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Contextual factors explaining risk-taking intentions at Australian level crossings

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Abstract

In Australia, the number of collisions at level crossings (LCs) remains stable and even increased between 2003 and 2011. A consistent number of crashes between trains and pedestrians compared to a decreasing number of crashes between trains and vehicles calls for a better understanding of the factors underpinning pedestrians' decision-making at such risky intersections. This study reports on an innovative method used to measure pedestrians' crossing intentions and risk perceptions in crossing scenarios recorded at three representative LCs for Queensland (Australia). Predictors of crossing intentions were examined and compared between five scenarios. An online survey featuring the footages of the crossing scenarios was completed by 222 participants. The results revealed that pedestrians' intentions to transgress depend on the situation, justifying the use of such methodology. Pedestrians perceived the lowest risk and reported the highest likelihood of risk-taking after the pedestrian lights are active, but before the pedestrian gates have started moving, confirming that pedestrian gates are an efficient safety measure. It was found that while pedestrians perceive others as more likely to take risks at LCs, they do not associate others' behaviour with higher risk of fatal consequences, suggesting that the risk of being hit by a train at LCs as a pedestrian is generally perceived as low. Past unsafe behaviour, descriptive norms and perceived risk of being involved in a crash were found to be consistent predictors of the likelihood to engage in risk-taking behaviour at LCs across the different scenarios. Implications for future research and strategies to reduce habitual unsafe behaviour are discussed.

Key words: crossing intentions; comparative perception of risk; descriptive norms; habits; level crossings; pedestrians; sanctions

1. Introduction

Level crossings (LCs) are intersections where road lanes and rail tracks meet at the same level providing a shared area for railway and vehicular traffic, and for other road users including pedestrians. In Australia, the number of collisions at such intersections remains stable and even increased between 2003 and 2011, reflecting a consistent number of crashes with pedestrians compared to a decreasing number of crashes with vehicles (ATSB, 2012). Similar trends are observed internationally which is why improving the safety of pedestrians at LCs has become an important objective of governments and rail providers in Australia (Evans, 2011; Metaxatos & Sriraj, 2013a; Queensland Government, 2012) and worldwide.

The performance of LCs may appear to be rigid compared to other transportation systems given that a train can only move in two directions, within well-defined boundaries (i.e., rail corridor) and following a strict schedule. However, in reality, the performance of LCs is highly variable and dynamic (Read, Salmon, & Lenné, 2013) with technical failures and human factors often causing unexpected disruptions to the system's performance. For example, crowds or passengers in wheelchairs requiring assistance to embark or disembark may cause delays. What is more important, LC users do not have access to information about the current state of the system and its potential failures (Read, Salmon, Lenné, & Stanton, 2016), and are likely to make decisions based on their expectations. Therefore, the deceptively rigid state of the system may be particularly dangerous for users, especially when trains pass 'unexpectedly' through the LC out of their predefined schedule.

Indeed, human factors rather than technical failures or other external events are found to be the main contributor to crashes, injuries and near-misses at railways and specifically at LCs (European Railway Agency, 2014; ONRSR, 2014). A better understanding of the core factors contributing to pedestrians' unsafe crossing decisions is necessary to improve safety at these intersections. At the same time, the available literature on the topic is scarce and rather descriptive compared to the larger amount of studies investigating the origins of risk-taking in driving, cycling or pedestrian road crossing. A large part of the conducted empirical studies examine the extent to which newly implemented safety measures would reduce unsafe behaviour at LCs, instead of trying to explain the precursors of such behaviour (Basacik, Cynk, & Flint, 2012; Lobb, Harre, & Suddendorf, 2001; Stewart, Brownlee, & Stewart, 2004). This paper contributes to the existing literature presenting the results from a study using video recordings of crossing scenarios to measure pedestrians' context-specific and comparative perception of risk and crossing intentions, thus informing intervention development and decision-making at LCs.

2. The level crossing context in Brisbane's metropolitan area - Queensland

Internationally, LCs are classified in two large categories - “passive” and “active”. Passive LCs are equipped with static warning signs and it is the road user’s responsibility to safely negotiate the crossing. Active LCs, on the contrary, are equipped with automatic controls (i.e., activated by an approaching train), which alert the road user that a train is about to arrive at the intersection, and thus crossing is dangerous and prohibited by law. In the city of Brisbane (and in the larger Brisbane metropolitan area), LCs are commonly equipped with a higher level of protection provided specifically to pedestrians, consisting of a “defined footway with gated pedestrian enclosures, red symbolic standing pedestrian signals, audible signals and signs warning pedestrians not to cross if the signals are displayed or alarm is sounding” (Standards Australia Limited, 2001, p. 54). Pedestrian lights (red symbolic standing pedestrian signals) resemble those at road intersections and start flashing 5-8 seconds after the activation of the audible signal and the typical red flashing lights for vehicles (e.g., twin red circle aspects arranged horizontally and equipped to flash alternately). “The signal cycle commences with a flashing warning phase, followed by a steady phase during the approach and passage of a train and for any additional time during which the crossing stays closed for a second train” (Standards Australia Limited, 2001, p. 51). Pedestrian gate systems (i.e., gated enclosures) comprise an entry gate - which closes the entry of the rail corridor a few seconds after the pedestrian lights are flashing, and an emergency escape gate - which could be pushed open from the inside in case a pedestrian is stuck on the rail tracks during a closure (i.e., the duration from the onset of the automatic controls until their cessation).

It is important to note that entry pedestrian gates could be locked when activated or not. In any case, pedestrians can circumvent this physical barrier by walking around, pushing or jumping over locked pedestrian gates. Pedestrian lights and gates are designed to support safe crossing through one or more rail tracks depending on whether there are station platforms separating the rail tracks. In this case, a pedestrian may be allowed to traverse one or more rail tracks where no train is expected, while at the same time crossing may be prohibited through another rail track where a train is expected.

