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The Recreational Skippers Ticket and Its Influence on Boater Behavior

Amanpreet Virk and Terri Pikora

Recreational boating is a popular leisure activity and possibly the least regulated of all forms of transport. To reduce the number of boating injuries and incidents, educational measures are important and mandatory boating education and training is recommended to improve boat operator skills. The Recreational Skippers Ticket (RST) was introduced in Western Australia (WA) in 2006 so that people in charge of a recreational vessel have a minimum level of skill and knowledge needed to protect themselves and their passengers and to share the water safely with others. The objective of this study was to monitor the uptake of the RST, to assess its influence upon boater's perceptions of changes in their behavior and to explore factors associated with completion of RST. Using the WA database of registered recreational vessels, a sample of 1,002 boaters was recruited to participate in a telephone survey in 2008. A response rate of 47.5% was achieved. More than one-half of the respondents had completed their RST and of these, more than one-third reported that obtaining their RST had changed their behavior. Those boaters who had completed their RST were more likely to be male, were more experienced boaters, and were a member of a boating association. While the RST has increased awareness among recreational vessel owners, further monitoring is needed to explore its influence upon attitude, knowledge, and behavior of recreational boaters.

Recreational boating is a popular leisure and recreational activity among Western Australians, although it is possibly the least regulated of all forms of transport. Every year, boating-related incidents result in an average of seven deaths and 127 serious injuries in Western Australia (WA; Pikora & Cercarelli, 2004). It has been suggested that boating incidents cause more harm than rail and aviation accidents combined, and boating is second only to road transport as a cause of transport-related injury at a national level (O'Connor, 2005).

Previous research into boating fatalities has suggested that human factors are the largest contributors to boating-related incidents and injuries (Ashby, Cassell, & Congiu, 2007; Cassell & Congiu, 2005; Maritime New Zealand, 2008; McKnight, Becker, Pettit, & McKnight, 2007; Washington State Parks, 2004). To prevent boating-related fatalities and injuries, educational measures are considered to be an essential component of any strategy (Christoffel & Gallagher, 2006), and mandatory

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boating education and training has been recommended to improve boat operator skills (Cassell & Congiu, 2005; Graefe, 2000). The introduction of boat operator licensing legislation aims at reducing boating incidents through improved education, improved skills of boaters, and the creation of greater awareness of safety issues, which would, in turn, lead to safer behavior and better decision making (Maritime New Zealand, 2008; Meehan & Hogan, 2006; National Marine Safety Committee, 2000).

In 2006, the Marine Safety Business Unit at the WA Department for Planning and Infrastructure (DPI) introduced mandatory recreational boating education and training in the form of the Recreational Skippers Ticket for all boaters aged 16 years or older who operate a vessel with an engine over 4.5 Kilowatts/ 6 Horsepower. The RST is a certificate of competency to operate a boat safely on water and involves both a written and a practical test (Department for Planning and Infrastructure, 2008).

Boat operator licensing schemes and safety training courses have been introduced in several Australian states and elsewhere, but, to date, there have been no published evaluations of boater licensing or training schemes in the literature (Bell, Howland, Mangione, & Senior, 2000; Glover, Lane, & Wang, 1995; Groff & Ghadiali, 2003; Strategic Research Group, 2003). Boater surveys conducted in the United States (U.S.) and Canada, however, have found that the levels of unsafe boating behavior (for example, alcohol use and the non-use of PFDs) remained the same or increased among boaters who had received formal training compared to those who had not (Bell et al., 2000; Groff & Ghadiali, 2003). These findings may be related to the quality of the training or to the reduced risk perceptions/overconfidence among boaters who have participated in training courses. The available evidence indicates that boater safety courses may be counterproductive to the adoption of safety behavior unless education and training initiatives are carefully planned, standardized, and evaluated (Ashby et al., 2007; Cassell & Congiu, 2005; Meehan & Hogan, 2006).

The aim of this study was to monitor the uptake of the RST, to assess its influence upon boaters' perceptions of changes in their behavior, and to explore factors associated with completion of the RST. This study will provide valuable information regarding the influence of the recently introduced mandatory RST education and training among recreational boaters and will assist in making informed decisions about the direction of future recreational boating policy.

