Texting While Driving Behaviour among Ontario Youth and Young Adults

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Texting While Driving Behaviour among Ontario Youth and Young Adults

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Overview

BACKGROUND

Distracted driving occurs when a driver's attention is temporarily diverted from the task of driving to an object, person, or task not related to driving.[1] According to current collision trends, fatalities related to distracted driving are forecasted to exceed those from drinking and driving by 2016.[2]

Texting while driving among youth and young adults is of particular concern. Texting while driving (TWD) is defined as the act of sending, reading or writing a text messages or electronic message using a handheld electronic telecommunications device to manually communicate with any person.[3] Within Ontario, over one-third (35.9 per cent) of Ontario student drivers in grades 10 to 12 self-reported TWD at least once in the past year.[4] These rates of TWD among youth are concerning, as TWD increases cognitive reaction time by 74.0 per cent,[5] and causes young drivers to spend 400.0 per cent more time looking away from the road compared to when they were not texting,[6] increasing their risk of collision. According to the Traffic Injury Research Foundation (TIRF) (2007) Canadians between the ages of 16 to 24 were more likely than their older peers to have steered or braked to avoid a collision due to an in-car distraction.[1] However, there is limited data available regarding distracted driving collisions specifically among Ontario youth and young adults.

To limit the risk and harm associated with distracted driving, particularly distractions associated with hand-held devices, Ontario introduced a ban in October 2009 on the use of hand-held devices while driving.[7] To complement the distracted driving law, a number of campaigns and programs have taken place in Ontario to reduce distracted driving.[7,8] However, education, awareness, and penalties may not be enough to deter youth and young adults from engaging in distracted driving behaviours.[9]

It has been suggested that understanding the beliefs and factors that motivate behaviour may be helpful in developing effective countermeasures for the behaviour (e.g., through social marketing campaigns).[10] The Integrative Model of Behavioural Prediction (IMBP)[11,12] has been shown to be a useful model for understanding these constructs. Additionally, identifying potential psychological, behavioural, and environmental factors that predict TWD may help to guide the development of interventions. However there is limited empirical data on psychological predictors of TWD,[13] particularly among our target population of Ontario youth and young adults.

PURPOSE AND OBJECTIVES

The purpose of this study is to examine the prevalence, motives and types of TWD behaviour among a sample of Ontario youth and young adults ages 16 to 24.

Specifically, the objectives were:

1) To measure the prevalence and predictors of TWD behaviour among a sample of Ontario youth and young adults ages 16 to 24.

2) To identify the reasons and/or motives for engaging in TWD among Ontario youth and young adults.

3) To explore theoretical constructs from the Integrative Model of Behavioural Prediction (IMBP) that may predict TWD behaviour.

METHODS

An online survey was conducted using a research panel. Ethics approval was obtained through Public Health Ontario's Ethics Review Board. Participants included youth and young adults 16 to 24 years of age, sampled to be reflective of the Ontario population based on age and gender. ***For the purpose of this study, youth were defined as those 16 to 19 years of age while young adults were defined as those 20 to 24 years of age****.*

Recruitment and data collection was conducted by a commercial market research company. Participants registered in an online research panel were recruited via email.

Participants were eligible to participate if they were an Ontario resident between the ages of 16 to 24 who had driven an on-road motor vehicle in the past 12 months, and had used a mobile device in the past 12 months. The survey was conducted between January 22, 2015 and February 6, 2015.

RESULTS

Overall, the majority (91.8 per cent) of participants were aware of the Ontario law banning TWD and the risks and dangers associated with TWD. Additionally, they believed that TWD is distracting (and more distracting compared to other distracted driving behaviours such as talking on a hands free phone or adjusting car controls while driving). Overall, participants had low intentions to engage in TWD, negative attitudes towards TWD, high self-efficacy regarding their ability to refrain from TWD, and high perceived behavioural control (PBC) regarding TWD. They believed that others who are important to them would disapprove of their TWD behaviour and participants had high moral norms, meaning that they knew the behaviour was wrong and felt guilty about doing it.

Despite these perceptions and beliefs, nearly half of all participants (55.0 per cent and 43.9 per cent for reading and sending respectively) reported ever engaging in TWD (although the greatest percentage of participants reported doing so 'rarely' or 'sometimes' (>90.0 per cent). Among our sample of Ontario youth and young adults, a greater percentage of participant's reported ever reading text messages while driving (55.0 per cent) compared to sending (44.0 per cent). This may be due to the perception that reading text messages while driving is safer than sending text messages while driving as 31% per cent of participants believed that reading text message while driving was 'extremely dangerous' compared to

57.0 per cent of participants who believed that sending text messages while driving was 'extremely dangerous'.

TWD was significantly associated with both age and education, where a greater proportion of young adults (20-24 years) and those with higher education levels reported ever engaging in TWD. TWD was not associated with gender. These associations were found for both reading and sending behaviours.

The most commonly reported themes and/or reasons for TWD were related to: making plans, perceived importance of the message, to get directions, to send or receive a message from friends/family or significant other, or to report to others or provide status updates (e.g., to let someone know they will be late). TWD in perceived emergency situations or because messages were perceived to be urgent/time-sensitive were also key themes that emerged from the qualitative results.

Additionally, the majority of participants (60.6 per cent) believed that they were 'much better/somewhat better' and 'much safer/somewhat safer' drivers (79.8 per cent) compared to most other drivers, and few (<20.0 per cent) had experienced the consequences of TWD (e.g., being stopped by police, receiving a ticket or being in a collision due to TWD). Lastly, the majority of participants (>70.0 per cent) overestimated the prevalence of TWD among their peers, perceiving the behaviour to be more common than it actually is.

LIMITATIONS

First, because an online panel was used, the findings cannot necessarily be used to establish prevalence rates of TWD among Ontario youth and young adults, given potential for sampling and other sources of bias. For example, the results may have been influenced by selection bias whereby participants who choose to participate in the online panel may have been more technologically experienced or dependant than those who are not part of an online panel and, therefore, may be more inclined to use technology (i.e., a cell phone) while driving. Second, the survey relied on self-reported data. As such, results may have been influenced by social desirability bias whereby participants may have felt uncomfortable reporting their engagement in a currently illegal activity such as TWD, and thus altered their responses accordingly (i.e., underreporting their engagement in TWD). Last, our sample included only Ontario youth, as such, these findings may not be generalizable to individuals from other jurisdictions. Despite these limitations, this report makes an important contribution by providing current data specific to the Ontario population regarding TWD behaviour in youth and young adults.

CONCLUSION/IMPLICATIONS

The results from the current study suggest that those developing social marketing campaigns targeting TWD among youth and young adults may wish to develop campaigns that: challenge the perception that TWD is the norm (i.e., target group norms) and that reading text messages is safer than sending text messages, highlight the reality of experiencing the consequences of TWD (i.e., receiving a ticket, getting into a collision), include content related to the key themes/reasons for TWD (i.e., perceived importance

of messages), while avoiding areas such as risk perceptions which have little room for change and are weak predictors of behaviour. Additionally, campaigns could focus on changing the perception that youth and young adults believe that they are much better and safer drivers than everyone one else, making them less prone to the consequences of TWD.

Background

Distracted Driving

Distracted driving occurs when a driver's attention is temporarily diverted from the task of driving to an object, person, or task not related to driving.[1] This might include visual (e.g., taking your eyes of the road), manual (e.g., taking your hands of the wheel) or cognitive (e.g., taking your mind off the road) distractions.[14-16] Distractions may be internal (i.e., coming from within the vehicle or the individual's mind), or external (i.e., coming from outside the vehicle such as signs or other vehicles).[16-18]

Common internal distractions include passenger conversations or activity, personal communication devices (e.g., mobile phones), computer navigation systems (e.g., GPS), adjusting vehicle controls (e.g., heat, music), personal grooming, and eating or drinking.[16] Common external distractions include pedestrians, other vehicles or cyclists, street signs and advertising, and scenery.[16]

According to the 2010 Road Safety Monitor, an annual public survey of a representative sample of Canadian motor vehicle drivers conducted by the Traffic Injury Research Foundation (TIRF), Canadians frequently engage in many activities that can be distracting while driving.[18]

For instance, among the Canadians surveyed:

- 85.7% read road signs,
- 67.0% talk or interact with passengers,
- 54.8% think about things other than the driving task at hand,
- 45.8% change the radio stations or CDs,
- 40.9% read billboards or advertising,
- 32.0% eat or drink,
- 19.9% talk on their hands-free phone,
- 17.4% use GPS to navigate,
- 8.0% talk on their hand-held phone,
- 7.4% use technical devices such as blackberries, palm pilots, or laptops,
- 5.2% text messages on their phone and
- 3.0% read a newspaper, put on make-up or shave.[18]

CONSEQUENCES OF DISTRACTED DRIVING

Previous collision trends forecasted that fatalities from the impacts of distracted driving would exceed those from drinking and driving by 2016.[2] However, the Ontario Provincial Police (OPP) reported that in 2013 distracted driving fatalities had already resulted in 78 fatalities surpassing both impaired and speed-related fatalities, which had 57 and 44 fatalities respectively.[19]

TEXTING WHILE DRIVING (TWD) AMONG YOUTH

Among all causes of distracted driving, TWD is of particular concern among youth and young adults. Texting while driving is defined as sending, reading or writing a text messages or electronic message using a handheld electronic telecommunications device to manually communicate with any person by using an electronic message.[3] An electronic message is a self-contained piece of digital communication that is designed or intended to be transmitted between hand-held electronic wireless communication devices.[3]

Tisen et al., (2011) found that drivers younger than age 25 were more likely than older drivers to read or send text messages or e-mails while driving.[20] Atchley et al., (2011) found that 70.0 per cent of young American adult drivers surveyed (ages 18 to 30) reported initiating text messages while driving, while higher numbers reported replying to (81.0 per cent) and reading text messages (92.0 per cent) while driving.[21] Within Ontario, findings from the Ontario Student Drug Use and Health Survey (OSDUHS) indicate that in 2013, over one-third (35.9 per cent) of Ontario student drivers in grades 10 to 12 self-reported TWD at least once in the past year.[4] Males (34.9 per cent) and females (37.1 per cent) were equally likely to report TWD in the past year, and there were no significant differences by geographic location.[4]

A simulation study conducted by Hosking et al., (2006) noted that youth and young adults (ages 18 to 21) spent 400.0 per cent more time looking away from the road when they were TWD compared to when they were not TWD.[6] Additionally, Long et al., (2012) found that cognitive reaction time increased by 74.0 per cent when TWD.[5] Reed et al., (2008) found that reactions times of 17 to 24 year old drivers were 35.0 per cent slower when writing a text message while driving compared to driving undistracted.[22] This is greater than the 12.0 per cent increase in reaction times caused by alcohol.[22]

