

Self-Awareness and Self-Monitoring: Important Components of Best Educational Practice for Novice Drivers

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Abstract

Self-awareness and self-monitoring of one's driving behaviour are important higher-order cognitive skills considered in the *National Road Safety Action Plan 2007 and 2008* to be integral to best educational practice for novice drivers. They hold a key status in several theoretical models of driver development, and are characteristic of current driver training programs in Scandinavia. They are gaining increasing recognition in Australia, not just in the *National Road Safety Action Plan*, but in their reflection in the adult learning approaches favoured in the ATSB Novice Driver Education Curriculum Trial. But what do self-awareness and self-monitoring actually involve and how can they be productively applied in driver training/practice supervision? The author's research indicates that, while many driving instructors consider such higher-order cognitive skills to be particularly important, few could give specific examples of how they actually apply them in their interactions with learner drivers. This is unfortunate because, when the author followed a small sample of 16 year old Learner's Permit applicants through to their Provisional Licence, not only did most of these novice drivers respond well to prompts to self-monitor driving behaviour, but they volunteered how self-monitoring had enriched their learning to drive experiences. The paper first examines self-awareness and self-monitoring in the theoretical and research literature on learning to drive and then, as examples of best educational practice for novice drivers, translates this

knowledge into practical techniques that learner drivers and their instructors / supervisors can implement.

Self-Awareness and Self-Monitoring: Important Components of Best Educational Practice for Novice Drivers

Learning to drive is undoubtedly among the chief life achievements universally valued by young adults. However, it is a complex task, involving acquisition of a range of physical and higher-order cognitive abilities, which, if inappropriately actioned, may lead to crashes involving themselves and other people. Those entrusted with introducing and nurturing in novice drivers the range of skills and competencies required for safe driving should implement best practice approaches to teaching and learning that are commensurate with contemporary thought and research in education.

1. Why best practice?

Many road traffic authorities, including in Australia, are now requiring fixed amounts of supervised driving practice before a provisional or probationary licence can be gained. This is based on the significantly reduced crash risk beyond the learner phase found in Sweden (after it implemented a requirement for 120 hours of supervised driving practice) (Gregersen 1997), as well as the knowledge that the first six months of solo driving attract the highest crash rates for young drivers (Christie 2001). Professional driving instructors may supervise some of a learner's driving practice, as well as teaching sessions, but instructors' contact with students may well average just one hour per week.

Instructors often face consumer expectations that they will teach no further than is necessary to enable students to pass their practical driving tests, or to demonstrate set competencies as cheaply and as soon as possible (McDougall 2004). At the same time, instructors (as do lay supervisors) operate in what can rapidly become very intense teaching-learning situations. Such critical moments can have profound implications, not only for the safety of both learner and instructor, but also for other road users in the immediate

vicinity. For all these reasons, instructors have a vital role to play in their interactions with novice drivers, and as such have a professional responsibility to ensure their teaching approaches accord with considered best practice.

2. Self-awareness and self-monitoring by novice drivers: towards best educational practice

Self-awareness and self-monitoring are among various overlapping higher-order cognitive skills collectively termed 'metacognition', that is, forms of strategic processing or executive control. They include:

- Self-feedback
- Self-coaching
- Self-regulation
- Self-efficacy
- Self-reflection
- Self-learning
- Self-evaluation
- Self-reliance
- Self-control
- Self-direction
- Self-pacing
- Self-motivation.

Broadly speaking, metacognition concerns the abilities of individuals in predicting learning outcomes, apportioning learning time and priorities, explaining to oneself in order to improve understanding, self-coaching and noting failures to understand (Bransford, Brown and Cocking 1999). Whichever contemporary theoretical positions on metacognition are used as bases, numerous empirical investigations have demonstrated that various forms of learning are enhanced when individuals have knowledge of and apply appropriate monitoring or executive strategies during the learning process (Alexander and Murphy 1994). Moreover, promoting metacognitive strategies has become a common feature of adult learning approaches, which secondary students, many of them young drivers, are not only familiar with but come to expect.

2.1 Self-awareness

A self-aware individual is one who is conscious of, or who gains insight in, the knowledge, skills and attitudes they have acquired. The term 'self-awareness'

can mean just that but, more commonly, its meaning encompasses the metacognitive skills listed above.