Method

The Marine Safety Business Unit at DPI maintains a database of all recreational vessels registered in WA. Recreational vessels must be registered with DPI if they have a motor and are used on navigable waters (Pikora & Cercarelli, 2004) and there were more than 72,000 recreational vessels registered in WA in 2008 (Department for Planning and Infrastructure, 2008). Using this database, 3,000 registered recreational vessel owners were randomly selected and the sample was divided into segments based on vessel type and location. Using these 3,000 boaters, a sample of 1,002 adult boaters in both metropolitan ($n = 564$) and regional areas ($n = 438$) was recruited to participate in a telephone survey. The eligibility criteria for the survey were that they were resident in WA and had a current registered recreational vessel with DPI. The data were collected during February and

March, 2008 using a CATI (computer-assisted telephone interviewing) system. The University of Western Australia Human Ethics Committee provided ethics approval for the survey.

The response rate for the telephone survey was 47.5% (i.e., 1,002 surveys /2,109 calls, including 1,034 refused, 16 language barriers, 57 screening). The survey instrument used was patterned after previous surveys conducted in 2003 and 2006. The questionnaire contained a total of 33 separate questions, including five items related to RST. Each respondent was asked the following: "Have you heard of the Recreational Skipper's Ticket (RST) for recreational boaters?" "The Recreational Skipper's Ticket (RST) is a compulsory qualification based on a set of marine safety competencies that all recreational skippers need to obtain. When did you complete your Recreational Skipper's Ticket (RST)?" "Do you think that the effort to obtain your RST qualification has been worthwhile?" "Do you consider that obtaining your RST qualification has changed your behavior while boating?" "If yes, can you describe how it has changed your behavior?" Demographic information including age, gender, location, and household structure were also collected. The remaining items were related to safe boater behavior and attitudes toward boating safety. The level of agreement for the RST items was between 73% and 100% in a small reliability study.

The Statistical Package for the Social Sciences (SPSS) version 14 for Windows was used to analyze the data. Descriptive analyses were undertaken using frequencies, and cross-tabulations and chi-square test statistics were used to examine any associations between variables. A series of logistic regression analyses were conducted to examine associations between obtaining the RST qualification and demographic variables and boating characteristics. In the first regression model, each factor was considered in isolation while the final model included only those factors that were significant ($p < 0.05$).

Results

As shown in Table 1, the majority of the recreational boaters in the sample were male (92.2%), aged 45 years or older (70.1%) and described themselves as families with older children or as older couples with no children at home (66.3%). The majority of the sample was not a member of any boating association (73.4%) and almost one-half of the boaters (46.1%) carried children aged less than 12 years on board on their most recent trip. Less than one-quarter (22.9%) went boating once a week or more frequently, while the most common activity was fishing (68.2%), and less than one-half (40.3%) went boating in protected waters. Very few respondents reported that they went boating alone (2.5%). The majority of the boaters had more than ten years overall boating experience (74.0%), and more than one-third (37.3%) had "open boat" vessels (see Table 1).

The vast majority (99.0%) of the respondents reported that they heard about the RST and more than one-half (69.3%) had completed their RST. The majority of the boaters who had completed their RST reported that obtaining this qualification was worthwhile (84%; see Table 2).

More than one-third (34.0%) of RST holders reported that obtaining the RST had changed their on-board behavior. When asked to describe how their behavior had changed, more boaters reported it as an increase in the awareness about

Table 1 Demographic and Boating Characteristics of the Sample

| Characteristics | Total Sample | Obtained RST Qualification | |
|---|--------------|----------------------------|------|
| | (n = 1002) | Yes | No |
| | % | % | % |
| <i>Gender</i> | | | |
| Male | 92.2 | 93.9 | 88.3 |
| Female | 7.8 | 6.1 | 11.7 |
| <i>Age*†</i> | | | |
| 18-24 years | 1.3 | 1.3 | 1.3 |
| 25-34 years | 8.4 | 5.7 | 14.7 |
| 35-44 years | 20.2 | 18.0 | 25.1 |
| 45-54 years | 27.6 | 27.9 | 27.0 |
| 55-64 years | 26.6 | 30.9 | 16.9 |
| 65+ years | 15.9 | 16.3 | 15.0 |
| <i>Household Structure†</i> | | | |
| Single living at home or out of home | 8.1 | 7.5 | 9.4 |
| Young couple no children | 2.9 | 2.6 | 3.6 |
| Family with children aged 12 or under | 22.7 | 18.3 | 32.5 |
| Family with older children | 27.8 | 29.4 | 24.4 |
| Older couple with no children at home | 38.5 | 42.2 | 30.2 |
| <i>Location</i> | | | |
| Metro | 56.3 | 55.9 | 57.1 |
| Regional | 43.7 | 44.1 | 42.9 |
| <i>Member boating association†</i> | | | |
| Yes | 26.6 | 31.8 | 68.2 |
| No | 73.4 | 68.2 | 85.1 |
| <i>Carry children under 12 years on board</i> | | | |
| Yes | 46.1 | 45.1 | 48.4 |
| No | 53.9 | 54.9 | 51.6 |
| <i>Boating frequency</i> | | | |
| More than once a week | 9.7 | 10.7 | 7.5 |
| Once a week | 13.2 | 14.0 | 11.4 |
| Every couple of weeks | 36.1 | 37.0 | 34.1 |
| Once a month | 22.4 | 21.9 | 23.4 |
| Less than once a month | 18.7 | 16.4 | 23.7 |
| <i>Activities</i> | | | |
| Fishing | 68.2 | 68.9 | 66.6 |
| Cruising/motoring | 19.0 | 19.5 | 17.9 |
| Water sports (e.g., skiing, wakeboarding) | 8.5 | 6.9 | 12.0 |
| Diving | 3.0 | 3.3 | 2.3 |
| Racing | 0.6 | 0.7 | 0.3 |
| Other | 0.8 | 0.7 | 1.0 |