Distracted Driving Laws in Ontario

To limit the risk and harm associated with distracted driving, particularly distractions associated with hand-held devices, Ontario introduced a ban in October 2009 on hand-held devices while driving.[7] The law prohibits drivers from talking, texting, typing, dialing or emailing using hand-held cell phones and other hand-held communications and entertainment devices. The law also prohibited drivers from viewing display screens unrelated to the driving task, such as laptops or DVD players, while driving; however the use of hands-free devices is still permitted.[7] Failing to comply with the law resulted in a $155 fine and 0 demerit points.[7]

In March 2014, Ontario introduced its Keeping Ontario's Roads Safe Act and supporting amendments to the Highway Traffic Act that increased fines for distracted driving from a range of $60 - $500 to a range of $300 - $1000 and assigns three demerit points upon conviction.[2] Despite these measures, it has been suggested that laws banning TWD are not effective in reducing the prevalence of TWD because they are difficult to implement and/or enforce (i.e., it is difficult to catch a driver texting).[3]

In addition to being fined for distracted driving, drivers who commit an offence that is dangerous to the public (i.e., bodily harm or deaths that may result from distracted driving) may also be charged for Dangerous Driving under the criminal code and may serve up to 14 years for an indictable offence.[23]

Motives of Distracted Driving Among Youth

To complement the distracted driving law, a number of campaigns and programs have taken place in Ontario to reduce distracted driving. For instance, the Ontario Ministry of Transportation (MTO) introduced a program called iDrive which raises awareness among youth about the risks of unsafe driving behaviour.[7] There have also been a number of distracted driving campaigns in Canada specifically targeting youth including the *Drop It and Drive*, *Think and Drive*, and *Is It Worth It?* campaigns.[8]

Campaigns may help to encourage youth to refrain from TWD; however education and awareness may not be enough to deter youth from engaging in distracted driving behaviours. Peters (2001) suggested that "merely conveying the fact that distractors result in accidents will not appreciably reduce the risks when there are perceived benefits or incentives to use the distractors."[9] For instance, Cazzulino et al., (2014) found that despite being aware of the risks of distracted driving many young drivers still continued to engage in the behaviour.[24]

Hallett et al., (2012) suggest that worldwide there is a need to invest more effort in investigating the reasons behind why drivers, who appear to be aware of the risks, continue to engage in TWD, and that more research on the interrelationships between the behaviour and drivers' beliefs and attitudes is needed.[25] It has been suggested that understanding the beliefs and factors that motivate behaviour may be helpful in developing effective countermeasures (e.g., social marketing campaigns).[10] Additionally, identifying potential psychological, behavioural, and environmental factors that predict TWD may help to guide the development of interventions; however there is limited empirical data on psychological predictors of TWD,[13] particularly among our target population of Ontario youth and young adults.

Purpose

This study was initiated as a result of a request for information from members of the Ontario Injury Prevention Practitioners Network (OIPPN), received through the Ontario Injury Prevention Resource Centre (OIPRC), to examine the motives of distracted driving behaviour among Ontario youth and young adults ages 16 to 24. OIPPN intends to use the results from this study to inform the development of a distracted driving social marketing campaign.

The purpose of this study is:

To examine the prevalence, motives and types of TWD behaviour among a sample of Ontario youth and young adults ages 16 to 24.

Objectives

1) To measure the prevalence and predictors of TWD behaviour among a sample of Ontario youth and young adults ages 16 to 24.

2) To identify the reasons and/or motives for engaging in TWD among Ontario youth and young adults.

3) To explore theoretical constructs from the Integrative Model of Behavioural Prediction (IMBP) that may predict TWD behaviour.

Methods

An online survey was conducted using a research panel obtained through a commercial market research company. Ethics approval was obtained from Public Health Ontario's Ethics Review Board. Participants included youth and young adults 16 to 24 years of age sampled to be reflective of the Ontario population based on age and gender. ***For the purpose of this study, youth were defined as those 16 to 19 years of age while young adults were defined as those 20 to 24 years of age***.

Participants

SAMPLING

Participants were sampled to include a representative number of Ontario youth and young adult drivers (ages 16 to 24) who reported TWD. The sample size was calculated in PASS 13®.[26] The desired sample size was n= 1529 participants. Because the sample proportion was based on the percentage of Ontario youth and young adult drivers (16 to 24 years of age) that reported using a cell phone while driving rather than specifically reporting TWD (note: TWD data not available for this target population), the sample size was increased to 2000 participants to account for this lack of specificity. That is, it was assumed that a smaller percentage of this proportion use their cell phone specifically for TWD.

QUOTA SAMPLING

Our goal was to obtain a sample that was generally representative of the Ontario population according to age and sex. According to 2011 census data from Statistics Canada, there were a total of 1,547,690 youth and young adults between 16 and 24 years of age living in Ontario.[27] Approximately 51.0 per cent of this population were male and 49.0 per cent were female; about 45.0 per cent of this population were 16 to 19 years of age and 55.0 per cent were 20 to 24 years of age.[27]

Given this information, nested age and gender quotas were used to ensure the sample was generally representative of the Ontario population in this age group.

The proposed sample included 51.0 per cent males and 49.0 per cent females. Additionally, the sample included 45.0 per cent of youth 16 to 19 years of age and 55.0 per cent of youth 20 to 24 years of age. See Table 1 below for numbers of participants in each age/gender group.

Table 1. Quota Sampling

	Males n(%)	Females n(%)	Total N(%)
Youth (ages 16 to 19)	461 (23%)	437 (22%)	**898 (45%)**
Young Adults (ages 20 to 24)	559 (28%)	543 (27%)	**1102 (55%)**
Total	**1020 (51%)**	**980 (49%)**	**N = 2000**

RECRUITMENT

Recruitment and data collection was conducted by a commercial market research company. Participants registered in an online research panel were recruited via email.

ELIGIBILITY

A screening survey was used to determine eligibility. Participants were eligible to participate if they were an Ontario resident between the ages of 16 to 24 who had driven an on-road motor vehicle in the past 12 months, and had used a mobile device in the past 12 months.

Procedure

Participants registered in the online research panel as an Ontario participant between the ages of 16 to 24 were contacted via email to participate in the distracted driving survey and were provided with a survey link. The survey link directed participants to a screening questionnaire asking participants to provide their age, gender, driving status and mobile device ownership.

Those who met the eligibility criteria (and where quotas were not filled) were provided with a letter of information and consent form. Those who consented to participate in the study were directed to the online survey followed by the study summary upon completion. Those who did not meet the eligibility criteria, or were part of an age and gender group that had met its quota were informed of their ineligible status and were thanked for their time (see Figure 1 for participant recruitment flow chart). Upon completion, participants received compensation according to the research panel's normal compensatory procedures (i.e., entries into monthly and quarterly cash draws).

Figure 1. Participant Screening and Recruitment
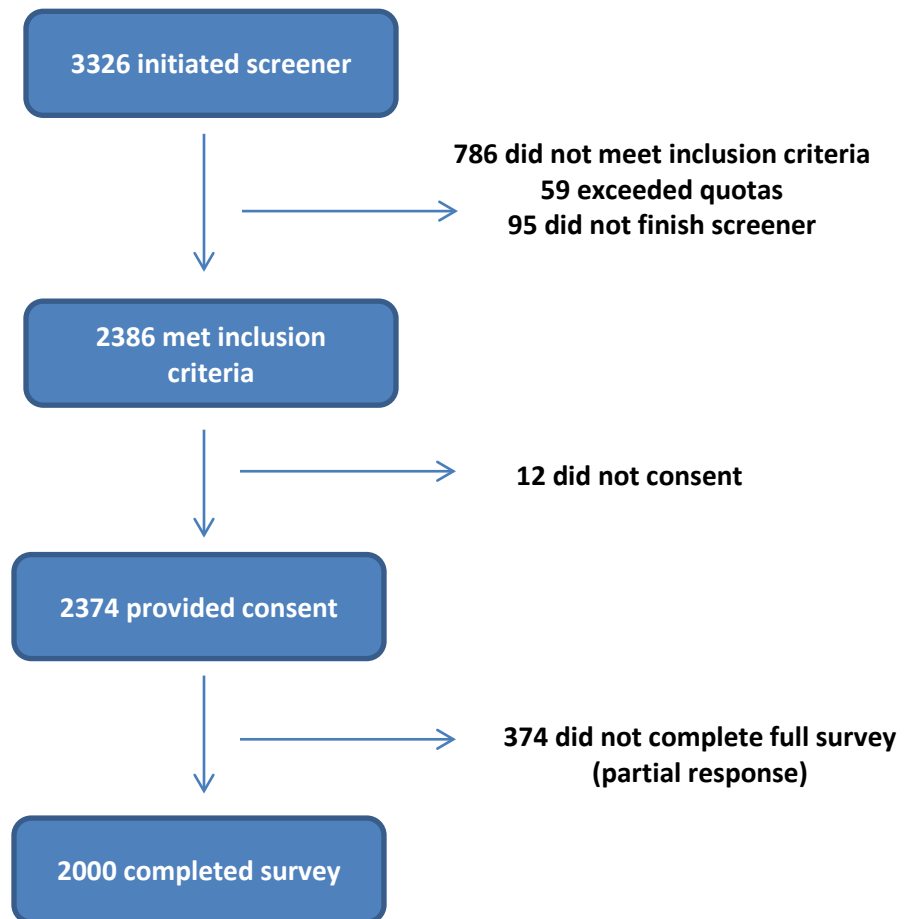
Survey Development
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Survey questions were developed using previously existing distracted driving surveys from published and unpublished literature.[1,20,21,28-36]

The survey was reviewed by content experts in the fields of injury prevention, health messaging and road safety to ensure validity of the survey. The survey was also reviewed by two experts in survey methodology from the commercial market research company to ensure survey flow.

SURVEY CONTENT

The survey was divided into the following 8 sections. The Integrative Model of Behavioural Prediction (IMBP) section was further broken down in to subcategories:

- Demographics
- Distracted Driving

- Cellphone Use and Ownership
- Driving Behaviour
- TWD Behaviour
- Reasons for TWD (reading and sending texts messages)
- Message Source
- Items from the Integrative Model of Behavioural Prediction (IMBP):
  - Past Behaviour
  - Intentions
  - Skills
  - Attitudes
  - Self-efficacy
  - Perceived Behavioural Control (PBC)
  - Perceived Norms (including group, moral and subjective norms)
  - Risk Perceptions
  - Outcome Evaluations/Behavioural Beliefs
  - Distracted Driving Law (external variable – exposure to interventions)
  - Messaging Campaigns (external variable – exposure to media)

The first section was included to understand the demographics of our target population. It included subsections asking about participants' age, gender, and education and community size. Additional sections asked about participants overall thoughts about the issue of distracted driving, their cell phone ownership and use, as well as their driving behaviour (including licence type, distance and frequency of driving, and perceived level of safe driving).

