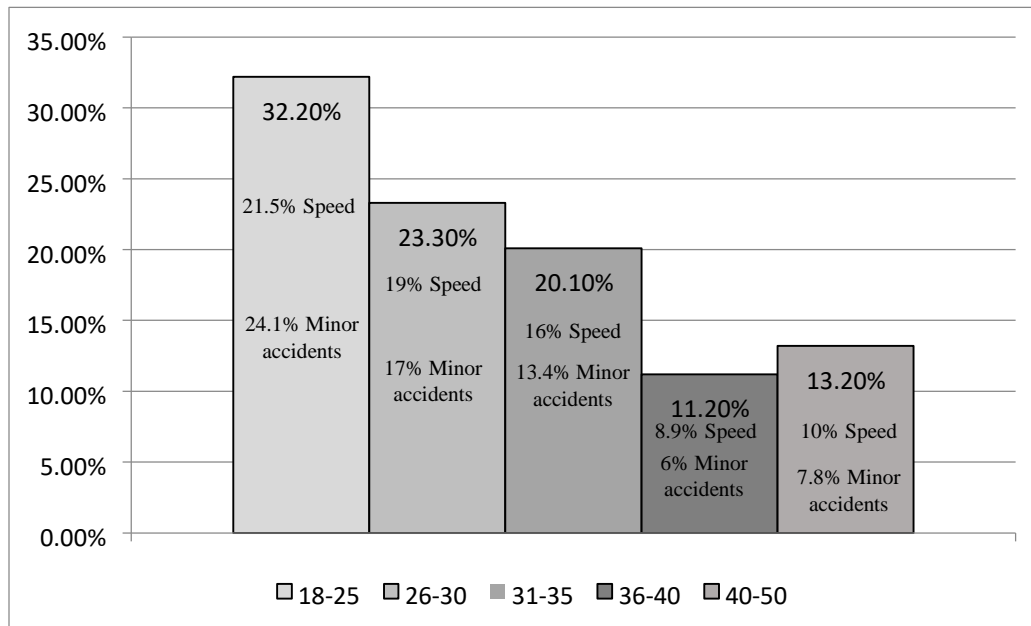
#### **6.1 Introduction**

In the first study of this research (Chapter Five), the researcher interviewed twelve drivers in Saudi Arabia to explore in detail the environmental stressors that provoke anger in traffic and identify the key appraisal component of anger. The results underscored the need for further investigation to understand both individual differences in appraising traffic events and the coping strategies utilised by Saudi drivers. This chapter will present the analysis of data gathered from Driver Stress Inventory (DSI) and Driver Coping Questionnaire (DCQ).

#### **6.2 Participants**

A total of 710 Saudi male drivers aged between 18 and 50 years (see Figure 6-1) voluntarily participated in the questionnaire. Frequency distribution and descriptive analysis were conducted in SPSS for missing and out-of-range values and to check for consistency. After data cleaning, 652 drivers remained. Most were experienced (mean 15.13 years driving experience). Almost all participants drove daily (99%), which indicated that a car is the only means of going to work or school (there is no public transportation in Saudi). Most drivers reported driving between 2 and 90 hours Sunday through Thursday (weekdays) (mean 9.78) and between 2 and 40 hours Friday and Saturday (weekends) (mean 5.11). The percentage of drivers who had one or more minor accidents in the last three years was 68.3%, whereas only 13.3% reported having a major accident in the same period. The percentage reporting being fined for exceeding a speed limit was 75.3%, while 16.4% had been charged with reckless driving.

**Figure 6-1 Age and performance of the drivers**



### 6.3 Measurement

In addition to demographic information, data on the following two measures were collected.

*Arabic version of the Driver stress inventory (ADSI):* Forty-eight items of the Driver Stress Inventory (Matthews et al., 1997) were used to measure stress reactions of drivers.

This self-report questionnaire has five subscales that assess different types of personality in traffic: aggression, dislike of driving, hazard monitoring, fatigue proneness and thrill-seeking.

*Arabic version of the Driver Coping Questionnaire (ADCQ):* Thirty-five items of the Driver Coping Questionnaire (Matthews et al., 1997) were used to assesses cognitive reactions to driving when it is difficult, stressful or upsetting. The questionnaire asks respondents how they try to deal with these types of traffic situations. It measures five dimensions of coping derived from the transactional model of stress, with both explicit behaviours and internal psychological coping strategies. The coping strategies measured included confrontive coping, task focus, emotion focus, reappraisal and avoidance.

## 6.4 DSI and DCQ overview

Table 6-1 shows the means and standard deviations of all sub-scales of both the DSI and DCQ. Scale scores were computed for each participant and can potentially range from 12 to 60 for both aggression and dislike of driving and from 8 to 40 for the remaining sub-scales in DSI. For the coping scales, the scores range from 7 to 35. The higher the score on each scale, the more the driver engages in that particular coping strategy.

In general, drivers reported relatively high levels of aggression and hazard monitoring, indicating that these were the common personality traits among Saudi drivers. Task focus and reappraisal were chosen more frequently than the other three coping strategies.

**Table 6-1 Means (M) and standard deviations (SD) for subscale scores of the Driver Stress Inventory (DSI) and Driver Coping Questionnaire (DCQ)**

	N	Minimum	Maximum	Mean	Std. Deviation
*Aggression	652	24.00	60.00	3.53	6.70
Dislike of driving	652	16.00	53.00	3.02	5.69
Hazard monitoring	652	15.00	40.00	3.93	4.25
Fatigue proneness	652	8.00	40.00	3.09	6.49
Thrill-seeking	652	8.00	40.00	2.39	6.54
Confrontive coping	629*	7.00	35.00	2.44	7.07
Task focus	629*	7.00	35.00	3.65	6.36
Emotion focus	629*	7.00	35.00	2.78	6.02
Reappraisal	629*	7.00	35.00	3.19	6.42
Avoidance	629*	7.00	34.00	2.39	5.37

\*Excludes drivers who did not base their answers on real traffic situations.

**\*Aggression**; the driver's reaction of irritation, impatience, and behavioural aggression, particularly when the driver's progress is impeded by other drivers. **Dislike of driving**; related to anxiety, unhappiness and lack of confidence. **Fatigue proneness** describing symptoms of tiredness. **Hazard monitoring** related to increased concentration for potential hazards. **Thrill-seeking** defined by items that describe enjoyment of danger. **Confrontational coping** involves several behaviours that might be considered dangerous. **Task-focus** strategies involve active attempts to enhance safety when driving is difficult or demanding. **Emotion-focused** is a negative strategy by which the driver blames him- or herself for difficulties he or she encounters or over-criticising his or her performance. **Reappraisal** is related to positive evaluation of driving experience. **Avoidance strategy**, the driver attempts to ignore the stressor by distracting him- or herself with something unrelated to the situation.

## 6.5 Factor analysis of the Saudi DSI

A principal components analysis (PCA) was conducted with oblique rotation on a 48-question questionnaire (DSI) that measured vulnerability to driver stress of 652 Saudi drivers. Using a PCA to define the component structure is consistent with the procedure used in the development of the DSI (Matthews et al., 1996; Dorn et al., 2010). It has been adopted in this study for easy comparison. The PCA determined the extent to which the factor structure of this study replicated the structure of the original questionnaire to determine which items failed to contribute to the analysis.

The overall Kaiser-Meyer-Olkin (KMO) measure was 0.86 with individual KMO measures all greater than 0.6; these are classifications of “mediocre” according to Kaiser (1974). Bartlett’s test of sphericity was statistically significant ( $p < .0005$ ), indicating that the data were likely to be factorisable. The PCA revealed 11 components that had eigenvalues greater than one and that explained 55% of the total variance.

However, visual inspection of the scree plot indicated that seven factors might be more appropriate to extract, which explained 45.4% of the total variance (Cattell, 1966). As such, seven components were retained. Table 6-2 shows component loadings and communalities of the rotated solution.

Forty-three items with factor loadings greater than 0.3 were selected to form the “Saudi driver stress” scales. The first two components comprised the items for fatigue proneness and thrillseeking, respectively. Component three consisted of 11 items and is labelled hazard monitoring, since seven of them are from the original hazard scale. The remainder are from other scales but may also refer to hazards, such as “Does it worry you to drive in bad weather?”

Component four consisted of four cognitive items referring to specific beliefs about the self (three items from dislike of driving and one from aggression); for example, “Do you feel confident in your ability to avoid an accident?” is therefore assigned to self-confidence.

Component five is comprised of five negative items that consider impeding traffic flow or forcing the driver to reduce speed to wait unnecessarily (four items from aggression and one from dislike of driving); for example, “Are you annoyed when the traffic lights change to red when you approach them?” is assigned to impatient driving. Component six, aggression, has seven items, six related to feelings of anger, hostility and negative beliefs about other drivers and only one related to dislike of driving. A seventh component had only one item loading and is omitted here. Finally, five items (four items from dislike of driving and one from hazard monitoring) did not load sufficiently strongly to warrant inclusion.

Scales were derived for each of the six factors; all items went through a procedure of two steps to maximise factor purity. The first was based on the commonly used benchmark of a loading greater than .3. Saucier (1994) recommended the second for a factor-pure item, suggesting that the item’s loading on the marked factor should be at least twice the value of the next highest loading. Table 6-2 presents the final numbers of items for the six scales.

**Table 6-2 Factor pattern matrix for the DSI**

Factor	1	2	3	4	5	6	7
<b>Factor 1: Fatigue Pronounce</b>							
Your vision becomes less clear	.833						
Become increasingly inattentive to road-signs	.801						
Reactions to other traffic increasingly slow	.761						
Overtaking becomes increasingly risky and dangerous	.742						
Increasingly difficult to judge your speed	.741						
Increasingly bored and fed-up	.692						
More drowsy or sleepy	.664						
More uncomfortable physically	.544						
<b>Factor 2: Thrill-seeking</b>							
I get a real thrill out of driving fast	.834						
I enjoy the sensation of accelerating rapidly	.829						
I would enjoy driving a sports car on a road with no speed-limit	.716						
I enjoy cornering at high speed	.641						
I sometimes like to frighten myself a little while driving	.632						
I would like to risk my life as a racing driver	.630						
I like to raise my adrenaline levels while driving	.606						
<b>Factor 3: Hazard-Monitoring</b>							
I become annoyed if another car follows very close behind mine for some distance			.625				
I try very hard to look out for hazards even when it's not strictly necessary			.621				
When I come to negotiate a difficult stretch of road, I am on the alert			.563				
I always keep an eye on parked cars in case somebody gets out of them			.559				
I make an effort to see what's happening on the road a long way ahead of me			.530				
If I make a minor mistake when driving, I feel it's something I should be concerned			.479				
I make a special effort to be alert even on roads I know well			.464				
<b>Factor 4: self confidence</b>							
Do you feel confident in your ability to avoid an accident?				.727			
Do you think you have enough experience and training to deal with risky situations on the road safely?				.616			
When you overtake another vehicle do you feel in command of the situation?				.513			
<b>Factor 5: Impatient driving</b>							
Are you annoyed when the traffic lights change to red when you approach them?						-.623	
Does it annoy you to drive behind a slow moving vehicle?						-.617	
When you're in a hurry, other drivers usually get in your way						-.470	
Do you feel more anxious than usual when driving in heavy traffic?						-.469	
<b>Factor 6: Aggression</b>							
Do you find it difficult to control your temper when driving?							.697
Do you lose your temper when another driver does something silly?							.672
At times, I feel like I really dislike other drivers who cause problems for me							.584
Other drivers are generally to blame for any difficulties I have on the road							.552
Driving brings out the worst in people							.532
<b>Variables excluded from the analysis (factor loadings &lt;0.4)</b>							
I make a point of carefully checking every side road I pass for emerging vehicles	-.004	.057	.390	.043	.142	.165	-.535
My driving would be worse than usual in an unfamiliar hired car	.166	.147	.212	-.099	-.057	.053	.297
I find myself worrying about my mistakes and the things I do badly when driving	.054	.022	.194	.028	.100	.164	.026
When you overtake another vehicle, do you feel tense or nervous?	.205	.028	.261	-.292	.230	.099	.230
Advice on driving from a passenger is generally useful.	.037	-.154	.196	.224	.216	.044	.064
Do you think it is worthwhile taking risks on the road?	.000	.459	-.129	.195	-.012	-.019	.318
I feel more anxious than usual when I have a passenger in the car	.049	.098	.459	-.132	.040	.101	.268
Do you usually make an effort to look for potential hazards when driving?	.023	.055	.457	.302	.028	.072	.251
Does it worry you to drive in bad weather?	.161	-.143	.456	-.237	.084	.056	.316
When driving on an unfamiliar road do you become more tense than usual?	.129	.011	.450	-.164	-.204	.105	-.014
It's important to show other drivers that they can't take advantage of you	.016	.080	-.021	.354	-.268	.317	.053
Are you usually patient during the rush hour?	.005	.084	.250	.158	.477	-.380	-.057
Does driving usually make you feel aggressive?	.015	.088	-.190	-.023	-.100	.604	.307
I am disturbed by thoughts of having an accident or the car breaking down	.180	.007	.237	-.195	.070	.314	.235

## 6.6 Factor analysis of the Saudi DCQ

The factor structure of the DCQ was examined using a principal components analysis with oblique rotation (Matthews et al., 1997). A scree test criterion was used to determine the number of components to be retained. The overall Kaiser-Meyer-Olkin (KMO) measure was 0.84 with individual KMO measures all greater than 0.6. These are classifications of “mediocre” according to Kaiser (1974). Bartlett’s test of sphericity was statistically significant ( $p < .0005$ ), indicating that the data were likely to be factorisable.

The PCA revealed nine components that had eigenvalues greater than one and that explained 54% of the total variance. However, visual inspection of the scree plot indicated that five factors might be more appropriate to extract, which explained 44% of the total variance. Table 6-3 shows component loadings and communalities of the rotated solution.

Factor one is labelled “task focus” and is comprised of twelve items reflecting attempts to avoid being involved in road accidents. Seven of these items were related to concentration on the task at hand, and four items refer to attempts to reappraise the situation more positively. The second factor is comprised of eight items that express confrontation and anger through risk taking, labelled “confrontive coping”. Six of the eight items loaded in this factor were from confrontive coping, one was from reappraisal related to showing the other driver “I am in charge”, and the last item was from emotion focus describing negative feeling about driving. The third factor is comprised of six items related to “blaming oneself” for the situation; this factor could be named “self-criticism”. The fourth and fifth factors are comprised of nine items referring to staying detached mentally and physically from the situation, with seven items from the avoidance scale and two from reappraisal. Thus, they are labelled “cognitive avoidance” and “emotional avoidance”, respectively.

The included items underwent the same method previously described. The final numbers of items and alpha reliability coefficients for the five scales were presented in Table 6-3. The result of factor analysis shows that some similarity and differences between the original and Saudi versions of DSI and DCQ. Therefore, the next section will re-run the same analysis looking at significant correlations between the new variables.

**Table 6-3 Factor pattern matrix for the DCQ**

Factors	1	2	3	4	5
<b>Factor 1: Task focus</b>					
Made an extra effort to drive safely	.685				
Made a special effort to look out for hazards	.682				
Deliberately slowed down when I met a difficult traffic situation or bad weather	.659				
Learned from my mistakes	.647				
Concentrated hard on what I had to do next	.644				
Felt that I was becoming a more experienced driver	.583				
Thought about the consequences of having an accident	.576				
Made an effort to stay calm and relaxed	.525				
Made sure I kept a safe distance from the car in front	.522				
<b>Factor 2: Confrontive coping</b>					
Swore at other drivers (aloud or silently)	.718				
Flashed the car lights or used the horn in anger	.715				
Showed other drivers what I thought of them	.713				
Let other drivers know they were at fault	.673				
Showed other drivers I was in control of the situation	.492				
Tried to make other drivers more aware of me by driving close behind them	.487				
Wished that I found driving more enjoyable	.311				
<b>Factor 3: Self-criticism</b>					
Worried about my shortcomings as a driver					-.707
Criticised myself for not driving better					-.653
Worried about what I was going to do next					-.513
<b>Factor 4: Emotional avoidance</b>					
Told myself there wasn't really any problem					.705
Refused to believe that anything unpleasant had happened					.559



**Factor 5: Cognitive avoidance**

Stayed detached or distanced from the situation **.598**

Cheered myself up by thinking about things unrelated to the drive **.537**

**Variables excluded from the analysis**

Felt I was learning how to cope with stress **.521** .015 -.109 .317 -.081

Tried to gain something worthwhile from the drive **.425** -.132 -.157 -.005 .219

Made sure I avoided reckless or impulsive actions **.418** -.229 .103 -.020 .406

Drove assertively or aggressively -.363 **.524** -.301 -.060 .025

Wished that I was a more confident and forceful driver -.043 .009 **-.555** -.106 .338

Blamed myself for getting too emotional or upset .121 .327 **-.409** .080 -.214

Relieved my feelings by taking risks or driving fast -.269 .361 **-.419** -.020 .067

Thought about good times I've had .329 -.054 -.366 **.425** -.146

Went on as if nothing had happened -.051 -.148 .075 **.566** .280

Looked at the drive as a useful experience -.049 .000 **-.289** **.420** -.090

Thought about the benefits I would get from making the journey .319 **-.033** **-.356** **.386** **-.122**

Ignored my feelings about the drive **-.154** **.027** **.014** **.384** **.487**

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## 6.7 New DSI and DCQ factors overview

Table 6-4 presents the means and standard deviations of all scales of both the DSI and DCQ. Scale scores were computed for each participant; the higher the score on each scale, the more the driver engages in that particular factor. In general, drivers reported relatively high levels of impatient driving and hazard monitoring, indicating that these were the common personality traits among Saudi drivers. Task focus and self-criticism were chosen more frequently than the other three coping strategies when dealing with stressful and conflict traffic situations.

**Table 6-4 Means (M) and standard deviations (SD) for subscale scores of new DSI and DCQ**

	N	Minimum	Maximum	Mean	Std. Deviation
New aggression (5 Items)	652	6.00	25.00	3.57	3.58
New hazard (7 Items)	652	13.00	35.00	3.95	3.86
Self confidence (3 Items)	652	4.00	15.00	3.68	1.93
Impatient driving (4 Items)	652	7.00	20.00	3.89	2.71
Fatigue proneness (8 Items)	652	8.00	40.00	3.09	6.49
New Thrill-seeking (7 Items)	652	7.00	35.00	2.49	6.06
New task focus (9 Items)	629*	9.00	45.00	3.65	8.04
New confrontive coping (6 Items)	629*	6.00	30.00	2.68	6.43
Self-criticism (3 Items)	629*	3.00	15.00	3.06	3.68
Emotional avoidance (2 Items)	629*	2.00	10.00	2.35	2.34
Cognitive avoidance (2 Items)	629*	2.00	10.00	2.69	2.39

## 6.8 Correlation analysis

Pearson correlation was run to assess the relationship between Saudi DSI scales. Table 6-5 shows the inter-correlation between the new DSI scales and alpha reliability coefficients. New aggression has a significant positive correlation with other scales but not with self-confidence. Impatient driving has the highest correlation with aggression ( $r = .41$ ). Interestingly, thrillseeking has a significant positive correlation with self-confidence ( $r = .12$ ) and impatient driving ( $r = .25$ ), indicating that the higher level of confidence a driver feels or the less patient he or she is, and the more likely they take a risky behaviour like speeding. The low level of Cronbach's Alpha for both self-confidence and impatient driving could be the result of the smaller number of items (Kline, 2011).