| Characteristics | Total Sample | Obtained RST Qualification | |
|--|--------------|----------------------------|------|
| | (n = 1002) | Yes | No |
| | % | % | % |
| <i>Number people go boating with**</i> | | | |
| 0 | 2.5 | 2.6 | 2.3 |
| 1 – 2 | 55.3 | 57.3 | 52.0 |
| 3 – 4 | 32.1 | 31.8 | 33.7 |
| 5+ | 9.4 | 8.3 | 12.1 |
| <i>Location go boating most often‡</i> | | | |
| Protected waters | 40.3 | 38.0 | 45.5 |
| Within 2nM from mainland | 16.4 | 15.0 | 19.5 |
| Between 2 & 5nM from mainland | 17.5 | 18.3 | 15.6 |
| More than 5nM from mainland | 25.8 | 28.7 | 19.5 |
| <i>Type of vessel</i> | | | |
| Open boat | 37.3 | 36.3 | 39.6 |
| Runabout | 26.6 | 27.8 | 24.0 |
| Cabin | 11.8 | 11.7 | 12.0 |
| Half cabin | 7.7 | 8.1 | 6.8 |
| PWC | 4.0 | 3.3 | 5.5 |
| Centre console | 3.7 | 3.6 | 3.9 |
| Yacht | 3.3 | 3.2 | 3.6 |
| Other | 5.6 | 6.1 | 4.5 |
| <i>Overall Boating Experience***†</i> | | | |
| ≤ 2 years | 4.5 | 3.6 | 6.6 |
| 3–5 years | 7.4 | 5.7 | 11.5 |
| 6–10 years | 13.2 | 11.4 | 17.7 |
| 11 + years | 74.0 | 79.3 | 64.3 |

† Chi square $p < 0.001$; ‡Chi square $p < 0.005$; Chi square $p < 0.05$

*Missing $n = 6$; **Missing $n = 7$; ***Missing $n = 10$

Table 2 Uptake of the RST Among Recreational Boaters

| Uptake of the RST | Total % |
|-----------------------------------|---------|
| <i>Heard about RST</i> | |
| Yes | (1,002) |
| No | 99.0 |
| | 1.0 |
| <i>Obtained RST Qualification</i> | |
| Yes | (1,002) |
| No | 69.3 |
| | 30.7 |
| <i>Obtaining RST worthwhile</i> | |
| Yes | (694) |
| No | 84.0 |
| | 16.0 |

boating issues (26.1%), boat safety issues (24.4%), and boating related rules and regulations (20.1%; see Table 3). Few boaters perceived it as an increase in general improvement of their boating skills (12.4%) or reported an increase in boating-related knowledge (3.8%).

As presented in Table 4, the odds of having completed the RST qualification were significantly associated ($p < 0.05$) with being male, with 11 or more years overall boating experience and having a membership in a boating association. Female boat owners were significantly less likely to report having completed their RST (OR 0.53; 95% CI 0.32-0.91) compared to male boat owners. Compared to boaters with 11 or more years of boating experience, those with fewer years of overall boating experience were significantly less likely to report having completed their RST (OR 0.64; 95% CI 0.42-0.96 for those with 6-10 years of boating experience and OR 0.58; 95% CI 0.37-0.91 for those with ≤ 5 years of boating experience). Similarly, compared with boaters who were not members of a boating association, those who were members were more than twice more likely to report having completed their RST (OR 2.23; 95% CI 1.50-3.30; see Table 4).