To address the first objective, '*To measure the prevalence and predictors of TWD behaviour among a sample of Ontario youth and young adults ages 16 to 24,*' items measuring TWD behaviour were assessed. For the purposes of this study, 'texting while driving (TWD)' was defined as: 'the act of reading, writing, or sending electronic messages on a mobile device while operating a motor vehicle.'[37] A text message was defined as 'any electronic communication sent and received by a mobile phone (i.e., SMS, iMessage, E-mail, Facebook chat message etc.).'[38] This section included questions asking about whether or not they had ever engaged in TWD (both sending and reading), frequency of TWD, how and when they engage in the TWD, how TWD impacts their driving, and situations in which they would be more or less likely to engage in TWD.

To address the second objective '*To identify the reasons and/or motives for engaging in texting & driving*.', open ended questions asking participants to list their top one to three reasons why they read or send texting messages while driving. Subsequent questions asked participants to indicate how often they engage in TWD for a number of pre-defined reasons (e.g., How often do you send a text message to ask for: directions?)

To better inform the development of a social marking campaign targeting distracted driving, a section on message source was included to understand key target groups from whom youth would be most receptive to hearing messages or campaigns targeting distracted driving.

Objective three was to '*To explore theoretical constructs from the Integrative Model of Behavioural Prediction (IMBP) that may predict TWD behaviour*.' Because the goal of the social marketing campaign that will be developed from this research (as noted by our stakeholders, members from the OIPPN) is to change distracted driving *behaviours*, a behaviour change theory was used to support the development of the survey. The Institute of Medicine (IOM) recommends using an integrative model for using communication strategies to change health behaviour.[39] Therefore, the Integrative Model of Behavioural Prediction (IMBP)[11,12] was used to support the development of the survey (in accordance with Objective 3), as it has been shown to be useful for the development of health messages.[40] This is particularly important as many existing distracted driving campaigns (i.e., YouTube ads) lack theoretical content from behaviour change theory.[41]

Yzer (2011) suggests that the IMBP is ideally designed to help to inform the process of choosing message content called the message strategy.[40] The IMBP can help to identify, in any given population, variables that determine health behaviour. In this way, use of IMBP supports the development of health messages that can address those critical determinants to improve that behaviour in a particular population.[40] Additionally, the model can help to develop message content that will maximize the correspondence between the content of the message and a populations' unique needs.[40] See Appendix A for description of the Integrative Model of Behavioural Prediction.

DEVELOPMENT OF SURVEY QUESTIONS

To incorporate the Integrative Model of Behaviour Prediction (IMBP) theory into the survey, survey items measuring the following constructs were included: past behaviour, intentions, skills, attitudes, self-efficacy, perceived behavioural control (PBC), perceived norms, outcome evaluations/behavioural beliefs, intervention exposure (i.e., distracted driving law), media exposure (i.e., exposure to media interventions regarding TWD), and other individual difference variables (i.e., risk perceptions).

The main IMBP constructs included in our survey (e.g., past behaviour, intentions, attitudes, PBC, and perceived norms (including subjective, group and moral norms) were adapted from published studies that tested the model with youth 17 to 24 years of age in relation to TWD behaviours (Cronbach's alphas ranging from 0.75-0.90, or Pearson's correlations *r, p*<0.001).[34]

Items measuring the remaining variables including outcome evaluations, self-efficacy, risk perceptions, intervention exposure (i.e., distracted driving law section), media exposure (i.e., media campaigns section) and skills were adapted from previous distracted driving surveys,[20,21,42,43] or literature on how to test constructs from behaviour change theories.[33,44] The items measuring skills were newly developed questions.

Analysis

QUANTITATIVE DATA

Frequency data were analyzed and proportions of survey responses were calculated for each survey question.

Recoding Categories (Education and Community Size)

The eight categories measuring education level and five categories measuring community size were each collapsed into three categories each for ease of comparison.

For instance, the following three education categories were created: 1) High school or less (includes 'some high school' and 'graduated high school'), 2) Some college/university (includes 'some college' and 'some university', and 3) Completed college/university/post-graduate degree (includes 'graduated college', 'bachelor's degree', 'graduate degree', 'technical/vocational college/apprenticeship' and 'professional certification/designation').

For the community size, the following three categories were created: 1) Population <10,000 (includes 'rural area of 5,000 or less' and 'rural area of 5,000 to 10,000'), 2) Population 10,000 to 100,000 (includes 'town or city of 10,000 to 100,000'), and 3) Population >100,000 (includes 'urban centre of 100,000 to 500,000 people' and 'urban centre of 500,000 or more').

Associations between TWD and Demographics TWD behaviour

Chi square tests were conducted to describe associations between demographic variables (i.e., age, gender, education and community size) and TWD.

Recoding Open-Ended Questions

Responses from the two open-ended questions asking about the 'percentage of Ontario youth 16 to 24 years of age that (participants) believe at least occasionally read/send text message while driving' were recoded into five separate categories (i.e., 0 to 19.9 per cent, 20.0 to 39.9 per cent, 40.0 to 69.9 per cent, 70.0 to 79.9 per cent and 80.0 to 100.0 per cent) after outliers were reclassified to three standard deviations of the mean.[45]

Calculating Mean Composite Scores

Where multiple items were used to measure one construct (i.e., intentions, attitudes, perceived behavioural control (PBC), self-efficacy, perceived norms, subjective and moral norms), mean composite scores were calculated by taking the average rating across all items measuring that construct. Cronbach's alphas ranged from 0.7 (acceptable) to 0.938 (excellent) according to George and Mallery's (2003) classification system.[46] This procedure has been previously used by Nemme et al., (2010) to calculate mean composite scores for measures of intentions, attitudes, PBC, subjective norms, group

norms, and moral norms regarding TWD behaviour among a sample of young drivers 17 to 24 years of age.[34]

QUALITATIVE DATA

The survey included two open-ended questions asking participants to: 1) 'Please describe the top one to three reasons you READ text messages while driving', and 2) 'Please describe the top one to three reasons you SEND text messages while driving'. Responses to the two open-ended questions were coded and summarized by themes (using Excel) following the methodology described below.

Developing Descriptive Categories

Two researchers independently reviewed responses to the open-ended survey questions. A sample of 100 responses for each question was taken. The two researchers reviewed these responses and independently generated descriptive categories of key themes in an inductive fashion. The researchers then met to compare categories and resolve differences through consensus to ensure consistency in coding. Results were highly consistent between coders. These themes were then reviewed by the project team for input and differences in themes were resolved through consensus. The identified themes for each question were used as a starting point for coding.

Coding

All survey responses were coded independently by two researchers. The two researchers met regularly to compare use of codes and ensure consistency in coding. Differences in coding were discussed and brought to the project team for discussion and resolved through consensus. During the independent coding process, the codebook was revised in an iterative manner. New categories were added on an as needed basis and confirmed by both reviewers.

Results

The survey response rate was 83.8% (2,000 participants completed the survey of the 2386 eligible participants). The survey findings are presented by research objectives with participant characteristics presented first, followed by findings from the quantitative and qualitative data analysis. Participant characteristics are described below. See Table 2.

PARTICIPANT CHARACTERISTICS

Table 2. Participant characteristics

Participant Characteristics	n(%)
Age	
16 to 19 years	898 (44.9%)
20 to 24 years	1102 (55.1%)
Gender	
Male	1020 (51.0%)
Female	980 (49.0%)
Education	
High school or less	749 (37.6%)
Some college/university	858 (43.1%)
Completed college/ university/post- graduate degree	382 (19.2%)
Community size	
Population <10,000	262 (13.9%)
Population 10,000 to 100,000	678 (35.9%)
Population >100,000	947 (50.2%)

QUANTITATIVE DATA

Objective 1 -To measure the prevalence and predictors of current TWD behaviour among a sample of Ontario youth and young adults ages 16 to 24

Texting While Driving Behaviour

About half of youth and young adults admitted to ever engaging in TWD behaviours; 55.0 per cent of participants had (ever) read and 43.9 per cent had (ever) sent a text message while driving.

Selected Demographic Findings

There was a significant association between age group and ever TWD, where a greater proportion of young adults (ages 20 to 24) reported ever engaging in TWD (Read 66 per cent; Send 55 per cent)

compared to youth (ages 16 to 19) (Read 41 per cent; Send 30 per cent). An association was seen between education level and ever TWD, where a greater proportion of participants with more education reported ever TWD compared with those with less education (College/university/post-graduate degree Read 72 per cent, Send 62 per cent; Some university/college Read 62 per cent, Send 49 per cent; High school or less Read 39 per cent, Send 30 per cent). In terms of community size, a greater proportion of those living in communities with a population less than 10 000 reported ever reading text messages while driving (62 per cent) compared with those living in communities with populations between 10 000 and 100 000 (52 per cent). No differences were found for ever sending text messages while driving across community sizes. Lastly, no significant gender differences were found for either reading or sending behaviours.

Note: For the following questions proportions represent only those who reported ever engaging in TWD (i.e., only those who indicated that they have ever read text messages while driving were asked how often they read text messages while driving).

Frequency of TWD

When asked 'how often' they engage in the behaviour, the greatest percentage of youth and young adults (who admitted to ever reading or sending text messages while driving), reported that they engage in TWD 'rarely' (Read 51.8 per cent; Send 62.3 per cent) or 'sometimes' (Read 40.5 per cent; Send 32.6 per cent), while few reported 'always' engaging in the behaviour (Read 0.8 per cent; Send 1.3 per cent). See Figure 2.