**Table 6-5 DSI new scale inter-correlations and  $\alpha$  coefficients**

	1	2	3	4	5	6	Cronbach's Alpha
New aggression	1	.37**	.03	.41**	.22**	.16**	.68
New hazard	.37**	1	.20**	.32**	.11**	.03	.72
Self-confidence	.03	.20**	1	-.01	-.11**	.12**	.55
Impatient driving	.41**	.32**	-.01	1	.29**	.25**	.65
Fatigue proneness	.22**	.11**	-.11**	.29**	1	.03	.86
New thrill-seeking	.16**	.03	.12**	.25**	.03	1	.83

\*\**. Correlation is significant at the 0.01 level (2-tailed).*

\**. Correlation is significant at the 0.05 level (2-tailed).*

The inter-correlation between Saudi DCQ scales was satisfactory in general. The highest inter-scale correlation was between task focus and self-criticism ( $r = -.35$ ). Contrary to the original confrontive coping, the new confrontive has only a weak correlation with emotional avoidance, which requires further investigation.

Internal consistency scores (i.e., Cronbach's alpha) were determined for each subscale of the coping questionnaire, which shows good consistency between items, but avoidance factors need further improvement (see Table 6-6 for full details).

**Table 6-6 New DCQ scale inter-correlations and  $\alpha$  coefficients**

	1	2	3	4	5	Cronbach's Alpha
New task focus	1	-.04	-.35**	.20**	.26**	0.74
New confrontive coping	-.04	1	-.05	.09*	.03	0.82
Self-criticism	-.35**	-.05	1	-.14**	-.15**	0.74
Emotional avoidance	.20**	.09*	-.14**	1	.14**	0.51
Cognitive avoidance	.26**	.03	-.15**	.14**	1	0.44

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

Table 6-7 shows that consistent with the transactional model of driver stress (Matthews et al., 1997; Matthews et al., 1998), new aggression scales were positively related to confrontive coping and negatively related to self-criticism. New hazard was positively related to new task focus and confrontive coping, contrary to expectations. Finally, people high in impatient driving reported higher use of confrontive coping and less use of self-criticism.

**Table 6-7 Correlations between New DSI and DCQ scales**

	New task focus	New confrontive	Selfcriticism	Emotional avoidance	Cognitive avoidance
New aggression	-.08*	.23**	-.12**	-.09*	.00
New hazard	.22**	.10**	-.18**	-.00	.05
Self-confidence	.11**	.07	.01	.06	.07*
Impatient driving	-.02	.18**	-.15**	-.07	.02
Fatigue proneness	.00	.06	-.14**	-.04	.06
New Thrill-seeking	-.17**	.08*	.05	-.08*	-.01

\*\*. Correlation is significant at the 0.01 level (2-tailed).

\*. Correlation is significant at the 0.05 level (2-tailed).

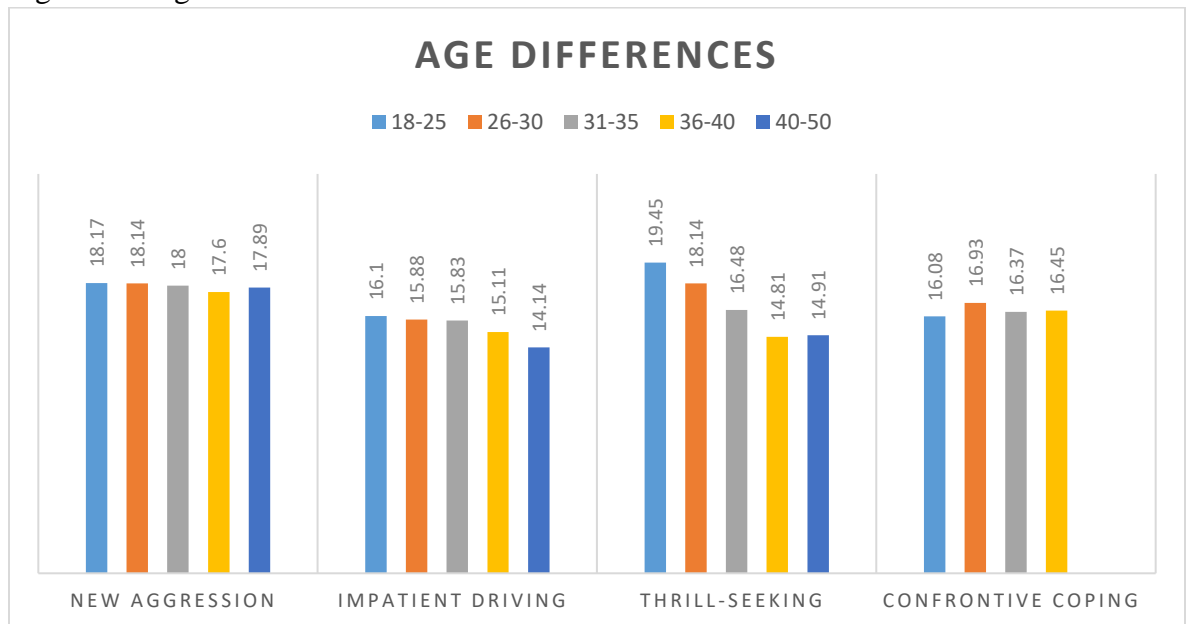
## 6.9 Age and experience differences

To examine whether Saudi drivers in the four age groups (18-25, 26-30, 31-35, 36-40 and 40-50) differed in their vulnerability to driver stress and the frequency of their use of coping strategies, a multivariate analysis of variance (MANOVA) was carried out. The independent variable in this analysis was age groups, and the dependent variables were the six dimensions of the Saudi DSI and the five subscales of coping strategies in the Saudi DCQ. The results indicate that there was a significant multivariate main effect for age (Wilks'  $\lambda = .822$ ,  $F(44, 2350.965) = 2.81$ ,  $p < .0005$ ). Given the significance of the overall test, the univariate main effects were examined.

Significant univariate main effects for age were obtained for new aggression ( $F(4, 624) = 2.396$ ,  $p = .049$ ), self-confidence ( $F(4, 624) = 2.661$ ,  $p = .032$ ), impatient driving ( $F(4, 624) = 9.38$ ,  $p < .0005$ ), thrill-seeking ( $F(4, 624) = 14.851$ ,  $p < .0005$ ) and confrontive coping ( $F(4, 624) = 3.164$ ,  $p = .014$ ).

Significant age pairwise differences were investigated because younger drivers reported higher levels of new aggression (mean 18.178), impatient driving (mean 16.104), thrill-seeking (mean 19.450) and confrontive coping (mean 16.084) than older drivers (16.843, 14.145, 14.916, and 13.916, respectively). (see Figure 6-2) (See appendix seven for full table)

Figure 6-2 Age differences



Moreover, Table 6-8 shows a moderate negative correlation between driver experience and new aggression ( $r = -.111$ ), impatient driving ( $r = -.201$ ) and thrill-seeking ( $r = -.252$ ); that is, these scales decrease due to increased experience. In addition, increased experience moderately led to an increase in self-confidence ( $r = .124$ ), which was expected.

**Table 6-8 Correlation between experience and Saudi DSI and DCQ factors**

Experience	New confrontive	New task	Self-criticism	Emotional avoidance	Cognitive avoidance	
	.00	.03	.04	.07	-.03	
	New aggression	Self-confidence	New hazard	Impatient driving	Fatigue	New thrill-seeking
	-.11**	.12**	.00	-.20**	-.06	-.25**

\*\**. Correlation is significant at the 0.01 level (2-tailed).*

Furthermore, although young drivers are (by definition) inexperienced, they may be older drivers that are similarly inexperienced. Indeed, the literature contains several studies that have tried to separate the effect of inexperience (length of licensure) and youth in roadway accidents (see McCartt et al, 2009 for a review). These researchers found that both youthfulness and inexperience play independent and important roles in the high-crash risk of younger and novice drivers. Accordingly, it is still unclear whether young age or lack of experience is a better predictor of driver stress leading to road rage. Moreover, the higher risk posed by younger drivers (as a class) can be explained by biological factors that are common among all of them.

For example, at the age of sixteen, the human brain is still not fully matured, particularly in the area of the brain called the frontal lobe—an area thought to be involved in executive control and risk taking (De Craen, 2010). Therefore, it might be useful to segment drivers into four groups in order to better identify the differences between them, specifically in terms of their vulnerability to experiencing driving-related stress—anger in particular. These groups can be classified as follows: (1) young (and thus inexperienced) drivers, (2) old and inexperienced drivers and (3) old and experienced drivers.

## **6.10 Self-reported behaviour**

### **6.10.1 Minor accidents**

A hierarchical multiple regression was run using three steps to predict minor accidents. In the first step, Saudi DSI factors were entered, while the contribution of the Saudi DCQ coping strategies to the prediction of minor accidents was assessed at step two. Step three consisted of the demographic variable age. The full model of these variables (Model 3) statistically significantly predicted minor accidents ( $R^2 = .115$ ,  $F(12, 616) = 6.644$ ,  $p < .0005$ ).

The results of the first model showed that after controlling for DCQ and age (because MANOVA analysis revealed differences between age groups), four of the Saudi DSI scales were significant predictors of minor accidents. New aggression ( $\beta = .107$ ,  $p = .016$ ), impatient driving ( $\beta = .098$ ,  $p = .030$ ) and new thrill-seeking ( $\beta = .216$ ,  $p < .01$ ) had significant positive regression weights, indicating that drivers with higher scores on these three scales were expected to have a higher number of accidents. However, self-confidence ( $\beta = -.102$ ,  $p = .017$ ) had a significant negative weight, indicating the more confidence the driver, the fewer accidents he was involved in.

Although none of the DCQ predicted accidents, the addition of coping factors to the prediction of minor accidents dropped new aggression, impatient driving and self-confidence from the model. Expectedly, the addition of age to the prediction of minor accidents had a significant negative weight ( $\beta = -.131$ ,  $p < .01$ ), indicating that older drivers were expected to have fewer accidents. Only thrill-seeking and new hazard monitoring were significant in the third model (see Table 6-9 for full details).

**6-9 Hierarchical regressions with Saudi DSI factors on step 1, Saudi DCQ factors on step 2, and age on step 3**

Factors	Minor accidents					
	Model 1 R <sup>2</sup> = .091		Model 2 R <sup>2</sup> = .100		Model 3 R <sup>2</sup> = .115	
	$\beta$	P $\leq$	B	P $\leq$	$\beta$	P $\leq$
New aggression	.10	<b>.01</b>	.08	.05	.08	.05
New hazard	-.01	.80	-.09	<b>.02</b>	-.09	<b>.03</b>
Self-confidence	-.10	<b>.01</b>	-.00	.97	.00	.83
Impatient driving	.09	<b>.03</b>	.08	.05	.06	.13
Fatigue	.01	.79	.01	.78	.01	.67
New thrill-seeking	.21	<b>.00</b>	.20	<b>.00</b>	.17	<b>.00</b>
New task focus			-.02	.58	-.02	.52
New confrontive			.04	.31	.03	.37
Self-criticism			-.04	.34	-.03	.41
Emotional avoidance			-.05	.15	-.05	.15
Cognitive avoidance			-.05	.17	-.05	.14
Age					-.13	.00

**6.10.2 Speed and reckless driving**

This analysis aimed to ascertain the effects of the Saudi DSI, Saudi DCQ and age variables on convictions of speeding and reckless behaviour. Since the dependent variable (speed) was binary (i.e., yes or no), a binary logistic regression analysis was appropriate. In these logistic regression analyses, Saudi DSI scales were entered in the first step, Saudi DCQ scales were entered in the second step and age was entered in the third step. Categorical variables of age were re-coded as contrasts between (0) young (18-25) and medium age (26-30) groups and (1) older than 30 years.

Table 6-10 shows that the first two stages explained 9% (Nagelkerke R<sup>2</sup>) of the variance in conviction of speeding. Of the variables in model one, only self-confidence and impatient driving were significant. In the second stage, DCQ explained an additional 1.5% to the variance. Cognitive avoidance was significant in this model. The full model best explained conviction of speeding.



**6-10 Binary logistic regression of the experience being charged by speeding**

Factors	Speed					
	Model 1 R <sup>2</sup> = 7.5%		Model 2 R <sup>2</sup> = 9%		Model 3 R <sup>2</sup> = 10.3%	
	β	P≤	β	P≤	β	P≤
New aggression	-.05	.09	-.05	.10	-.04	.13
Self-confidence	.14	<b>.00</b>	.15	<b>.00</b>	.15	<b>.00</b>
New hazard	-.05	.05	-.05	.05	-.06	<b>.04</b>
Impatient driving	.17	<b>.00</b>	.18	<b>.00</b>	.18	<b>.00</b>
Fatigue	.00	.70	.00	.68	.00	.73
New thrill-seeking	.01	.36	.01	.35	.02	.13
New task focus			-.00	.90	-.00	.94
New confrontive coping			-.00	.54	-.00	.60
Self-criticism			-.03	.25	-.03	.22
Emotional avoidance			.01	.82	.01	.78
Cognitive avoidance			-.09	<b>.02</b>	-.09	<b>.01</b>
Age					-.48	<b>.01</b>

*Note: Age is for older compared to younger.*

The model was significant ( $\chi^2(12) = 45.384, p = .000$ ), explaining 10.3% (Nagelkerke R<sup>2</sup>) of the variance in conviction of speeding and correctly classifying 76.0% of cases. Of the 12 predictor variables, only five were statistically significant: self-confidence, impatient driving, new hazard, cognitive avoidance and age (see Table 6-10). Increasing self-confidence and impatient driving were associated with an increased probability of speeding convictions, but increasing new hazard monitoring and cognitive avoidance were associated with a reduction in being fined for speeding. Finally, young drivers are more likely to be charged with speeding than older drivers.

Table 6-11 shows the results of the stepwise logistic regression to predict convictions for reckless driving. The results show no difference between the first and two models. New hazard monitoring, impatient driving and new thrill-seeking remain significant in both models. However, adding the age variable to the last model changes impatient driving and new thrill-seeking from significant to non-significant.

## 6-11 Binary logistic regression of the experience being charged with reckless driving

Factors	Reckless driving					
	Model 1 R <sup>2</sup> = 6.4%		Model 2 R <sup>2</sup> = 6.8%		Model 3 R <sup>2</sup> = 8.5%	
	$\beta$	P $\leq$	$\beta$	P $\leq$	$\beta$	P $\leq$
New aggression	.02	.50	.02	.48	.02	.52
Self-confidence	.03	.57	.03	.54	.03	.54
New hazard	-.09	<b>.00</b>	-.09	<b>.00</b>	-.09	<b>.00</b>
Impatient driving	.10	<b>.04</b>	.10	<b>.04</b>	.08	.08
Fatigue	.02	.21	.02	.21	.02	.19
New thrill-seeking	.04	<b>.01</b>	.04	<b>.01</b>	.03	.07
New task focus			.00	.59	.00	.62
New confrontive coping			-.00	.81	-.00	.81
Self-criticism			.00	.85	.00	.82
Emotional avoidance			-.04	.36	-.04	.35
Cognitive avoidance			-.02	.61	-.02	.66
Age					.62	<b>.01</b>

*Note: Age is for older compared to younger.*

## 6.11 Discussion

Before analysing traffic situations, it is necessary to discuss the main findings so far. The aims of using DSI and DCQ were to identify Saudi driver characteristics in terms of their driving personalities, coping styles and driving performance and validate the Arabic versions of the DSI and DCQ in the Saudi context. This discussion addresses four major issues: habitual driving styles and identifying how these styles are influenced by drivers' personal characteristics; coping strategies and their implications for road safety practitioners; the link between three driving problems—accidents, speeding and reckless driving—and both driverpersonality and coping; and the validity of Arabic versions of the DSI and DCQ in the Saudi context.

### 6.11.1 Driving personality

Driving styles were measured to identify the common personality among Saudi drivers. From the original scales, hazard monitoring and aggression have the highest means compared to the other three types of stress, while the new scales revealed that impatient driving and new hazard monitoring have the highest means.

It seems that aggressive driving behaviour and the attribute of being impatient in traffic are the major concerns on Saudi roads (see Table 6-12), particularly impatient driving as 66% of Saudi drivers score more than 15 (out of 20) on this scale and it is the strongest predictor of poor driving performance.

**Table 6-12 Summary of the relationship between driving styles and driving performance**

Driving styles	Minor accidents	Speed	Reckless driving
Aggression	Positive		
Hazard monitoring			Negative
Self-confidence	Negative	Positive	
Impatient driving	Positive	Positive	Positive
Fatigue proneness			
Thrill-seeking	Positive		Positive

Impatient driving is contextually significant because Saudi Arabia has high traffic density and congestion, which can worsen a driver's feeling of impatience. Supporting this finding, Hassan (2014) found that running late was the main reason for taking risks while driving in Saudi Arabia. Moreover, the literature showed that deliberate dangerous driving to save time at the expense of others (running red lights and stop signs, obstructing path of others, weaving) is one type of aggressive driving (Shinar, 1998).

The main challenge of these findings is that if impatient driving style and practices are common in Saudi Arabia, this may raise risks in the Kingdom from an accumulation of unsafe behaviour patterns that might become socially acceptable with time (Magableh et al., 2013). This is because driving behaviour is strongly influenced by the attitudes of one's family, peers and other significant people because each driver is affected by the collective behaviour of other drivers (Zaidel, 1992; Redshaw, 2001; Özkan, 2010). Therefore, such behaviours might be difficult to influence at an individual level without considering them on a social level as well. Consequently, dealing with behaviour beliefs and attitudes at a cultural level is important (Redshaw, 2001).

Like most previous studies (Matthews et al., 1998; Matthews et al., 1999; Andrews and Westerman, 2012), this study identified age-related differences in driver stress vulnerability, with younger drivers reporting higher levels of aggression, impatient driving and thrill-seeking than older drivers. Furthermore, these three factors plus dislike of driving were negatively correlated with experience. At the same time, driving experience gained over several years played an important role in producing more advanced driving skills, which resulted in more confidence in driving (Andrews and Westerman, 2012).

As a matter of fact, more than half of the participants in this study were under the age of 30, and the result revealed that this group is more likely to engage in risky behaviour. This suggests this group should be targeted with a strategy that prevents the negative effects of these driving styles.

### **6.11.2 Coping strategies**

Coping strategies were examined to identify the common coping styles among Saudi drivers. Task focus and reappraisal were found to be frequently used by most Saudi drivers in stressful traffic situations. Interestingly, similar results were found in three other samples: UK workers and students, US students (Matthews et al., 1996) and Australian coach drivers (Machin and Hoare, 2008). However, the Saudi scales revealed that task focus and self-criticism were chosen more frequently than the other three coping strategies when dealing with stressful and conflict traffic situations. One explanation for this finding might be that Saudi roads are considered some of the most dangerous in the world, and when they are about to drive there, people often say to each other something like “Be ready for the war”. This could increase the necessity to be more alert in traffic and focus on safety more than anything else.

Furthermore, this study revealed that younger drivers tend to adopt a more confrontive coping strategy. In contrast, the more experienced a driver is, the more likely he is to avoid conflict in traffic.

### **6.11.3 Driving performance**

In the Saudi context, several factors may be responsible for the high rate of minor accidents in this study (68.3%). First, previous studies have identified speeding as the main cause of accidents in Saudi Arabia. For example, Ansari et al. (2000) examined the cause and effect of road traffic accidents in Saudi Arabia and found that over 50% were linked to excessive speed. Likewise, more than one-third (36%) of the male students in Al-Khalid's study (2006) identified high speeds as the most significant cause of accidents.