Self-awareness is characteristic of the development of expertise and is considered to be relevant in the development of safe driving behaviour — for example, a driver who is aware they cannot easily resist peer pressure, or who knows their skill limitations on slippery roads, can adapt their driving behaviour accordingly (Hatakka, Keskinen, Hernetoski *et al* 2002). The significance of driver self-awareness has been recognised for some time, since at least 1988. According to Brown and Groeger (1988, in Lynam & Twisk 1995), successful hazard perception depends not only on identification of hazards, but also on the self-perceived ability of the driver to handle them (self-efficacy).

Self-awareness and self-monitoring of one's driving behaviour, are now among the higher-order cognitive skills considered in the *National Road Safety Action Plan 2007 and 2008* to be integral to best educational practice for novice drivers. As well, they hold a key status in some recent theoretical models of driver development, and are characteristic of current driver training programs in Scandinavia.

For example, in Sweden, Mattsson (2000) developed a 5-step model of the successive competencies that drivers need to acquire in order to demonstrate safe driving behaviour. The model represents a distillation of the conceptions of several well-reputed driving instructors and educational researchers on what needs to be learned in driving. The five steps required, from the basic level (1) to safe solo driving behaviour (5), are:

- 1) **Vehicle Knowledge and Manoeuvring** [e.g. acceleration, understanding braking distances, cornering skills, use of gears, staying in lane];
- 2) **Applying Traffic Rules in Practice** [e.g. give way signs, road markings, drink drive rules, speed limits];
- 3) **Perception and Awareness (particularly of risky situations)** [e.g. scanning the road ahead, hazard perception, awareness of distractions];

- 4) **Communication and Adaptation to Situations** [e.g. appropriately early signalling of intentions to other drivers, staying within a traffic stream, planning trips according to road/traffic conditions]; and
- 5) **Realistic View of Own Capacity and Others** [e.g. awareness of limitations in city/rural driving experience, not being overconfident].

Mattsson's fifth step can be achieved through teaching/learning approaches that actively develop aspects of self-awareness, such as novice drivers' abilities to more realistically self-evaluate their performance. Indeed, there is a growing move, particularly in Scandinavia, to adopt driver training approaches that require students to be actively involved in this way in their learning. For example, novice drivers in Finland compare their self-assessments of skills in vehicle manoeuvring and anticipation of risks alongside their instructors' evaluations, and have reported they are more realistically able to analyse and predict (self-efficacy) their own driving performance as a consequence (Laapotti 1995, in Katila, Keskinen & Hatakka 1996).

Assisting novice drivers to become more self-aware of their learning and driving may lead to drivers acquiring ways to modify their motives and goals for driving, in accordance with the risks they experience, their social needs for driving and the prevailing driving behaviour 'culture'. Differences have been found in Sweden in the ways a sample of crash-involved young drivers reflected on their driving, compared with the self-reflections of non-crash involved young drivers (Berg 2001).

The crash-involved drivers tended to reflect over specific details of their driving such as physical control skills and compliance with regulations. Gregersen (2005) speculates that the limited self-reflection abilities of such crash prone young drivers may be due to incomplete brain development at ages 16-17. By contrast, the non-crash involved group tended to express thoughts about driving on a higher level that were 'interwoven with the social context in which they live', without necessarily linking this to specific traffic

situations. Redshaw's (2003) research in Sydney on the social and cultural dimensions of driving throws much light on how these phenomena affect young provisional drivers.

Novice driver self-awareness is gaining increasing recognition in Australia, not just in the *National Road Safety Action Plan*, but in its reflection in the adult learning approaches favoured in the Australian Transport Safety Bureau's (2004) Novice Driver Education Curriculum Trial. In the ATSB curriculum document, the developers state that they consider the program to represent a best practice approach as a development program for novice drivers who have acquired six months of solo driving experience. In particular, they consider it is sound from both an educational and behaviour modification perspective.

This new Australian curriculum is based on a hierarchical driver behaviour model developed in the European Union project, GADGET, (Hatakka *et al* 2002). The Swedish National Road and Transport Research Institute (VTI) also utilised the GADGET model when developing its current curriculum for driver training and licensing in Sweden (Gregersen 2001). The GADGET model places emphasis, not just on vehicle manoeuvring and control skills, but more critically on higher-order skills, such as developing the novice driver's understanding of the nature of risk, factors influencing driving risk, and risky driving behaviour. Also importantly, the novice driver is encouraged to develop abilities in self-evaluating any risky tendencies and impulses, along with self-evaluating their driving goals and personal driving styles (represented by the peak stage of the GADGET model).