Figure 2. Frequency of texting while driving
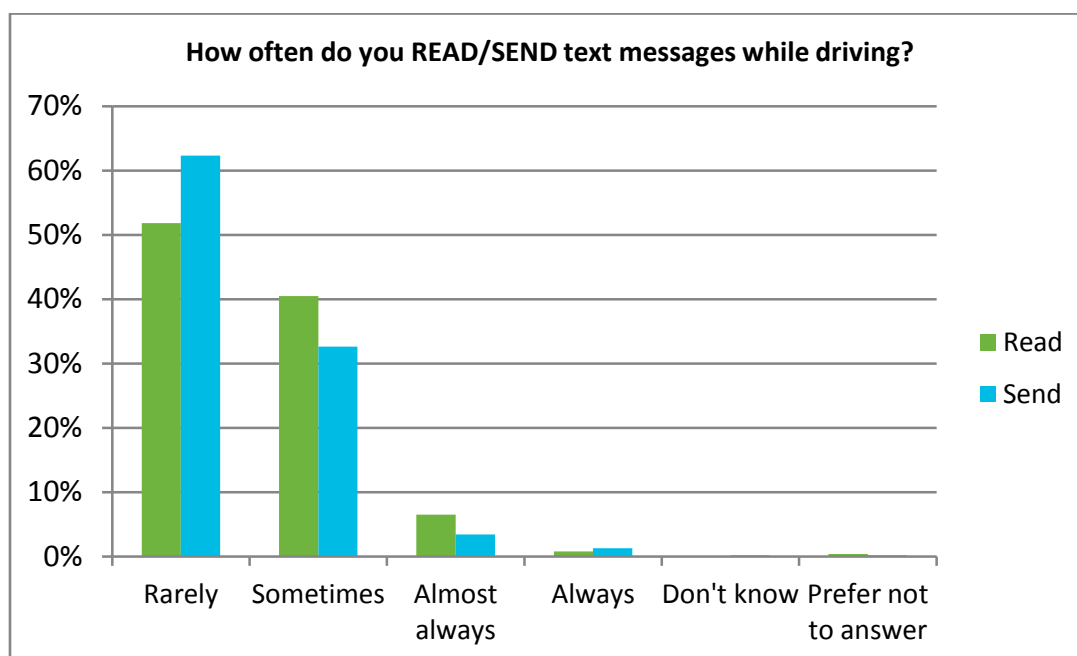
How TWD influences driving

The majority of participants indicated that reading and/or sending text messages while driving causes them to: take their eyes off the road (Read 69.8 per cent; Send 63.1 per cent), increase their distance from the lead vehicle (Read 68.4 per cent; Send 62.8 per cent), drive slower (Read 64.5 per cent; Send 62.2 per cent), change lanes less frequently (Read 57.2 per cent; Send 54.3 per cent) or avoid changing lanes all together (Read 62.9 per cent; Send 60.4 per cent).

Objective 2 - To identify the reasons and/or motives for engaging in texting & driving

Frequency of TWD for '_____' Reason

When asked about the frequency of engaging in TWD for a variety of different reasons, the majority of participants indicated that they 'never' *read* text messages while driving for: status updates (82.0 per cent), sports/current events (81.5 per cent), to say hi (79.7 per cent), boredom (72.6 per cent), instant gratification (69.6 per cent), multitasking (61.4), or because they can't stop (72.3 per cent).
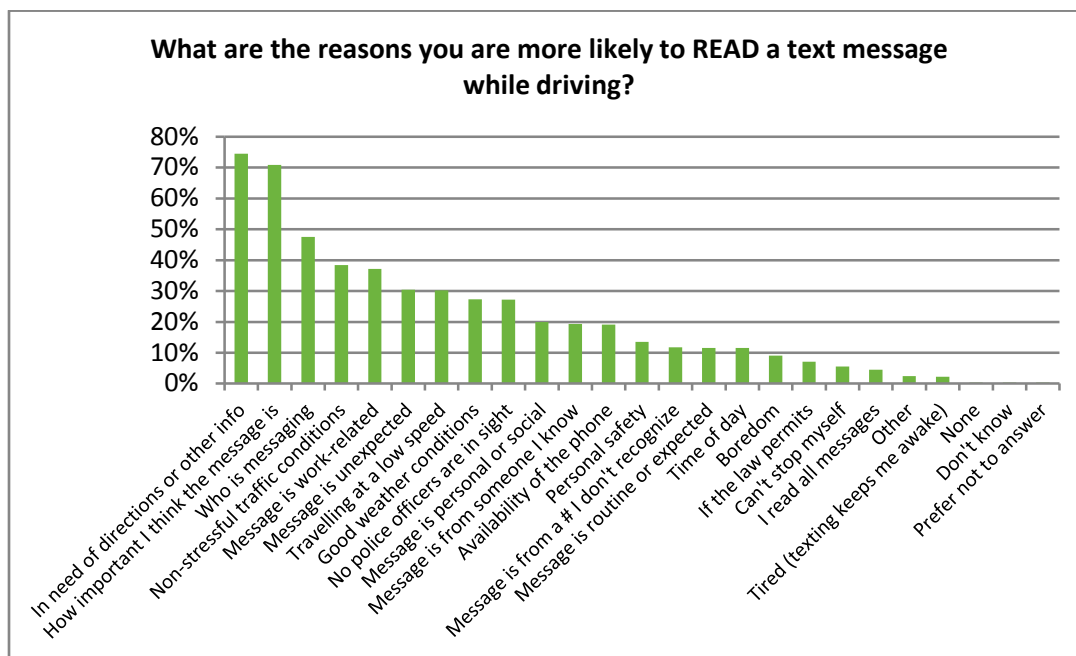
Similarly, the majority of participants indicated that they 'never' *send* text messages while driving: to say hi (84.9 per cent), for status updates (84.6 per cent), sports/current events (84.2 per cent), they can't stop (82 per cent), instant gratification (80.8 per cent), boredom (80.5 per cent) or multitasking (61.4 per cent).

Instead, the greatest percentage of participants reported 'always' *reading* texts while driving: to get directions (12.3 per cent), to make plans (8.5 per cent), or because the message was from a significant other (7.9 per cent). Additionally participants reported 'always' *sending* text messages while driving: to let someone know they will be late (12.6 per cent), to get directions (7.6 per cent) or to message a significant other (7.6 per cent).

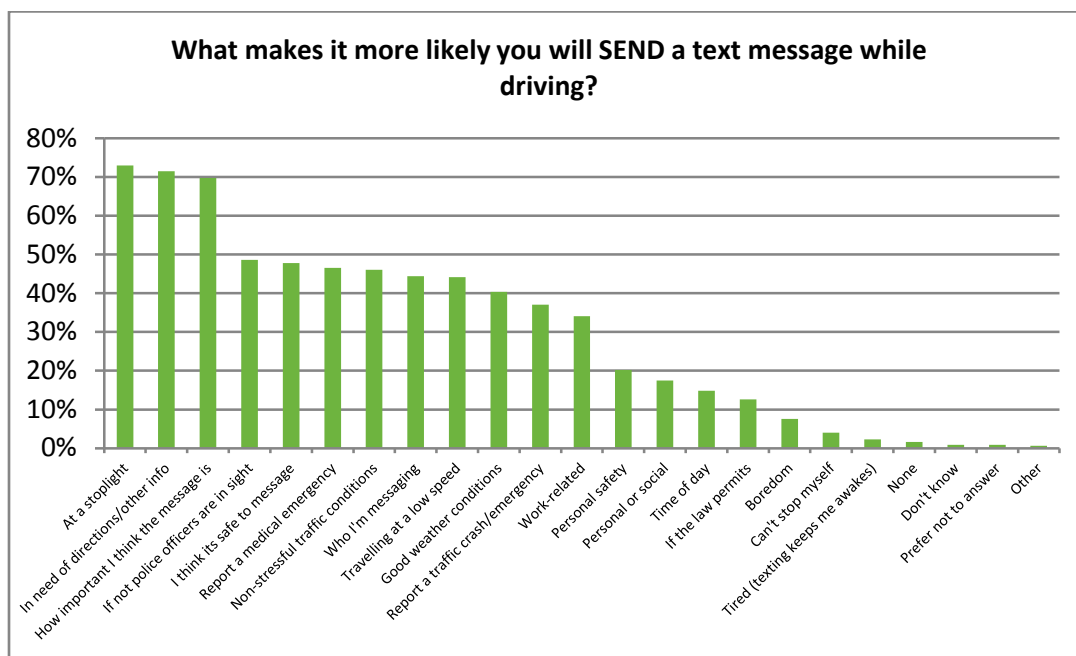**Reason participants would be more likely to engage in TWD**

When asked specifically about the reasons they would be more likely to engage in TWD, the majority of participants indicated that they would be more likely to *read* a text messages while driving: 1) if they are in need of directions or other info (74.5 per cent) or 2) dependant on the perceived importance of the message (70.9 per cent). See Figure 3.

Figure 3. Reasons participants are more likely to read a text message while driving

What are the reasons you are more likely to READ a text message while driving?

(Bar chart showing percentages for various reasons, in descending order:)

- In need of directions or other info: ~75%
- How important I think the message is: ~70%
- Who is messaging: ~47%
- Non-stressful traffic conditions: ~39%
- Message is work-related: ~37%
- Message is unexpected: ~30%
- Travelling at a low speed: ~30%
- Good weather conditions: ~27%
- No police officers are in sight: ~27%
- Message is personal or social: ~20%
- Message is from someone I know: ~19%
- Availability of the phone: ~19%
- Personal safety: ~13%
- Message is from a # I don't recognize: ~11%
- Message is routine or expected: ~11%
- Time of day: ~11%
- Boredom: ~9%
- If the law permits: ~7%
- Can't stop myself: ~5%
- I read all messages: ~4%
- Tired (texting keeps me awake): ~2%
- Other: ~2%
- None: 0%
- Don't know: 0%
- Prefer not to answer: 0%

The majority of participants indicated that they would be more likely to *send* a text message while driving if: 1) they are at a stoplight (73.0 per cent), 2) they are in need of directions or other info (71.5 per cent), or 3) dependant on how important the message is perceived to be (69.8 per cent). See Figure 4.

Figure 4. Reasons participants are more likely to send a text message while driving

What makes it more likely you will SEND a text message while driving?

(Bar chart showing percentages for various reasons, in descending order:)

- At a stoplight: ~73%
- In need of directions/other info: ~71%
- How important I think the message is: ~70%
- If not police officers are in sight: ~49%
- I think its safe to message: ~48%
- Report a medical emergency: ~46%
- Non-stressful traffic conditions: ~46%
- Who I'm messaging: ~44%
- Travelling at a low speed: ~44%
- Good weather conditions: ~40%
- Report a traffic crash/emergency: ~37%
- Work-related: ~34%
- Personal safety: ~20%
- Personal or social: ~18%
- Time of day: ~15%
- If the law permits: ~13%
- Boredom: ~8%
- Can't stop myself: ~4%
- Tired (texting keeps me awakes): ~2%
- None: ~1%
- Don't know: ~1%
- Prefer not to answer: ~1%
- Other: ~1%

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Reasons participants would never engage in TWD

When asked about reasons in which they would *never* read or send a text message while driving, the majority of participants indicated that they would *never* read or send a text message while driving: 1) when they see a police officer (Read 89.6 per cent; Send 85.9 per cent), 2) when merging with traffic (Read 88.3 per cent; Send 83.0 per cent) or 3) in bad weather (Read 87.5 per cent; Send 81.7 per cent). Driving on familiar routes or empty roadways was less frequently reported as a reason in which they would *never* read or send a text message while driving (8.1 per cent to 13.2 per cent). See Figure 5.