Recently, the Saudi government implemented a law enforcement system (LES) as part of the larger Saher System to monitor traffic violations automatically and issue violation notices; however, 75.3% of the participants in this study admitted to exceeding the posted speed limit, which is in line with results reported in previous studies. These findings are significant in any discussion of the usefulness of the law alone in changing behaviours.

Second, Saudi cities do not have public transportation systems, so there is a high percentage of daily car use and, correspondingly, a high rate of minor accidents. Third, the number of registered vehicles increases year by year, which means more cars come on the roads every day. Fourth, the number of expatriates who are unfamiliar with local driving conditions and requirements continues to increase (Ansari et al., 2000). Last is the rapid expansion of road construction and the use of mobile phones for calling or texting (Al-Aseeri and Oghuehi, 2013).

The particular focus here has been on driving styles. Substantial research has identified high rates of aggression as a predictor of traffic accidents, speeding and reckless driving (Matthews et al., 1997; Matthews, 2002; Kontogiannis, 2006; Dorn and Gandolfi, 2007; Öz et al., 2010). These findings were partly confirmed by this study: The results indicated that aggressive drivers drive faster than those with different personality types and are more likely to be involved in accidents. In contrast, the revised aggression scale was only able to predict involvement in minor accidents, but not any undesirable behaviour such as speeding and reckless driving. Nevertheless, the impatient driving scale, which was part of the original aggression scale, was stronger in predicting traffic accidents, speeding and reckless driving.

These findings make sense for two reasons. First, the original aggression scale consisted of 12 items that measured three characteristics: appraisal of other drivers' intentions (e.g., "Other drivers are generally to blame for any difficulties I have on the road"), patience level in certain traffic situations (e.g., "Does it annoy you to drive behind a slow moving vehicle?") and the level of aggressive behaviour (e.g., "Does driving usually make you feel aggressive?").

In contrast, the revised aggression scale contained five items that only measured the negativity of the driver's beliefs towards the behaviour of other drivers (blaming) (e.g., "Driving brings out the worst in people"). Moreover, the factor analysis extracted four items from the original aggression scale that measure patience level only and were labelled "impatient driving". Consequently, because the original aggression measured different aggressive characteristics, it is not clear exactly which is stronger in predicting certain behaviours in traffic. Therefore, the aggression scale needs to be defined clearly and its characteristics broken down into subscales. Further studies should be conducted on impatience driving scale.

Second, aggressive drivers do not always underestimate risk or overestimate their driving skills (Matthews, 2002). Aggressive drivers are not always risk-takers who drive confrontively and dangerously in all situations, because the logistic regression model in this study did not predict a relationship between an aggressive driving style and reckless driving. Therefore, the problem with those drivers is most likely to arise when anger is activated by situational cues, such as congestion or conflict with another driver (Matthews et al., 2010). Instead, in this study, impatient drivers are far more likely to exhibit dangerous behaviours than aggressive drivers as indicated in table 6-20.

It is important to note that the reckless driving measure in this study should be analysed with caution because the questionnaire did not define or describe the meaning of reckless driving. The literature gives several examples of reckless driving behaviour, including speeding, running red lights, changing lanes and using mobile phones (McNally and Bradley, 2014). Accordingly, the participants may have interpreted this measure differently. However, the high percentage of drivers (16.4%) who had been charged with reckless driving needs further study to examine the common reckless driving behaviours among Saudi drivers.

Finally, thrill-seeking is another important scale that needs to be taken into account because it was the strongest predictor in the original DSI for self-reported accident involvement, speeding and reckless driving.

Furthermore, coping strategies such as confrontive and emotion-focused coping are generally associated with more negative outcomes such as violations, errors and loss of safety (Matthews et al., 1996; Machin and Hoare, 2008; Desmond and Matthews, 2009). However, none of the coping strategies in this study could confirm these findings.

The possible explanation is that, unlike the previous studies of coping, the instructions of the DCQ adopted in this study were based on a specific traffic incident rather than a general coping style (dispositional coping). The respondents were asked to report traffic events and complete the DCQ based on the prescribed situation. This different procedure might explain why coping factors could not predict any driving behaviour. This finding is interesting because it may suggest that general coping used by drivers differs from coping strategies used in a situation-specific study. Indeed, a study by Brown et al. (2011) examining coping among African American young adults to determine whether there are differences in the way they cope generally and in the way they cope with racism-related situations found that they reported using various strategies, but they used a different set of coping strategies in racism-related situations. Therefore, future research should examine whether general coping used by drivers differs from coping strategies used in situation-specific study.

#### **6.11.4 Validation of the questionnaires**

The factor analysis results for the Arabic-adapted DSI identified six types of driving personalities among Saudi drivers: aggression, hazard monitoring, self-confidence, impatient driving, fatigue proneness and thrill-seeking. These factors were similar to the original factors but had specific differences. For instance, the impatient driving style is an important factor in the Saudi context; it should be separated from aggression to provide a clearer understanding of aggressive drivers' behaviour. However, the reliability of this scale in the current study was only .65; therefore, further support for this scale, such as adding more items that measure the tendency of being patient in traffic, is needed to improve its validity.

Likewise, some of the "dislike of driving" items are inapplicable to the Saudi context. For instance, the nature of the weather phenomena that contribute to drivers' stress levels may be different in various regions.

In Riyadh, hot weather (34.7 C, with a maximum of 42.7 C), paired with heavy traffic and intense sunlight, is an important factor in increased stress and decreased performance (Nofal and Saeed, 1997). Accordingly, the item related to weather conditions should be re-written to focus on hot weather rather than general bad weather, because snow and hail are very rare in Riyadh.

In addition, there may be cross-cultural differences in the perception of risk. For example, overtaking from the wrong side or performing an incorrect U-turn is more common in Saudi Arabia than in the United States (Ansari et al., 2000); thus, a Saudi driver is less likely to experience anxiety while overtaking another vehicle (Matthews et al., 1999). This may explain why the item “When you overtake another vehicle, do you feel tense or nervous?” failed to load in any factor.

Furthermore, the factor analysis results for the DCQ in this study showed less consistency with those in the UK study (Matthews et al., 1996), particularly for reappraisal and avoidance scales. Translation, method or cultural differences, or some combination of these factors may account for the inconsistency. Unfortunately, the literature on coping strategies in Saudi Arabia is very limited, partially due to poor access to data. More studies are required to fill this gap and develop a better understanding of coping strategies in the Saudi context.

The correlates of the original DSI scales in this study were generally similar to those in the UK sample (Matthews et al., 1997). In particular, this study replicated the positive correlations between aggression and thrill-seeking and between dislike of driving and fatigue proneness in the UK study. However, there were some differences. For instance, aggression and thrill-seeking had the highest correlations among UK drivers, whereas aggression and dislike of driving had the highest correlations among Saudi drivers. These differences may be related to the higher traffic density and congestion in Saudi Arabia. Likewise, aggression had a negative association with hazard monitoring in the UK study.

However, unexpectedly, aggression had a positive correlation with all DSI scales in the current study, including hazard monitoring. This suggests that even alert drivers who generally focus on task coping may become aggressive in certain traffic situations in Saudi Arabia (Kontogiannis, 2006). Moreover, the results established an association between thrillseeking and both self-confidence and impatient driving.



In this case, the more confident a driver feels or the less patient a driver is, the more likely he or she is to perform a risky behaviour such as speeding. Similar findings were reported in a study on Australian drivers (Hartley and El Hassani, 1994), which showed that drivers with a long record of driving violations rated themselves higher in terms of confidence in vehicle control.

However, caution is needed in explaining correlations between factors because drivers may be affected by stress in other domains, including work and domestic life. Further research might examine the dynamic interplay between driving and life stress more closely (Rowden et al., 2011).

On the other hand, the correlates of the original DCQ scales in this study were generally similar to those in the UK sample (Matthews et al., 1997). However, the new confrontive coping has no correlation with other coping strategies except a weak correlation with emotional avoidance, which requires a further examination of this scale.

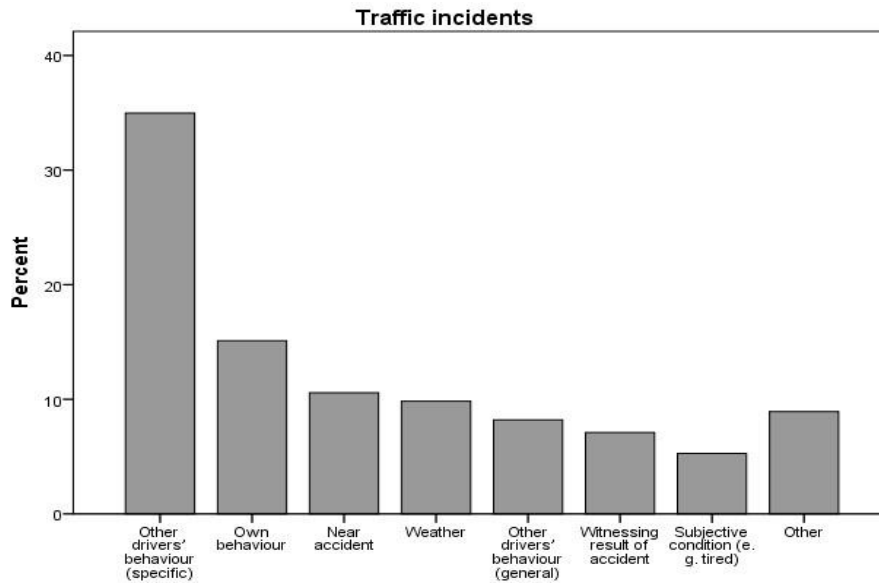
The chapter now looks in detail at different traffic events and their relationship with anger, different personalities and coping strategies.

## **6.12 Analysis of traffic incidents**

As was noted at the beginning of this chapter, respondents were asked to report a traffic problem they encountered while driving and complete DCQ based on it. Five hundred forty-nine traffic incidents were obtained from the analysis and were classified into ten main categories ranging from weather to factors extraneous to driving, as was described in methodology chapter.

Figure 6-3 Traffic incidents shows that the source of stress most frequently spontaneously reported in Saudi roads is specific behaviour by a particular driver (as opposed to general behaviour by other drivers). Thirty-five percent of all responses recognise this source of stress. Moreover, “other behaviour” is expressed in very general terms.

**Figure 6-3 Traffic incidents**



For example, “There are several dangerous behaviours that repeatedly happen on our roads that always cause accidents, for example, tailgating, flashing high beams and wrong-way driving (e.g., driving a motor vehicle against the direction of traffic”.

Another driver generally blames other drivers for any difficulties he has on the road: “Most drivers here in Riyadh are idiots, which make me really nervous”.

A further analysis of this source reveals several specific driving behaviours. Sudden changes of lane or merging from a side road into the main road without using the indicators are by far the most common behaviours that cause drivers to experience stress in general and anger in particular. For example, consider the following driver’s comment: “A taxi driver changed his lane from the left to the right without considering other traffic, just to pick up a customer”.

Another behaviour in this category is intentional reckless behaviour, as some driver use their cars as weapons to get revenge in response to the incorrect perception of other’s behaviour

“The car behind me was trying to overtake but I was not able to move to the middle lane because of the traffic. Once I got the chance to move, he passed me and cut off my lane as a sign of his anger”.

Running a red light, which puts others in great danger, is also a behaviour recognised by participants: “Someone deliberately ran a red light and was about to cause a serious collision with me”.

Given the fact that this study focused on anger, Pearson correlations were run to assess the relationship between types of traffic situations and anger. In line with the findings in Study One, Table 6-13 shows that other drivers’ behaviours, whether specific or general, are the only type of traffic incidents related with high anger.

**Table 6-13 Pearson correlation between anger and type of traffic situation**

Weather	-.20**
Car condition	-.08*
Witnessing result of accident	.06
Other drivers’ behaviour (specific)	.31**
Subjective condition (e.g., tired)	-.12**
Traffic/road conditions	.00
Near accident	-.11**
Other drivers’ behaviour (general)	.12**
Own behaviour	-.09*
Extraneous factors	.05

Anger

*Correlation is significant at the 0.01 level (2-tailed). \*\**

*Correlation is significant at the 0.05 level (2-tailed). \**

### 6.12.1 Correlation between type of traffic situation, personality and coping strategies

The researcher examined the relationship between identified traffic situations and different types of personalities and coping strategies. Therefore, he coded those ten categories into dummy variables to enable statistical analyses and investigated the relationships between them and both personalities and coping strategies. For example, the weather situation was given a score of 1, and the others were given 0.

Regression analyses for each type were used for predicting the use of coping strategies, in which the type of situation was entered as dependent and coping strategies were entered as independent. Table 6-14 shows that confrontive coping strategy is more likely to be used in a situation in which the driver attributed negative outcomes to other drivers.

In addition, there was a high probability of using emotion focus and self-criticism when driver commit mistakes (i.e., using mobile phones) and lapses (i.e., memory and attentional) while driving. Finally, Saudi drivers seem to be more alert and focusing on the task when driving in adverse weather conditions (i.e., slowing down when driving under reduced visibility conditions).

**Table 6-14 Regression analysis on the relationship between coping and different type of traffic situations**

Coping	1		2		3		4		5	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
New task	<b>.18</b>	<b>.00</b>	.00	.88	.03	.44	-.02	.51	-.01	.77
New confrontive	<b>-.22</b>	<b>.00</b>	<b>-.09</b>	<b>.01</b>	-.00	.87	<b>.31</b>	<b>.00</b>	<b>-.21</b>	<b>.00</b>
Self-criticism	<b>-.16</b>	<b>.00</b>	.01	.73	-.01	.78	<b>-.15</b>	<b>.00</b>	<b>.15</b>	<b>.00</b>
Emotional avoidance	.01	.63	<b>.09</b>	<b>.02</b>	.01	.79	-.03	.33	-.01	.63
Cognitive avoidance	-.03	.42	-.07	.06	-.00	.95	-.00	.94	-.03	.43

Coping	6		7		8		9		10	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
New task	-.01	.69	.05	.17	<b>.08</b>	<b>.04</b>	-.02	.62	-.01	.74
New confrontive	<b>-.08</b>	<b>.03</b>	-.06	.12	<b>.15</b>	<b>.00</b>	<b>-.13</b>	<b>.00</b>	.05	.20
Self-criticism	.02	.61	.02	.51	<b>-.10</b>	<b>.01</b>	<b>.23</b>	<b>.00</b>	-.03	.43
Emotional avoidance	.00	.83	-.00	.87	.02	.48	-.06	.07	.01	.79
Cognitive avoidance	-.03	.44	.02	.55	.00	.96	.01	.79	-.02	.56

*\*\*1 = Weather, 2 = Car condition, 3 = Witnessing result of accident, 4 = Other drivers' behaviour (specific), 5 = Subjective condition (e.g., tired), 6 = Traffic/road conditions, 7= Near accident, 8 = Other drivers' behaviour (general), 9= Own behaviour, 10 = Extraneous factors*

### 6.12.2 Prediction of anger on the road

It is important to remember that anger and appraisal components were measured in this study for a specific traffic situation, since respondents were given an option to rate their level of anger for the written situation as well as three questions about appraisal.

The next sections will identify which type of personality and coping strategies are stronger in predicting the experience of anger in traffic and will explore the relationship between anger and its appraisal component.

According to a transactional model of driver stress (Chapter Two, Section 2.5), an aggressive driver is more prone to aggression (personality) who tends to appraise environmental stressors (e.g., a risky manoeuvre by another driver) as hostile and intended to impede his or her progress. Therefore, he or she is more likely to adopt a confrontational coping strategy and retaliatory behaviour (e.g., tailgating the “offending” driver) (Lennon et al., 2011).

Therefore, a linear regression was conducted to determine whether driving styles (DSI) and coping strategies (DCQ) contribute to the prediction of anger on Saudi roads, as the model suggested. The DSI and DCQ scales as well as the Saudi DSI and Saudi DCQ scales were entered separately into the regression in four models to assess their independent effects on anger.

As expected, new aggression ( $\beta = 0.15$ ,  $p < 0.01$ ), impatient driving ( $\beta = 0.12$ ,  $p < 0.05$ ) and new confrontive coping ( $\beta = 0.41$ ,  $p < 0.01$ ) were significant predictors of anger in traffic. This also was supported by the results of Study One (qualitative), in which there was a link between anger and aggressive behaviour. Moreover, these findings are vital in segmenting drivers because it is more important to target those who score high in these scales in an intervention (Table 6-15).

**Table 6-15 Regression analysis of the relationship between anger and both DSI and DCQ**

Factors	Anger			
	Saudi DSI $R^2 = .073$		Saudi DCQ $R^2 = .183$	
	$\beta$	$P \leq$	$\beta$	$P \leq$
New aggression	<b>.15</b>	<b>.00</b>		
Self-confidence	-.00	.90		
New hazard	.07	.10		
Impatient driving	<b>.12</b>	<b>.00</b>		
Fatigue	-.01	.70		
New thrill-seeking	-.02	.53		
New task focus			-.05	.21
New confrontive			<b>.41</b>	<b>.00</b>
Self-criticism			.01	.67
Emotional avoidance			<b>-.09</b>	<b>.01</b>
Cognitive avoidance			.04	.19

#### **6.12.2.1 Appraisal components of anger**

Study One found qualitatively that other-blame was the key appraisal component of driving anger, as Lazarus' theory suggested. This study also examined quantitatively which appraisal components were related to anger by conducting multiple regressions analysis. Blaming, threatened the self (safety) and threatened self-esteem were entered to evaluate their sufficiency for the experience of anger. The model showed that blaming ( $\beta = 0.375$ ,  $p < 0.01$ ) and threatened self-esteem ( $\beta = 0.326$ ,  $p < 0.01$ ) significantly predict the experience of anger.

### **6.13 Conclusion and recommendations**

This study explored habitual driving styles in Saudi Arabia by conducting a self-reported survey. Additionally, coping strategies used by Saudi drivers were examined in different traffic incidents. Overall, the findings indicate that self-report measures of driver stress can be used to predict certain driving criteria for drivers in Saudi Arabia and the Gulf States because they share a similar culture.

The factor structure and correlates of the Saudi DSI are broadly similar to those of the original British version of the questionnaire, but there may also be some notable cross-cultural differences. In Saudi, feeling time pressure and displaying impatience during driving appear to be associated with unsafe driving behaviours. It may be worthwhile for road safety strategists to screen drivers for impatience since this particular form of stress is a particularly important causal factor of anger and aggression on the road. Interventions targeting impatient drivers should take into account both upstream and downstream approaches to effectively reduce the negative consequences of impatience. Strategies at a structural level could include road design that ensures greater flow of traffic and reduces the pressure of being stuck in traffic, electronic signs displaying better information about delays on the road, or the government introducing working policies that give employees flexible start and finish times.

Strategies at the individual level could include training-based interventions directed towards different personalities, as identified here. However, the main challenge of such a strategy is recruiting young drivers who believe they already possess sufficient skills to drive safely. How to market the intervention to the community is an important step towards building a strong relationship with the target audience. The next chapter will fill this gap by interviewing those drivers who are at risk of experiencing driving anger.