3. Explaining unsafe behaviour at active level crossings – theoretical background

In regards to pedestrians’ unsafe behaviour at active LCs, a distinction must be made between the intentional transgression of the law – violations, and the non-volitional transgression of the law – errors (Reason, Manstead, Stradling, Baxter, & Campbell, 1990). Errors may be associated with failures of the attentional resources (e.g., failure to see the pedestrian light), with poor judgements based on wrong assessment of the situation (e.g., others are crossing so the lights must be off), or resulting from poor knowledge about the properties of the LC system and its performance (e.g., crossing is allowed and safe

until the pedestrian gate starts closing). Violations, on the other hand, imply that the decision to cross is based on conscious weighting of the costs and benefits of risk-taking. For a pedestrian, the costs of risk-taking could be associated with the perceived risk of being involved in a crash or with the perceived risk of being penalized for transgression of the road rules. Positive outcomes could be associated with perceived benefits such as saving time (e.g., by reducing waiting time or by taking a shortcut), avoid missing the train, or being socially accepted by a group of important others. According to most recent studies conducted in Brisbane, pedestrians commit intentional violations more often than they make errors at LCs (Freeman & Rakotonirainy, 2015; Stefanova, Burkhardt, Filtness, et al., 2015).

There is evidence that violations can be explained by more automatic and routinized decision-making, than by decisions based on the careful weighting of costs and benefits (Lennon, Oviedo-Trespalacios, & Matthews, 2017; Lheureux, Auzoult, Charlois, Hardy- Massard, & Minary, 2016; Oviedo-Trespalacios & Scott-Parker, 2017). The most studied predictor of routinized unsafe road behaviour is past experience leading to "habits". If a given behaviour is frequently repeated in the past in the same or similar context, it becomes a habit triggered automatically by specific environmental cues (Verplanken, 2006). In fact, Lheureux et al. (2016) provide evidence that habits and intentions are two distinct mechanisms leading to violations. In this vein, automatic processes based on habit were found to explain a larger percentage of pedestrians' intentions to cross unsafely than more effortful reasoned action (Xu, Li, & Zhang, 2013). Past experience has also been identified as an important precursor of pedestrian decision-making at LCs (Beanland, Lenné, Salmon, & Stanton, 2013; Palat, Paran, & Delhomme, 2017), however not much evidence is available on the specific cues in the crossing environment leading to the formation of habits and to more automatic decision-making.

Social influences may also contribute to the formation of habits and more heuristic-based decision-making. Referring to the Social Learning Theory (Bandura & McClelland, 1977) people learn how to behave by observing others' behaviour. Indeed descriptive norms, corresponding to the perception of what others typically do, are found to be a stronger predictor of pedestrian road crossing intentions compared to injunctive norms, which correspond to the perception of what others approve of (Cialdini, Reno, & Kallgren, 1990; Zhou, Romero, & Qin, 2016).

Furthermore, Social Comparison Theory (Festinger, 1954) posits that people use the information about what others do and approve of to evaluate themselves and where they stand in the absence of more objective criteria. However, when comparing to others, people are prone to biased thinking, underestimating potential risks and overestimating their likelihood to experience positive events (Harris &

Middleton, 1994; Perloff, 1983; Perloff & Fetzer, 1986; Weinstein, 1980; Weinstein & Klein, 1996). This phenomenon is known under different names and has generated a number of debates among scholars. For instance, the terms “comparative optimism (CO)” or “comparative pessimism (CP)” are used to describe how individuals evaluate their own risk with reference to their own subjective evaluation of the risk for others (Harris & Middleton, 1994). On the other hand, unrealistic (comparative) optimism and pessimism describe a biased perception of risk with reference to an objective (comparative) measure (Shepperd, Waters, Weinstein, & Klein, 2015). Comparative optimism has been demonstrated in hundreds of studies (see Shepperd, Carroll, Grace, & Terry, 2002) and specifically regarding driving behaviour (Delhomme, 1991; Delhomme, Verlhiac, & Martha, 2009; Guppy, 1993; Harré, Foster, & O'Neill, 2005; McKenna, 1993). People who express CO are found to take less health preventive measures (Hoorens, 1995) and engage in more risk-taking behaviour (Delhomme & Meyer, 1999; McKenna, Stanier, & Lewis, 1991). One possible explanation of such unsafe behaviour is that people perceive themselves as more skilled than the average other and therefore express more optimistic views about their future. Given the extensive literature on the role of descriptive norms and comparative risk judgements in explaining road user’s behaviour, only one study, as far as our knowledge goes, has so far examined these constructs in a LC context (Palat et al., 2017).

4. The present study

4.1. Aims and overview of the study design

Considering the variable and dynamic nature of LC performance from one situation to another, but also from one LC site to another, this study’s main aim was to investigate more or less common (i.e., context-specific) factors contributing to crossing decisions. Three research questions were formulated:

1) To what extent the reported crossing likelihood and perceived risk differ from one situation to another?
2) Are there any differences in the reported crossing likelihood and perceived risk for the self and for others across different crossing situations?
3) Are there any similarities and differences in the precursors of crossing likelihood in different situations?

To answer these questions, an innovative method was employed which consisted in measuring pedestrians' crossing intentions and perceived risk across five recorded crossing scenarios. For each scenario, participants reported crossing likelihood, perceived risk of being hit by a train and perceived risk

of being sanctioned. Additionally, participants answered the same questions about other pedestrians of different age and gender. A number of additional variables related to habitual LC use, familiarity with LCs and past unsafe behaviour were examined as potential predictors of crossing likelihood. Variables related to the status of safety controls and to train's position were manipulated in the recorded scenarios so as to vary the level of risk in each scenario.

4.2. Existing research and hypotheses

4.2.1. Reported crossing intentions and perceived risk according to the status of automatic safety controls

The existing evidence about the effect of different automatic controls on crossing decisions is not consistent. On one hand, it was found that pedestrian gates reduce unsafe crossing intentions and behaviour (Clancy, Dickinson, & Scott, 2007; McPherson & Daff, 2005; Roy Morgan Research, 2008). In line with this, a recent observational study conducted at three LCs in Brisbane showed that the large majority of transgressions overall occurred before the gates are active (Stefanova, Burkhardt, Wullems, et al., 2015). On the other hand, in another Australian study, Edquist, Hughes, and Rudin-Brown (2011) observed that the majority of transgressions occurred while the pedestrian gates were in the process of closing. Pedestrians may believe that they still have time to cross safely until the gate has fully closed. Indeed, research on countdown timers suggests that providing indications on the level of risk (e.g., remaining time to gates fully closed and train arrival) increases confidence and perceived control in road users (Huang & Zegeer, 2000; Paschalidis, Politis, Basbas, & Lambrianidou, 2015; Vujanić, Pešić, Antić, & Smailović, 2014). Similarly, Palat et al. (2017) provided evidence that pedestrians' crossing intentions at LCs decrease with the chronological activation of automatic controls. Therefore, we hypothesise that:

H1a: Participants will report stronger crossing intentions before the gates are active than while they are closing and the least strong intentions once they are closed.

