Using Self-Witnessing Reports to Study Drivers in Traffic

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Introduction

Two types of driver behavior models have been advanced, those involving input-output relations and those involving internal states [1,2] Input-output models use taxonomies or inventories based on task analyses, as well as functional control models of a mechanistic nature. Internal state models use trait analyses of drivers and their motivational-cognitive context. Michon considers the input-output models as "behavioral" while the internal states models are termed "psychological" [1].

This paper argues that the internal state models are also to be considered as behavioral. The real contrast in driver behavior models is external-behavioral vs. internal-behavioral. Inventories of driver tasks have so far been based on external behaviors that are accessible to public observation and description of driving performance. A way of obtaining internal behavioral or private data is presented in what follows [3-5].

At the beginning of the century, Watson championed a radical behaviorism that was to exclude the study of inner activities such as thinking and feeling [6]. Skinner's more moderate approach included the serious attempt to give a behavioral analysis of speech, its grammatical system, and its sub-vocal verbalizations identified with the activity of thinking [7]. Since then, the earlier work of Russian psychologists on the control functions of inner speech has received widespread attention and acceptance among behaviorists, neo-behaviorists, and cognitivists [8,9]. Staats has worked out functional-behavioral theories of inner activities that cover what is ordinarily called thinking and feeling [10,11].

Educators and test makers have long used the "thinking aloud" verbalizations of college students to study their problem solving abilities [12-14]. Silent verbalizations were used by Meichenbaum and Goodman Watson and Tharp in the form of self-regulatory sentences that mediate and control the overt performance of students and clients in need of greater self-control of their behavior in a number of areas [15,16]. Abelson has proposed "script analysis" as a method of reconstructing the cognitive activities that underlie routine behaviors such as ordering food in a restaurant [17]. Ericsson and Simon have described their extensive attempts in "protocol analysis" which involves the tape recording of a subject's thinking aloud routine while engaged in problem solving activity of specific tasks (e.g., solving a chess problem) [18]. These research and clinical efforts represent significant advances in the scientific study of the private world of inner behaviors. James& Nahl report findings with the "self-witnessing" technique to obtain reliable data on the ongoing events in the private world of drivers [19].

The Self-Witnessing Method

Drivers readily discuss their driving behavior and that of other drivers. For example, when I have asked students in my driving psychology course to write an introduction about themselves as drivers, they spontaneously mentioned various aspects about themselves such as the following: How long I've been driving; what kind of cars I can drive (gear shift or automatic); how driving affects my everyday life (its cost, dangers, frustrations, stress); what images I project as a driver (power, status, lifestyle); whether I consider myself to be a good or bad driver; whether I like myself as a driver; how I react to common driving situations; how much control I have over my driving and my emotions; how my mood changes as a result of driving episodes; how aware I am of my driving or of driving conditions; how the traffic went on a

particular trip; my driving record (traffic tickets, accidents, near misses); and some others [19].

Asking drivers to describe their own driving behavior provides *retrospective* data in which the respondents' recollection of facts is mixed with their self-image as drivers. Self-witnessing reports yield data that are *on-going* descriptions of things as they happen, whether thoughts, emotions, speech, or car maneuvering. The driver behind the wheel speaks out loud while a suitable device in the car is recording the voice. This is an ongoing report at the very time that the emotions, thoughts, perceptions and actions arise spontaneously and *concurrently* with the act of driving. Later analysis of the recording yields detailed and accurate information about the driver's ongoing emotions, thoughts, and perceptions that were experienced during a particular driving episode.

In its modern version behaviorism is committed to a unified theory that tries to deal with external and internal aspects of the self [1,10]. For instance, the concept of personality is defined in terms of built-up repertoires of basic habits. These are actually skills and errors that can be modified through further learning. This acquisition process is going on in three distinct domains of the person: affective, cognitive, and psychomotor, which is also called perceptual-motor and sensory motor. All skills at any level of expertise contain affective, cognitive, and psychomotor features.

Expressing fear in a driving incident and showing disapproval of another driver are instances of *affective* driving behavior, e.g., "*Careless and pushy drivers always do things like that.*" Or: "*I almost sideswiped a car which had been travelling in my blind spot. Thinking about what could've happened made me scared"* [20,21].