Figure 5. Situations in which participants would never read or send text messages while driving
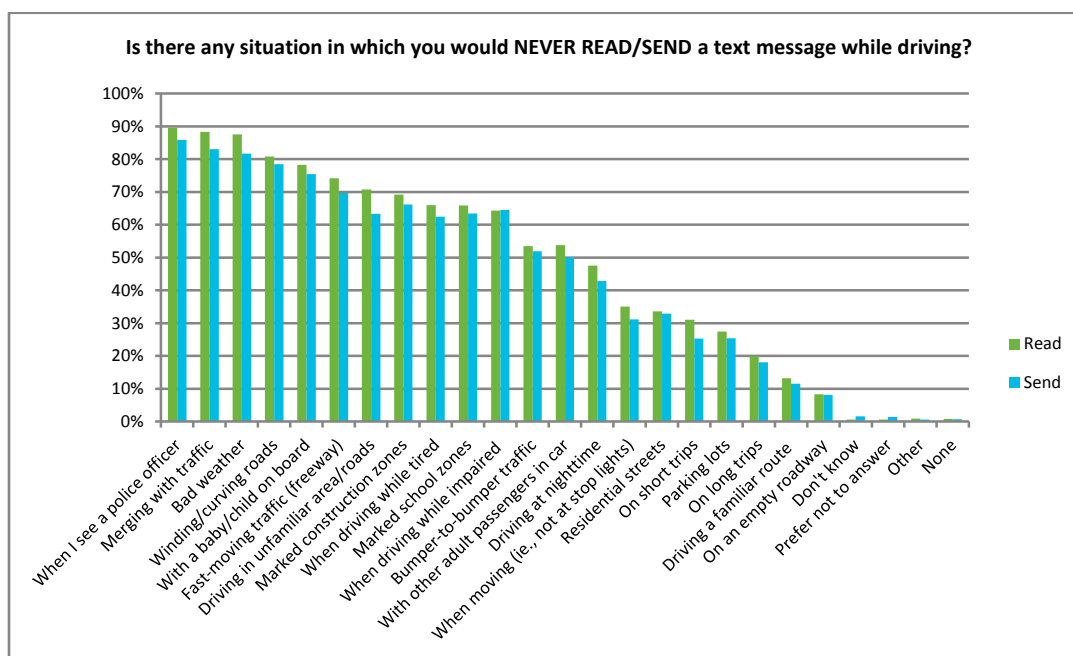
Objective 3 -To explore theoretical constructs from the Integrative Model of Behavioural Prediction (IMBP) that may predict TWD behaviour

Note: For the following questions and responses, proportions represent all participants.

Past Behaviour

The majority of participants indicated that they did not read (64.4 per cent) or send (77.9 per cent) any text messages while driving in the past week. In contrast, only 2.0 per cent of participants reported regularly reading, and 1.4 per cent reported regularly sending text messages while driving in the past week.

Intentions

Intentions to engage in TWD behaviours were low (Read Mean=1.72; Send Mean= 1.53).The majority of participants 'strongly disagreed' that they 'plan to', 'intend to' or 'are likely to' read (59.0 per cent to

79.0 per cent) or send (70.0 per cent to 80.0 per cent) text messages while driving in the next week. See Figure 6.

Skills

Thirty-four per cent and 46.0 per cent of participants reported that they are 'not skilled at all' at reading or sending text messages while driving, respectively. In contrast, less than 4.0 per cent of participants reported being 'extremely skilled' at reading or sending text messages while driving (Reading 3.4 per cent, Sending 3.5 per cent).

Attitudes

Attitudes towards TWD among youth and young adults were generally low (Read Mean= 1.7; Send Mean= 1.5). The majority of participants rated reading and sending texting messages while driving as: bad (Read 68.3 per cent; Send 78.2 per cent), worthless (Read, 58.8 per cent; Send 67.7 per cent), unwise (Read 75.3 per cent; Send 81.5 per cent), and negative (Read 68.5 per cent; Send 76.7 per cent). See Figure 6.

Self-efficacy

Self-efficacy for refraining from reading or sending text messages in the next week was generally high (Read Mean= 5.9; Send Mean= 6.2). The majority of participants 'strongly agreed' that they could refrain from reading (65.1 per cent) or sending (72.7 per cent) text messages while driving in the next week. In contrast, less than 10.0 per cent of participants 'strongly disagreed' that they could refrain from reading or sending text messages in the next week (Read 7.5 per cent; Send 7.6 per cent). See Figure 6.

Additionally, the majority of participants indicated that refraining from reading or sending text messages while driving in the next week would be 'easy' (Read 61.9 per cent; Send 72.4 per cent). Less than 5.0 per cent indicated that refraining from reading or sending text messages in the following week would be 'difficult' (Read 4.3 per cent; Send 3.5 per cent).

Perceived Behavioural Control (PBC)

Perceived behavioural control over engaging in TWD behaviours was generally high among youth and young adults (Read Mean= 6.4; Send Mean= 6.4). The majority of participants 'strongly agreed' that they have complete control over reading (74.1 per cent) or sending (79.0 per cent) text messages while driving in the next week. Additionally, the majority of participants 'strongly agreed' that it is mostly up to them whether they read or send text messages while driving in the following week (Read 75.7 per cent; Send 77.2 per cent). See Figure 6.

Subjective Norms

The mean composite scores for subjective norms were generally low (Read Mean= 1.6; Send Mean= 1.4). The majority of participants 'strongly disagreed' that the people who are important to them would: 1) 'approve of', 2) 'want them to', or 3) 'think they should' read or send text messages while driving in the next week (Read 69.0 per cent to 75.5 per cent; Send 75.4 per cent to 78.6 per cent). See Figure 6.

**Figure 6. Mean composite scores of constructs from the IMBP**
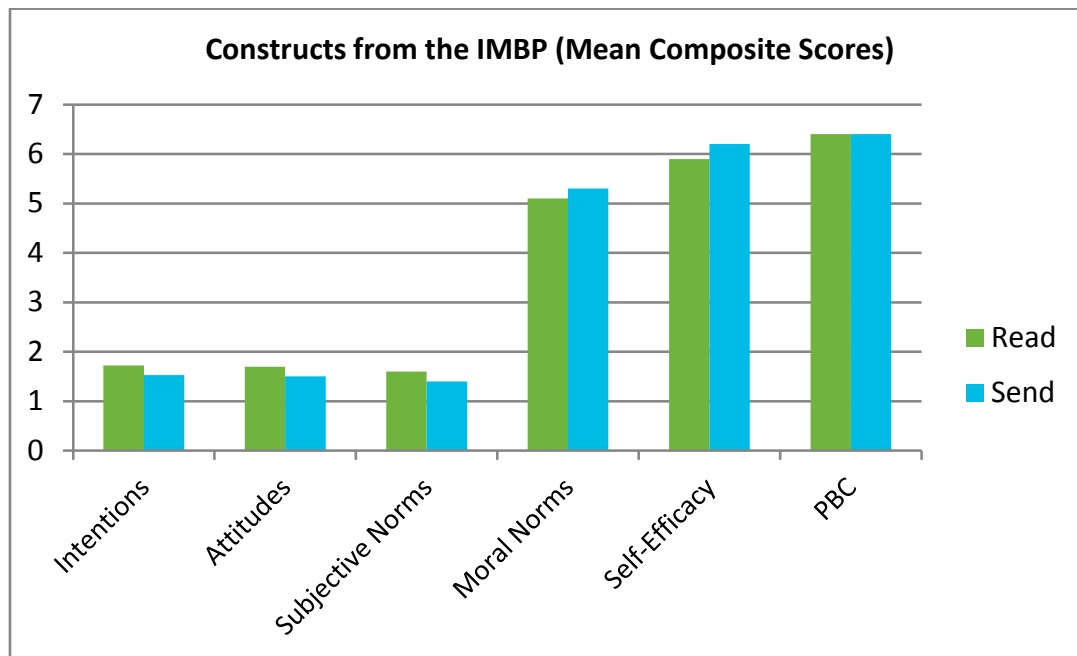
Group Norms

TWD among Other young Ontario drivers

When asked "What percentage of young Ontario drivers do you believe at least occasionally *read* text messages while driving", the mean response was 75.6 per cent. This is higher than the 55.0% per cent of our sample that admitted to ever reading text messages while driving. The majority of participants (56.5 per cent) estimated that 80.0 per cent to 100.0 per cent of young Ontario drivers occasionally read text messages while driving, 30.0 per cent of participants estimated between 60.0 per cent to 79.9 per cent, 8.2 per cent estimated percentages of 40.0 per cent to 59.9 per cent and 5.0 per cent estimated percentages of 20.0 per cent to 39.9 per cent. See Figure 7.

When asked "What percentage of young Ontario drivers do you believe at least occasionally *send* text messages while driving", the mean response was 67.9 per cent. This is higher than the 43.9% per cent of our sample that admitted to ever sending text messages while driving. Many participants (39.1 per cent) estimated that over 80.0 per cent of young Ontario drivers occasionally send text messages while driving, 34.5 per cent estimated percentages between 60.0 to 79.9 per cent, 17.6 per cent estimate percentages of 40.0 to 59.0 per cent and less than 8.9 per cent of participants reported percentages less than 40.0 per cent. See Figure 7.

Figure 7. Group norms regarding perceived TWD behaviour among other young Ontario drivers

What percentage of young Ontario drivers do you believe at least occasionally READ/SEND text messages while driving?