H1b: Participants will perceive less risk of being hit by a train before the gates are active than while they are closing and the most risk once they are closed.

4.2.2. Reported crossing intentions and perceived risk according to train's visibility and position

Some studies suggest that independently of the availability and the status of automatic controls, the most important factors considered by pedestrians before making a crossing decision are the visibility and the position of a train (Beanland et al., 2013; Stefanova, Burkhardt, Filtness, et al., 2015). Specifically,

Beanland et al. (2013) compared the importance of a number of factors to pedestrian versus motorist decision-making at LCs. They found that seeing a train was the most important piece of information for pedestrians, whereas motorists and cyclists relied more on the visual (e.g., traffic lights) and audible cues (e.g., bell ringing) in the environment. Similarly, Stefanova et al. (2015) conducted focus groups with pedestrians who suggested being more likely to cross if a train was stopped at station perceiving it safe 'to go' as long as the train is not moving. Regarding train's visibility and position, the following hypotheses were formulated:

H2a: Participants will report stronger crossing intentions in the absence of a visible train than in the presence of a visible train.

H2b: Participants will perceive less risk of being hit by a train in the absence of a visible train than in the presence of a visible train.

H3a: Participants will report stronger crossing intentions in the presence of a stopped train than in the presence of a visibly approaching train.

H3b: Participants will perceive less risk of being hit by a train in the presence of a stopped train than in the presence of a visibly approaching train.

4.2.3. Similarities and differences in the reported crossing intentions and perceived risk for the self versus for others

So far, only the results from a qualitative focus group study conducted in Brisbane support that observing others' unsafe crossing (e.g., descriptive norms) may lead to a lowered perception of risk for the self (Stefanova, Burkhardt, Filtness, et al. (2015). Participants from the same study viewed their past unsafe behaviour as "well-calculated", while at the same time describing others' behaviour as "reckless" (e.g., younger pedestrians crossing for a dare) and "erroneous" (e.g., elderly pedestrians blindly following others, not hearing the train). Employing similar methodology (i.e., crossing scenarios at different LCs depicted in pictures), a study conducted in France found that injunctive rather than descriptive norms are a predictor of crossing intentions among pedestrians (Palat et al., 2017). According to the authors, it is possible that the high prevalence of observed others' unsafe behaviour could reduce the effect of descriptive norms on crossing intentions. Given these contradictory results, we hypothesise that descriptive norms about specific age groups of others may influence crossing decisions:

H4a: Participants of different age will estimate their likelihood to transgress as lower compared to the perceived likelihood of other young pedestrians.

H4b: Participants of different age will estimate their risk of being hit by a train as lower compared to the perceived risk for other young and elderly pedestrians.

In addition, Stefanova, Burkhardt, Filtness, et al. (2015) found that pedestrians' unsafe crossing decisions might be influenced by their own (lack of) experience with sanctions compared to others' (e.g., "see I do it all the time and I never got caught", p.179), but also by knowledge about similar others' experience with sanctions (e.g., "younger pedestrians [like me] only receive warnings [not sanctions]", p. 181). The last hypothesis states that:

H4c: Participants will estimate their likelihood to be issued a sanction as lower compared to the perceived likelihood for others of different age groups.

Finally, there are no specific hypotheses regarding the predictors of crossing likelihood for each scenario. However, it is expected that the predictors of crossing likelihood before all of the automatic controls are active and a train is not visible would be different than the predictors of crossing likelihood once all controls are active and a train is visible.

5. Method

5.1. Participants

Individuals aged 16 and over years old, current residents of Queensland and those who have already used LCs as a pedestrian were invited to take part in the survey. To ensure that pedestrians crossing at different LCs have equal opportunity to participate, recruitment posters were displayed at all central railway stations in Brisbane and flyers were distributed at suburban stations in close proximity to LCs. Social media channels were also used to seek participation. The final sample consisted of 222 participants with mean age 32.3 years (*SD* = 12.9, Median = 29) ranging between 16 and 67 years. A slightly larger number of male participants (*n* = 115) completed the survey than female participants.

To inform on the representativeness of the sample in terms of exposure to different LC contexts, participants were asked to report up to three of their most frequently used LCs. A similar number of frequented LCs were reported across all seven suburban rail lines, accounting for the total number of LCs on each rail line that provide access to pedestrians. Less than 10% of the participants reported being users of the same LC, which is evidence of the diversity of the current sample. Furthermore, the large majority of

participants were exposed to automatic controls given that 92% of the listed LCs were equipped with pedestrian lights and with pedestrian automatic gates, noting that the latter gates are equipped with locking mechanism only at some LC sites.

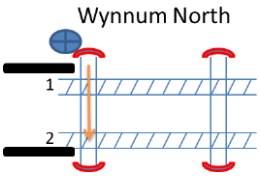
5.2. Material

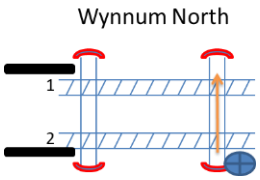
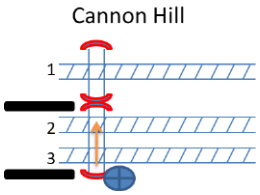
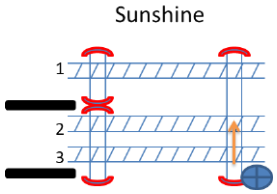
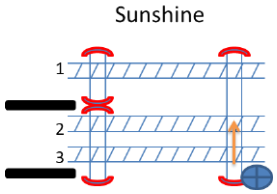
5.2.1. Five recorded crossing scenarios at three different LC sites.