In the model, failures and successes at the higher self-awareness, motivational and attitudinal levels affect psychomotor or physical skills, and hence overall driving performance. In fact, if these higher levels fail to translate to a careful strategy for driving, then no amount of skill in mastering traffic situations or vehicle handling will be sufficient to *alone* produce a safe driving outcome. This may well explain the apparent failure of much

advanced skills driver training to result in hoped for crash reductions (Gregersen 1996).

2.2 *Self-monitoring*

Self-monitoring is an aspect of self-awareness involving a cyclic process in which learners monitor the effectiveness of their learning methods and progress, and respond to this feedback in a variety of ways (Zimmerman 1986). In a study by Bailey (2005), thirteen 16 year old novice drivers were invited over several weeks to self-monitor their strengths and difficulties experienced when learning to drive, and to consider factors they perceived to be influential (causal attributions) on those successes or difficulties. A novice driver who, in self-monitoring, identifies several factors of influence on their learning to drive provides much material for fruitful discussion with an attentive instructor and in group settings with other novice drivers.

In particular, Bailey found that the novice drivers who self-monitored to a greater extent were those whose causal attributions for their driving successes or difficulties over time tended consistently towards a *high degree of internality* and *personal control*, considered in the research literature to be most adaptive to the driving task (Martin & Horneman 1998). For example, students in Bailey's study said:

“I cut someone off because *I* didn't notice them.”

“Being able to ‘suss’ things out — *I think I'm better* at doing this now”.

Such drivers were also often strongly aware of their learning needs and gaps in skills and knowledge. For example:

“Every time I go out on the road, *I make sure* I pick up tips and things from watching other drivers.”

These drivers also tended to be aware of automated learning occurring (i.e. without deliberate or conscious thought), and they appreciated the power of personal motivation in achieving learning success:

“You know when you’ve learned them enough [clutch and gear changing], you start to do them automatically.”

“Now that I know what to do, it makes it easier to always be more relaxed and confident.”

They were also very aware of the nature and extent of driving mistakes made, including the contribution of lack of personal effort:

“You’re meant to slow down and watch the intersection anyway.”

“The natural thing to do is to blame someone else, but a lot is mistakes in your own judgment.”

Some of the drivers were not just aware of their learning needs, but had even developed their own self-coaching strategies and goals, to ensure successful performance outcomes:

“I’m going to refine everything [learned so far]... more practice will help me and the more I watch what others do.

“My instructor wants me to do moving away from the kerb next week... but I want to concentrate on coming into turns.”

Still others mentally rehearsed correct or otherwise successful driving task sequences for their practice driving, much as they do for other areas of their learning, such as sports competitions or playing a musical instrument.

These statements were made by the students in response to prompts to self-monitor, (e.g. “What factors do you think helped you to change lanes so smoothly when you were last driving?”) Such prompts were offered by Bailey when discussing previous and future driving sessions with the students, either singly or in small groups.

2.3 How facilitated discussion can boost self-awareness and self-monitoring

Various isolated small-scale empirical studies have reported low reductions in traffic offences and/or crash rates for drivers following programs of structured discussions (Gregersen 1999). However, an unexpected but often neglected finding from a landmark study of 4 500 Swedish Telecom drivers was that, the group undertaking traffic safety personal goal setting during group discussions achieved the best road crash costs reduction in the following three years,

compared with the driver education, financial bonus, media campaign and control groups (VTI 1990).

Based on a focus group study, Harrison (1999) has concluded that discussion of driving errors experienced, although stressful for the learner, may assist in higher-order cognitive processing of the knowledge gained as a result of the errors. Elliott, in discussing an evaluation of a Netherlands post-licence driver training course, wrote how group discussion became highly valued by the participants,

“The discussion of the way in which somebody contributes to an unsafe situation, for instance, assumes another dimension when this is brought up in discussion. Learning from each other is not the only important issue here. They also realise that other people *also* have shortcomings.” [emphasis added] (2000: 186)

This suggests that participant self-monitoring is occurring because, in order to appreciate that others *also* have shortcomings, one must first be aware of one's own.

