應用多維度及單維度Rasch模式量測警察取締

交通違規行為能力感知之研究

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摘要

酒後駕車與闖紅燈行為是導致死亡及嚴重車禍主因，就車禍原因而論，以美國而言，2010年肇事致死亡人數有約有10,228人，其中有百分之31係由酒醉駕車引起，而有百分之35已號誌化路口，涉入因闖紅燈違規行為而引起的死亡車禍；以台灣而論，自2002年至2011年，每年因酒後駕車與闖紅燈行為肇事致死亡合計人數平均高達625人，佔肇事死亡人數百分之30，而受傷者有30, 133人。因此，如何遏制此二種侵略性的行為以促進交通安全，實刻不容緩。實際上，在交通安全領域，警察執法已成為阻卻違規行為的重點手段，在降低酒後肇事事故面向，警察執法取締已成為遏制酒後駕車最重要的作為，「取締酒後駕車路檢」、「威力巡邏」及「整合性執法」等執法方式均已被廣泛使用，其中「取締酒後駕車路檢」在歐、美各國已有實施30年以上經驗，並已見其成效。

在遏制闖紅燈行為面向，雖然路口闖紅燈自動照相設備已廣泛使用於取締闖紅燈行為，惟造價昂貴且經研究指出，其可能提高車輛在路口發生尾撞情形，因此，在台灣以路口站崗執法方式取締闖紅燈行為仍為主力，故如何提昇警察取締闖紅燈行為能力以促進交通安全，值得深入研究。在遏制酒後駕車面向，台灣已實施威力巡邏取締酒後駕車

多年，而取締酒後駕車路檢勤務自1996年開始執行，雖然已見渠等執法方式遏制酒後駕車、降低重大交通事故的成效，然而，取締酒後駕車路檢是疲累又浪費警察資源的勤務，因此，執行過多路檢點或增加路檢頻率，將使警察無法負荷。研究指出：警察執行取締酒後駕車路檢勤務成效，決定於執行的效能，而工作能力又與執行效能成正比；鑑此，本文建議透過提昇警察執法能力，使警察取締酒醉駕車行為更具效能，以達遏制酒後肇事的目的。

在量測取締闖紅燈執法能力部份，本研究以「取締闖紅燈主要步驟」連結「執法能力感知架構」構建問卷，經驗證為單一維度問卷，即應用單維度Rasch模式進行分析警察執法能力。進一步，回顧各國取締酒後駕車相關文獻，可歸納出：威力巡邏的執法程序行為，包括偵測駕駛人可能涉及酒醉駕車的行車樣態，及攔停酒後駕車可疑車輛兩項，至於警察執行取締酒後駕車路檢勤務時，欲有效攔查逮捕酒醉駕車車輛，須具備三項主要執法程序行為：（1）以觀察法可以偵測出駕駛人可能涉及酒醉駕車的行車樣態，（2）成功攔停酒後駕車可疑車輛，（3）有能力追緝不服攔查逃逸車輛。本文據此針對渠二種執法分別設計「交通警察能力感知問卷」，用以量測警察取締酒後駕車執法能力，經發放問卷實證研究，計得到502份有效問卷。問卷資料經由因素分析結果，威力巡邏方面，問卷符合單一維度構面，因此以單維度Rasch模式分析各項參數；而在路檢勤務方面，警察執法能力可詮釋為：（1）偵測酒醉駕車行車樣態能力，及（2）攔停兼追緝酒醉駕車車輛能力等二個構面，接續，本研究應用多維度Rasch模式，量測警察執行取締酒後駕車路檢的執法能力及困難度。

就闖紅燈執法而言，由本研究可推論，追車與攔停逃逸車輛列為最困難的執行項目，而在極寒冷天氣追車是最具危險性的任務，為提昇警察取闖紅燈執法能力，未來教育訓練應著重於安全駕駛訓練、能化身體負荷功能及適應極寒氣候。在執行酒駕威力巡邏勤務方面，警察對於以巡邏方式取締酒駕車輛能力具有信心，其偵測酒駕樣態車輛能力優於攔車的能力，其中酒駕蛇行車輛最難以攔查，其次為左右浮動及超速車輛；值得研究的是，此三種酒駕行車樣態是最易被偵側認定為酒駕的車輛。由於這些具侵略的駕

車樣態具有不規則性的行車軌跡，對於執勤警察及其他用路者會產生相當危害，應列為教育訓練的重點。而大部份受測者對於執行路檢勤務時，偵測酒醉駕車樣態車輛的能力自覺良好，但有一半的參與者，對於攔車與追車的能力尚覺不足；其次，酒駕蛇行是最具侵略性的危險駕車方式。最後，本研究的分析結果期望能提供警政單位設計有效的課程，訓練員警提昇執法能力，並冀有助於相關單位提出以行政或立法機制改善警察執法過程所遭遇的困境。

關鍵詞：闖紅燈、取締酒後駕車路檢、酒醉駕車、威力巡邏、執法能力、多維度、Rasch 模式

Measuring Police's Perceived Traffic Law Enforcement Abilities– Applications of Multidimensional and Unidimensional Rasch Models

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ABSTRACT

Drunk driving and red light running are the most two important contributing factor to fatal accidents in many countries. There were 10,228 fatalities in DWI crashes in 2010– 31 percent of total traffic fatalities for the year in the United States. Approximately 35% of all signalized intersection and signalized-intersection-related fatalities involve red-light running. These two illegal driving behaviors totally accounted for 30,133 injury accidents and resulted in 625 fatalities each year on average in the period of 2002-2011. These data indicated that these two aggressive driving are severe problem and reducing the violated driving behaviors is critical for road safety improvement. Indeed, road safety enforcement has been especially emphasized as a deterrence to hit drunk driving red light running. Many enforcement measures have been utilized to deter drivers from driving while intoxicated (DWI), including sobriety checkpoints, saturation patrols and integrated enforcement. Of these measures, sobriety checkpoints and saturation patrols have been used in many countries such as the United States and New Zealand for more than three decades.