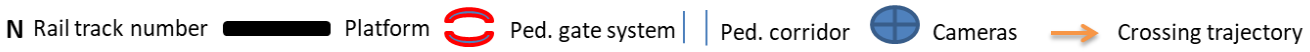
Five scenarios (Sc.) were selected after multiple recording trials and pre-test of the survey. The scenarios had to include realistic combinations of the factors tested through our hypotheses. The first two scenarios (Sc.1, 2) were designed to examine crossing decisions according to the status of active controls (i.e., before the pedestrian gates are active and while the pedestrian gates are closing). Scenarios three, four and five (Sc.3, 4, 5) were designed to examine crossing decisions after the pedestrian gates are fully closed and in the presence of at least one visible train. To investigate the effect of train position, Sc.3 and 4 featured a stopping and an express train respectively. Finally scenario five, in which both a stationary and an express train could be seen approaching from opposite directions, was designed to explore the effect of number of trains on crossing decisions in addition to the formulated hypotheses. The scenarios were recorded at three different LCs (Wynnum North, Cannon Hill and Sunshine) with two and three rail tracks, which is the most common design of LCs in Brisbane, and where an optimal view towards the rail tracks could be recorded. For a detailed description of each scenario and the manipulated variables, please see Table 1.

Table 1

Overview of the five crossing scenarios

Video screenshot	LC plan	Key manipulated variables	Description
Sc1. Ped lights & sound		Ped lights & sound active No visible train	Red flashing lights and pedestrian lights are flashing and the audible alarm can be heard. The video ends just before the gate starts closing.

Sc2. Closing gate		Ped lights & sound active Closing ped. gate No visible train	The video starts with the activation of the pedestrian gate and ends as soon as the gate is fully closed.
Sc3. Stopping train		Ped lights & sound active Closed ped. gate Stopping train	A train coming from the station side stops at the station on rail track 2.
Sc4. Express train and another pedestrian		Ped lights & sound active Closed ped. gate Express train approaching Pedestrian crossing	An express train arrives on rail track 1 shortly after its horn can be heard. As soon as the train is visible, a pedestrian legally crosses tracks 3 and 2 from the station side. The video ends before the train has crossed the LC.
Sc5. Two trains		Ped lights & sound active Closed ped. gate Stopping train Express train approaching	A train coming from the station side stops on track 1. The controls continue to be active and the video ends with another train visibly approaching on track 2 from the opposite direction.



The closed pedestrian gates in Sc.4 and 5 were not visible in the videos. However, this was explained to participants in the instructions preceding each question. Two cameras, each covering one side of the pedestrian corridor (left and right side), were used to record the scenarios, which lasted between 4 to 27 seconds. Prior to responding to the questions, a wide-angle photograph was presented to participants to familiarise them with the crossing context, the field of view covered by Camera 1 and 2, and the trajectory they needed to consider while answering the questions (yellow arrow) (Figure 1).

Figure 1. Wide-angle photograph of the emplacement of cameras 1 and 2 (Sc. 5)

5.2.2. Measures

5.2.2.1 Assessing transgression (comparative) likelihood and perceived (comparative) risk for each scenario.

For each scenario, participants were asked 3 main questions assessing: transgression likelihood (Cronbach α = .72), perceived risk of being sanctioned – "fine risk" (Cronbach α = .90), and perceived risk of being hit by a train – "crash risk" (Cronbach α = .84). Responses were given on scale of 1(Not at all likely) to 5 (Extremely likely). After having responded for the self, participants were asked to respond to the same questions for others of different gender (male vs. female) and age groups (under 25 years old vs. 26-55 years old vs. 56-75 years old vs. over 76 years old). Thus, participants responded to a total of 27 questions associated with each scenario:

$[3\text{Questions}_{self} + 3\text{Questions}_{others} \times (\text{Gender}_{2} \times \text{Age Groups}_{4})] \times 5\text{Scenarios}$

All 27 questions for each scenario appeared on the same page under the video, which could be replayed as many times as required and the photograph was visible at all times. Participants were provided with the opportunity to leave a comment after the questions for each scenario.

5.2.2.2. Identifying the best predictors of context-specific transgression likelihood.

In addition to the questions associated with the scenarios, a broad range of variables related to habitual LC use (e.g., crossing alone or among others, journey purpose), familiarity with the LC system (e.g., awareness of different controls, awareness of sanctions' likelihood), precautionary behaviour (e.g., train checks, vigilance) and self-reported past unsafe behaviour at LCs were included in the survey. Within the scope of this paper, these variables were tested as potential predictors of transgression likelihood across the five scenarios. Table 2 provides details and descriptive statistics of the variables in question.

Table 2

Details of the items tested as potential predictors of transgression-likelihood across the five scenarios

Variable:	Question	Response Type	Response Items	M (SD)	%
Familiarity					

with LCs					
Visibility of active controls	In general, is it easy for you to see the activation of the automatic warnings?	scale	1(Not at all)-5 (Extremely)	4.42 (0.79)	N/A
Recall of ped. lights*	Have you seen this warning at the LC/s that you cross?	nominal	Correct recall	N/A	66.2
			Incorrect recall	N/A	14.4
			Unsure	N/A	14
Purpose of ped. Lights*	How familiar are you with the purpose of this warning?	scale	1(Not at all)-5 (Extremely)	4.75 (0.62)	N/A
Purpose of ped. Gates*	How familiar are you with the purpose of this warning?	scale	1(Not at all)-5 (Extremely)	4.7 (0.65)	N/A
Sanction likelihood	In general, how likely are pedestrians to be penalised for crossing at LCs during the activation of the automatic warnings?	scale	1(Not at all)-5 (Extremely)	2.24 (1.06)	N/A
Habitual LC use					
Journey purpose	Most frequently, do you cross at level crossing/s	nominal	1.... on your way to/out of a train station?	N/A	75.7
			2. ... not going to a train station?	N/A	24.3
Crossing with/among others	Most frequently, when at level crossings - are you crossing ...	nominal	1…. alone	N/A	36.5
			2…with random/known others	N/A	55.6
			3….both alone and with others	N/A	27.9
Past unsafe crossing					
Transgression closing gate	How often have you crossed pushing against a closing pedestrian gate at a LC?	scale	1(Never)-5(Almost all the time)	1.22 (0.6)	N/A
Transgression closed gate	How often have you crossed pushing against a closed pedestrian gate at a LC?	scale	1(Never)-5(Almost all the time)	1.17 (0.52)	N/A
Explanations of past transgressions	**Based on your past experience, how likely are you to cross at a level crossing when at least one of the automatic warnings has activated because:**				
Error	… you didn't realise that the warning was activated	scale	1(Not at all)-5 (Extremely)	1.53 (0.82)	N/A
Hurry train	… you were in a hurry to catch a train	scale	1(Not at all)-5 (Extremely)	1.68 (0.97)	N/A
Hurry cross	... you were in a hurry to cross (but didn`t have to catch a train)	scale	1(Not at all)-5 (Extremely)	1.3 (0.73)	N/A
Perception of control	... you could (you had enough time before the train arrives)	scale	1(Not at all)-5 (Extremely)	1.43 (0.85)	N/A
Others crossing	... there were other people crossing at the same time	scale	1(Not at all)-5 (Extremely)	1.62 (0.99)	N/A
Too hot	… it was too hot	scale	1(Not at all)-	1.23	N/A