Facilitated discussions emphasising higher-order thinking skills such as self-evaluation of driving ability and of crash risk, and/or consideration of causal attributions, seem likely to feature in emergent programs of motor driving instructor training, such as in the draft competency unit *Apply Safe Driving Behaviours*, now being developed by Australia's Transport and Logistics Skills Council (2007). Both Finland's driver training scheme (Keskinen, Hatakka, Katila *et al* 1999) and Sweden's new curriculum (Gregersen 2001) already incorporate group discussions to analyse the possibilities of safer driving through reflecting on personal experiences. However, techniques of facilitated discussion and promoting forms of self-awareness go beyond the set of teaching skills driving instructors have traditionally held.

3. How well do driving instructors provide best practice teaching/learning experiences, such as forms of self-awareness?

Despite the critical nature of their teaching situations, very few studies have explored driving instructors' approaches. A study by Britain's Department for Transport (2000) involving long-term video-camera recording of twenty learner

drivers and their instructors yielded some useful information about instructors' teaching approaches. For example, the teaching comments made by these instructors to their pupils tended to only occur when specific driving tasks were performed. Little advantage was taken of opportunities in between these times for the instructors to draw drivers' attention to broader aspects of the driving task in the context of the surrounding traffic, such as may apply when in novel driving circumstances. In fact, only about six per cent of all instruction made reference to hazards or road dangers and/or traffic judgments, such as whether to show initiative or to hold back.

Moreover, while over half of all instruction constituted information advice that was neutral in tone, critical comments were the next most frequent, with praise for effort shown being quite rare. The researchers concluded that adjusting the imbalance in favour of praise-related comments, as best practice by instructors, might encourage greater self-reliance in learning to drive, through decreasing dependency on the instructor. It is significant that increasing self-reliance (though not to the point of overconfidence) is the ultimate step seen earlier in Mattsson's model of the necessary competencies for acquiring safe driving behaviours.

More recently, Rismark and Sølvsberg (2007) recorded 'behind the wheel' dialogues between 17 instructors and 32 pupils in Norway. They found that instructors and pupils tended to exhibit different understandings about aspects of the driving task, due to a conceptual mismatch in language use ('scientific' concepts versus 'everyday' concepts). Their conclusion was that successful learning to drive outcomes are contingent on instructors not just endeavouring to use dialogue techniques that elaborate on the student's meaning, but aim at co-constructing shared knowledge about particular driving contexts the student has faced or will face. Developing shared understandings would be a best practice pre-requisite skill for instructors in promoting forms of self-awareness by students, such as self-evaluation and self-monitoring of driving, and who then assist the student, through discussion, to identify how this self-feedback may improve their learning to drive.

In Australia, Fitzgerald and Harrison (1999) held in-depth interviews with fifty driving instructors to investigate the methods used to teach cognitive-based driving skills. The instructors were asked to select what they thought were the most important skills for safe driving to develop in novice drivers, and they chiefly nominated various high-level cognitive functions such as critical decision making and hazard perception. However, the researchers found that, while the instructors were aware of the skills that are relevant for safe driving, they were generally unable to suggest instructional strategies or teaching approaches *specifically* targeting these skills. They concluded that there is a need for further work in developing appropriate teaching strategies for driving instructors, especially in relation to developing higher-order thinking skills in novice drivers.

Bailey (2006) has made a similar finding in a questionnaire/interview study of 36 driving instructors' teaching approaches. Various questions were used to engage the instructors in describing their teaching approaches for beginning novice drivers and then for more experienced novices. Bailey found that, although the instructors generally considered that experienced learner drivers are more capable of making their own complex driving decisions, it seemed many instructors were uncertain about how to support this learning. Specifically, they experienced difficulty in giving many tangible examples when responding to open-ended questions about their teaching approaches, even when different prompts were given. Very few instructors, for example, mentioned getting students to comment aloud on their driving while actually driving (commentary driving), drawing diagrams, using model cars, or drawing on other motorists' behaviours as discussion material.

No instructor in Bailey (2006) mentioned learner driver self-awareness, let alone how to foster it. Perhaps instructors tend to lack understanding in this area, but this is unfortunate, given Bailey's 2005 finding that learner drivers are likely to respond well to prompts to self-monitor their driving behaviour. Moreover, in a recent Australian study of 159 young drivers' risk perceptions and speeding behaviours, Machin and Sankey (2006) concluded that instructors implementing self-awareness exercises can help young drivers

gain insight in to how personal motives, such as their tendency to crave excitement and their risk perception, may affect their willingness to speed.