Discussion

The premise behind the introduction of mandatory license through boat safety education and training is to make the recreational boater population more aware and informed to take safety precautions while on the water and thus reduce their risk of being in a fatal or serious incident (Department for Planning and Infrastructure, 2007; Meehan & Hogan, 2006). We found a high level of support for the RST among the boater community since its introduction in 2006. More than one-half of the recreational boaters had obtained their RST and the vast majority (84%) of these reported that it was worth the effort. This level of uptake may be due to the legislative and enforcement efforts to ensure that boaters had obtained

Table 3 Boater's Perceptions After Obtaining the RST

| Boaters' Perceptions | Total % |
|--|----------------|
| <i>Obtaining the RST has changed on board behavior</i> | (694) |
| Yes | 34.0 |
| No | 66.0 |
| <i>Description of change in behavior*</i> | (236) |
| Awareness about boating issues | 26.1 |
| Awareness about boat safety issues | 24.4 |
| Awareness about rules and regulations | 20.1 |
| General improvement | 12.4 |
| Increased knowledge | 3.8 |
| Other | 13.2 |

*Missing $n = 2$

Table 4 Multivariate Analysis of Those Who Had Completed Their RST Compared With Those Who Had Not

| Factors | Single Factor | | Final Model | | |
|---------------------------------------|---------------|---------|-------------|---------|-------------|
| | OR | p-value | OR | p-value | 95% CI |
| <i>Gender</i> | | | | | |
| Male | 1.00 | | 1.00 | | |
| Female | 0.49 | 0.003 | 0.54 | 0.022 | (0.32-0.91) |
| <i>Age</i> | | | | | |
| 50+ years | 1.00 | | * | | |
| 35-49 years | 0.64 | 0.003 | | | |
| 18-34 years | 0.31 | 0.000 | | | |
| <i>Household structure</i> | | | | | |
| Older couple with no children at home | 1.00 | | * | | |
| Family with older children | 0.86 | 0.414 | | | |
| Family with children aged 12 or under | 0.40 | 0.000 | | | |
| Young couple no children | 0.44 | 0.010 | | | |
| Single living at home or out of home | 0.67 | 0.171 | | | |
| <i>Activities</i> | | | | | |
| Fishing | 1.00 | | * | | |
| Cruising/Motoring | 1.05 | 0.776 | | | |
| Water sports | 0.56 | 0.012 | | | |
| Other | 1.29 | 0.481 | | | |
| <i>Overall boating experience</i> | | | | | |
| 11+ years | 1.00 | | 1.00 | | |
| 6-10 years | 0.52 | 0.001 | 0.64 | 0.034 | (0.42-0.96) |
| ≤ 5 years | 0.42 | 0.000 | 0.58 | 0.017 | (0.37-0.91) |
| <i>No people go boating with</i> | | | | | |
| 1-2 | 1.00 | | * | | |
| 3 or more | 0.65 | 0.002 | | | |
| Alone | 0.64 | 0.300 | | | |
| <i>Frequency of boating</i> | | | | | |
| Every couple of weeks | 1.00 | | * | | |
| Once a month | 0.86 | 0.422 | | | |
| Less than once a month | 0.64 | 0.018 | | | |
| Once a week | 1.13 | 0.587 | | | |
| More than once a week | 1.31 | 0.303 | | | |
| <i>Location go boating most often</i> | | | | | |
| Protected waters | 1.00 | | * | | |
| Inshore ocean waters | 1.13 | 0.421 | | | |
| Offshore ocean waters | 1.76 | 0.002 | | | |
| <i>Member boating association</i> | | | | | |
| No | 1.00 | | 1.00 | | |
| Yes | 2.66 | 0.000 | 2.23 | 0.000 | (1.50-3.30) |

Note. OR- odds ratio; CI- confidence interval; *factor not significant in final model.

this qualification, although it was not mandatory for WA boaters to have an RST until April 1, 2008.

In this study, about one-third of the boaters who had obtained their RST confirmed that it has changed their on-board behavior by increasing awareness (70.6%) about boating and boat safety issues and also boating rules and regulations. This increase in awareness is important as it has been suggested that a large proportion of boating-related incidents are not the result of deliberate reckless behavior, but due to a lack of safety awareness and knowledge (Maritime New Zealand, 2008). It has also been suggested that greater awareness of safety issues may lead to safer behavior and improved decision making and that educated boaters may reduce the number of incidents, which would lead to fewer injuries, fatalities, damage, and pollution (Meehan & Hogan, 2006). The findings from this study suggest that the RST had a positive influence on boaters, but it is important to acknowledge that boating safety behavioral change will take time to achieve and that ongoing reinforcement and monitoring is necessary to secure long-term and permanent change.