			5 (Extremely)	(0.66)	
Raining	…it was raining	scale	1(Not at all)- 5 (Extremely)	1.38 (0.79)	N/A
Precautionary behaviour					
Vigilance	In general do you consider yourself vigilant for the activation of the automatic warnings?	scale	1(Not at all)- 5 (Extremely)	4.36 (0.9)	N/A
Train checks (INactive)	Normally, before you cross do you visually check for an approaching train if the automatic warnings ARE NOT activated?	scale	1(Never)- 5(All the time)	4.13 (0.98)	N/A
Train checks (ACtive)**	Normally, before you cross do you visually check for an approaching train if the automatic warnings ARE activated?	nominal	1.Never 2.Occasionally 3.All the time	N/A N/A N/A	0.9 10.8 69.8
Earphones	When you cross at level crossing/s, do you wear earphones?	nominal	1.No	N/A	67.1
			2 Yes	N/A	32.9

Note. * Questions related to the recall and understanding of different safety controls included a picture of each control. To estimate whether participants recalled correctly or not the existence of pedestrians lights ('ped lights'), their responses were compared with objective information about the equipment of their most frequently used LC site/s. Cases that could not be classified as correct or incorrect were coded as unsure. ** An additional point (Doesn't apply) was initially included in the scale and was subsequently dropped prior to data analysis, to account only for the responses of pedestrians who reported having crossed during active controls.

5.2.3. Procedure

The survey was administrated through the online "Key survey tool". To enter the survey, participants were screened for: LC use as a pedestrian, age at which pedestrians are expected to cross unaccompanied (16 and over years old), and current Queensland residency. The survey started with general questions about LC use, knowledge and past experience at LCs, and ended with questions related to the five recorded crossing scenarios which were visualised by all participants in a random order, in a YouTube video format. The survey took approximately 20 minutes to complete. After completion, participants were invited to participate in a prize draw. This study's procedure was approved by the university's ethics committee

5.2.4. Data analysis

Chi-square and Fisher exact test were used to compare responses of different demographic groups of participants. In addition, repeated measures analysis of variance (ANOVAs) were performed to compare within subject responses. Greenhouse-Geisser correction was applied for violated assumption of sphericity (Mauchly's Test of Sphericity, ε). Post-hoc test using Bonferroni correction was utilized for every ANOVA with significant effect to examine the relationship between the modalities of the variables. Using repeated measures ANOVAs to compare the risk perceptions reported for the self with those reported for others

corresponds to the indirect measure of comparative risk judgments used to detect the expression of comparative optimism (CO) or pessimism (CP).

Items of transgression likelihood were transformed to dichotomous (positive vs. negative transgression likelihood) variables to examine potential predictors. Scenario-stratified forward stepwise logistic regressions were calculated to determine which variables from the set of predictors provided the best model. Forward stepwise logistic regressions method evaluates the value of the coefficients and their significance, including variables that are statistically significant until the best possible model is fitted. Stepwise regression analyses help to isolate which factors separately contribute to transgression likelihood through the determination of parsimonious models. In transportation, parsimonious models have been widely recommended and implemented for numerous benefits such as fewer data requirements, reduced computational complexity, improved system representation, and insightfulness (Daganzo, Gayah, & Gonzales, 2012). The fitness of the models was assessed using the Nagelkerke R^2 statistic, which ranges from zero for models that provide no predictive information to 1 for models that predict accurately. The Nagelkerke R^2 should be at least 0.3 to be acceptable (Lattin, Carroll, & Green, 2003). Finally, a thematic analysis was performed to identify common themes that emerged among the comments provided by participants after responding to the questions for each scenario.

6. Results

Firstly, the reported transgression likelihood across the five scenarios was explored as a dichotomous variable (every score larger than 1 was considered as positive transgression likelihood). The largest number of participants reported being likely to cross in the first scenario (see Table 3). Furthermore, responses were examined to investigate whether the same individuals reported transgression likelihood across different scenarios. More than half of the participants (56.7%, n = 126) reported being likely to transgress at least in one scenario. Participants who reported transgression likelihood only in the first scenario (lights and sound) accounted for 32.5% (n = 41) and only 9.5% (n = 12) reported transgression likelihood in all 5 scenarios. The next highest percentage of participants with similar answers was 7.9% (n = 10), who reported being likely to transgress both in Sc.1 (lights and sound) and in Sc.4 (express train and another pedestrian). The remaining participants (50%, n = 63) reported transgression likelihood for different number and combinations of scenarios, with no more than 5 (3%) participants having similar answers. It is important to note that the reported transgression likelihood in 18% (n = 23) of the cases concerned scenarios other than the first one, which could be considered as the least risky one.

Table 3

Prevalence of reported transgression likelihood for each scenario.