43.9% and 55.0% of our sample *actually* read and send text message while driving, respectively.
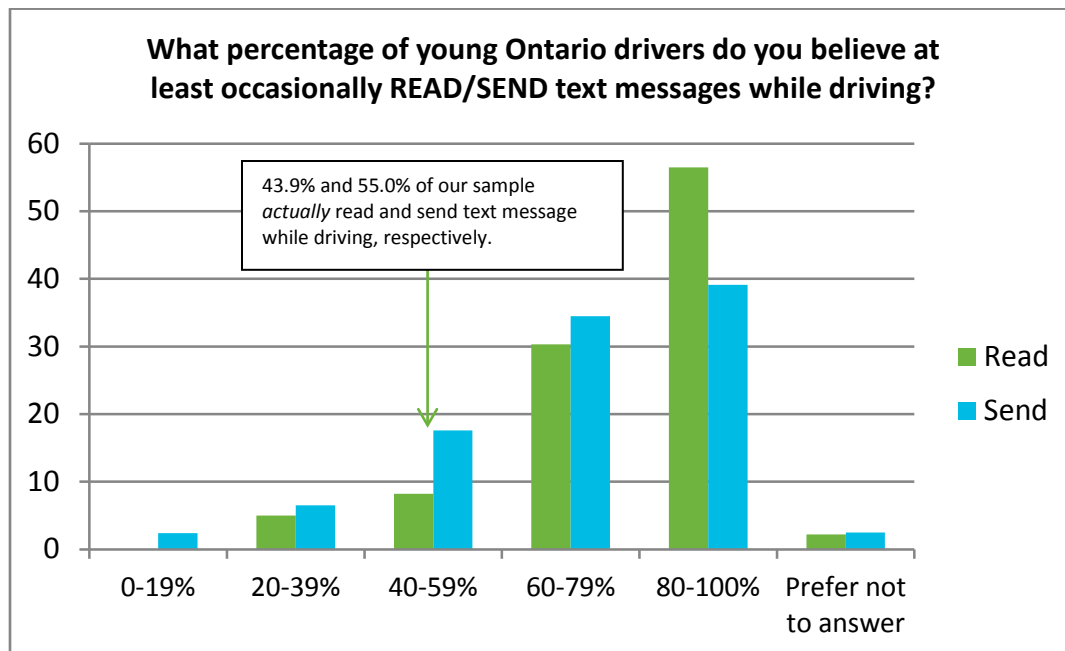
■ Read
■ Send

TWD among Friends, Family and Peers

When asked 'How many of your friends and peers would think that reading/sending a text message while driving is a good thing to do?' (on a scale from 1-none, to 7-all), a greater percentage of participants reported 'none' (Read 27.2 per cent; Send 33.5 per cent), compared to the less than 2.0 per cent of youth reported 'all' (Read 1.5 per cent; Send 0.9 per cent).

However, when asked about how many of their friends, family and peer would read or send a text messages while driving in the next week (on a scale from 1-none, to 7-all), few selected 'none' (Read 6.7 per cent; Send 10.3 per cent) or 'all' (Read 4.7 per cent; Send 3.3 per cent), while the majority of participants selected a rating between 3 and 5 (Read 60.2 per cent; Send 56.7 per cent).

Additionally, the majority of participants 'strongly disagreed' that their parents would think that 'reading/sending' a text message while driving is a good thing to do (Read 76.8 per cent; Send 80.8 per cent).

Moral norms

Overall youth and young adults had strong moral norms against TWD (Read Mean= 5.1; Send Mean= 5.3). The greatest percentage of participants 'strongly agreed' that 1) they would feel guilty if they read/sent text messages while driving (Read 37 per cent; Send 46.8 per cent), 2) they personally think that reading/sending texting messages while driving is wrong (Read 48.6 per cent; Send 54.9 per cent), and that 3) reading/sending text messages while driving goes against their principles (Read 36.4 per cent; Send 43.9 per cent). See Figure 6.

Risk Perceptions

Perceived Risk of TWD

Youth and young adults generally perceived TWD to be a risky behaviour. About half of participants (49.4 per cent) rated TWD as an extremely risky behaviour while only 0.4 per cent indicated no risk was involved.

Perceived Danger of TWD

Thirty-one per cent and 57.0 per cent of participants indicated that reading or sending text messages while driving was extremely dangerous, respectively, while less than 1 per cent suggested that it was not dangerous at all (Read 1.0 per cent; Send 0.7 per cent). See Figure 8.

Figure 8. Perceived danger regarding texting while driving
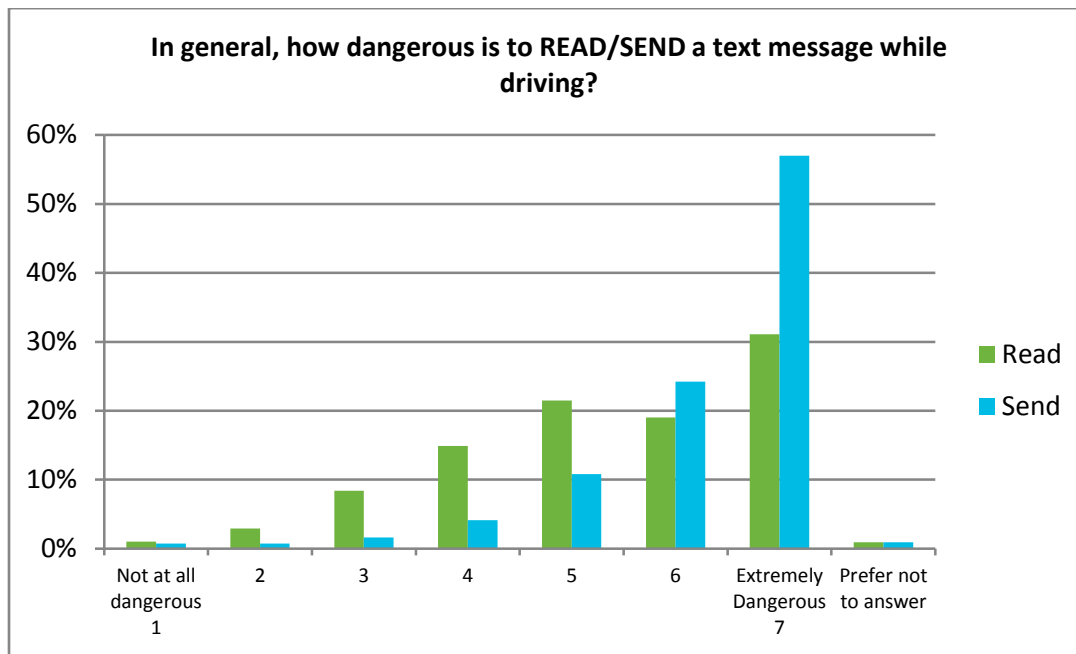
TWD versus other Distracted Driving Behaviours

In comparison with other distracted driving behaviours, a greater percentage of participants indicated that TWD was *more distracting* than: 1) reading road signs, 2) interacting with passengers, 3) thinking about things other than driving, 4) adjusting car controls, 5) reading billboards/advertising, 6) eating/drinking, 7) talking on hands free phone and 8) using GPS. The only behaviour that was perceived by a greater percentage of youth to be *equally distracting* as TWD was putting on makeup/shaving while driving.

Past Involvement with Collisions

When asked about their past involvement with collisions caused by TWD, the majority of participants (86.9 per cent) indicated that they have not been in, or almost been in, a collision because they were TWD. About half of participants (50.8 per cent) indicated that their friends or family members have not 'been in', or 'almost been in' a collision due to TWD. However, some participants indicated that a friend or family member had 'been in' (9.1 per cent), or 'almost been in' (20.1 per cent) a collision because they were TWD.

Outcome Evaluations

Five separate outcome evaluations were measured. The majority of participants indicated that they would 'likely' 1) get a ticket or be fined if they engaged in TWD (56.9 per cent), 2) feel guilty if they were responsible for a collision due to TWD (84.6 per cent), 3) be ashamed if others knew that they were involved in a collision due to their TWD (73.1 per cent), and 4) that TWD would reduce their ability to drive safely (65.0 per cent). Interestingly, only 4.2 per cent of participants felt that they would likely be perceived as anti-social if they don't respond to a text message right away.

Perceived Driving Skills

The majority of participants (60.6 per cent) reported that they are 'somewhat better/much better' drivers and 'somewhat more safe/much more safe' (79.8 per cent) compared with other drivers.

Issue of Distracted Driving

The majority of participants believed that distracted driving was an issue for Ontario (on a scale from 1 – 'not a problem at all' to 10 –'a huge problem'), 81.6 per cent selected a rating of seven or higher.

Intervention Exposure (Distracted Driving Law)

Knowledge of Ontario Law

Knowledge of the Ontario distracted driving law was high. More than 90 per cent of participants reported that Ontario had a law banning TWD. Among those who did not know there was a law, or were unsure, 46.7 per cent reported that they were aware of the law after being reminded of it.

Perceived Likelihood of Receiving a Ticket

When asked about the 'likelihood that an individual who frequently sends messages while driving would receive a ticket in the next six months', 42.1 per cent of participants believed that it was 'somewhat likely' or 'very likely' (22.7 per cent).

Experience with Police and Tickets

Most participants had not, themselves, (or known anyone else) who have been stopped by the police (70.2 per cent), or received a ticket (70.8 per cent) for TWD.

Media Exposure (TWD Media Interventions)

The majority of youth and young adults (71.1 per cent) had seen or heard messages that discourage people from TWD. Of those that reported seeing or hearing messages, the three most common sources of these messages were: 1) TV ads/public service announcements (PSAs) (67.9 per cent) 2) social networking sites (47.6 per cent) and 3) TV news (45 per cent).

Preferred Message Source

When asked about which messages sources they would be most receptive to receiving distracted driving messages from, many participants indicated that they would be 'extremely caring' about distracted driving messages from: 1) their parents (47.1 per cent), 2) passengers of their car (46.9 per cent), 3) distracted driving victims and their families (46.5 per cent), 4) their spouse/boyfriend/girlfriend/partner (44.4 per cent) and 5) police/emergency responders (40.1 per cent).

In contrast, the greatest percentage of participants indicated that they would not care about distracted driving messages from 1) celebrities or pop figures (24 per cent), 2) cell phone companies (17.9 per cent), or 3) social networking sites (16.8 per cent).

SUMMARY OF QUANTITATIVE RESULTS

Overall, the majority of participants believed that distracted driving is an issue for Ontario. Many were aware that TWD is a risky and dangerous behaviour (and believed that it was riskier than many other distracted driving behaviours), and that TWD impacts their driving (e.g., causing them to take their eyes off the road). Additionally, over 90 per cent of participants reported being aware of the law banning TWD in Ontario.

Despite this, about half of youth and young adults in our sample reported ever engaging in TWD behaviours, although most indicated that they do so 'rarely' or 'sometimes'.

Age group was significantly associated with ever TWD where a greater proportion of young adults (ages 20 to 24) reported ever engaging in TWD compared to youth (ages 16 to 19). In addition education level was significantly associated ever TWD, where a greater proportion of participants with more education reported ever TWD compared with those with less education. Gender was not found to be significantly associated with TWD for either reading or sending behaviours.

A greater proportion of youth and young adults reported always TWD: to let someone know they will be late, to get directions, to make plans, or to send or receive a message from a significant other. Additionally, they indicated that they would be *more likely* to engaging in TWD behaviours if: they are in need of directions or other info, at a stoplight, or dependent on how important they think the message is. Conversely, the most common reasons in which they would *never* engage in text while driving include: when they see a police officer, when merging with traffic, or driving in bad weather.