In this study, the odds of having completed the RST qualification were significantly associated ($p < 0.05$) with being male with 11 or more years overall boating experience and having a membership of a boating association. Perhaps, not surprisingly, female vessel owners were significantly almost twice less likely to report completing their RST. While this result may be due to the low number of females included in the sample, although the confidence interval (i.e. 95% CI 0.32–0.91), which is precise given the number of females in the sample, is not consistent with this explanation. It is recommended that further investigation is required to confirm this finding. The finding that more experienced boaters were more likely to report completing their RST compared with less experienced boaters may reflect the boaters that were included in this survey. In addition, the finding that members of boating associations and/or clubs were more likely to report completion of their RST may suggest that these associations provide ready access to training that had been taken up by their members; however, this might reflect the small proportion of boaters who were members who participated in the study as evident from a wider 95% CI (1.68–3.53). Unfortunately, there are no published studies that have assessed the factors associated with the completion of a mandatory boating education and training. Therefore, this is the first study to investigate these factors and it is suggested that further research be conducted to confirm these findings.

There are several limitations to this study. The first was the reliance on self-reported data that may have resulted in boaters over reporting changes in their boating behavior and their perceptions about changes in their behavior after obtaining the RST; however, similar studies investigating boater behavior have also collected self-reported data (Florida Fish and Wildlife, 2006; Miller & Pikora, 2008).

Another limitation was that the sample was skewed toward older, more experienced male boaters. An important issue over here is whether the higher proportion of males in this study sample is representative of the majority of boaters in WA, as the demographic factors like gender are not recorded in the vessel registration database and no information was collected from those who did not complete the survey. The larger proportion of males included in the sample, however, is consistent with other surveys among boaters (Ashby et al., 2007; Marine and Safety Tasmania, 2000; Pelot, Delbridge, Jakobsen, & McIsaac, 2004; Penalzoza, 1992) and may reflect the population of interest. For example, Pelot and colleagues con-

ducted surveys across Canada at boat shows and at marinas and found that 85% of respondents were male (Pelot et al., 2004). The inclusion of passengers in future surveys may allow for a larger proportion of female participants to be obtained as well as younger, less experienced boaters. The use of random-digit-dialed telephone surveys have achieved higher proportions of female participants compared to those obtaining a sample from a register of boat owners (Bell et al., 2000); however, this may not be cost-effective in obtaining a large enough sample.

Another limitation is that the sampling frame included only registered vessel owners and that information about passengers and other people who rent and/or borrow the vessel was not collected. This was because the database used for gaining access to contact information only provides contact information for vessel owners; however, databases of registered vessel owners have also been used in similar recreational boaters' surveys conducted internationally (Florida Fish and Wildlife, 2006; Howland, Mangione, & Minskey, 1996; Mello & Nirenburg, 2004; Pelot et al., 2004; Penaloza, 1992). Alternate methods for collecting this type of information include conducting surveys at boat ramps and marinas. Using this method would allow for the inclusion of passengers and other users but is also resource intensive and would restrict the sample to boaters at certain locations on a particular day, thereby restricting the sample to those who were using the vessel rather than all boaters. The aim of the current study was to survey a sample of vessel owners in WA, including those in regional areas, regardless of when they last used their boat.

There are a number of issues relating to the influence of RST education and boating safety behaviors that warrant further investigation. Future research should explore the effect of boat safety education and training upon recreational boaters and monitor the effects of mandatory boating education and training legislation and boating safety promotion campaigns. In this way, the effects of licensing programs over a longer term and monitoring of the influence of these upon safe boating behavior will be able to be conducted. In addition, it will be interesting to monitor the effects of the RST over time and to establish whether there is a tapering off in terms of behavior. It will be important to monitor these effects and to note whether there is a need for the skills learned to be reinforced and updated over time.

The effect of gender on completion of the RST and safe boating behavior among recreational boaters may be an issue that warrants further exploration. In particular, very little is known about behavioral, cognitive, and psychological differences among males and females in boating injury risk and in reducing this risk, given that boating may be a recreational activity that is enjoyed by more males. It is also recommended that public boat safety education and awareness campaigns be monitored and evaluated to determine their influence upon safe boating behavior.

Conclusion

While the results about the influence of the RST upon recreational vessel owners are encouraging in terms of increasing awareness about safe boating, further monitoring is needed to explore its influence upon attitude, knowledge, and behavior among recreational boaters. Also, it will be important to see how long this increase in awareness about boating rules and regulations and boat safety issues persist. Even with an increase in awareness of boating safety issues, behavioral change takes time

to achieve, and the ongoing reinforcement of boating safety through a combination of legislative, educational, and engineering measures will be necessary to secure a long-term and permanent change. It is important to recognize that it is only through such behavioral changes, with supportive legislative and engineering efforts, that the number of incidents and injuries may be reduced among recreational boaters.

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