	Transgression likelihood	
	n	% among all responses
Sc.1 Lights & sound	103	46.4%
Sc.2 Closing gate	46	20.7%
Sc.3 Stopping train	40	18.0%
Sc.4 Express train & pedestrian	49	22.1%
Sc.5 Two trains	39	17.6%

Note. N total = 222

Differences of transgression likelihood were examined by age. A new variables age group was created: under 25 years old (38.7%), between 26 and 55 years old (52.3%) and older than 56 years (9%). Only in the second scenario (e.g., closing gate) a significant difference was found between the reported transgression likelihood according to participants' age group (Fisher's exact test, $p < .01$, $V^2 = 0.03$). According to the calculated relative deviations, the youngest participants (<25 years old) were the most likely to transgress, whereas the older (56+ years old) showed the least likelihood.

6.1. Self-reported transgression likelihood and perception of risk according to the status of controls and the train's position

Two repeated measures ANOVAs indicated significant differences in the reported transgression likelihood F (2.62, 578.10) = 32.66, $p < .001$, $\eta 2 = .129$ ($\varepsilon = .65$) and perceived risk of being involved in a crash F (3.82, 845.87) = 18.45, $p < .001$, $\eta 2 = .077$ ($\varepsilon = .95$) between the five scenarios. In partial support of H1a,b, pairwise comparisons indicated that participants reported the highest transgression likelihood ($p < .001$) and the lowest perception of risk of being involved in a crash ($p < .001$) for the scenario with active lights and sound (Sc.1) compared to all other scenarios. In terms of differences between the scenario with closing gate (Sc.2) and the scenarios with closed gates and trains present (Sc.3, 4, 5), participants reported significantly higher risk of being involved in a crash only for the scenario with two trains (Sc.5) compared to the scenario with the closing gate (Sc.2).

The four hypotheses related to train's presence and position (H2a,b, and H3a,b) were not supported with no estimated differences between the reported transgression likelihood and perceived risk of being involved in a crash respectively between the scenarios with (Sc.3, 4, 5) and without a visible train (Sc.1, 2), and between the scenario with a stopping train (Sc.3) and those with an approaching one (Sc.4, 5).

In addition, a third repeated measures ANOVA determined a significant difference between the perceived likelihood of being issued a sanction across the five scenarios, F (4, 884) = 15.26, $p < .001$, $\eta 2 = .065$, such that the least likelihood was reported for the first scenario compared to Sc.2 ($p = .002$) and Sc.3,

4 and 5 ($p < .001$). The highest likelihood to receive a sanction was reported for the scenario with a stopping train (Sc3), which was only significantly different compared to scenarios 1 ($p < .001$) and 2 ($p = .001$). Further significant differences between these three variables are presented in Table 4.

Table 4

Descriptive statistics of the reported transgression likelihood and perceived risk across the five scenarios.

Questions		Scenarios				
		1.Ped.lights and sound	2.Closing gate	3.Stopped train	4.Express train & another pedestrian	5.Two trains
Transgression likelihood	M	2 **be**	1.36 **a**	1.32 **a**	1.41 **a**	1.31 **a**
	SD	1.36	.83	.81	.89	.8
Likelihood of being involved in a crash	M	2.21 **bd**	2.62 **c**	2.83 **ce**	2.85 **ce**	2.86 **e**
	SD	1.29	1.4	1.34	1.41	1.44
Likelihood of being issued a sanction	M	2.02 **e**	2.29 **b**	2.56 **d**	2.41 **bd**	2.45 **bd**
	SD	1.16	1.36	1.37	1.35	1.34

Note. Different letters in rows and columns indicate statistically significant differences of at least $p < .05$

6.2. Perceived comparative transgression likelihood and comparative risk for each scenario

Differences between the reported for the self and the perceived for others risk and transgression likelihood (descriptive norms) were explored for each age group and gender of participants, using repeated measures ANOVAs. The detailed descriptive statistics for each test are provided in Appendices as follows: comparative transgression likelihood (Appendices A to C); comparative risk of being sanctioned (Appendix D); comparative risk of being involved in a crash (Appendix E). A summary of the results is presented in the following sections.

6.2.1. Comparative transgression likelihood

Partially consistent with H4a, all of the participants perceived youth (e.g., under 25 years old), but also adults aged between 26 and 55 as more likely than them to cross in all of the scenarios. Females between 26 and 55 were the only participants who were comparatively pessimistic about the likelihood of elderly pedestrians to transgress compared to their own likelihood (see Table 5). Regarding differences in descriptive norms related to males and females of the same age, males under 55 years old systematically perceived other males as more likely to transgress than other females (Appendix A).

Table 5

Perceived comparative transgression likelihood by participants of different age groups regarding other pedestrians of different gender and age groups.

Reported	Perceived transgression likelihood for other pedestrians :

transgression likelihood by participants of:									
Age		<25 years old		26 - 55 years old		56 - 75 years old		76 + years old	
	Gender	Male	Female	Male	Female	Male	Female	Male	Female
<25 years old	Male (*n*=44)	CO ALL	CO ALL	CO ALL	CO ALL	*n.s.*	*n.s.*	*n.s.*	*n.s.*
	Female (*n*=42)	CO ALL	CO ALL	CO ALL	CO ALL	*n.s.*	*n.s.*	*n.s.*	*n.s.*
26 -55 years old	Male (*n*=61)	CO ALL	CO ALL	CO ALL	CO ALL	CO ALL	CO 2,3,4	CO ALL	CO 3,4,5
	Female (*n*=55)	CO ALL	CO ALL	CO ALL	CO ALL	CO 3	CO 3	CP 1	CP 1
56 + years old	Male & Female (*n*=20)	CO ALL	CO ALL	CO ALL	CO ALL	CO 2,3,5	CO 5	*n.s.*	*n.s.*

Note. CO = comparative optimism (i.e., the perceived transgression likelihood for others is significantly higher compared to the transgression likelihood reported for the self); CP = comparative pessimism (i.e., the perceived transgression likelihood for others is significantly lower compared to the reported transgression likelihood for the self); ALL= significant differences of at least $p < .05$ were found for all scenarios; where significant differences were found only for some scenarios, the number of this/those scenario/s are provided instead; *n.s.* = no significant differences were found for any of the scenarios.

6.2.2. Comparative risk of being involved in a crash

Hypothesis 4b was only supported regarding the comparative risk as reported by the youngest and to a smaller extent the oldest participants, and only related to a small number of scenarios (see Table 6). With the exception of young female (under 25), participants perceived older adults (56-75) and elderly (76+) as being more at risk of being hit by a train, mainly if they were to cross in scenarios without a train (Sc.1, 2) and with two trains (Sc.5). No significant differences were found in the perceived risk for other male and female pedestrians of the same age group (Appendix E).