As reducing red light runner is concerned, even though red-light cameras are prevalently applying at intersection to deter traffic accidents resulting from red light running, it is costly and might increased rear-end collisions. Thus, in Taiwan, the stand guards at intersection are still in widespread used for deterring red light running, and similar to checkpoints and patrols how to enhance the executing ability is also a critical issue for road safety. Next, Taiwan has conducted saturation patrols for more than two decades, and has administered sobriety checkpoints since 1996. However, these two enforcement methods are demanding duty and

checkpoints often exhaust police resources. Previous studies have conformed that the success of conducting these two traffic law enforcement is primarily determined by the performance of the police officers involved. Further, work ability is positively related to performance. Accordingly, this study suggested that improving enforcement ability of police officers is just the prior choice to reduce the numbers of deaths and injuries resulting from impaired drivers.

The major processes of executing red-light running enforcement joined the framework of perceived enforcement ability to design an enforcement ability scale for measuring police enforcement abilities. It was also fulfilled unidimensionality assumption; and a unidimensional Rasch analysis was applied to measure the police officers' perceived abilities. Reviewing previous literature related to arrest drunk driver, we concluded that the main process of apprehending drivers who are driving while intoxicated (DWI) when conducting sobriety checkpoints should include three steps: detecting possible drunk drivers by observing DWI cues, detaining suspected DWI motorists, and intercepting escaping motorists, while saturation patrols include the first two steps. Thus, this study developed two scales to measure 502 Taiwan traffic police officers' perceived ability to administer the enforcement activities. Through factor analysis, the officers' enforcement ability on checkpoints was found to consist of two component latent traits: detecting ability (DA) and detaining and intercepting ability (DIA). Because the scale for saturation patrols was identified as a unidimensional latent trait, a unidimensional Rasch analysis was then applied to measure the police officers' perceived parameters. Next, a multidimensional approach of Rasch models was then applied to measure the police officers' perceived abilities and particular difficulties in conducting sobriety checkpoints.

From the viewpoints of red light running enforcement, the results indicated that chasing and detaining escaped vehicle was the most difficult mission to be conducted. Second, to intercept escaped violator in extreme cold weather may be the most dangerous mission. Next, in order to enhance the traffic police enforcement ability of red light running, the future training for traffic police should focus on safety driving discipline, strengthen physical loading and ability to accommodate extreme weathers. On the other hand, the results suggested that most participant police officers perform fair or even better on conducting DWI patrols, and they have better abilities on detecting than detaining DWI vehicles. Detaining DWI vehicles with a weaving pattern is the most difficult task to be accomplished, which is followed by drifting pattern and speeding pattern. Interestingly, these three patterns are just the easiest three to be detected. A training program for improving enforcement skill to deter

the aggressive drivers is needed for both checkpoints and patrols enforcement, because their unpredictable driving courses are relatively dangerous for police officers and other road users. For the abilities on conducting DWI checkpoints, the results indicated that the majority of police officers performed well in detecting DWI vehicles, but half of the study participants lacked confidence in detaining DWI vehicles and intercepting escaping DWI vehicles. DWI with weaving was found to be the most aggressive and threatening behavior to traffic police. Finally, we expect our research could be used to provide enforcement authorities guidance in developing programs to improve officers' ability or applying administration or legislation mechanism to assist them in resolving problems originated from enforcement process.

Keywords: red light running, sobriety checkpoints, driving while intoxicated (DWI), saturation patrols, enforcement ability, multidimensional, Rasch model.

誌謝

本論文得以完成，感謝管理學院院長恩師　張新立教授七年來不厭其煩的指導，不論是研究議題或是研究方法的擬定，在每週一次的討論中獲益良多。畢業典禮當天穿上恩師贈送的管理博士袍，並由恩師親自撥穗，感激之情永生難忘。

感謝論文計畫書審查委員汪進財教授、任維廉教授的指正，使得論文內容更豐富；更感謝博士學位口試委員陳惠國教授、李志綱教授、蘇志強教授、任維廉教授、汪進財教授的寶貴意見，讓論文結構更臻完善。

感謝修課期間韓復華教授的物流管理、任維廉教授的運輸組織與管理、高凱教授的運輸經濟學、張新立教授的運輸需求與高等統計學、吳宗修教授的運輸安全與道路安全、吳水威教授的車流理論運輸環境影響評估、王晉元教授與黃家耀教授的智慧運輸系統、以及英文教學研究所葉修文與孫于智教授的學術論文寫作等課程，讓我在交通運輸與管理領域及英文寫作獲益匪淺。

論文撰寫過程中，感謝鄭美幸教授、吳舜丞博士的不吝指點；感謝Richard、Yvonne與葉修文教授在英文章編修上的協助；感謝舜承與政樺的激勵。感謝賓權、來順、晉光、東石、祈延等博士班同學以及SONY LAB 學弟妹們的相互勉勵；特別感謝美珍在多維度Rasch模式分析上的協助。

最後，能夠在身兼公務員與學生、為人夫與為人父的多重角色下，順利完成本論文，要感謝妻子與吾妹、家弟的全力支持，以及四個乖巧兒女越騰、政展、承宗與甜心芙臻的體貼與相伴。

謹將此論文獻給一直以我為榮的母親。

施昌谷 謹誌

2012 年 7 月 16 日

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