4. What are the implications for instructors in embracing best practice teaching/learning experiences?

While driving instructors certainly require expert knowledge and skills related to driving, expert subject knowledge alone does not produce expert teaching ability (Bransford, Brown and Cocking 1999). Instructors also need to know how to tap into their students' learning needs and motivations, and how to meld these with ways of representing aspects of the driving task and learning to drive that make them more comprehensible (put simply, what makes learning to drive easy or difficult). Instructors who foster forms of self-awareness in learners about their learning to drive abilities, needs and motivations will benefit the learner but, just as crucially, the instructor as well, through feedback solicited on his or her attempts to make aspects of driving more easily learned.

Aspects of higher-order thinking in driving, including forms of self-awareness, are best developed in learner drivers by instructors who provide active forms of learning, including self-evaluation, feedback, experiential learning approaches and facilitated group discussion of problems encountered and other experiences (Hatakka *et al* 2002). In consequence, the ATSB Novice Driver Curriculum (2004) requires driving instructors to possess a much broader and more complex set of teaching skills than they traditionally have had. Importantly, these include a focus on learner-centred and active approaches, such as those favoured by Hatakka *et al* (2002):

- Modern, participatory/interactive approaches to adult learning, such as coaching and mentoring novice drivers in respect to skills like gap selection, speed control, scanning and hazard perception [the ATSB curriculum includes coaching/mentoring guidelines for instructors to implement];

- Instructors giving feedback to novice drivers, but also instructors receiving feedback on their driving from the novices [and possibly also receiving feedback on their style of teaching];
- Fostering novice drivers' reflection and self-evaluation skills through appropriate open-ended questioning techniques;
- Facilitating small group discussions, including of participants' driving experiences and their choice of other driving topics.

Professional development programs that encourage instructors to self-reflect on and discuss their teaching experiences, in conjunction with formal training, may assist instructors to better understand the newer teaching / learning methods, their relevance to higher-order cognitive skills, and equally important as components of best practice, how to apply them. In this context, this section of the paper focuses on practical coverage of promoting forms of self-awareness in learning to drive. The approaches are not exclusive to instructors, as some techniques can be just as easily implemented by lay supervisors given some guidelines.

4.1 Fostering self-awareness, such as self-monitoring and self-evaluation

Self-awareness, monitoring and evaluation can be fostered in learner drivers simply through instructors asking more open-ended questions requiring reflective answers, for example, "Did you notice anything odd about the way you went around that corner?" However, driving instructors who do this in conjunction with providing learning to drive experiences that successfully connect the *current* knowledge of the learner with the *learning task ahead* achieve the shared knowledge basis advocated by Rismark and Sølvsberg (2007), as well as a best practice foundation for fostering various forms of self-awareness.

For example, such driving instructors might assist novice drivers by drawing diagrams or showing video clips of different driving scenarios (either potential or recently experienced by the student) and discuss how the drivers think they might react (or ought to have reacted) to them. Various layers of complexity can be added by the instructor, such as new stationary or moving vehicles, road markings or traffic signals. The driver could be asked to make choices based on his/her own position and to consider how other drivers might perceive the situation and respond (Rismark & Sølvsberg 2007).

In promoting driver self-evaluation, instructors should become adept at helping drivers to articulate what the drivers themselves consider to be their driving strengths and weaknesses (as distinct from the instructor's observations and deductions). Other active learning methods, such as questionnaires, rating scales, competency skill assessments, and discussions among groups of novice drivers are also valuable aids in promoting self-evaluation of driving experiences (Hatakka *et al* 2002). Note, however, self-evaluation and other self-awareness abilities may not be readily present in some drivers, but may require development through training and practice (*ibid*).

4.2 *Commentary Driving*

Commentary driving is a powerful learning technique that involves talking aloud one's driving observations, thoughts and actions, for example, "I'm driving just under the speed limit; the car behind me is changing lanes; coming now to a line of parked cars - must watch out for pedestrians", etc. Such an activity assists in developing the higher-order cognitive skill of personal control in paying full attention to the driving task. However, it can also help learners become more self-aware of their developing skills when scanning the driving environment, particularly in appreciating salient features and in anticipating and perceiving hazards, as well as in self-monitoring and evaluating their progress in learning such skills. Besides this learning value for the student, the instructor can readily notice what things the driver is

attending to and discuss as needed. One of several available useful practical guides to the commentary driving procedure is provided by VicRoads (2007).