When looking at theoretical constructs from the Integrative Model of Behavioural Prediction (IMBP), intentions to engage in TWD in the next week were low, attitudes towards TWD were negative, and self-efficacy for refraining from and PBC regarding TWD were generally high among participants.

With regards to subjective norms, the majority of participants believed that the people who are important to them would disapprove of their TWD behaviour, particularly their parents. However, the majority of participants indicated that their family, friends and peers engage in the behaviour themselves. Additionally, many participants indicated that TWD is wrong, goes against their principles and that they would feel guilty about doing it.

Many participants believed that they were 'somewhat/much better and safer' drivers compared to others, and the majority of participants reported not having been stopped by the police, receiving a ticket, or being in a collision while engaging in TWD.

Lastly, the majority of participants had seen some sort of messaging campaign discouraging TWD (most often on TV or social networking sites). Participants reported that they would be most receptive to receiving messages about TWD from: 1) their parents, 2) passengers of their car, 3) distracted driving victims and their families, 4) their spouse/boyfriend/girlfriend/partner and 5) police/emergency responders.

QUALITATIVE DATA

The survey included two open-ended questions asking participants to list their top three reasons why they read or send text messages while driving, respectively. Only those who indicated that they read or send text messages while driving were asked to respond to the respective reading or sending questions. The response rates for reading and sending questions were 88.0 per cent (n=973) and 82.0 per cent (n=727) respectively.

Inter-rater agreement between coders was 97.3 per cent and 96.8 per cent for the reading and sending questions respectively.

REASONS FOR READING TEXT MESSAGES WHILE DRIVING

Twenty-eight themes were identified from responses to the qualitative question asking participants to list their 'top one to three reason of why they *read* text messages while driving'.

The following table lists the 28 themes identified from participant responses, starting with the most commonly reported themes. For complete list of participant responses please contact the authors.

Table 3. **Themes identified regarding reasons for reading text messages while driving.**

Rank	Theme	% of Total responses (n= 973)
1.	Plans	35% (n= 338)
2.	Important	29% (n= 282)
3.	Emergency	19% (n=183)
4.	Urgency/immediacy/time-sensitive	14% (n= 139)
5.	Friend/family/significant other	14% (n= 132)
6.	Directions	12% (n= 117)
7.	Curiosity	11% (n= 108)
8.	Expecting message	11% (n= 107)
9.	At a stop	10% (n=97)
10	Other	9% (n= 91)
11.	To stay connected	6% (n= 60)
12.	Desire/instant gratification/impatient/no self-control/habit	6% (n= 56)
13.	Specific driving conditions	6% (n= 54)
14.	Work/school-related	4% (n= 42)
15.	Can do it quickly	4% (n=41)
16.	Bored	4% (n=35)
17.	Easily accessible	3% (n= 32)
18.	Feel capable/confident	2% (n= 21)
19.	I don't text and drive/I use alternative methods	2% (n= 21)
20.	Long drive	2% (n=20)
21.	Short message	2% (n= 20)
22.	Perceived safety in doing so	2% (n= 19)
23.	No reason/I know I shouldn't	2% (n= 17)
24.	Repetitive messages	1% (n= 12)
25.	To continue a conversation	1% (n= 11)
26.	Efficiency/convenience/multitasking	1% (n= 10)
27.	Unexpected Text	1% (n= 7)
28.	In a hurry	<1% (n= 5)

** Percentage of total responses was calculated by dividing the number of times a theme was identified by the total number of responses. **Note**: 'Total responses' refers to the number of participants who provided a response to the question. Each participant provided one response, including up to three reasons for reading and/or sending text which may have included multiple themes.

REASONS FOR SENDING TEXT MESSAGES WHILE DRIVING

Thirty unique themes were identified from responses to the qualitative question asking participants to list their 'top one to three reasons of why they send text messages while driving'.

The following table lists the 30 themes identified from participant responses, starting with the most commonly reported themes. For complete list of participant responses please contact the authors.

Table 4. Themes identified regarding reasons for sending text messages while driving.

Rank	Theme	% of Total responses (n= 727)
1.	Reporting to others/status update	24% (n= 177)
2.	Important	22% (n= 162)
3.	Urgency/immediacy/time-sensitive	20% (n= 147)
4.	Directions	19% (n= 141)
5.	Emergency	16% (n= 118)
6.	Plans	16% (n= 115)
7.	Friend/family/significant other	12% (n= 89)
8.	Work/school related	8% (n= 55)
9.	Short/quick message	6% (n= 45)
10	At a stop	6% (n= 44)
11.	Boredom	4% (n= 28)
12.	Desire/feel the need to respond/instant gratification/ impatient/no self-control/ habit	4% (n= 26)
13.	To send/receive information (generic)	3% (n= 23)
14.	Other	3% (n= 23)
15.	Don't want to make someone wait for a response/impolite	3% (n= 19)
16.	Late	2% (n= 18)
17.	Specific driving conditions	2% (n= 16)
18.	I don't text and drive/I use alternative methods	2% (n= 15)
19.	Lost	2% (n= 14)
20.	N/A	2% (n= 11)
21.	Perceived safety in doing so	1% (n= 8)
22.	Efficiency/convenience/multitasking	1% (n= 8)
23.	To continue a conversation	1% (n= 8)
24.	Long drive	1% (n= 8)
25.	Emotion-related	1% (n= 8)
26.	Unexpected Text	1% (n= 6)
27.	Curiosity	1% (n= 6)
28.	Risk behaviour/irresponsibility	1% (n= 5)
29.	To stay connected	1% (n= 5)
30.	Remembered something/don't want to forget	<1% (n= 4)

**** Percentage of total responses was calculated by dividing the number of times a theme was identified by the total number of responses. **Note**: 'Total responses' refers to the number of participants who provided a response to the question. Each participant provided one response, including up to three reasons for reading and/or sending text which may have included multiple themes.

SUMMARY OF QUALITATIVE RESULTS

The most commonly reported reason for reading text messages while driving was to make/confirm or address plans. Perceived importance of the message was also a highly reported theme; many participants reported that they read text messages while driving to determine if the message is important. For instance, reading messages in emergency situations or to determine if there was an

emergency was commonly reported among participants. Many participants also felt the need to read messages if the messages were perceived to be urgent or time-sensitive. Lastly, many participants reported reading messages from friends, family of significant others or to read/receive directions related to where they are driving.

The most commonly reported reason for sending text messages while driving was to report to others or provide status updates. Importance was the second most common theme where participants indicated that they sent text messages while driving because the message was perceived to be highly important. Messages that were perceived to be of urgent nature or time-sensitive were also commonly reported. Other key themes identified included sending messages in emergency situations, to ask for or provide directions or to make plans, particularly when communicating with friends, family or significant others.

Overall, plans, perceived importance of messages, emergency situations, urgent/time-sensitive messages and directions were the most commonly reported (i.e., among top six themes) reasons for reading and sending text messages while driving. Additionally, friends, family and significant others were important reasons for reading text messages while driving while reporting to others was an important reason for sending text messages while driving.

Implications

Texting While Driving

Among our sample of Ontario youth and young adults, a greater percentage of participants reported ever reading text messages while driving (55.0 per cent) compared to sending (44.0 per cent). This may be due to the perception that reading text messages while driving is safer than sending text messages while driving as 31% per cent of participants believed that reading text message while driving was 'extremely dangerous' compared to 57.0 per cent of participants who believed that sending text messages while driving was 'extremely dangerous'. Social marketing campaigns may wish to target this discrepancy in perceived danger and highlight the danger of reading text messages while driving among the youth and young adult population.

There was a significant association between age group and ever TWD, where a greater proportion of young adults (ages 20 to 24) reported ever engaging in TWD compared to youth (ages 16 to 19). An association was also seen between education level and ever TWD, where a greater proportion of participants with more education reported ever TWD compared with those with less education. Young adults are likely to have had more years of driving, and therefore more opportunities to ever engage in TWD, as compared to youth. Similarly those with higher education levels, who are likely older, may also, have had more years of driving increasing their opportunities for engaging in TWD.

Reasons for engaging in TWD

The findings have potential implications for those who may wish to develop social marketing campaigns to address issue of TWD. The key themes and/or reasons for which youth engage in TWD (i.e., making

plans, perceived importance of the message, to get directions, etc.) may be potential content areas for the development of a social marketing campaign. For instance, because perceived 'importance' of the message emerged as a key theme/reason for both reading and sending text messages while driving (from both our qualitative and quantitative results), social marketing campaigns could include messages challenging how important reading or sending a message really is in comparison with their own lives or the lives of others. Gauld et al., (2014) suggested that perhaps messages could focus on the 'unimportance' of having a friend wait for a message in comparison to the potentially fatal consequences associated with TWD, targeting both the theme of 'importance' as well as 'urgency/time-sensitive messages'.[47]

Examining constructs from the IMBP

With regards to constructs from the Integrative Model of Behavioural Prediction (IMBP), intentions to engage in TWD in the next week were low, attitudes towards TWD were negative and self-efficacy for refraining from and PBC regarding TWD were generally high among the majority of youth and young adults in our sample. Therefore, these are not likely areas to focus a social marketing campaign on as there is little room for change, as many youth reported engaging in TWD despite having low intentions, negative attitudes and high self-efficacy and PBC.

Normative Beliefs

Group norms is one construct from the IMBP that may be a potential area to target in a social marketing campaign, as it has been shown to be a significant predictor of TWD behaviour.[34] Participants estimated that a high proportion of other young adult drivers engage in TWD (Read 75.6 per cent, Send 67.9 per cent) suggesting that they perceived TWD to be a normative behaviour (i.e., the perception that 'it's the norm, everybody does it'). The estimates are higher than the 55.0 per cent and 43.9 per cent of our sample who reported ever reading or sending text messages while driving respectively. Carter et al., (2014) suggested using social marketing techniques such as targeted media and educational campaigns to reset perceived social norms regarding distracted driving behaviours.[48] For instance, social marketing can be used to challenge the perception that TWD is a common behaviour by highlighting that the prevalence of TWD is a lot lower than it is perceived to be.