## Chapter Seven

### Intervention Design and Testing

#### **7.1 Introduction**

Chapter Three noted that it is fundamental to conduct formative research, not only to understand the target audience but also to pre-test the programme's materials and ideas before final implementation. The secondary and primary data from this thesis have revealed several ideas that need to be pre-tested with the target audience to examine their effectiveness in solving driving anger issues. Chapter Seven presents the findings obtained from the focus group interviews (18 drivers) conducted during the third stage of the data collection process. In particular, this chapter will show the results of testing three concepts. First, the study tested the promotion of "clinical" interventions such as relaxation techniques and cognitive interventions to improve recruitment process. The second concept was the effectiveness of messages that focus on positive coping strategies to motivate drivers to manage anger and maintain safety. The final concept was encouraging drivers to positively appraise their situation by sending messages that should help them look at events from a different perspective. These results were used to develop an intervention to reduce the negative effect of driving anger.

#### **7.2 Results of focus group interviews**

The data obtained from Study Three have been structured according to the interview protocol described in the methodology chapter (see Appendix five). This section is divided into five sections: starter questions, training intervention, coping strategy, positive messages and general findings. The results are presented under each subheading, with all groups combined due to commonalities in terms of their profiles and general agreement between them. Any differences between the three groups or within the same group have been noted. These findings have then been used to discuss drivers' perceptions towards the treatment of anger due to driving.



### **7.2.1 Starter questions**

It was very important to base the discussion on a solid foundation and to understand the participants' perceptions of the driving anger issue. Hence, at the beginning of the discussion, general questions concerning driving anger were posed.

#### ***7.2.1.1 Importance of the issue***

When initially asked whether driving anger in Saudi Arabia is an issue worth investigating, the three groups agreed and expressed concern over the issue.

“You really have a point in studying anger on Saudi roads, because I think drivers in Riyadh have a higher chance than other cities in the world of experiencing driving anger” (Group Three).

Another driver from Group Two was dissatisfied with driving in the city and showed great concern about anger.

“I am really suffering from anger, and I do not think it is just me; if you have a quick look at other drivers' faces, you can notice the expression of anger. We really worry about every single journey that we make”.

Moreover, Chapter Two determined that family issues are external factors that could cause anger in traffic (Gulian and Debney et al., 1989). However, one driver in Group One raised a fundamental negative effect of driving anger as driving makes him nervous and that carries over after he reaches home.

“When I get back home after driving, I become really nervous, so that affects my relationship with my family”.

Another participant in Group Two shared a story that he heard about someone killing another driver on the roadside. Indeed, the participants believe that fighting on the roadside (road rage) is the main consequence of driving anger. Such results support the reason for studying driving anger and related issues to control their negative effects.

### ***7.2.1.2 Causes of driving anger***

Other participants tried to explain the causes of this issue. In their views, there are internal and external factors that cause anger. For example, some drivers are calm even in congestion, while others may experience anger in various traffic events. Therefore, it is important to consider different types of personalities (e.g., trait anger).

Another internal factor is that most drivers are in a rush, so any obstacle blocking their way (e.g., congestion, roads being cut off) could trigger driving anger, especially when they have an important appointment. Hence, it is important to identify and target aggressive and impatient drivers as well as those who use confrontive coping.

On the other hand, the participants gave several examples for external factors, such as the weather (e.g., hot, cold and rain), that could increase the chance of being angry if drivers are not comfortable driving in such conditions. Moreover, police officers sometimes are not strict with drivers who break the rules or endanger other drivers, but these types of behaviours elicit anger. Furthermore, unfortunately, narcissism on roads is common, and many drivers do not share the roads in an appropriate way.

Data from Studies One, Two and Three reveal similar findings on the causes of driving anger, identifying the main cause of anger in traffic as the relational meaning of encounter between a driver and the environment, that is, the driver's sense of harm in a particular traffic situation. Therefore, what causes driving anger is not the environmental "stressor" alone but also its significance as appraised by the driver who encounters it (Lazarus, 1993).

### ***7.2.1.3 Impatient driving***

The discussion then moved on questioning whether there is a "general culture" of Saudi driving which Study Two identified as "impatient driving". The researcher asked participants about their opinions on such findings, asking the following question: "In general, do you think Saudi drivers are impatient; if so, why?" Again, respondents from different groups agreed with this question. Indeed, the participants expressed very negative sentiments about this question.

"In Riyadh, everyone is in a hurry, and there is no patience at all" (Group One).

“Sometimes, I think drivers think they are racing, so everyone would like to be the first and will not let another beat him” (Group Two).

“Impatient driving is the main reason for being angry on the roads” (Group Two).

“Yes, it is a common thing; it is not just one or two drivers or one part of the city. You see it every day and everywhere” (Group Three).

Others believe that traffic congestion and running late for appointments are the two main causes of being impatient while driving.

“People try to beat the traffic jam by driving fast” (Group Two).

“Because we have problems with our appointments, people become more prone to experiencing anger and being in a hurry. For example, if someone has an appointment at seven o’clock, he does not leave at six o’clock. He would rather wait until just ten minutes before and then leave, so if anyone blocks his way, he will be angry” (Group Two).

#### ***7.2.1.4 Managing driving anger***

The drivers were then asked, “Do you think it is difficult to control anger in traffic?” This question asked if they believed it was possible to do something to minimise the effect of driving anger, or whether they thought this issue was difficult to solve.

Although all groups believed that it is not difficult to control anger, they suggested several important determinants that affect on a driver’s ability to manage anger. Age and experience seem to be important factors influencing driver’s ability to manage anger.

“Those who are of the age 18-20 will never be able to control anger” (Group One).

In addition, one participant in Group One shared what he has learned with years of driving.

“But now with years, I have learned from different situations, and I care more about my new car, so I try to avoid any dangerous reactions to protect my car”.

Moreover, the presence of passengers and the reaction of the offender are critical in increasing or lowering anger.

“Passengers might affect your reaction. Some people are calm and do not like to be involved in any problems, while others get mad very quickly, so they will encourage you to get revenge” (Group One).

Apologies seem to be an important behaviour in helping drivers to manage their anger.

“If he apologises, okay, I will let it go. But if he starts yelling, of course I will become really angry” (Group Two).

“Three quarters of the issue will go away with apologies” (Group three).

“Eighty percent of the issue will be solved with apologies” (Group Three).

This general agreement on the possibility of tackling anger suggests that driving anger could be managed as long as needs and expectations of drivers are met by social marketing intervention. The discussion then turned to possible sources of influence and persuasion for managing driving anger. It began with a training intervention, which has been used successfully in the treatment of driving anger; however, the discussion covered marketing perspectives in more detail.

### **7.2.2 Training intervention**

Previous studies have demonstrated that teaching drivers how to cope with conflicts in traffic can effectively reduce anger among drivers (Deffenbacher, 2013,2016). However, the main challenge lies with motivating people to take part in such activities (see Chapter Two). Thus, this issue was discussed with a target audience to enhance recruitment activities and identify the elements that can be manipulated to maximise the achievement of such a goal.

In this section, the interviewees were encouraged to share their views on the importance of training as a tool for solving driving anger and on marketing strategies that need to be considered when running the course.

The specific content and efficacy of clinical interventions such as cognitive, relaxation and behavioural interventions were not part of the discussion, as they are not within the scope of this study. The desired behaviour here is to encourage drivers to take part in a training course to learn how to manage driving anger.

### ***7.2.2.1 The efficacy of training***

The discussion with the following question: “Do you think training in the required skills will help to manage anger?” Generally, there was no agreement about the effectiveness of taking a training course, and the participants in all three groups only partly supported training as a tool for solving driving anger, which would make recruitment even harder. However, some respondents believed it could help if it was combined with other strategies such as laws. Others showed no interest in such an idea because they thought it is other drivers who needed to change their behaviour, not themselves. Respondents who thought training might be useful were also sceptical about the probability of training being successful.

“This idea is very difficult to apply, unless it is compulsory upon receiving a driver’s licence” (Group One)

“It would do something but not that much” (Group One)

“I think training will solve 20% of the issue, but we need to do another strategy to solve the rest” (Group Three)

“Make it compulsory upon receiving a driver’s licence, but the problem with this idea is that drivers might come but will not be convinced” (Group Three).

Supporters of training emphasised the importance of age as an essential factor that could increase the efficacy of training. Most of the respondents believe that training will work only for those who are in the early stages of driving.

“In my opinion, I do not think such an idea will work for those who are twenty-five years old and over because their personalities are already developed, so it is very difficult to change. However, training might work for those who are under 25 years” (Group One).

“I think training will solve the issue, but not for everyone; older people might not find it useful” (Group Three).

Another person in Group One had a different view.

“It could be the other way around—a young driver who is eighteen might find it difficult to control his anger, so training may not help; but those who are over twentyfive years old start using their minds more than their emotions, so it could do something for them”.

Another essential factor for efficacy of training is support after training to enable drivers to apply the skills and principles they have learned. One interviewee described the difficulties of applying the skills he had learned from previous training courses.

“Sometimes you would like to apply what you have learned, but there are many things that make it difficult to do so; you need support to facilitate it” (Group One).

Another person from Group One stated,

“This is the role of the trainer, as he/she needs to give a real example and be realistic”.

On the other hand, some participants had very negative views of training, believing external factors such as low levels of law enforcement, other drivers’ behaviour, traffic congestion, and hot weather are the main reasons for being angry on the road and that training cannot solve any of these issues.

“Driving anger cannot be solved by training, because our roads are like a jungle! What other drivers do is what causes anger, so if you want to overcome the issue, you need a law that could improve and change people’s behaviour”. (Group Two)

Support for this view came from another participant in the same group who attributed driving anger to external influences.

“I doubt that training could have an impact on our behaviour, because external factors are more important than anything else. Imagine that you have an appointment in north of Riyadh and you live in the south, so you have to take King Fahad Road—a highly congested road—on an afternoon when the temperature is really hot, and you are surrounded by some stupid drivers; anything could make you angry in this situation”.

Another respondent in Group Two believed that there is a negative attitude towards training.

“This idea will not work because most of the people do not believe in training”.

Thus, practitioners might face difficulties when recruiting drivers for such training, and several factors should be considered when designing an intervention. Moreover, findings in this study used a perspective of social marketing aimed at individuals, rather than social marketing aimed at social or structural change, therefore, the discussion moved to exploring the best way to market the intervention and encourage drivers to participate. Marketing mix were employed to aid the presentation of the results.

#### **7.2.2.2 Product**

In the treatment of driving anger, the clinical intervention (e.g., cognitive intervention) is the product (Nichols et al., 2004). The scientific, theoretical basis and effectiveness of current driving anger treatment has been evaluated in the literature (see Chapter Two). As noted, this study does not focus on the content of such an intervention. What is more important is the attractiveness of the content and how it can be adjusted to market the course while also helping change behaviour, which is rarely examined in the literature.

Accordingly, drivers were asked about the types of social and personal rewards that could encourage them to take part in training. The groups identified several motivators and benefits. The first was the concept of inviting distinguished guests such as footballers and actors to join the intervention and ask people to take selfies with them.

“It will get more interest if you ask Yasser Alqahtani [footballer], for example, to join the training because people love him and they will listen to him” (Group One). The second idea was to emphasise what people will gain if they participate. The respondents suggested several incentive strategies to encourage drivers to take further training. However, one interviewee warned that “using too many motivators could have a negative effect on the benefits of the course” (Group One).

Consider the following ideas.

“Give him one day off from his work” (Group One).

“Give him the chance to drive a sports car on a race track” (Group One).

“Give him extra marks in his study” (Group One).

“Reduce car insurance payments because it is expensive” (Group Two). However, this value might not work for others, as one said, “I do not think this will work, because financial matters are not important for some of us” (Group One).

“Give him a discount card that he can use in sport centres or in car accessory shops” (Group Three).

### **7.2.2.3 Price**

Price in this context refers to the cost of the training course, both monetary and non-monetary. The timing of training delivery is one non-monetary cost drivers have to pay, but this does not seem to be an issue for participants as long as the course is run during weekends and more than one session is offered. With regard to monetary cost, most respondents prefer to impose fees on joining the course to ensure that people will value it and take it seriously. However, they also suggested two important conditions: Fees should not be high, and they should be refunded to those who complete the course.

“I think if you want him to be serious about it, ask him to pay fees but make sure it is not too much, because he will try to take advantage of it” (Group Two).

### **7.2.2.4 Place**

Regarding the most convenient place to have driving anger training, respondents suggested four places: universities, sport centres, race tracks and cafes. For universities, one interviewee stressed that

“this needs to be done with the cooperation of the lecturers, otherwise they may not allow them to be absent” (Group Three).

Because Riyadh is a very big city and traffic is congested most of the time, one respondent emphasised that to improve the accessibility of the training sessions, training must be “in different places in Riyadh, because those who live in the south will not come for the training if it is held in the north” (Group One).



### **7.2.2.5 Promotion**

The proper name for the training course is typically important; therefore, the discussion was about what we should call the intervention. The scientific name for this intervention is cognitive intervention or cognitive behavioural intervention (see Chapter Two); however, the participants were given five names and were asked to choose the best one.

The participants indicated that promoting training of driving skills would be the most attractive strategy to encourage younger drivers to take part. That is to say, skills for managing driving anger should be part of a whole programme on general driving skills and not delivered in isolation. Hence, the benefit drivers will experience from the training course is to be a skilful driver rather than managing driving anger only.

One participant in Group One explained the reason for this view,

“The young driver does not admit that he has a problem with anger, they think other drivers are to blame, therefore if you ask them to join a managing anger course they will not come”.

Another participant said:

“Some people might be upset if you tell them that they have a problem with anger, so driving skills are better”.

That said, there should be a specific programme on managing driving anger for those who are high in the trait of anger or who would like to solve this issue.

Interestingly, drivers prefer “Are You a Good Driver?” over “driving skills”, even though both promote the same concept. It seems that the question format was more attractive for the drivers. It is important to note that some participants did not show a preference towards any of the five suggested names; therefore, there might be a better name for this intervention.

“Although none of them convinced me, managing driving anger is the best” (Group Two).

“Personally, none of them is good enough to grab young drivers’ attention, but if I have to take one, I would choose ‘managing driving anger’, because those who have a problem might come” (Group Three).

Table 7-1 ranks the most popular names for the intervention based on their answers, and Table 7-2 summarises the pros and cons of the three most attractive names.

Table 7-1 Training name preferences

Training name	Rank
Are You a Good Driver?	37 <sup>1</sup>
Managing Driving Anger	40
Driving Skills	45
Managing the Road	48
Cognitive Behavioural Therapy Courses	68

Table 7-2: Pros and cons of the training course names.

Names	Cons	Pros
Are You a Good Driver?	<ul style="list-style-type: none"> <li>• “I think everyone would like to be a good driver” (Group One).</li> <li>• “Everyone thinks that he is the best driver, come and see if this</li> </ul>	<ul style="list-style-type: none"> <li>• “It might just interest drivers between 18-20 years old” (Group One).</li> <li>• “Someone who does not have a problem with anger might come”</li> </ul>
	<p>is true” (Group Two).</p> <p>□ “The question form of the sentence might interest people” (Group Two).</p>	<p>(Group Three).</p>

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<sup>1</sup> As was explained in Chapter Four, the suggested names were presented to participants in individual booklets in rotating order. The researcher instructed the interviewees to rate their responses in their booklets from 1 to 6 for each strategy, with 1 = very effective and 6 = not at all effective. Therefore, the above number is the total of all three groups’ responses (the lower the number, the more effective)

<p>Managing Driving Anger</p>	<p>“The name could attract all age groups” (Group One). “It is very clear” (Group Three).</p>	<ul style="list-style-type: none"> <li>• “I think it is too serious, so it is impossible that those who are 18 will come, because they do not admit they become angry in traffic; they think they are normal and that others are to blame” (Group One).</li> <li>• “Some might be sad if you tell them about anger” (Group Three).</li> </ul>
<p>Cognitive Behavioural Therapy Courses</p>		<ul style="list-style-type: none"> <li>• “I do not think this name will work, because it is too scientific” (Group One).</li> <li>• “It looks like a lecture in university” (Group Three). “If you say ‘therapy’, people will not come, because they believe they do not have any problem” (Group Three).</li> </ul>

In terms of promotion strategies, all three groups identified social media, such as Twitter and Facebook, as the best channel. Specifically, they suggested asking those who have thousands of followers, such as popular footballers, to tweet about the intervention. During sports programs on TV is also a good time to show the ads,

“I do not think advertising on TV will work except within famous sports programs” (Group Two).

Furthermore, one participant believed radio was useful.

“You might listen to the advertisement while you are experiencing anger in traffic, so it comes on at the right time” (Group Three).

Furthermore, there are some streets in Riyadh where young drivers gather, so one participant suggested we should distribute leaflets there.

“You could do the advertisement in Algurabi Street, as it has many car accessory shops” (Group Two).

Finally, one respondent stated that “You might advertise at a stadium” (Group Two) because most of the spectators are young men.

### **7.2.3 Coping strategy**

The second concept discussed was coping strategies. The aim was to identify the effectiveness of six coping messages in preventing elicitation of driving anger. These messages were developed based on the results of Study Two and the principles of Islamic teaching. The behavioural goal was to encourage drivers to adopt positive coping strategies to prevent anger. All the concepts communicated the desired main message: “Control your anger and avoid risky behaviour”. Participants were asked to rate each message from 1 (very effective) to 5 (not at all effective) to identify the most motivating message.

Table 7-3 shows that “seeking refuge in Allah from Satan the outcast” and “concentrate on enhancing driving safety” generated more interest than other strategies for coping with driving anger. Indeed, Study One (see Chapter Five) confirms this finding, showing that the initial response to the question, “What do you do when someone makes you angry?” was “Seeking refuge in Allah from Satan the outcast”. The interviewees usually borrowed the quote from the Prophet Mohammad—peace be upon him—which explains their choice, and said, “Because the devil flows in a man like his blood, so when you seek refuge from him, you feel peace” (The Hadith, n.d.) (Group One).

Table 7-3 Best coping strategies

Coping messages	Ranked
Seek refuge in Allah from the outcast Satan (evil).	45
Concentrate on enhancing driving safety.	48
Ignore what people have done and just keep going.	50
Attempt to control oneself.	59
Cheer myself up by thinking about things unrelated to the drive.	72
Re-evaluate the situation in a positive way.	81

Additionally, Study Two (see Chapter Six) found that “task focus” was chosen more frequently than the other coping strategies in traffic situations. Because reaching the destination safely is the central aim for all drivers,

“You should get in the habit of just focusing on your way and not do any reckless behaviour” (Group One).

“It is more realistic ‘to concentrate on enhancing driving safely’ because the first thing you lose when you are angry is concentration, so first think about your safety and see what you can do” (Group Two).

Furthermore, the factor analysis conducted in Study Two for the Driving Coping Questionnaire (DCQ) did not load items from the reappraisal coping scale in one factor. In this study, the “re-evaluate the situation in a positive way” coping message ranked at the bottom because interviewees could not find any positive side to a dangerous event.

“Someone cut you off! There is no positive side to it” (Group One).

“It is too difficult” (Group Two).

“Because I am angry, there is no positive side” (Group Three).

#### 7.2.4 Messages while driving

This section presents the results of the third tested concept. Five messages based on cognitive theory (see Chapter Two) were tested to examine the effectiveness of their incorporated strategies. The aim was to develop persuasive messages that could draw the driver's attention away from his traffic situation or to something more important.

Table 7-4 shows that the top main message was, "Just focus on safe driving, ignore idiots" and "Whoever forgives and amends, he shall have his reward from Allah". Thus, maintaining safe driving and remembering the reward of forgiving were identified as appealing benefits that can be used in advertisements.