The instructor should first demonstrate commentary driving for the student to follow, although not every driver finds commentary driving easy, but many do with practice (Regan, Triggs, Mitsopolous *et al* 2000; Steer Davies Gleave 2004). It is probably most suited to the later learning consolidation phase, when the student has acquired some automated skills when experiencing moderately demanding traffic conditions, and has found self-reflection and discussion of their experiences to be helpful.

4.3 Helping learners identify causal attributions for their driving performance

Instructors can help learners become more self-aware of their driving through discussing with them the learner's explanations (causal attributions) for driving tasks they have performed well, or tasks they have had difficulty with. Such discussion can lead to learners valuing internal attributions such as their personal control and effort over and above externalities in their driving environment, as factors of influence on their driving performance. An example of this would be when a driver attributes a 'near miss' to *their own* failure to look out or brake sooner, rather than simply blaming the other driver for not looking where they were going. Internal attributions are considered to be more adaptive to the driving task than attributions to external causes. In-depth information about this and how causal attributions can be discussed with learner drivers can be found in Martin and Horneman (1998) and Bailey (2005).

4.4 Facilitated discussion sessions

Facilitated discussion (one to one or in a group), as discussed earlier, can rank as a high-quality learning experience for novice drivers, particularly if it prompts self-awareness of learning to drive. Not only may discussion prompt

drivers who rarely self-monitor their driving, to do so, it may also offer enrichment to high self-monitoring drivers by encouraging them to reflect on a wider and deeper range of factors surrounding their learning to drive experiences than they had previously considered.

4.5 Improved feedback for the learner

Learner self-evaluations of strengths and weaknesses and areas to focus on (identified through various active learning approaches) can be juxtaposed with instructor/mentor evaluations and feedback. Phrased in appropriately supportive ways, by the instructor, such feedback provided can stimulate further development of the range of self-awareness skills, now considered to be essential at the higher levels of cognition and behaviour, and which are present in the best practice theoretical models. The UK Department of Transport study (2000) also demonstrates the importance of feedback that praises drivers, not just for correct manoeuvres executed smoothly and safely, but for exercising sound judgment when making decisions.

6. Conclusion

All these approaches towards promoting self-awareness of, and consequently self-reliance in driving, are of life-long self-learning importance once the novice no longer has an instructor alongside to guide them. Not only are they commensurate with best practice as indicated in the theoretical and research literature, but they are best practice teaching/learning approaches that young people are already quite familiar with in a variety of learning endeavours.

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APPENDICES

Executive summaries from Bailey (2005 and 2006) follow. Copies of the full reports are available on request from trevor.bailey@saugov.sa.gov.au

YOUNG NOVICE DRIVERS' SELF-MONITORING ABILITIES

Bailey (2005)

Executive Summary

Worldwide, there is a growing consensus that quality driver training approaches need to emphasise higher-level cognitive abilities rather than just physical control skills. Past attention to high-level cognitive abilities in general educational provision has focused on the development of skills such as self-monitoring, and learners' awareness of the causal attributions they use when explaining learning outcomes. Research has only just begun to examine the training implications of novice driver self-monitoring (e.g., Gregersen 1996b), and causal attributions assigned to driving events (e.g., Martin *et al* 1991, 1998).

Past research on self-monitoring has shown it can be influential on subsequent learning achievement through the self-feedback generated. Very little information is available for novice drivers on how frequently and on what they self-monitor. Self-monitoring of causal attributions for learning achievements is of particular importance as certain patterns of attributional thinking are considered to be more *adaptive* to learning and to the driving task than others. Existing research and theory considers that an internal / unstable / controllable attributional pattern is more adaptive to learning to drive than an external / stable / uncontrollable (maladaptive) one. However, there is very little information on novice drivers' patterns of attributional thinking. There is a need to know how such patterns can change over time when external prompts to self-monitor are provided to novice drivers, together with feedback discussion focussing on emergent attributional patterns and how adaptive they are to learning to drive. It is also not clear if there is any gender difference in novice driver self-monitoring. This consideration of the relevant

theoretical and empirical literature led to four main research questions for the present study:

- 1) How frequently do young novice drivers self-monitor?
- 2) How adaptive to learning to drive is novice driver self-monitoring?
- 3) How does novice driver self-monitoring develop or change over time, particularly with respect to any emergent patterns of causal attributions for learning achievements?
- 4) Is there any gender difference in young novice drivers' self-monitoring?