Table 6

Perceived comparative risk of being involved in a crash by participants of different age groups regarding other pedestrians of different gender and age groups.

Perceived likelihood of being involved in a crash by participants of:		Perceived likelihood of being involved in a crash for other pedestrians :							
Age		<25 years old		26 - 55 years old		56 - 75 years old		76 + years old	
	Gender	Male	Female	Male	Female	Male	Female	Male	Female
<25 years old	Male (*n*=44)	*n.s.*	*n.s.*	*n.s.*	*n.s.*	CO 2	CO 2	CO 1,2,3	CO 1,2
	Female (*n*=42)	CO 5	CO 5	CO 5	CO 5	CO 2,5	CO 2,5	CO 2,5	CO 2,5
26 -55 years old	Male (*n*=61)	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*
	Female (*n*=55)	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*

56 + years old	Male & Female (*n*=20)	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	CO 1	CO 1

Note. CO = comparative optimism (i.e., the perceived risk for others to be involved in a crash is significantly higher compared to the perceived risk reported for the self); *n.s.* = no significant differences were found for any of the scenarios; where significant differences of at least $p < .05$ were found the number of this/those scenario/s are provided

6.2.3. Comparative perceived risk of being sanctioned

The assessed comparative likelihood to be issued a sanction produced different effects across scenarios (see Table 7). Contrary to what was hypothesised (H4c), the large majority of participants did not perceive others of different age groups as more likely to receive a sanction compared to the self. Only the youngest participants demonstrated CO regarding others of different age groups. Curiously, female participants (26-55 years old) perceived older than them and elderly pedestrians as less likely to be sanctioned compared to the self (CP), specifically regarding the scenario with a stopped train at station (Sc.3).

The only significant difference in the perceived risk for others of the same age but different gender was found for the scenario with an express train approaching and a pedestrian crossing safely at the same time (Sc.4). The youngest male participants (<25 years old) reported that other male pedestrians of their age would be more likely to be sanctioned than other female pedestrians of the same age (Appendix D).

Table 7

Perceived comparative risk of being issued a sanction by participants of different age groups regarding other pedestrians of different gender and age groups.

Reported likelihood of being issued a sanction by participants of :		Perceived likelihood of being issued a sanction for other pedestrians:							
Age		<25 years old		26 - 55 years old		56 - 75 years old		76 + years old	
	Gender	Male	Female	Male	Female	Male	Female	Male	Female
<25 years old	Male (*n*=44)	CO 1,2,4	CO 1,2	CO 1,2	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*
	Female (*n*=42)	CO 1,2,3,5	CO 1,2,3,5	CO 1,2,5	CO 1,2,5	*n.s.*	CO 1	*n.s.*	*n.s.*
26 -55 years old	Male (*n*=61)	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*
	Female (*n*=55)	*n.s.*	*n.s.*	*n.s.*	*n.s.*	CP 3	CP 3	CP 3	CP 3
56 + years old	Male & Female (*n*=20)	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*

Note. CO = comparative optimism (i.e., the perceived risk for others to be sanctioned is significantly higher compared to the perceived risk reported for the self); CP = comparative pessimism (i.e., the perceived transgression likelihood for others is significantly lower compared to the reported transgression likelihood for the self); *n.s.* = no significant differences were found

for any of the scenarios; where significant differences of at least $p < .05$ were found the number of this/those scenario/s are provided

6.3. Predictors of transgression likelihood for each crossing scenario.

Five binary logistic regressions were conducted to identify the best predictors of transgression likelihood for each scenario among variables related to demographics, habitual use of LCs, familiarity and past experience at LCs (see Table 2) and the measured for each scenario perceived risk for the self and for others. Table 8 lists the significant predictors of transgression likelihood across all scenarios, followed by the indicators of model fit for each scenario presented in Table 9.

Table 8

Predictors of reported transgression likelihood across the five scenarios

Variables	*ScN*	*B*	*S.D*	Wald $\chi 2$	*df*	Sig	Exp(*B*) - OR	95% CI for Exp(*B*)	
								Lower	Upper
Familiarity with LCs									
Visibility Active Ctrls	2	-0.73	0.26	8.09	1	.004	0.47	0.28	0.79
Recall Ped. Lights(correct)	4			7.11	2	.029			
Recall Ped. Lights(incorrect)		1.37	0.59	5.39	1	.02	3.96	1.24	12.7
Purp. Ped. Lights	3	-1.41	0.38	13.77	1	< .001	0.24	0.11	0.51
Sanction likelihood	1	-0.43	0.19	4.67	1	.031	0.65	0.44	0.96
Past unsafe behaviour									
Trans. Closing Gate	3	1.06	0.35	8.99	1	.003	2.89	1.44	5.8
	5	1.33	0.42	9.83	1	.002	3.81	1.65	8.81
Explanations of past unsafe behaviour									
Hurry train	1	1.22	0.29	17.37	1	< .001	3.41	1.91	6.07
	2	1.66	0.29	32.06	1	< .001	5.25	2.91	9.34
	3	1.28	0.28	20.7	1	< .001	3.61	2.07	6.27
	5	1.22	0.29	17.37	1	< .001	3.41	1.91	6.07
Hurry crossing	4	0.94	0.31	9.32	1	.002	2.56	1.4	4.69
Perceived control	3	-0.92	0.33	7.58	1	.006	0.39	0.21	0.76
Others crossing	4	0.88	0.22	15.21	1	< .001	2.41	1.55	3.77
	5	-1.04	0.36	8.37	1	.004	0.35	0.17	0.71
Too hot	1	-0.85	0.34	6.19	1	.013	0.42	0.21	0.83
Precautionary behaviour									
Vigilance	5	-0.84	0.23	12.45	1	< .001	0.43	0.27	0.68
Train check (INactive)	1	-0.48	0.18	6.71	1	.01	0.61	0.42	0.88
Earphones (yes)	5	0.99	0.49	4.08	1	.043	2.7	1.03	6.93
Perceived risk for SELF									
Crash risk	1	-0.68	0.16	17.16	1	< .001	0.5	0.36	0.69
	2	-1	0.25	16.09	1	< .001	0.36	0.22	0.59
	3	-0.61	0.22	7.21	1	.007	0.54	0.35	0.84
	4	-0.49	0.18	7.18	1	.007	0.61	0.42	0.87
	5	-0.8	0.22	12.45	1	< .001	0.43	0.27	0.68
Descriptive norms									
Trans.Female26-55	2	1.22	0.26	20.98	1	< .001	3.4	2.01	5.74
Trans.Female56-75	1	0.57	0.19	8.81	1	.003	1.78	1.21	2.6