**Table 7-4 Positive messages**

Positive messages	Ranked
Just focus on safe driving, ignore idiots.	25
Whoever forgives and amends, he shall have his reward from Allah.	33
I am not going to stoop to his level.	41
It is not worth thinking about him, let's think about something more important.	43
We all make mistakes, take a breath and keep going.	48

Nevertheless, the data analysis indicates that the situation is important when determining the persuasiveness of the messages. One driver selected "We all make mistakes" as number one because he based his choice,

"on a particular traffic event where someone did a mistake which I used to do, so we all make mistakes, and he will learn from his mistakes" (Group Three).

However, another driver from the same group opposed this statement, saying,

"I put 'we all make mistakes' as number five because I will never do the same mistake as he did and this was based on a real situation that happened to me".

Another driver even said,

"None of them is good enough because the situation was the worst ever" (Group One).

Thinking about families and children was identified as a fundamental reason to maintain safety and to avoid risky behaviour.

“Focusing on safe driving is the most important thing because some drivers have nothing to lose, but for me, I have a wife and children” (Group One).

Another driver said:

“Most of the mistakes are made by young drivers, so I am not going to stoop to their level because I have a wife and children” (Group One).

Furthermore, minimising the importance of the event or the other driver is also a possible way to help drivers manage their anger.

“Actually, you are right, it is not worth thinking about him, because you are going to a particular destination so it is not worth it to take time with him and then you may be late to your appointment” (Group Two).

Another driver has a different view on this statement.

“It is actually the situation itself that was not worth thinking about. I strongly believe that if people think the traffic event that they are involved in is not that important, it would affect their feelings” (Group Two).

Another important matter with messages is the communication channel. The main aim is to send and display these messages at the right time and at the right place for drivers who experience anger. Traffic lights, billboards or electronic signs and messages on the radio were the most commonly mentioned channels.

Finally, although the data analysis showed that messages are useful tools to use when addressing driving anger, one interviewee emphasised that

“we all know these messages, but the problem is recalling them at the right time, and sometimes anger controls you, so these messages will not be effective” (Group Two).

However, two respondents from Group Two felt that

“If we blanket the society with these messages, it will be easy to recall them, but this needs time”.

### **7.2.5 General findings**

Participants were asked how we can solve the issue of driving anger. Their answers indicated the necessity of implementing a coherent intervention that includes several strategies.

- Driving a clean or an expensive car seems to be enough reason to control anger: “If your car is clean, you would try to protect it, so if someone cuts you off, you would just let him go” (Group One). Another driver supports this statement by noting, “Look at those who have an expensive car; they try their best to protect it”.
- A dangerous habit showed by one interviewee was that he cheered himself up by using his phone: “If someone makes me angry, I take out my phone and check the WhatsApp application” (Group Two). However, it could also be said that if practitioners were able to disconnect drivers—mentally and physically—from their situation to a safer habit such as a stress relief ball, it could help them control their anger.
- Technology is drastically changing people’s lives; therefore, “health devices that could measure your heartbeat would be a useful tool for drivers to know how much anger affects their health” (Group Two). Another driver suggested, “The devices could also be embedded within steering wheels to automatically do the measurement” (Group Two).
- Being in congested traffic congestion can cause anger; hence, it is important to “redesign roads and provide solutions to reduce congestion” (Group Three).
- One critical prevention strategy suggested, “Targeting fathers as well as their children will teach them how to deal with anger” (Group Three).
- Time management is central in reducing symptoms of impatient driving: “I take going to my work as a project, so I give myself enough time in case of congestion, and that helps me a lot to be relaxed” (Group Three).



### **7.3 Discussion**

This study constructed and tested three intervention strategies aimed at preventing and managing driving anger in Saudi Arabia. The effectiveness of providing the necessary anger management skills in the form of training, cognitive coping strategies and persuasive messages based on psychological background was examined with Saudi drivers. Effectiveness was measured by the audience's intentions to participate in training as well as the ability of the messages to encourage drivers to abstain from driving anger and ultimately avoid acting out.

It is clear that Saudi drivers are suffering from driving anger and contemplate taking action and getting support from outside sources. The effectiveness of training drivers to act safely and implement safe acts by acquiring coping skills related to driving anger showed promise in the literature, but at the same time, the results present significant challenges to the treatment of driving anger. This is primarily due to the complexity of the underlying causes of anger in traffic, which include both personality and environmental factors and participants' negative attitudes towards suggested interventions.

The developed messages of coping strategies and positive thinking seem to be generally useful in reminding drivers to maintain safety and control anger, but the findings identify several obstacles that prevent the target audience from engaging in such interventions, such as peer pressure, lack of enforcement and a culture of impatient driving that normalises anger.

The above findings concentrate on individual change only, however after deeper analysis of the materials, it seems that there are also wider social and structural determinants of driving that need to be discussed such as culture of impatience and lack of enforcement. Therefore, solving these problems would require a comprehensive model of anger prevention and management that considers individual and wider social factors together which will be presented in chapter eight.

What is important before development of the framework is to address these barriers and challenges to design an effective model. This discussion will be undertaken in the next section.

## **7.4 General attitude and barriers towards driving anger**

Although all groups believed that it is not difficult to control their anger and are willing in general to overcome this issue, the data suggested several cognitive and social factors that might prevent them from engaging in the suggested interventions. While these issues are increasingly well understood academically, an in-depth study of how they apply to driving anger treatment has yet to be undertaken.

This study explains some of these relationships, but it might be difficult to generalize the findings without support from a quantitative approach that includes a larger sample. The next sections will address these underlying factors and suggest possible behaviour change interventions aimed at treating driving anger.

### **7.4.1 Other-blame and self-enhancement bias**

This formative research reveals that drivers have a negative attitude towards experiencing anger while driving, and there was no contest about its negative consequences. However, they also believed that other drivers' behaviour and lack of respect are major contributors to anger problems. This was indicated when they were asked about their views on driving anger issues; most were generally aware that driving anger is a risk that should be remedied, but they cited several factors not attributed to their own behaviour. This finding is in agreement with the appraisal theory (Lazarus, 1991), which assumes that the largest contributor to experiencing anger while driving is the belief that another driver is responsible for the traffic incidents that are incongruent with the driver's current goals (Stephens et al., 2016).

This important appraisal in a driving situation, accompanied by the tendency of drivers to overestimate their own driving skills (called, in academia, self-enhancement bias) makes it even more difficult to address (Svenson, 1981; Walton and Bathurst, 1998). This combination of the appraisal of other-blame and unrealistic risk assessments required further investigation within the context of driving anger to broaden our understanding of the issue.

Likewise, these two factors were identified in this study as significant obstacles to recruiting drivers to participate in training intervention. Data indicated that a driver might not admit an individual problem with anger or driving skills and would point the blame at other drivers.

If asked to join a course on managing anger, these types of drivers may respond by saying, “It is not me, it is all the other drivers who should attend such training”.

Support of the challenge of self-enhancement bias can also be seen in drivers’ perceptions of the message, “We all make mistakes, take a breath and keep going” because it was less likely to encourage drivers to re-evaluate their traffic situations positively.

Indeed, earlier studies (Lajunen, Corry et al., 1998) have shown a positive relationship between perceptual motor skills and emotional attitudes towards driving, suggesting that those who over-estimate their skills are more likely to get frustrated when traffic conditions do not meet their expectations.

Svenson (1981) warns that traffic safety campaigns with general road safety propaganda seem to be less effective. This could simply stem from drivers’ belief that their driving is safer than that of most others. Therefore, they question why they should pay much attention to information directed towards drivers in general. Tapp et al. (2015) support this claim, suggesting that a shift in training approach from the “general” to the “personal” will be required for rapid behavioural improvements to dangerous speeding, since drivers tend to excuse themselves from messages about speeding because “These messages are for others, not me.” They suggest providing in-depth personalised training, such as one-on-one demonstrations of one’s own limitations through regular testing or in-car training, especially for high trait anger. In these cases, an additional measure might be required at regular intervals (e.g., every few years).

As noted throughout this thesis, anger can be aroused not solely by how drivers evaluate the situation (driver personality), but also by the anger-provoking situations drivers are experiencing (environmental factors) (Stephens and Groeger, 2011). Therefore, the emphasis in this section about assignment of blame and self-enhancement bias should not underestimate the importance of environmental factors, particularly other drivers’ behaviours.

#### **7.4.2 Negative attitude towards traffic law**

The perception that other drivers are to blame for driving anger issues is accompanied by the belief that authorities are not strict enough in enforcing traffic laws. These findings have some similarities to those reported for Jordanian drivers (Magableh et al., 2013).

Therefore, such attitudes may lead to a lack of interest in solving anger issues. This is in line with a study (El Bcheraoui et al., 2015) (see Chapter Three) that concludes that enforcement laws are crucial to reducing road injuries and deaths and it is time for aggressive monitoring and enforcement of laws on Saudi roads. However, traffic law enforcement is lacking in the country, so the Ministry of Interior has to increase its activities to overcome this barrier.

### **7.4.3 Impatient driving and social norms**

One general cultural element among Saudi drivers is “impatient driving”, which was identified quantitatively (Study Two) and qualitatively (Study Three) as significantly connected with the initiation of traffic anger. Impatient driving refers to a lack of patience in several driving situations, such as being annoyed when traffic lights change to red upon approaching them and being anxious in congestion. It appears that this cultural norm influences people’s road safety practices (Guttman, 2015). Although drivers in this study believed that such a driving style is dangerous, the tendency to be impatient is common on the road and could be defined as a social norm. Such a phenomenon has two negative effects on driving anger: First, this style links anger to the individual driver, and second, it puts pressure on other road users to behave likewise.

According to social normative literature (Guttman, 2015) people’s behaviour is influenced by their perception of social norms and how these norms encourage them to keep up with what the society is doing. For example, drivers adopt speeds by comparing their speed to that of others on the road (Connolly and Aberg, 1993). Unfortunately, this peer pressure and normative influences, combined with the previous two factors, lead some drivers to conclude that driving anger is the consequence of their environment, rather than their own behaviour.

The challenge of impatient driving is that road safety practitioners are not dealing with one particular behaviour, such as speeding or seat belt use, but rather with targeting and changing the driving style itself that can include several behaviours. For example, some drivers indicated, “In Riyadh, everyone is in a hurry” and “Everyone would like to be the first and will not let another beat him”.

Are these observations due to poor time management (as one participant believed) or are several factors at play that need to be understood? Practitioners should investigate these issues in much more detail and include certain skills in their training syllabi to deal with impatience in traffic, such as time management and practical scenario situations.

#### **7.4.4 Incongruence between attitudes and behaviour**

Early studies have demonstrated that the Theory of Planned Behaviour (TPB) is effective in predicting intentions and behaviour of several traffic safety behaviours (Elliott and Armitage 2009, Tavafian et al., 2011).

The TPB (Ajzen, 1985) proposes that behavioural intentions and perceived behavioural control are the principal determinants of behaviour. Behavioural intentions are in turn determined by an individual's attitude towards performing a specific behaviour, the individual's perceived subjective norm for that behaviour and perceived behavioural control. An important aspect of this theory is that it distinguishes between attitudes towards a particular behaviour and acting out that particular behaviour. For example, Fleiter and Watson (2006) used self-reported behaviour and attitudinal measures and found that two-thirds of the participants agreed that exceeding the speed limit is not worth the risks, nor is it acceptable to exceed the posted limit. Despite this, more than half (58.4%) reported a preference to exceed the 100km/hour speed limit.

In this study, drivers were asked to identify the best coping strategy and positive message to prevent driving anger. The results showed that enhancing driving safety (task-focused) was the common strategy drivers preferred to use to deal with anger situations, but this attitude seems to be incongruent with their actual behaviour.

Study Two confirms that impatient driving is associated with anger in traffic and several risky driving behaviours, such as speeding. Moreover, such style is related to the use of confrontive coping, which indicates that their current practice is not safe. A possible explanation for such findings could be found in TPB.

The normative belief about the common driving style in Saudi Arabia (impatient driving) might create pressure to not perform the targeted behaviour (safety coping and thinking); this, along with drivers' beliefs about the presence and power of environmental factors (other road user's behaviour, weather, congestion) may impede adoption of safer coping strategies. Therefore, communication activities to change common driving culture and the appraisal of blame on a community level might be a more effective approach than trying to change individual attitudes towards safety behaviour.

## **7.5 Conclusion**

This formative research study explored the factors that could be important for the implementation of social marketing intervention aimed at treating driving anger. The focus group research enabled the researcher to identify some hidden attitudes of drivers towards solving driving anger issues. Appraisal of blame is the main key negative attitude, that is, the belief that the traffic environment needs to be changed to overcome driving anger issue.

Given the complexity of driving anger treatment, single behavioural change components such as training may fail in the face of incongruent traffic environments. Therefore, the centrepiece to overcome driving anger issues is based on the assumption that removing or decreasing the environmental causes of driving anger should facilitate a change at the individual level, therefore, both personality and environmental factors should be addressed simultaneously, as will be elaborate in the next chapter.

In particular, the proposed intervention design fused enforcement, engineering, culture change campaign, training and message advertisements underpinned by social marketing principles to form behavioural change.

Nevertheless, although this study's aim was to include drivers between the ages of 18 to 30 in the discussion, the difficulties in contacting and recruiting drivers resulted in most participants being in their late 20s.

Greater detail could be achieved if the researchers could group participants according to their ages as well. Moreover, this study did not examine the efficiency of interventions to lower anger and aggression in angry drivers such as cognitive, relaxation and behavioural interventions and their combinations. Therefore, it is not yet clear which intervention is more appropriate for Saudi drivers.

## Chapter Eight

### Final Discussion and Conclusion

#### 8.1 Introduction

Almost every day throughout the Kingdom of Saudi Arabia one can hear or read about cases of angry drivers losing control and committing acts of road rage. Indeed, the review of the literature presented in chapter two found that anger while driving is a worldwide issue that has a strong relationship with several risky driving behaviours such as speeding (O'Brien, Tay et al. 2002, Tay 2007, Underwood, Chapman et al. 1999, Parker, Lajunen et al. 2002, Deffenbacher, Richards et al. 2004, Sullman 2006, Yasak, Esiyok 2009). Despite the fact that anger while driving was identified in the literature as a strong predictor of several driving behaviours that increase the risk of crash involvement, such issues were rarely investigated in the literature with the aim of providing effective solutions that reduce or eliminate the negative effects of driving anger. This thesis therefore set out to explore the role social marketing approaches could play in the treatment of driving anger.

The overall purpose of this thesis was to offer an appraisal theory-based framework that can enable social marketers to reduce the effect of road rage (or driving anger) and target large groups of people rather than just a small number of high-anger drivers (Deffenbacher 2013, 2016). Therefore, to achieve the overall objectives of the research, three studies were conducted that utilize both qualitative and quantitative approaches (chapters Five, Six, Seven) to enable a greater understanding of the issue.

In response to the mentioned gap, chapter two reviewed the general theoretical literature on this subject and detailed the main three marketing theories of emotion in order to gain an insight into different causes of anger. Specifically, in this study, Lazarus' CognitiveMotivational-Relational (CMR) model was used as a framework for better understanding driving anger, which claims that emotions are preceded by appraisal triggered by specific environments and related to an individual's experience. According to Lazarus (1991), in order for specific emotions to be induced, distinct appraisals of situations and events need to occur.



These appraisals can be categorised into two stages, primary and secondary appraisals. In the primary appraisal stage, individuals evaluate whether an event is relevant or significant to their needs or well-being, and whether the event is consistent with their goals. In a driving context for instance, primary appraisals are related to the main goals of driving, which are the desire to reach a specific destination safely and on time.

Secondary appraisal, however, is a subjective assessment of three components: a person's coping resources, expectations, and other responsibilities. Central to the secondary appraisal for driving anger is the perception that the blocking of the goal is caused by an obvious target—that is, that another driver is culpable for the situation.

Likewise, the review examined the determination of appraisal components that are generally associated with anger (goal-incongruence, threat to self-esteem, and other – blame) and how these components are linked to different type of traffic situations. Accordingly, study one (Chapter Five) was conducted to explore qualitatively the environmental factors that might be related to the experience of anger in traffic as well as explaining how anger is provoked in traffic situations through identifying the key appraisal components of anger in traffic as acknowledged in study one.

In addition, the review of personality and coping literature presented in this thesis indicates that aggression style and confrontive coping are linked to the experience of driving anger as was claimed by the transactional theory of driver stress (Matthews 2002). Therefore, study two (Chapter Six) was formulated out to confirm this connection and examine another important causative factor of driving anger that is related to personality factors.

Finally, existing driving anger interventions and their limitations were reviewed. Most driving anger interventions—specifically cognitive, relaxation, and behavioural interventions—are psychotherapeutic in origin (Deffenbacher, 2013, 2016) and focus mainly on high-anger drivers. While these interventions are promising, the main limitation of such an approach is the recruitment process; this is especially true for young drivers, as indicated in the literature review above. Therefore, study three (Chapter Seven) aimed to overcome such limitations and provide more comprehensive interventions that are based on the results from study one and two and the principles of social marketing.

The general theoretical literature on driving anger, and in particular studies focused specifically on the context of Saudi Arabia, is inconclusive on several vital questions with regard to the causative factors of driving anger, Therefore, this work sought to answer the following 14 questions:

1. What types of driving situations could make drivers angry?
2. Which appraisals are associated with anger in traffic?
3. How do Saudi drivers cope with anger during traffic events?
4. What are the common personality styles among Saudi drivers?
5. What is the relationship between personality styles and driving performance?
6. What type of personality have been shown to be significant predictors of anger?
7. What coping strategies do young drivers use in traffic situations that arouse anger?
8. What is the relationship between personality styles and coping preferences?
9. What is the relationship between coping strategies and driving performance?
10. What type of coping have been shown to be significant predictors of anger?
11. What are the best ways to promote a course on managing driving anger?
12. What are the barriers and facilitators that drivers may face when engaging in driving anger intervention?
13. What coping strategies do drivers believe are most helpful?
14. Which positive messages are most persuasive in helping drivers better evaluate driving events?

The following sections will provide a synopsis of the numerous empirical findings obtained across all three studies conducted during this research. The research questions that provided the foundation for this work will be used to organize the main findings. This will be followed by a section to explained the suggested intervention framework. Finlay, the limitations of the overall research and recommendations for future research will be discussed.

## **8.2 Study one: Environmental factors**

The aim of Study One (Chapter Five) was to investigate the effect of environmental factors on the experience of driving anger in Saudi Arabia. In particular, it explored the characteristics of common traffic situations that result in Saudi drivers experiencing anger as well as behavioural responses to these events, and examined the key appraisal component of anger that was suggested by Lazarus. As few prior studies have addressed these objectives, study one utilized qualitative methods to answer the first three questions of this thesis and provide a coherent understanding of these issues.

The initial research question focused on identifying the most common anger-eliciting incidents that people tend to experience while driving in Saudi roads. Subjects in this study were interviewed and asked to recall and describe a traffic event that caused them to experience anger. The results of the interview indicated that, the behaviour of other drivers in four type of situations (progress impeded, reckless driving, hostile gestures, and discourtesy) were the main source of anger in Saudi roads.