These questions were explored over a 3 month period through structured interviews and a group discussion with 13 sixteen year old learner drivers (5 female and 8 male) to develop a holistic understanding of novice driver self-monitoring. In addition to the qualitative aspects of the interviews, two rating scale exercises were used to examine the causal attributions assigned by the drivers: the set of driving scenarios used by Martin *et al* (1991) and the Revised Causal Dimension Scale (CDSII) of McAuley *et al* (1992), designed to measure attributions for specific actual events.

The present study showed that novice drivers are not only capable of self-monitoring and likely to already be doing so covertly, but that this can be extended by external prompts to self-monitor in specific ways. It was found that drivers who self-monitored to a high degree were those whose attributions were most adaptive to the driving task, tending to have a highly internal locus of causality, and degree of personal control. They were strongly aware of their learning needs and gaps in skills and knowledge, they were aware of automated learning occurring, and they appreciated the power of personal motivation in achieving learning success. They were also aware of the nature and extent of mistakes made, including the contribution of lack of effort. Some drivers had developed their own self-coaching strategies to ensure successful performance outcomes, for example, mental rehearsal of driving task sequences.

Low self-monitoring drivers were largely aware of the influence of driving practice on learning progress and of the nature and extent of mistakes made,

including lack of effort. More often than not, they were likely to value confidence and discussion with other drivers as aids to learning. Generally, they tended to be aware of their own learning needs and mistakes made. Task difficulty and information overload were often seen as main detractors of learning progress.

Changes in self-monitoring over time were measured qualitatively and through the use of the two attributional rating exercises. Over six to eight weeks, the CDSII findings showed that the causal attributions collectively assigned by the drivers changed from a state of wide variability to a more rational, conceptually coherent and consistent pattern considered in the reviewed research literature to be adaptive to learning to drive. By contrast, some early inconsistencies in attributional thinking had dissipated by the conclusion of the study. While findings from the driving scenarios generally supported the CDSII findings, the scenario exercises generally appeared to be not as sensitive to the attributional changes as the CDSII. This may have been due to the scenario incidents being somewhat removed from the driving experience of many of the novices, who had had limited driving experience up to that point. There were no statistically significant differences between male and female novice drivers. However, it seemed that males may predominate among high self-monitoring novice drivers, and that females more adaptively assign internal loci of causality in their attributions.

There was a consensus view among the drivers that the changes in their thoughts were due to a combination of factors, including discussion with the researcher at interview, discussion with their parents and driving instructor, and their own self-monitoring. Based on this, and other findings from research literature, it seems likely that facilitated discussion can have an instrumental role in prompting self-monitoring in learning to drive. Not only may it prompt drivers who rarely self-monitor, to do so, it may also offer an enrichment to high self-monitoring drivers by encouraging them to reflect on a wider and deeper range of factors surrounding their learning experiences than they had previously considered.

Although the study was a small-scale one, its findings provide sufficient grounds for recommending the study be replicated on a larger scale, and over a longer time span, to examine whether encouragement to self-monitor would be a valuable adjunct to driver training and practice. Ideally, an intervention level study should be conducted, but a more definitive way of measuring self-monitoring is needed that takes into account the various ways in which drivers self-monitor.

DIFFERENCES IN MOTOR DRIVING INSTRUCTORS' TEACHING APPROACHES

Bailey (2006)

Executive Summary

This study explored qualitative and quantitative differences in driving instructors' approaches to teaching in relation to a short review of the literature on the nature of driving, driver training and the approaches teachers use. Traditionally, driving instruction has relied on *teacher focused* approaches, which suffice where acquisition of basic driving skills is a matter of demonstration by the instructor, then repeated practice by the student. However, higher-order cognitive skills such as, hazard perception, decision-making, and the ability to plan ahead have a major influence on driving, as do allied emotive and motivational factors such as, personal values, risk acceptance, goal formation, and impulse control. Aspects of higher-order thought are best acquired by learner drivers if their instructors implement *student focused* approaches involving active learning aimed at helping students construct their own knowledge about learning to drive.