Reasoning about one's own driving errors is an instance of *cognitive* driving behavior, e.g., "*I'm driving too fast. I've got to slow down or get into a crash*." Or: "*I could have killed the guy back there. I am so careless!"*

Looking around and managing the car's movement are instances of *sensorimotor* driving behavior. The complexity of mental systems that require safe driving is impressive [22]. It is hard to think of any other task that ordinary people perform on a routine basis every day that is as dangerous as driving.

Illustration of Findings

Self-witnessing reports expose a stressed traffic environment in which intense emotions and violent impulses are occasioned by acts that don't actually cause a collision but are regarded by motorists as "near misses". In an earlier article I present the following segment of a driver's self-witnessing report involving a near miss [24].

I am scared, anxious, fearful, panic stricken, agitated, bothered, irritated, annoyed, angry, mad. I feel like yelling and hitting [17]. *I'm thinking, Oh, no, what is he doing. What's happening* [12]. *How could he do that. The guy was speeding. I hear myself saying out loud, S--t! Stupid guy! I'm breathing fast, gripping the wheel, perspiring, sitting up straight and slightly forward, my eyes are open and watching straight ahead [13].*

Segment [17] addresses affective behavior. Segment [12] addresses cognitive behavior. Segment [13] addresses sensorimotor behavior.

Negative reactions frequently mentioned in drivers' self-witnessing reports include the following [23].

Physiological reactions: heart pounding, stopping breathing, muscle spasms, stomach cramps, wet hands, pallor, faintness, trembling, nausea, discoordination, inhibition, visual fixation, facial distortion, back pain, neck cramp.

Emotional reactions: outbursts of anger, yelling, aggressive gestures, looking mean and glaring, threatening with dangerous vehicle manipulation, fantasies of violence and revenge against other drivers, panic, incapacitation, distortion, regressive rigid pattern of behavior, fear, anxiety, delusional talk against non-present drivers and objects.

Thought sequences: paranoia thinking that one is being followed or inspected, talking out loud to other drivers who are not within ear shot, script writing scenarios involving vengeance and cruelty against "guilty" drivers, denial of reality and defensiveness when a passenger complains of a driver's error, psychopathic interactions as when two drivers alternately tailgate each other dangerously at high speed.

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These findings raise an important public issue: What is the mental health of the more than one hundred million licensed drivers in this country? Research with the self-witnessing method is needed to assess the generality of these preliminary findings with college students. We need to map out the behavior of drivers under varying social and psychological conditions so as to arrive at a comprehensive theory of driving behavior.

Conclusion

This review argues that self-witnessing reports can be appropriately used for investigating the inner or private psychological factors involved in driving behavior. For instance, self-witnessing reports can uncover factors that influence obedience or disobedience to road signs and regulations. Kelman proposes that external compliance is mediated by externally applied rewards for obedience and punishment for disobedience [24]. The self-witnessing reports of some drivers reveal a preoccupation with 'watching out for cops' and so-called "speed traps," indicating that obedience to the speed limit is conditioned to the presence of threat [21,23].

Perhaps deeper stages of compliance could be achieved through identification with other highway users. The process of identification is more internal than fear of punishment. This would require switching locus of control of one's driving speed from external threat to a more internal source. For example, the driver might stay within the speed limit out of consideration for the safety of other motorists.

Drivers who express concern about the safety, rights, and comfort of other drivers reflect this deeper stage of compliance (e.g., "*I better not follow so close. Don't want to intimidate that driver.*"). Similar sentiments are involved in thinking that drivers have rights or that we must all be fair to one another.

Even deeper levels of internalization on moral reasoning have been described by Kohlberg, such as expressions of mutual concern, altruism, and religious values in connection with one's driving [25]. Some of the self-witnessing reports reveal a sense of responsibility in driving which stems from the driver's conscience and regret (e.g., "*I felt guilty for cutting in on that driver. They must have been real scared not knowing whether I was going to hit them or not*").Future research may investigate the conditions that foster greater internalization of obedience to road regulations and safe driving principles.

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