The second question of this research was aimed at identifying the key appraisal components that are associated with anger in traffic as suggested by Lazarus (1991) (goal incongruence, threat to self-esteem, and blame). These appraisal components were implicitly expressed by participants when they asked to evaluate their events; however, it was clear that the perceived incorrect behaviour of other road users is the main reason for drivers' experiences of anger. That is to say, the drivers interviewed in this study believed that other drivers were to blame for what happened to them and that they (the other drivers) could and should have behaved differently. Therefore, blame is the key appraisal component of the experience of anger in traffic.

The third question was aimed at identifying whether drivers committed any form of road rage crimes in response to anger-provoking driving situations, and if so which actions they engaged in. Participants were asked to indicate what they did in response to the events in the anger-inducing situations they described. The results confirm the seriousness of driving anger, as over half of subjects reported aggressive reactions and driving violations such as fighting and chasing.

Other drivers preferred to maintain their safety and avoided any risky behaviours. Additionally, it seems that the more experienced the driver is, the better response he might adopt to any conflict in traffic; hence novice drivers often act more aggressively than other road users. Furthermore, participants believed that apologies can mitigate a driver's anger and aggression, as this behaviour indicated that the (perceived) offender showed respect to the other driver and did not intend to commit the (perceived) offense.

Another remarkable finding from study one is the significance of including angry drivers, other road users and passengers in any intervention, as each group can have an important role in the reduction of driving anger. Most existing interventions focus specifically on angry drivers, but other road users have the strongest potential to reduce driving anger issues on the roads because their driving behaviour is central to the elicitation of anger, and their responses to driving events (i.e., offering apologies or refusing to admit their (perceived) offenses) can catalyse or inhibit drivers' expressions of anger. Therefore, it is recommended that campaigns should develop programs that target each group in order to maximise the effect of an intervention.

### **8.3 Study two: personality and coping strategies**

Study Two (Chapter Six) extended the understanding of driving anger through a self-report questionnaire that was aimed at exploring the characteristics of Saudi drivers in terms of both driving styles and coping strategies. This study employed a questionnaire that consisted of four sections: demographic information, an Arabic-language version of the driver stress inventory (DSI), a brief text containing a traffic description followed by four items to measure the appraisal components of anger, and an Arabic version of the driver coping questionnaire (DCQ). The data from this study provided quantitative information to use in addressing the fourth, fifth, sixth, seventh, eighth, and ninth research questions, as detailed below.

Several studies in the literature (Chapter Two) have been conducted to identify the links between certain driving styles (e.g., aggression, dislike of driving, hazard monitoring, fatigue proneness, and thrill seeking) and various driving-related criteria such as speeding, using the DSI.

Therefore, study two was interesting in identifying the common personality styles among Saudi drivers as well as exploring the relationships between identified styles and driving

performance. Factor analysis was conducted to determine the scales of DSI that represent driving styles in the Saudi context.

The data demonstrate that aggression, hazard monitoring, self-confidence, impatient driving, fatigue proneness, and thrill seeking are good descriptions for the different driving styles in Saudi Arabia. Among these styles, impatient driving and hazard monitoring were reported relatively more frequently than other styles. Unfortunately, the data indicated that impatient driving is the most dangerous style, as it is positively associated with anger and poor driving performance. Moreover, the analysis found that younger drivers reported higher levels of aggression, impatient driving and thrill seeking than older drivers which emphasises the importance of targeting this group as a whole.

A further area of investigation in study two was coping strategies. The DCQ showed that there are five coping strategies available for drivers to use in traffic conflict situations: confrontive coping, task focus, emotion focus, reappraisal, and avoidance. However, the factor analysis of the DCQ data suggested slightly different strategies. These data showed that task focus, confrontive coping, self-criticism, emotional avoidance, and cognitive avoidance are used most frequently by drivers in the Saudi context. Specifically, task focus and selfcriticism were chosen more frequently than the other coping strategies when dealing with stressful and conflict-filled traffic situations. Furthermore, the relationships between personality styles and coping preferences were examined, and it was determined that in terms of this thesis the most important relationship is the positive link between impatient driving and confrontive coping.

Finally, the analysis of 549 described traffic incidents obtained via the questionnaire indicated that the source of stress most frequently spontaneously reported by Saudi drivers is a specific behaviour by a particular driver, which supports the importance of developing programs to reduce the effect of such source and teach drivers better ways to cope with the effects of this type of stress in order to reduce the experience of anger in traffic.

## 8.4 Study three: intervention development

Using the findings from the literature review and the first two studies in this thesis, study three (Chapter Seven) developed three programs aimed at lowering anger in traffic. These include training drivers to use cognitive (e.g. redirecting attention) and behavioural skills (e.g. focusing on safety) to deal with anger and persuading drivers to maintain safety through two type of messages, positive thinking (e.g. forgiving.) and safe coping strategies (e.g. task focus). The challenge with training, as mentioned previously, is the recruiting process, therefore for this study drivers who scored high on anger-related scales were selected for interviews to explore the best ways to promote a course on managing driving anger. The data showed that not all drivers believe training could mitigate driving anger because of the strong effects of environmental factors such as other road users' behaviours. On the other hand, other drivers suggested several recommendations that would enhance recruitment, including;

1. Promoting training in the context of improving driving skills, rather than managing driving anger.
2. Avoiding scientific names such as cognitive behavioural therapy, and instead using more appealing names such as Are You a Good Driver?
3. Include various motivators and benefits to encourage drivers to join the training. For example, getting a day off from work or reducing car insurance payments.
4. Charge for taking part in the training, but not too much.
5. Choose the right location—somewhere that is not far from the target audience and convenient for them to get to (e.g. universities).
6. Use social media to promote the training programs

Furthermore, other strategies, such as the use of short anger-reducing messages on electronic message boards on highways, could also be an effective strategy for reducing driving anger and road-rage-related incidents. These messages need to work in line with the training offered in courses or programs, functioning as a reminder of the important skills and techniques for dealing with anger, such as “Just focus on safe driving, ignore idiots!”.

In addition, such messages should underscore the benefit of controlling anger (e.g. rewarding from

God) to encourage drivers to maintain safety. Nevertheless, study three identified four barriers and social factors that may prevent drivers from engaging in these interventions:

1. **Other-blame and self-enhancement bias:** Drivers believed that other drivers' behaviour and lack of respect are major contributions to anger problems; this combined with the tendency of some drivers to over-estimate their own driving skills compared to other drivers therefore means that drivers may think that training for driving skills is only intended or necessary for others who are causing the harm in the streets.

2. **Negative attitude toward traffic laws:** Some drivers who participated in this research expressed the belief that police officers are not serious in applying traffic enforcements, which is why the roads are full of driving mistakes; they therefore feel that the government has to improve the current traffic situation before training and messages can be effective.

3. **Impatient driving and social norms:** One general cultural element among Saudi drivers is 'impatient driving', which refers to a lack of patience in many driving situations that appears to negatively influence people's road safety practices. This phenomenon has two negative effects on driving anger: first, this style links anger to the individual driver; and second, drivers feel that it puts pressure on them to behave in a similar way to other (impatient, aggressive, angry, etc.) road users. Therefore, some drivers conclude that driving anger is a consequence of their environment, rather than their own behaviour.

4. **Incongruence between attitudes and behaviour:** It seems that there is a gap between what drivers think they should do in an anger-inducing situation and their actual behaviour in such situations. Their stated attitude is to maintain safe driving practices, but the results from this research showed that in actuality drivers use confrontive coping strategies in dealing with driving anger. This gap may be attributable to the previous three barriers which prevent drivers from behaving in the suggested safe manner.

## **8.5 Intervention development and strategies**

The transactional model of driver stress discussed in Chapter Two (Matthews, 2002) underscores the significance of understanding both the driving environment and drivers' personalities in situations that could potentially incite anger. This is because the way an individual evaluates the personal significance of encounters with the environment causes emotional reactions in that individual (Lazarus, 1991). Therefore, if this person-environment relationship is perceived and evaluated differently because of different personality traits or changes in the environment, it will lead to different emotions being experienced. This assumption was the basis of this research.

The results of the three studies showed that driving anger is really an interaction between the individual and larger social (e.g., culture of driving) and physical environmental factors (e.g., congestion) (see Figure 8-1). Therefore, social marketing solutions need to employ different strategies to address the cultural and social norms by conducting for example a national conversation about the driving problems in Saudi as well as looking at individual level to improve their coping strategies and evaluation process.



**Figure 8-1 Driving anger reduction framework**

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Redacted *Adapted from Mathew (2001)*

### **8.5.1 Driving anger reduction framework**

According to the suggested framework, the antecedent variables of driving anger consist of a driver's characteristics such as being aggressive and impatient and environmental conditions such as other drivers' behaviour. These two sets of antecedent variables—personality and environmental—integrate into a relational meaning based on the relevance of what is happening for the driver, which is the task of appraisal (Lazarus, 1991). Specifically, if another driver interferes with a driver's execution of plans or attainment of goals (to reach the destination safely and on time) by behaving incorrectly and interrupting goal-directed activities (e.g., cutting off), driving anger could result. To help social marketers overcome the issue of driving anger, two kinds of causal factors need to be identified.

First is the specific personality of an individual. Second are the environment factors that are related to the natural and constructed settings in which the human activities of a community take place, in this case, a traffic context.

Furthermore, an attempt is made to integrate treatment and prevention approaches with the transactional framework for driver stress presented in Figure 8-1. Treatment of driving anger is based in two main logics. First, if the driver learns to process things in less demanding, inflammatory, aggressive ways and think about them in more realistic, calm, problem oriented ways, then anger will be lowered, and the person can access other cognitive and behavioural coping skills for improved responses (Deffenbacher, 2015). Second, if the environment of a driver can be changed by actions such as improving driving culture and road design, the relationships with the environment might also change (Lazarus, 1991). Accordingly, professionals need to help drivers change this relationship by changing the way it is appraised (emotion-focused coping) and/or acting on the environment (problem-focused coping—primary prevention).

The core strategy of suggested intervention is creating an environment in which drivers are exposed less to the cause of anger by reducing or eliminating social, psychological and environmental barriers, alongside individual strategy.

The proposed strategies reflect the emphasis made by social marketing scholars to broaden its scope beyond individuals and influence those that help shape the determinants of human behaviour such as policy-makers, regulators, family and peers (Andreasen, 2006; Gordon, 2013). Wymer (2011) noted that social marketing strategies must take environmental reality into account to develop more effective strategies and not primarily focus on individual-based behavioural change strategies. Wymer (2011) states that some social marketing campaigns are not effective because they are aimed at helping individuals change their behaviours and disregard the wider environmental factors by not developing strategies to address root causes of problems.

Moreover, evidence from both tobacco and alcohol programmes consistently concludes that the programmes bringing about the greatest reductions in smoking or harmful alcohol consumption are those that involve policy (e.g., banning alcohol advertising) (Hoek and Jones, 2011).

Furthermore, an extensive review by Lund and Aarø (2004) of the literature on interventions intended to prevent or mitigate accidents found that the most general types of preventive measures behaviour modification (acting upon behaviour), attitude modification (acting upon attitudes) and structural modification (acting upon the physical and organisational environment). They conclude that evidence from 158 different studies indicate that 145 produced positive effect, while 13 gave negative effects, suggesting that using regulation and enforcement, or environmental and product modifications, has a generally strong positive effect on the incidence of accidents and injuries. Therefore, considering the environment in road safety prevention seems important to maximising the effect of the intervention. The preferred process suggested in the framework is to remove barriers concurrently from both antecedent variables—personality and environment. The next sections will move to discuss how this process might work.

#### ***8.5.1.1 Individual level***

The crux of this model rests in “cognitive process”, which includes appraisal and coping processes. Therefore, the main strategy of this level is to alter drivers’ appraisal of traffic situations and help them manage their circumstances through adoptive coping skills. The central box of Figure 8-1 shows the resulting appraisal and coping from the interaction between personality and environment that leads to driving anger. This box is surrounded by two boxes that indicate the main two techniques to help improve drivers’ evaluation and coping: training and messages.

##### **8.5.1.1.1 Training**

The first strategy is training. Drivers may not know enough about cognitive and behavioural skills to deal with anger issues in traffic. Thus, training is important to improve their knowledge and equip them with crucial skills.

The effectiveness of driving training in general and treatment of driving anger has been discussed in Chapter Two. However, encouraging drivers to take part in training might be a big problem.

To be maximally effective, training must be not only scientifically and theoretically sound, with components identified in the driving anger treatment literature, but also must consider the other elements of product development, referred to here as the marketing mix. Thus, motivational orientation to participate in training is likely to be shaped significantly by the following recommendations.

*Product:* Along with teaching drivers needed coping strategies to control anger, the content should also include training about common sources of anger and how to deal with the aggressor effectively, for example, encouraging drivers to report to the police aggressive driver behaviours rather than reacting to the aggressor.

Moreover, beside the training itself, it is important to offer two main aspects. First, support after training is crucial (e.g., follow-up sessions and a hot line) to ensure that knowledge and skills learned during training translate to the traffic environment.

Second, benefits of participating in training should be provided such as discount cards to sports centres to obtain “value added” benefits and make activities fun and attractive.

*Price:* Drivers are willing to pay a training fee as long as it meets two conditions. First, the fee should be set at the right price; it cannot be too expensive, yet it should not be so cheap that people will minimise its value. However, some people in socially and economically deprived areas in Riyadh might not be able to pay any fee; this should be considered when targeting such groups. Alongside monetary cost, social marketers must be able to reconcile the perceived costs of participation with the perceived benefits. Timing was identified as a cost, drivers may not pay, not because they are busy but because they prefer to spend their free time doing something they value. Therefore, compensatory elements need to balance the sacrifices drivers would have to make to take part in the training.

*Place:* Providing the service in convenient and informal places such as cafés and sports centres seems more attractive and convenient for young drivers. Furthermore, travelling to the training may be an issue for some drivers. Social marketing should consider appropriate places for their targeted audience such as universities (because they are already there).

*Promotions:* As discussed earlier, the challenge is that promotions may be strongly influenced by factors such as drivers' self-enhancement bias (Tapp et al., 2015) because drivers believe that other drivers are to blame for their own poor behaviour rather than themselves. Therefore, training would need to be promoted on the basis of driver skills rather than anger management to be attractive. Data obtained from this study indicate that social media such as Twitter and Facebook are acceptable avenues for reaching the target population. This is also supported by the current trend in using different social media platforms. According to the Third Arab Social Media Report by the Dubai School of Government, Saudi Arabia has the third highest number of Twitter users in the Middle East—1.9 million users, which accounts for over half of all active Twitter users in the Arab region (ASMR, 2013). The total number of Facebook users in Saudi Arabia as of the end of May, 2013, is 7,800,000 (Top in Social, 2013). This huge shift towards social media encourages marketers to use those platforms to market and promote their interventions.

*Partners:* Although this is not part of the marketing mix, the synergy of partners with place and promotion elements provides a powerful marketing strategy. For example, partners such as universities and schools could provide convenient locations and facilitation of contacting drivers through their databases. Additionally, car insurance companies and sports centres play a major role in promotion because they help provide incentives for the target audience. Therefore, social marketers should aim for a closer working relationship with different partners.

All in all, it is highly recommended to conduct a small-scale pilot study with pre- and post-training assessments to test the effectiveness of this training programme that teaches drivers how to deal with conflict in traffic before the final trial design.

#### 8.5.1.1.2 Messages

The second strategy in the individual level is situational messaging to promote safe evaluation of and coping methods for traffic situations through short anger reduction messages drivers will see while on the road. The immediacy hypothesis predicts that behaviour effects are maximised when messages are presented near the relevant situation or when the behaviour is occurring (Rooijers, 1988; Glendon and Walker, 2013).

Thus, the aim is not only to inform drivers of the better cognitive and behavioural skills to use but also to persuade them to use these techniques in dealing with driving anger by offering them something of value.

For example, the results suggest redirecting the attention of the driver to something more important (“Just focus on safe driving, ignore idiots”) or rewarding the driver for seeming to be effective in enhancing safe practices (Deffenbacher, 2016). Moreover, these messages should be displayed on billboards or electronic signs and broadcast on the radio.

However, messages alone are unlikely to make much difference in controlling anger because drivers who do not see the value of the healthy behaviour (e.g., safety) as exceeding the benefits of the unhealthy behaviour (e.g., aggression) will filter the messages out. McKenna (2010) believes that a weak intervention may fail if it does not compete effectively with a stronger attraction to the activity. For example, anti-speeding messages may not be able to encourage drivers to keep within the speed limit when the benefits of speeding (“Driving fast is fun” and “Reaching a destination sooner”) outweigh the suggested attitude or behaviour.

Therefore, the benefits of retaliation and restoring self-image as well as peer pressure to take revenge against the offender (i.e., the other driver) might be considered competitors that outweigh safe practices. Therefore, although participants consider safety and rewards the benefits of controlling anger, to enable effective assessment, a comparison to control communities could assess the effectiveness of the suggested messages by using, for example, driving simulations to confirm their workability.

Finally, these messages were developed based on cognitive interventions which aim to help individual learns how to process the evaluation of the situation in less demanding and aggressive ways and think about them realistically, therefore, the focus was on promoting positively-framed messages, but it neglected the possible role of negatively-framed messages that show the danger of being angry in traffic; future work could examine the efficacy of fear appeal strategies in dealing with such issues.

Moreover, negative passengers’ influence (i.e., peer pressure) on drivers’ behaviour towards the source of anger has been identified in Study One.

Therefore, there should be also a focus on the people who may influence drivers to experience anger. Hence, practitioners need to wider their target audience and include those who could affect drivers' behaviour.

Finally, strategies at the individual level are required to lower anger experience in the short term especially for those who are high in aggression and trait anger. Another long term strategy is required as well which is acting on the environmental level to improve the current tariff situations.

#### ***8.5.1.2 Environmental level***

The overwhelming majority of driving anger treatments (see Chapter Two) rely heavily on the ability of drivers to evaluate the situation more positively by teaching them coping skills that could be described as downstream social marketing (Hoek and Jones, 2011). Although such a strategy is useful and important, the findings of this thesis showed that some drivers believe the remedy of driving anger is not under their control and harder to address without considering the effect of external issues. In other words, drivers consider their own aggressive on-road behaviour to be justified retaliation in response to the deliberate driving acts of others (Lennon and Watson, 2011; O'Brien and Sharon, 2012). This is because driving anger occurs when an aggressive driver engages in traffic situations that are contrary to his or her goals, but if the environment is irrelevant to the driver, driving anger should be inactive (Lazarus, 1991).

The main aim of this level is to create environment that make "the safer choice the easy choice". To achieve such an aim, social marketers need to search for those variables in the environment that provoke anger and prevent adopting safer choices with the aim to eliminate them or decrease their effect (Wymer, 2011).

Such a task has been conducted throughout this thesis and recognises that the primary sources of anger in traffic are other driver's behaviours (e.g., cutting off, flashing headlights or high beams, sustained inappropriate horn-honking), because without driving mistakes by road users, anger might hardly be experienced. Therefore, interventions should focus on creating stigma around those behaviours and promoting driving courtesy (e.g., apologising, forgiving, sharing the roads, respecting all motorists). This is in line Evans' (1990, p. 121) conclusion:

“If the type of courtesy that applies in most walks of life were applied more on the road, it seems likely that substantial safety benefits would result”.

However, it is important to note that some drivers might become unreasonably angry or on account of some unrelated behaviour besides the heavy traffic. For example, as noted in chapter five, one driver might experience anger merely because another driver has a similar car, but with better features (e.g., colour, extra accessories, etc.). In this case, the environment has nothing to do with the driving-related anger. Moreover, it is hardly reasonable to blame another driver for having a better car and, therefore, the angered driver should be responsible for any angry reaction and not simply blame others for his bad behaviour: “it is not me; it is the other drivers!”.