Instructors particularly need to adopt approaches in which the prime focus is on students' learning because past research has shown that, the more teachers adopt student focused approaches, the better the learning outcomes will be. Conversely, greater adoption of non-student focused (i.e. teacher-focused) approaches is associated with less than desirable learning outcomes. On this basis, three research questions were posed for the study:

1. To what extent do driving instructors possess student focused approaches to teaching, and how may this differ if the learner is new or more experienced?
2. Is there a positive relationship between teaching approach and driving instructor degree of experience?

3. Is there a positive relationship between teaching approach and use of the CBT (competency-based training) or VORT (single driving test) schemes for obtaining a driver's licence in South Australia?

The research questions were explored through a questionnaire/interview-based survey of 36 Australian driving instructors. After describing their general teaching approaches, the instructors were asked to consider a typical lesson for a new learner and a typical lesson for a more experienced learner, and to describe their teaching approaches in more detail; for example, what are the important things to teach, how they teach them, and what kinds of things they say to the students. Instructors' statements were analysed as to whether they were student or non-student focused. A student focused approach was defined as an instructor's intention that students construct their own knowledge, as a necessary means to change their conceptions or produce new conceptions about learning to drive. Prosser and Trigwell's (1999) *Approaches to Teaching Inventory* (ATI) was also used to gauge the extent of student focused teaching. It contained sixteen items for the instructors to rate, and concerned intentions and strategies for student and non-student focused teaching approaches. Some participants were willing for a short telephone interview to discuss their written responses in more detail.

Overall, the survey's open-ended responses were considered to be ecologically valid, and indicated that most instructors adopted a mixture of student focused and non-student focused teaching approaches, even though very few instructors gave more than a few student focused responses in total. However, the instructors tended to simultaneously strengthen both a student focus and a non-student focus in their teaching approaches when teaching experienced as opposed to new learners. A reliability analysis performed on the ATI ratings showed that the instructors were highly consistent when rating the student focus items but often inconsistent when rating the non-student focus items, particularly those items concerning formal assessment requirements. Like the open-ended data, the ATI ratings showed most instructors adopted a mixture of teaching approaches; however, they tended to be more student focused, especially when rating teaching *strategy* items.

When rating the teaching *intention* items, instructors' approaches seemed to be divided between non-student focus and student focus. Analysis of the mean ratings for each ATI item showed that the eight student focus items were consistently rated quite highly, whereas the non-student focus items tended to be rated inconsistently.

On comparing the open-ended data with the ATI scores, there was a significant moderate correlation for student focused approach, but a low correlation for non-student focus. The instructors were then divided into high, middle and low sub-groups, according to their ATI scores. There did not appear to be any important gender or locality associations with these sub-groups. Correlations between the two data sets for each sub-group were found to support the general pattern of coherence and consistency among student focused approaches, but not for non-student focused approaches. When the five highest and five lowest student focus instructors' responses to the open-ended questions were studied, some deep level student focus was reflected in most of the highest scorers' statements. Likewise, the lowest scorers' statements were predominantly non-student focused. Instructors with further training and who had more years of experience were quite likely to be strongly student focused in their teaching approach, but there was a small proportion of instructors with such a background who were strongly non-student focused who might benefit from specifically-tailored professional development programs.

That the instructors generally exhibited a mixture of student focused and non-student focused teaching suggested that many instructors might be fluctuating between the two focuses. The high dependency placed on driving instructors by their students may mean that some amount of non-student focused teaching remains necessary throughout the learning to drive period. This is despite the desirability of adopting teaching approaches with a greater student focus, known to lead to quality learning outcomes. Encouragingly, the student focus ATI data was not only internally consistent with respect to intentions and strategies, but correlated well with the student focus open-ended data, and also compared favourably with Prosser and Trigwell's (1999) original data

derived from university teachers. By contrast, the non-student focus data was characterised by an inconsistent pattern of correlations, which differed markedly from Prosser and Trigwell's positive finding for non-student focus. The most plausible explanations for the inconsistent pattern lie in differences in the ways different kinds of teacher might interpret the ATI statements. Unlike university teachers, driving instructors operate in teaching-learning contexts with critical safety implications that often require high learning dependency on the instructor (non-student focused teaching). Moreover, driving instructors are under various pressures to tailor their teaching to the required formal assessment process, even if they wish to teach beyond that level using student focused approaches. In conclusion, it was suggested that some work needs to be undertaken on the original ATI, particularly with respect to the wording of its items, but also on the notion of a continuum between the two focuses. In addition, more data needs to be obtained from other teaching contexts for comparison purposes.