Risk Perceptions

In contrast, because the youth and young adults in our sample are already aware of the risks associated with TWD, campaigns targeting risk perceptions through social marketing campaigns may have little impact on TWD; Cazzulino et al., (2014) found that despite being aware of the risks of distracted driving, many young drivers continued to engage in the behavior.[24] Risk perceptions among this target population are already high, leaving little room for improvement. Additionally, risk perceptions have been shown to be a weak predictor of TWD behaviour.[21]

Instead, social marketing campaigns could target the perceived 'good/safe' driving skills of our target populations as many participants believed that they are 'somewhat/much better' and 'somewhat safer/much safer' drivers compared to others, which may be influencing their behaviour.[49]

Consequences of TWD

Additionally, the majority of participants reported that they have never been stopped by the police, received a ticket, or been in a collision for engaging in TWD. Those who engage in TWD may perceive that the benefits of TWD outweigh the risks;[50] Hafetz et al., (2010) found that that drivers' perception of social benefits (e.g., "I would not be able to tell people where I am or when I will arrive") were associated with more frequent use of cell phones while driving.[51] Therefore, social marketing campaigns may be needed to highlight the reality of the consequences associated with TWD in order to help deter the behaviour and dispel any myths associated with the perceived benefits outweighing the risks.

Message Source

Lastly, our survey indicated a number of message sources from which youth and young adults may be most receptive to hearing distracted driving messages (e.g., their parents, passengers of their car, distracted driving victims and their families, their spouse/boyfriend/girlfriend/partner and police/emergency responders). These may be key sources through which social marketing campaigns regarding TWD could be delivered.

Limitations

There are a number of limitations to be considered. First, because an online panel was used, the findings cannot necessarily be used to establish prevalence rates of TWD among Ontario youth and young adults, given potential for sampling and other sources of bias. For example, the results may have been influenced by selection bias whereby participants who choose to participate in the online panel may be more technologically advanced or dependant than those who are not part of an online panel; those individuals who chose to participate in the online panel may be more inclined to use technology (i.e., a cell phone) while driving. For instance, Beck et al., (2009) compared participant responses from an online or telephone survey measuring driver concerns about a variety of traffic safety issues including specific driving behaviours and found that telephone respondents were less likely to report risky driving behaviours such as using a cell phone while driving compared to online respondents.[52]

Secondly, the survey relied on self-reported data. Therefore results may have influenced by social desirability bias whereby participants may have felt uncomfortable reporting their engagement in a currently illegal activity such as TWD, and thus altered their responses accordingly (i.e., underreporting their engagement in TWD behaviour).

Additionally, we have not tested the constructs from the IMBP as predictors of TWD behaviour, and therefore we cannot conclude which constructs are most important in terms of contributing to TWD behaviour. However, this will be tested in future analyses.

Finally, because our sample included only Ontario youth, these findings may not be generalizable to individuals from other jurisdictions. Lastly, because the survey asked about TWD *ever* it may not be

representative of *current* TWD behaviour. Despite these limitations, this report makes an important contribution by providing current data specific to the Ontario population regarding TWD behaviour.

Conclusion

The results from our survey suggest that, overall, the majority of Ontario youth and young adults (from our sample) are aware of the Ontario law banning TWD, they are aware of the risks and dangers associated with TWD, and believe that TWD is distracting (and more distracting than many other distracted driving behaviours). The majority of participants have low intentions to engage in TWD, negative attitudes towards TWD, high self-efficacy regarding their ability to refrain from TWD and high PBC regarding TWD. They believe that others who are important to them would disapprove of their TWD behaviour and they have high moral norms meaning that they know the behaviour is wrong and feel guilty about doing it. This discrepancy between the high moral norms (i.e., knowing the behaviour is wrong), low subjective norms (i.e., others disapprove of the behaviour), and high group norms (i.e., the perception that everyone is doing it) may be driving the TWD behaviour among this population. However, future research is needed to determine the significance of group norms as a predictor of TWD within our sample population.

Among our sample of Ontario youth and young adults, a greater percentage of participant's reported ever reading text messages while driving (55.0 per cent) compared to sending (44.0 per cent). This may be due to the perception that reading text messages while driving is safer than sending text messages while driving as 31% per cent of participants believed that reading text message while driving was 'extremely dangerous' compared to 57.0 per cent of participants who believed that sending text messages while driving was 'extremely dangerous'.

TWD was significantly associated with both age and education, where a greater proportion of young adults (20-24 years) and those with higher education levels reported ever engaging in TWD. TWD was not associated with gender. These associations were found for both reading and sending behaviours.

From both the qualitative and quantitative results, key themes and/or reasons for TWD driving included: making plans, perceived importance of the message, to get directions, to send or receive a message from friends/family or significant other, or to report to others or provide status updates (e.g., to let someone know they will be late). TWD in perceived emergency situations or because messages were perceived to be urgent/time-sensitive were also key themes that emerged from the qualitative results.

Additionally, most participants believed that they were 'much better/somewhat better' and 'somewhat safer/much safer' drivers compared to most other drivers, and the majority of participants had not experienced the consequences of TWD (i.e., being stopped by police, receiving a ticket or being in a collision due to TWD). Lastly, many youth overestimated the prevalence of TWD among their peers perceiving it to be more common than it actually is.

For these reasons, those developing social marketing campaigns targeting TWD among youth and young adults may wish to develop a campaign that: challenges the perception that TWD is the norm (i.e., target group norms) and that reading text messages is safer than sending text messages, highlights the reality of experiencing the consequences of TWD (i.e., receiving a ticket, getting into a collision), includes content related to the key themes/reasons for TWD (i.e., perceived importance of messages), while avoiding areas such as risk perceptions which have little room for change and are weak predictors of behaviour. Additionally, campaigns could focus on changing the perception that youth and young adults believe that they are much better and safer drivers than everyone one else, making them less prone to the consequences of TWD.

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# Appendix A: Integrative Model of Behavioural Prediction

THE INTEGRATIVE MODEL OF BEHAVIOURAL PREDICTION (IMBP)

The IMBP is an adapted version of the Theory of Planned Behaviour (TPB) and Theory of Reasoned Action (TRA) that integrates constructs from both these theories as well as other important theories of behaviour change.[40,44] The IMBP focuses on changing beliefs about consequences, normative issues and efficacy of engaging in a particular behaviour.[11] It is based on the proposition that a small set of variables can help to explain a substantial proportion of the variance in a behaviour observed in a population.[11,40] According to the model, a behaviour is most likely to occur if the following conditions are met: 1) if the individual has strong intentions to perform the behaviour, 2) the individual has the necessary skills and abilities to perform the behaviour and 3) there are no environmental constraints preventing the behaviour from being performed.[11,40] (See Figure 9.)

According to the model, intentions are a function of three types of perceptions including: attitudes, perceived norms and self-efficacy.[11] Attitudes describe an individual's evaluation of how favourable or unfavourable performing behaviour will be.[40,44] Perceived norms can include three categories including subjective, group and moral norms. Subjective norms refer to the perceived social pressure or approval/disapproval from significant others.[34] Moral norms involve an individual's perception of how morally correct or incorrect and behaviour is, and group norms involve the expectations regarding one's attitudes and behaviours as a member of a specific reference group within a certain context (i.e., youth who drive).[34] Self-efficacy is an individual's perceived capability or confidence to successfully perform behaviour.[40,44]

The model also includes other external variables that may be associated with the behaviour including: demographics, socio-economic variables, culture, media use (including exposure to health messages), or other individual difference variables such as perceived risk.[11,40] However, the influence of these variables on behaviour is indirect.[40]

Figure 9. Integrative Model of Behavioural Prediction (Fishbein 2000, 2006)
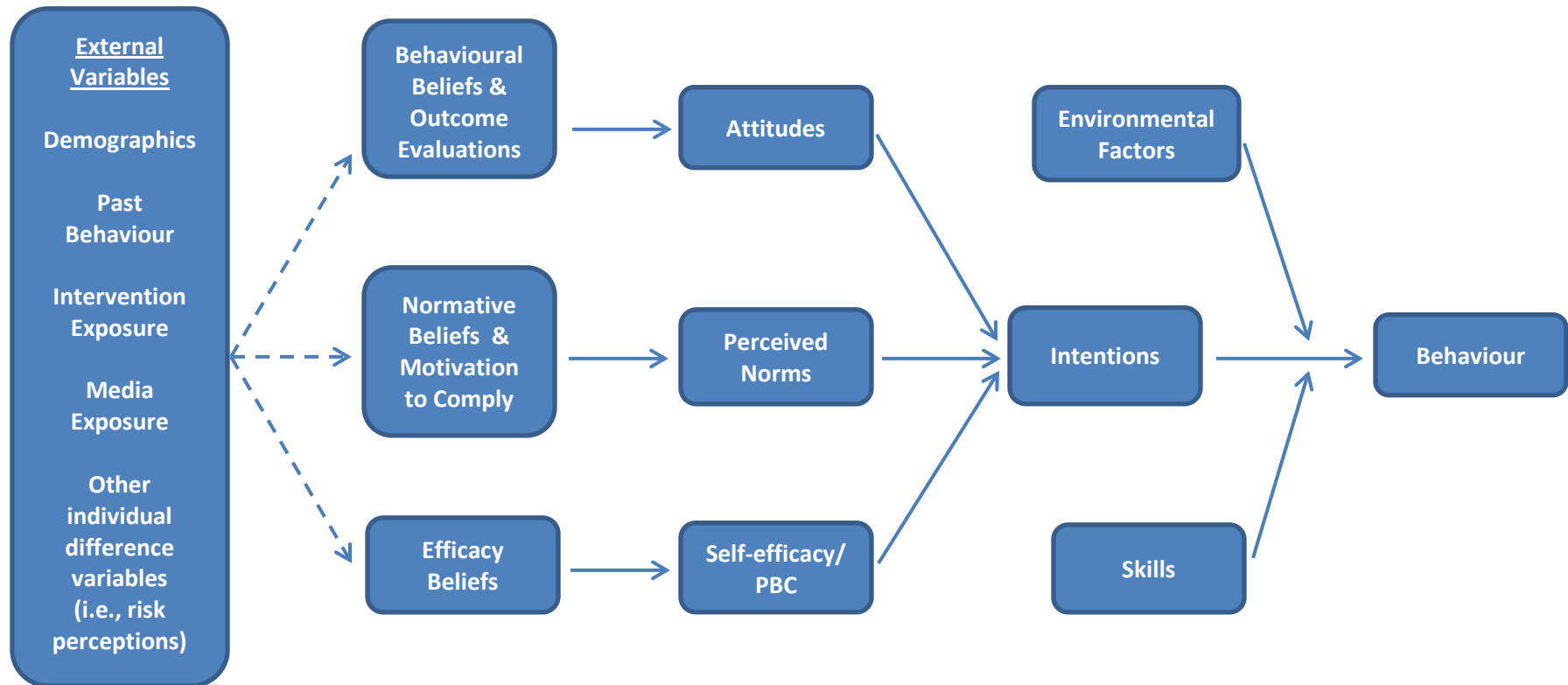
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