Courtesy in this sense means simply “how our own actions affect others” (Hutchinson, 2008). Therefore, interventions could attempt to activate drivers’ appreciation of the impact of their behaviour on others, particularly regarding the potential for anger (Lennon and Watson, 2011).

Hutchinson (2008) reviewed the role of courtesy in road safety and argued that urging people to be courteous does not tell them what action to take. Instead, they need to translate courtesy into something specific, thus suggesting that for sufficient and better countermeasures, messages should emphasise the specific unwanted action and what behaviour to adopt instead, with courtesy or consideration mentioned as a reason: “Keep safe distance, because you’re a real Saudi who thinks of others”.

Study One of this thesis identified four major traffic situations that cause anger in traffic: progress impeded, hostile gestures, reckless driving and discourtesy. Therefore, it is recommended to conduct national long-term, culture-change campaigns to eliminate such situations or decrease their effects. Additionally, strict and fair enforcement should focus on these behaviours as much as ordinary violations (e.g., speeding) to re-build the reputation of police officers among drivers and decrease the main causes of anger (Özkan et al., 2010).

Furthermore, expressing regret and offering apologies after making a driving error were found to be (see Studies One and Three) effective actions that help other drivers control their anger. However, one challenge in this regard is the difficulties of interaction between drivers, especially in high speed encounters.



Therefore, there is a suggestion to improve drivers' interpersonal communication skills on the road by providing a wider repertoire of signals (e.g., blinkers, headlights, passing lights, horns, hand gestures, eye contact, head movements) for better communication between road users (Renge, 2000; Hutchinson, 2008).

Likewise, current road design needs to be carefully considered to reduce congestion in the city and maintain traffic flow, as well as to keep drivers informed about reasons for delay (Matthews, 2002). Importantly, a partnership with the government is required to achieve such goals.

Finally, the findings showed that there is a culture of impatient driving among Saudi drivers that may raise risks in the Kingdom. Therefore, such challenge need to be address in societal level not necessarily at the individual level. A more sophisticated message strategy that has to do with the establishment and influence of perceived norms by conducting for example mass media campaign that promote appropriate actual norms might help counteract this issue. Additionally, the campaign could urge the society to reflect on their driving culture by inviting them for example to share their views on YouTube video that discuss the issue and seek a mass change not just an individual change. Importantly for this mass media to work better it needs to be used in conjunction with other prevention strategies that have been discussed in both level individual and environment.

All in all, such models might be transferred or utilized to study other anger issues, such as child abuse. Previous studies (Whiteman, Fanshel, & Grundy 1987; Kolko, 1996) focused on the individual level, training parents to use several coping strategies. However, examining the issue from a wider perspective might help researchers discover important factors that could lead to better anger-reduction techniques. For example, conducting a formative research with parents, children, community, schools and others that share similar concerns with the issue at hand may be useful in identifying and understanding the characteristics—i.e., the interests, behaviours and needs—of target populations that might prove useful in shaping policy intervention strategies.

## 8.6 Social marketing benchmarks criteria

Chapter Three presented the seven social marketing benchmarks commonly used as criteria to determine how close the study is to best practice for developing effective social marketing intervention. The following paragraphs will briefly examine the extent to which this thesis has met these benchmarks.

**Benchmark one: Behaviour Change;** the focus of this thesis was on changing maladaptive coping strategies, such as confrontive coping used by angry drivers, to safe and adaptive coping strategies, such as task focus. Another specific behavioural goal of this thesis was encouraging drivers to take part in learning how to cope effectively with anger in traffic. However, these are behavioural objectives only. The intervention has yet to be implemented, and did not change behaviour. The measurement of such goals was therefore not performed in this thesis due to time and resource limitations.

**Benchmark two: Research—Customer Orientation;** this work was based on formative research, utilising both qualitative and quantitative approaches, to understand driver experiences, values, and needs with regards to driving anger. Additionally, three intervention elements (training, coping messages, and positive messages) were pretested with selected groups, in order to gauge their perceived benefits and barriers, as well as examining the effectiveness and suitability of these components for these particular groups.

**Benchmark three: Segmentation;** A segmentation exercise was undertaken following study two. The use of DSI and DCQ helped the researcher to identify those drivers who are more at risk (e.g. high on the impatient driving scale). Drivers were then able to be segmented according to their driving style, coping strategies, and driving performance. This targeted approach was dictated by four criteria: 1) drivers must be between the ages of 18 – 30; 2) they must live in Riyadh; 3) they must have the highest score on one of the following scales: aggression, “new aggression”, impatient driving and confrontive coping; 4) drivers have had one accident or more, have exceeded the speed limit, and/or have reported driving recklessly.

**Benchmark four: Exchange;** the exchange in this work took two forms: 1) drivers may gain safety, calmness, peace, and religious benefits by not acting aggressively. Therefore, by changing their behaviour, drivers acquire the psychological benefits of peace of mind or satisfaction, and messages were consequently developed on this basis; 2) provision of incentives for drivers (e.g. insurance discounts) in exchange for taking part in training.

**Benchmark five: intervention and marketing mix;** One useful strategy for tackling the issue of driving anger is intervention mix (Chapter Three), in which four interventions including (a) informing and educating drivers, (b) improving road design, (c) simultaneously supporting programs for improving traffic courtesy and driving behaviour, and (d) enforcement of regulations controlling problematic driving behaviours, are combined. An effective marriage between these interventions permits the generation of synergies, which can result in dramatic reductions of driving anger.

**Inform and educate:** Interventions need to initially build awareness of the negative effects of driving anger, and encourage citizens to take actions against the driving anger issue. In addition, short messages that encourage drivers to cope effectively, and think positively, should be widely used in a variety of media, and on road information systems such as electronic warning signs, to help drivers recall them easily. Moreover, training programs that improve drivers' skills in general, and in their abilities to deal with traffic conflict in particular, are needed.

**Design:** Local authorities are encouraged to re-consider current road designs, and implement road control systems to reduce congestion, which would ease environmental pressures on drivers, and ultimately bring about behavioural changes.

**Support:** In this regard, support could take two forms: support in facilitating behavioural change, and support after training. Interventions should simultaneously hold programs that aim to promote courtesy in traffic, and improve those current driving behaviours that cause anger whilst driving. This should help create a traffic environment that facilitates changing behaviour. Further, Drivers may need to be encouraged to apply skills acquired from the training program, by conducting, for example, a follow up group discussion to overcome any issues, or providing a hot line service to help drivers deal with anger problems.

**Control:** Finally, the introduction of new enforcement regulations for common problematic driving behaviours, such as cutting off other drivers, and driving too close to other cars, can help to control these behaviours. In addition, training could be made compulsory for those drivers who demonstrate a high level of anger, or who have previously had a problem with angry or aggressive driving.

On the other hand, the use of a full marketing mix (product, place, price and promotion), was clearly effective in promoting training to young drivers who are likely to experience anger in traffic, as was discussed in chapter seven.

**Benchmark six: Competition** several competitors were identified in this thesis that prevent drivers engaging in the intervention. The main source of competition was the appraisal of blame, that is drivers blame other drivers, law enforcement officers and road construction, for the experience of anger in traffic. Therefore, this important challenge was considered, and strategies were employed to minimise it.

**Benchmark seven: Theory;** a cognitive-motivational-relational model of emotions was used, not only to help the researcher understand how anger is provoked in traffic, but also to develop an intervention that targets both antecedents (personality and environment). The use of such a theory demonstrates the value of using theory-based formative research with the target audience, in order to fully understand a variety of social issues.

## **8.7 Limitation of the study and future research**

This research set out to explore the potential of social marketing approaches to encourage drivers to manage anger in traffic, and maintain safety. Although the three studies generated some interesting findings, and fulfilled each of their objectives, due to time and resource limits, the researcher was unable to empirically test these findings, and thus implement a social marketing campaign. Hence, future research could assess the effectiveness of the suggested programs, through comparisons to control communities.

This study was also limited, because it only included respondents from the city of Riyadh.

This could affect the generalisation of findings to the entire Saudi population.

Therefore, a national survey should be conducted in the future, in order to obtain information from respondents in a variety of cities.

The primary data for study 3 was largely focused on individual solutions not social solutions however, driving anger is a complex issue that cannot be fully addressed in a single study. There are a number of social, environmental, and individual factors that were not analysed in this thesis, which in future studies may add valuable information to the understanding of driving anger.

One critical social issue that requires more research is impatient driving. This type of driving requires a strong impatient driving scale to measure the tendency of drivers to become impatient in traffic. Also, the influence of passengers on drivers' thoughts, emotions, and behaviours should not be underestimated. Further studies are needed to explore the role passengers could play with respect to the driving anger issue, and what their perception is regarding issues of driving anger and aggression, as well as identifying their roles in increasing or mitigating this anger.

Other factors that were not investigated in this study were the effects of road construction and road design on driving anger. Several questions arise with regard to these factors; for example, how does poor road design contribute to angry and aggressive driving behaviours? Does major road construction increase the experience of anger? Thus, it is important that more research be conducted to focus on the variety of factors that may have some impact on angry and aggressive driving.

Furthermore, the study applied the appraisal theory to social marketing intervention programs, with the aim of solving the driving anger issue in Saudi Arabia, and it proved effective in understanding the issue. The researcher urges social marketers to use a wider range of theories of behaviour, and include theories of emotion to other important areas, such as family abuse.

Finally, it is hoped that future research will provide insight into new, effective strategies that will help to reign in increasing rates of violence due to driving anger.

# List of Appendixes

## Appendix 1 original Driver Stress Inventory Version and Arabic

### Driver Stress Inventory Version

السلام عليكم ورحمة الله وبركاته، نشكر لك حرصك على المشاركة في هذا الاستبيان والذي يهدف إلى دراسة سلوك قائدي المركبات ومعرفة الطرق والوسائل التي يتبعونها للتغلب على ضغوطات الطريق كالغضب والقلق والإرهاق، وذلك من أجل فهم هذه الظاهرة والبحث عن حلول مناسبة لها، مع العلم بأن جميع المعلومات سوف تستخدم لأغراض البحث العلمي لنيل درجة الدكتوراه، وسوف يتعامل معها بسرية تامة.

قد تستغرق الإجابة على الاستبيان مدة لا تتجاوز 20 دقيقة، فنأمل منك الحرص على فهم المطلوب وكتابة الجواب الأقرب للصواب.

**في نهاية الاستبيان نسعد أن تدخل معنا في السحب على جوائز متنوعة كعربون شكر لمشاركتك معنا.**

العمر

Please state your age in years:

في أي عمر حصلت على رخصة القيادة

Please state the year when you obtained your full driving licence

كم عدد سنوات الخبرة لديك في قيادة السيارة

How many years of driving experience do you have?

كم عدد الايام التي تستخدم فيها السيارة

About how often do you drive nowadays?

كم عدد الساعات التي تقضيها في قيادة السيارة وسط الاسبوع الأحد -الخميس

In a typical week, estimate roughly how many hours do you spend driving?

هل تستخدم السيارة في الذهاب إلى العمل أو مكان الدراسة، الجامعة مثلا

Do you drive to and from your place of work or study?

أختر الأماكن التي تقود فيها السيارة غالباً، يمكنك اختيار أكثر من خيار

الطريق السريع – السفر

الطرق الكبيرة داخل المدينة

الطرق الداخلية في المدينة

الطرق الزراعية

Please state whether you drive frequently on: (tick one or more boxes as appropriate)

Motorways

Other main roads

Urban roads

Country roads

خلال الثلاث سنوات الماضية، كم عدد الحوادث الصغيرة التي حصلت لك نقصد

بالحوادث الصغيرة تلك التي لم يتأذى فيها أحد وكلفتك أقل من ثلاثة آلاف ريال

During the last three years, how many minor road accidents have you been involved in? (A minor accident is one in which no-one required medical treatment, AND costs of damage to vehicles and property were less than £500).

خلال الثلاث سنوات الماضية، كم عدد الحوادث الكبيرة التي حصلت لك نقصد بالحوادث الكبيرة تلك التي تأذى فيها

أحد وتطلب تدخل طبي أو توفي فيها أحد لا سمح الله وكلفتك أكثر من ثلاثة

ألاف ريال

During the last three years, how many major road accidents have you been involved in? (A major accident is one in which EITHER someone required medical treatment, OR costs of damage to vehicles and property were greater than £500, or both).

خلال الثلاث سنوات الماضية هل سبق وحصلت على مخالفة بسبب السرعة أو تهور

During the last three years, have you ever been convicted for: Speeding and Careless or dangerous driving



نأمل منك التكرم بالإجابة على الفقرات التالية بناء على مشاعرك المعتادة أثناء قيادتك للسيارة وتحديد نسبة موافقتك عليها، من المهم جدا قراءة السؤال وفهمه جيدا قبل الإجابة واختار الخيار المناسب والذي تعتقد بأنه الأقرب للصواب، نأمل الإجابة على جميع الفقرات حتى لو لم تكن تنطبق عليك، خمن الجواب الأقرب للصحة.

Please answer the following questions on the basis of your usual or typical feelings about driving. Each question asks you to answer according to how strongly you agree with the statement. Please read each question carefully before answering. Be sure to answer all the questions, even if some of them do not seem to apply to you very well: guess as best you can if need be. .... تم صياغة الفقرات لتكون (.....) مناسبة لطريقة خيارات الإجابة (موافق - موافق بشدة أالخ

أشعر بالقلق أثناء قيادة السيارة في الأجواء السيئة (مطر- غبار).

Does it worry you to drive in bad weather?

أشعر بالتشويش بسبب تفكيري باحتمالية حصول حادث أو تعطل السيارة.

I am disturbed by thoughts of having an accident or the car breaking down

أفقد أعصابي حينما يقوم قائد المركبة الأخرى بعمل سخيف.

Do you lose your temper when another driver does something silly?

أعتقد أن لدي الخبرة والتدريب الكافي للتعامل مع المواقف الخطرة في الطريق.

Do you think you have enough experience and training to deal with risky situations on the road safely?

أشعر بالقلق من التصرفات الخاطئة التي أقوم بها أثناء القيادة.

I find myself worrying about my mistakes and the things I do badly when driving

أرغب بالمخاطرة بحياتي كقائد في سباق السيارات .

I would like to risk my life as a racing driver

لن تكون قيادتي على ما يرام عندما أقود سيارة مستأجرة لم أعتد عليها

My driving would be worse than usual in an unfamiliar hired car

أرغب بعض الأحيان بأن أخوف نفسي قليلا أثناء القيادة.

I sometimes like to frighten myself a little while driving

أشعر بالنشوة والفرح حينما أقود السيارة بسرعة.

I get a real thrill out of driving fast

أحرص بشدة على التأكد من خلو جميع الطرق الجانبية التي أتجاوز من سيارات ترغب في الدخول في الطريق.

I make a point of carefully checking every side road I pass for emerging vehicles

قيادة السيارة تظهر أسوأ ما عند الناس.

Driving brings out the worst in people

أعتقد بأنه من المفيد ارتكاب بعض المخاطر في الطريق .

Do you think it is worthwhile taking risks on the road?

في بعض الأحيان، أشعر أنني حقا أكره السائقين الآخرين الذين يسببون لي المشاكل.

At times, I feel like I really dislike other drivers who cause problems for me

نصائح الركاب حول القيادة مفيدة بالجملة.

Advice on driving from a passenger is generally useful

أحب أن أرفع من مستويات الأدرينالين لدي أثناء القيادة.

I like to raise my adrenaline levels while driving

من المهم ألا تجعل قائدي المركبات الأخرى يستغلونك.

It's important to show other drivers that they can't take advantage of you

أشعر بثقة تجاه قدرتي على تجنب الحوادث .

Do you feel confident in your ability to avoid an accident?

أقوم غالبا بجهد لملاحظة الأخطار المحتملة في الطريق.

Do you usually make an effort to look for potential hazards when driving?

قائدي المركبات الأخرى هم المسؤولون في الغالب لما يحصل لي من متاعب في الطريق.
Other drivers are generally to blame for any difficulties I have on the road
سوف أشعر بالابتهاج إذا قدت سيارة رياضية في طريق مفتوح السرعة .
I would enjoy driving a sports car on a road with no speed-limit
أجد صعوبة في السيطرة على أعصابي أثناء القيادة.
Do you find it difficult to control your temper when driving?
عند القيادة على طرق غير مألوفة أصبح أكثر توتراا من المعتاد.
When driving on an unfamiliar road do you become more tense than usual?
أبذل جهد خاص لأن أكون منتبه حتى على الطرق التي أعرفها جيدا.
I make a special effort to be alert even on roads I know well
أجد إحساس بالمتعة عندما أزيد من السرعة .
I enjoy the sensation of accelerating rapidly
من المهم أن أشعر بالقلق عندما أقوم بارتكاب خطأ صغير أثناء القيادة.
If I make a minor mistake when driving, I feel it's something I should be concerned about
غالبا ما أكون مستيقظ ومنتبه للسيارات الواقفة حتى لا تتحرك أحدها فجأة أو يخرج من بينها أحد المشاة.
I always keep an eye on parked cars in case somebody gets out of them, or there are pedestrians behind them
أشعر بالقلق أكثر من المعتاد حينما يكون معي ركاب.
I feel more anxious than usual when I have a passenger in the car
أشعر بالإزعاج حينما تكون السيارة التي ورائي خلفي مباشرة لفترة من الزمن ولم يترك مسافة آمنة بيني وبينه.
I become annoyed if another car follows very close behind mine for some distance
أبذل جهدا في الطريق لمعرفة ما يحدث في الأمام البعيد (وليس القريب).
I make an effort to see what's happening on the road a long way ahead of me

أحاول قدر الجهد للانتباه لمخاطر الطريق حتى لو لم يكن هذا مهما.
I try very hard to look out for hazards even when it's not strictly necessary
أنا شخص صبور في الغالب عند الزحام.
Are you usually patient during the rush hour?

أشعر بالسيطرة على الموقف عندما أتجاوز السيارة الأخرى.
When you overtake another vehicle do you feel in command of the situation?
أشعر بالقلق والتوتر عندما أقوم بتجاوز السيارة الأخرى.
When you overtake another vehicle do you feel tense or nervous?
أشعر بالإزعاج حينما أسير خلف سيارة بطيئة (سيارة الشحن الثقيلة)
Does it annoy you to drive behind a slow moving vehicle?
عندما أكون مستعجل، غالبا ما تعترض السيارات الأخرى طريقي.
When you're in a hurry, other drivers usually get in your way
أكون متيقظا عند القيادة في وصلة صعبة من الطريق
When I come to negotiate a difficult stretch of road, I am on the alert
أشعر بالقلق غالبا حينما أقود في الطرق المزدحمة.
Do you feel more anxious than usual when driving in heavy traffic?
أشعر بالمتعة حينما أسرع في المنعطفات.
I enjoy cornering at high speed
أشعر بالإزعاج حينما تتغير الإشارة إلى الأحمر إذا قربت منها .
Are you annoyed when the traffic lights change to red when you approach them?
قيادة السيارة دائما تجعلني أشعر بالعدوانية.
Does driving usually make you feel aggressive?

<p>تخيل أنك تقود السيارة لفترة طويلة من دون توقف أو توقف لفترة قصيرة، ماذا سوف يحدث لك من تغير أثناء القيادة.</p> <p>Think about how you feel when you have to drive for several hours, with few or no breaks from driving. How do your feelings change during the course of the drive?</p>
<p>أشعر أكثر بالتعب الجسدي (صداع أو آلام بالعظام).</p> <p>More uncomfortable physically (e.g. headache or muscle pains)</p>
<p>أشعر أكثر بالدوخة والنعاس.</p> <p>More drowsy or sleepy</p>
<p>ردة فعلي تجاه الطريق والسيارات تصبح أبطئ.</p> <p>Reactions to other traffic increasingly slow</p>
<p>يقل انتباهي لعلامات الطريق بشكل كبير.</p> <p>Become increasingly inattentive to road-signs</p>
<p>رؤيتي تصبح أقل وضوحا.</p> <p>Your vision becomes less clear</p>
<p>أجد صعوبة بالغة في تقدير السرعة المناسبة.</p> <p>Increasingly difficult to judge your speed</p>
<p>أشعر بالملل وعدم الرغبة في الاستمرار بالقيادة.</p> <p>Increasingly bored and fed-up</p>
<p>تصبح عملية تجاوز السيارات أكثر خطورة.</p> <p>Overtaking becomes increasingly risky and dangerous</p>

## Appendix 2 original Driver Coping Questionnaire (DCQ) Version and Arabic Driver Coping Questionnaire (DCQ) Version

فكر مليا في تلك المواقف الصعبة والمقلقة التي حصلت لك خلال السنة الماضية أثناء قيادتك للسيارة، ربما حصل لك موقف كاد يحصل لك فيه حادث، أو أنك عاقت في الزحام، أو ربما قادت السيارة لمسافة طويلة في أجواء سيئة، أو حصل لك موقف غضبت فيه، خذ بعض الوقت وفكر في موقف واحد ومحدد حصل لك أثناء قيادتك للسيارة، أكتب كل تفاصيل هذا الموقف في الأسفل:

Think of those occasions during the last year when driving was particularly stressful. Perhaps you nearly had an accident, you were stuck in a traffic jam, or you had to drive for a long time in poor visibility and heavy traffic. Take a few moments, think about one traffic event in particular and write it below.

نأمل منكم الإجابة على الأسئلة التالية والمتعلقة بالموقف الذي ذكرت

Can you answer the following questions with regard to your situation?

إلى أي أحد شعرت بالغضب في هذا الموقف

To what degree did you feel angry in the situation?

إلى أي أحد شعرت بالإهانة في هذا الموقف

To what degree did you feel threatened in your self-esteem?

إلى أي أحد شعرت بالخطر على سلامتك في هذا الموقف

To what degree did you feel your safety was threaten?

إلى أي أحد تشعر بأن اللوم ينصب على قائد السيارة الأخرى

To what degree did you blame the other driver?

الفقرات التالية تتعلق بالطريقة التي تعاملت فيها مع الموقف السابق، أقرأ الفقرات التالية واكتب إلى أي حد تم استخدام الطريقة في الموقف المذكور من خلال التقييم التالي) 1 لم أستخدمه أبد – 5 تم استخدامه بشكل كبير)

These questions are concerned with how you actually deal with driving situation you have just described. Read each item below, and indicate, by using the following rating scale, to what extent you used it in your situation.

Relieved my feelings by taking risks or driving fast	نفست عن مشاعري بالمخاطرة في القيادة أو زيادة السرعة.
Cheered myself up by thinking about things unrelated to the drive	رفهت عن نفسي بالتفكير بأمر لا تتعلق بالقيادة.
Stayed detached or distanced from the situation	حاولت الابتعاد عن الموقف.
Tried to make other drivers more aware of me by driving close behind them	حاولت أن ألفت انتباه قائد المركبة الأخرى وذلك بالقيادة خلفه تماما.
Wished that I was a more confident and forceful driver	تمنيت لو أنني أكثر ثقة وأني قائد قوي.
Ignored my feelings about the drive	تجاهلت مشاعري تجاه القيادة.
Made sure I avoided reckless or impulsive actions	حرصت أن أتجنب أي سلوك متهور أو سلوك لا تحمد عواقبه .
Showed other drivers what I thought of them	أظهرت لقائد المركبة الأخرى ماذا أعتقد (أظن) تجاهه.
Drove assertively or aggressively	قادت السيارة بعدوانية.
Tried to gain something worthwhile from the drive	حاولت أن أكتسب بعض الفائدة من القيادة.
Showed other drivers I was in control of the situation	أظهرت لقائد المركبة الأخرى أنني كنت مسيطر على الموقف.

بذلت جهدا إضافيا للقيادة بأمان.

Made an extra effort to drive safely

شعرت بأنني اكتسبت خبرة أكبر في القيادة.

Felt that I was becoming a more experienced driver

بذلت الجهد لهدوء الأعصاب والراحة .

Made an effort to stay calm and relaxed

شتمت قائد المركبة الأخرى (بصوت عالي أو في نفسك)

Swore at other drivers (aloud or silently)

فكرت في أحد الأوقات الجميلة التي سبق وأن عشتها.

Thought about good times I've had

تمنيت لو أنني أجد متعة أكثر في القيادة.

Wished that I found driving more enjoyable

حرصت على ترك مسافة أمانة بيني وبين السيارة التي أمامي.

Made sure I kept a safe distance from the car in front

أكملت طريقي وكأن شيء لم يكن.

Went on as if nothing had happened

رفضت الاقتناع بأن مكروه حصل لي .

Refused to believe that anything unpleasant had happened

أقنعت نفسي بأنه لم يحدث أي مشكلة.

Told myself there wasn't really any problem

جعلت قائد المركبة الأخرى يعرف أنه كان على خطأ.

Let other drivers know they were at fault



Criticised myself for not driving better	عاتبت نفسي بأني لم أقد بصورة أفضل.
	فكرت في عواقب حصول حادث.
Thought about the consequences of having an accident	
	استخدمت النور العالي أو المنبه (البوري) وأنا غاضب.
Flashed the car lights or used the horn in anger	
	شعرت بأني تعلمت كيف أتعامل مع الضغوطات.
Felt I was learning how to cope with stress	
	خففت من السرعة عمداً عندما واجهت عقبات في الطريق أو أحاول جوية سيئة.
Deliberately slowed down when I met a difficult traffic situation or bad weather	
	بذلت بجهد خاص للتنبيه إلى أي أخطار في الطريق .
Made a special effort to look out for hazards	
	عاتبت نفسي بأني لم أسيطر على مشاعري أو حزني.
Blamed myself for getting too emotional or upset	
	ركزت بما يجب علي فعله لاحقاً .
Concentrated hard on what I had to do next	
	قلقت بشأن ما يجب فعله في الخطوة التالية.
Worried about what I was going to do next	
	نظرت إلى القيادة على أنها تجربة مفيدة.
Looked on the drive as a useful experience	
	قلقت بشأن قصوري في قيادة السيارة .
Worried about my shortcomings as a driver	
	فكرت في الفوائد التي يمكن أن أحصل عليها من رحلتي.
Thought about the benefits I would get from making the journey	
	تعلمت من أخطائي
Learnt from my mistakes	

## Appendix 3 Population (15 Years and Over) By Age Groups and Educational Status: 1435 H / 2014 D

السكان الذكور ( 15 سنة فأكثر ) حسب فئات العمر والحالة التعليمية لعام 1435 هـ / 2014 م											
Saudi Male Population ( 15 Years And Over) By Age Groups And Educational Status : 1435 H / 2014 D											
Age Groups	Educational Status Or Highest Certificate					الحالة التعليمية أو اسم أعلى شهادة					فئات العمر
	جملة	دكتوراه	ماجستير	الجامعة	دبلوم دون	الثانوية	المتوسطة	الإبتدائية	قرأ وكتب	أبى	
	Total	Ph. D	Master High Dip	University	Pre-Univ Diploma	Secondary Equivalent	Intermediate	Primary	Read Write &	Illiterate	
15 - 19	1294678	0	0	0	0	259851	788707	223128	15757	7235	15 - 19
20 - 24	1246309	0	147	77053	73412	842262	153738	62227	27669	9801	20 - 24
25 - 29	1368968	451	8430	264625	140688	537596	222065	122415	58386	14312	25 - 29
30 - 34	1685542	1139	16510	349425	116666	501726	350849	223426	104486	21315	30 - 34
35 - 39	1930199	10296	24587	389517	102696	464957	406516	319508	178652	33470	35 - 39
40 - 44	1612893	15001	26634	327776	72831	341502	340702	267456	179500	41491	40 - 44
45 - 49	1246370	18927	17103	228217	63488	259607	262258	204878	151229	40663	45 - 49
50 - 54	874792	12249	20773	164641	36739	151693	169577	153530	126015	39575	50 - 54
55 - 59	587217	11781	11763	108928	25194	84591	93852	127638	87374	36096	55 - 59
60 - 64	350094	4864	4747	53163	12250	43905	60095	66580	74084	30406	60 - 64
65+	451459	4565	4880	26099	10896	39881	43548	78318	111976	131296	65+
Total	12648521	79273	135574	1989444	654860	3527571	2891907	1849104	1115128	405660	الجملة

## Appendix 4 Arabic online questioner



University of the West of England

bettertogether

أهنت ... بوصولك إلى هذا المكان فأنت تشارك الكثير من الأشخاص الحريصين على اكتساب مهارات جديدة ويستمتعون بمساعدة الآخرين. تشكر لك حرصك على المشاركة في هذا الاستبيان والذي يهدف إلى دراسة سلوك قاندي المركبات ومعرفة الطرق والوسائل المتبعة للتغلب على ضغوطات الطريق، كالغضب، والقلق، والإرهاق، وذلك من أجل فهم هذه الظواهر والبحث عن حلول مناسبة لها، مع العلم بأن جميع المعلومات سوف تستخدم لأغراض البحث العلمي لنيل درجة الدكتوراه في تخصص التسويق الاجتماعي، وسوف يتعامل معها بسرية تامة. تستغرق الإجابة على الاستبيان مدة لا تتجاوز 20 دقيقة، فنأمل منك الحرص على فهم المطلوب وكتابة الجواب الأقرب للضوابط. في حالة وجود أي استفسار أو ملاحظات أرجو التواصل مع الباحث على الإيميل أدناه وتقبل فائق التحية والتقدير.

كما ندعوك للمشاركة في وسم ( #بشاعري\_في\_السيارة ) على تويتر ليتم إثراء الموضوع من قبلكم.

تأليف بن حمد الجابر  
جامعة غرب إنجلترا في بريستول-بريطانيا  
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في نهاية الاستبيان نسعد أن تدخل معنا في السحب على جوائز متنوعة كعربون شكر لمشاركك ، نأمل منك التكرم بإدخال إيميلك الإلكتروني في نهاية الاستبيان.

العمر

18-25

26-30

31-35

36-40

40-50

الدرجة العلمية

قل الجامعة

المكفوريوس

الماجستير

الدكتوراه

## Appendix 5 Focus group interview schedule

Group		Duration time	
Date		No of participants	

### **Warm Up Phase**

Good evening and welcome to our discussion. Thanks for taking the time to join us to share Your views and thought about driving anger. My name is Naif I am a PhD Student at University of the West of England.

Please feel free to share your thought and experience and there are no right or wrong answers but rather differing points of views. As you can see we are audio-taping and it only be used for research purpose.

### **Interview questions**

#### **Topic: Starter**

1. When you think about driving anger, what is the first thing that comes to mind?
2. Do you think there is a problem of driving anger in Saudi Arabia? How
3. In general, do you think Saudi drivers are impatient, why
4. Do you think it is difficult to control anger in traffic?
5. Do you think an apology from the offender will cool angry driver down?
6. Do you think passenger could influence your behaviour? In which way?

#### **Objective one: Training intervention**

- Do you think training with needed skills will help managing anger? If they agree with this idea the following questions concern about how to market such program.
- Which of the flowing course title will grab your attention?

	Are you a good driver?
--	------------------------

	Managing driving anger
	Cognitive behavioural therapy courses
	Driving skills
	Managing the road

- What is the best method to advertise for this program? Who is the best messenger? (Professional driver, Foot player, Policeman, your friends)
- How could we make such a program attractive to young drivers?
- Where would be the most convenient place to hold this program? For how long (days and times)?
- Would you be willing to pay?
- What sorts of incentives are best to offer? Money? (e.g. Playing PlayStation)
- What do you think about developing a driving game? What are the most features?

**Objective two: Coping strategy**

- In your opinion, what is the most effective coping strategy that angry driver can use?
- Do you think it is easy to apply your suggestions? Are there any barriers?
- Which of the following coping strategies could help control anger;

*Task-Focus	Concentrate on enhancing driving safely.
	Attempting to control the self.
Reappraisal	Re-evaluate the situation in positive way.
Avoidance	Cheered myself up by thinking about things unrelated to the drive
	Ignored what people have done and just keep going
Quran teaching	I seek refuge in Allah from the outcast Shaitan (evil)

- *This column is just for an illustration for the reader and was not showed in the discussion*  
A discussion of their choice was held after that.

**Objective three: Messages on the way**

We need to send direct messages that elicit positive emotion and appraisal and to use better coping.

In order to gain independent responses to the messages prior to the group discussion, the messages were presented to participants in individual booklets in rotating order. The researcher instructed the interviewees to remember a time when they experience anger on the road and rate their responses in their booklets from one to five for each message, as one (not all effective) and five (very effective). A discussion of the effectiveness of these messages held as well. They may not make sense in English.

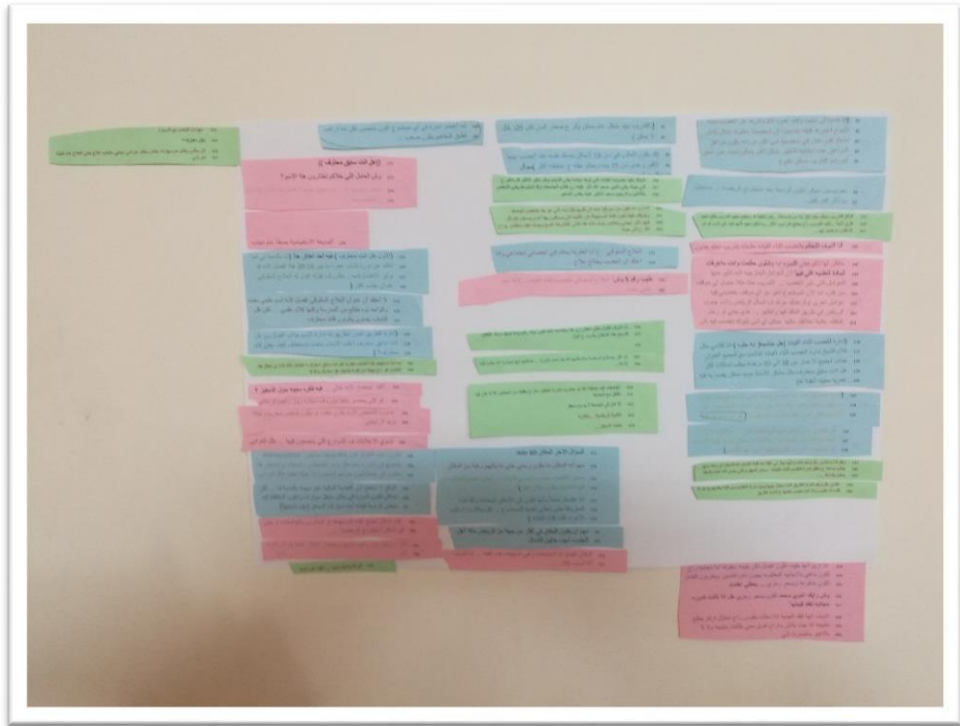
Strategy	Message
*Redirection of attention	It is not worth to think about him, let's think about something more important.
Letting go and focus	Just focus on safe driving, ignore idiots.
Acceptance	We all make mistakes, take breath and keep going.
No revenge	I am not going to stoop to his level.
Forgiving	Whoever forgives and amends, he shall have his reward from Allah.

*\*This column is just for an illustration for the reader and was not showed in the discussion*

### **Discussion:**

- How can we encourage driver to generate alternative appraisals? Why
- What do you think about stickers installed inside the car that have some messages, or some pamphlets?
- Where is the best place to remind you, to send the messages? Displaying messages on billboards, electronic signs and messages on the radio
- Which part of the day do you think is the best to send the message, morning when you got to your university or afternoon or at weekends?
- Which type of roads?

# Appendix 6 data analysis for study three



## Appendix 7 MANOVA analysis for age differences in study two

<b>Descriptive Statistics</b>				
	Age	Mean	Std. Deviation	N
Aggression	18-25	18.1782	3.32156	202
	26-30	18.1429	3.60175	147
	31-35	18.0000	3.56651	126
	36-40	17.6056	3.55559	71
	40-50	16.8434	4.28976	83
	Total	17.8935	3.61787	629
Hazard	18-25	27.8168	3.67337	202
	26-30	27.7075	3.37438	147
	31-35	28.2857	3.74776	126
	36-40	27.6197	3.89639	71
	40-50	27.4096	4.80862	83
	Total	27.8092	3.81397	629
Self-confidence	18-25	10.9208	2.07895	202
	26-30	11.3741	1.75254	147
	31-35	10.8413	1.78174	126
	36-40	10.8873	2.04625	71
	40-50	11.4578	1.93996	83
	Total	11.0779	1.93657	629
Impatient driving	18-25	16.1040	2.63993	202
	26-30	15.8844	2.56295	147
	31-35	15.8333	2.47467	126
	36-40	15.1127	2.80076	71
	40-50	14.1446	2.89294	83
	Total	15.6280	2.71319	629
Thrill-seeking	18-25	19.4505	6.07826	202
	26-30	18.1497	5.89794	147
	31-35	16.4841	5.97024	126
	36-40	14.8169	5.20799	71
	40-50	14.9157	5.40146	83
	Total	17.4308	6.08777	629
Fatigue	18-25	24.7327	6.17553	202
	26-30	25.2925	6.47673	147
	31-35	25.1349	6.28822	126
	36-40	24.8310	6.36954	71
	40-50	23.9277	7.16152	83

	Total	24.8490	6.42084	629
Task-focused	18-25	32.8911	8.27320	202
	26-30	32.4354	8.06656	147
	31-35	33.0079	6.94838	126
	36-40	34.3239	8.34399	71
	40-50	32.5422	8.75312	83
	Total	32.9237	8.04410	629
Confrontive	18-25	16.0842	6.56827	202
	26-30	16.9388	6.72271	147
	31-35	16.3730	6.46311	126
	36-40	16.4507	6.50228	71
	40-50	13.9157	5.01997	83
	Total	16.0970	6.43872	629
Self-criticism	18-25	8.9554	3.58174	202
	26-30	9.3129	3.71926	147
	31-35	8.9683	3.63084	126
	36-40	9.6197	3.61096	71
	40-50	9.6145	3.98421	83
	Total	9.2035	3.68072	629
Emotional AV	18-25	4.6931	2.49673	202
	26-30	4.7211	2.32256	147
	31-35	4.5556	2.16723	126
	36-40	4.7887	2.19034	71
	40-50	4.9157	2.45548	83
	Total	4.7122	2.34891	629
Cognitive AV	18-25	5.4455	2.44329	202
	26-30	5.2585	2.29976	147
	31-35	5.7460	2.45581	126
	36-40	5.4789	2.49490	71
	40-50	4.8795	2.20530	83
	Total	5.3911	2.39486	629



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