	3	1.71	0.32	27.4	1	< .001	5.51	2.91	10.44
	4	1.01	0.23	19.05	1	< .001	2.75	1.74	4.34
Trans. Male <25	1	0.50	0.18	7.75	1	.005	1.65	1.16	2.35
	5	1.36	0.29	22.06	1	< .001	3.92	2.21	6.93

Legend: ScN (Scenario Number)-The number of scenario for which each of the variables was found to be a significant predictor of transgression likelihood

Table 9

Indicators of model fit for each model

Model N	Chi-square	*p*	Nagelkerke R^2	-2 Log Likelihood	% of cases correctly classified	% of cases initial classification
1	$\chi 2$ (7, *N*=222) = 114.07	< .001	0.53	192.53	82%	53.6%
2	$\chi 2$ (4, *N*=222) = 116.76	< .001	0.64	109.78	89.6%	79.3%
3	$\chi 2$ (6, *N*=222) = 103.08	< .001	0.6	106.33	91%	82%
4	$\chi 2$ (6, *N*=222) = 90.72	< .001	0.53	130.07	86.7%	78.1%
5	$\chi 2$ (7, *N*=222) = 90.3	< .001	0.55	116.05	91%	82.4%

Three variables were found to be consistent predictors of transgression likelihood across all scenarios. Firstly, the odds of reporting transgression likelihood increased for each additional score on the scales measuring reported likelihood to cross unsafely if in a hurry to catch a train or just to cross. Next, the higher perceived risk of being hit by a train (crash risk) significantly reduced the odds of reporting crossing likelihood in all scenarios. The last common predictor of transgression likelihood was descriptive norms about specific others. Namely, the perception that other female pedestrians are likely to transgress increased the odds of reporting transgression likelihood in almost all scenarios. This concerned mainly older female adults aged between 56 and 75. Believing that young males are likely to transgress predicted increased reported transgression likelihood in the first and the last scenarios.

Regarding the context-specific predictors of transgression likelihood, most variables related to familiarity with the LC predicted decreased odds of reporting transgression likelihood except for the recall of pedestrian lights. Participants who were not aware of the presence of pedestrian lights at their most frequented LCs were more likely to report transgression likelihood in the fourth scenario (e.g., approaching train and another pedestrian crossing) than those who remembered seeing pedestrian lights. Of the two variables related to past unsafe behaviour, only transgressions of closing gates predicted an increase in the odds of reporting transgression likelihood in the third (e.g., stopped train) and last (e.g., two trains passing) scenarios. Besides being in a hurry, three more explanations of past unsafe behaviour were significant predictors of transgression likelihood. Contrary to what may be expected, those who were previously likely to transgress because they ‘could make it, had enough time’ (e.g., perceived control) were less likely to report transgression likelihood in the presence of a stopped train (Sc.3). Previous likelihood to transgress if

others were crossing at the same time increased the odds of reporting transgression likelihood in the scenario where a train was approaching and another pedestrian was crossing. The same variable decreased the odds of reporting transgression likelihood in the last scenario with two trains. Two out of the three predictors associated with precautionary behaviour concerned the last scenario with two trains. More vigilance for the active controls predicted low transgression likelihood, whereas usually wearing earphones while crossing increased the odds of reporting transgression likelihood.

Fifty participants of different age and gender provided similar number of comments regarding the scenarios. Following a thematic analysis, 68 comments were classified in five broad themes (see Table 10). Participants commented mostly on their lack of experience with sanctions, on their lack of knowledge about others' being sanctioned and on the absence of visible traffic officers in the recordings and in general.

Table 10

Emerging themes from the provided comments regarding the questions related to the five crossing scenarios

Theme	Total N of comments	Theme description	Example quotes
Sanctions	28	Lack of experience with sanctions	*Have never seen anyone fined. Did not know until filling in this survey that it was possible* (F24, Sc.2)
		Lack of knowledge about others' being sanctioned	*I have seen so many people cross the gates when the warnings are active no-one ever gets fined* (F30,Sc.1)
		Absence of visible traffic officers in the recordings and in general	*There would have to be someone there to actually fine you. Rarely see anyone at the crossings and there aren't any in the videos that I can see.*(F55, Sc.1)
Safety controls	18	Crossing before the gates are active	*There's no problem with crossing; the fence isn't across and the boom gate isn't down* (F37, Sc.1)
		Familiarity with LC site	*I am not familiar with this location/site. Extra caution would apply in addition to following the advisory signage and barrier controls* (M62, Sc.2)
		Train whistle	*The closed gate and alarm sounds are a huge deterrent but in this situation I think not being able to see or hear the train means initially people will cross. Once the whistle sounds on train indicating to me it's an express train travelling through not stopping I would not cross* (F36, Sc.4)
Descriptive norms	11	Elderly	*In this situation it is not clear whether it is best to finish crossing or go back as you are halfway. Older people have hearing problems and won't always hear* (F58, Sc.4)
		Young people	*Young people tend to be listening to musical devices or on their phones* (F58, Sc.3)
		Common behaviour	*This is when most people are likely to cross on the signals, i have seen it happen* (F29, Sc.2)
Train's visibility and position	6	Train visibility	*If I was unable to visibly confirm there was no train, then I would not cross. However the situation at most ped. crossings is a clear view of the line in both direction* (M56, Sc.4)
			If the train is slow moving indicates it is stopping in the station

		Train speed	*and probably wise to complete crossing if you are on the tracks already* (F58, Sc.5)
Distance to train arrival	5	Train schedule	*Insufficient information to gauge whether I would go or not. Factors like how long to next train do matter in a situation like this* (M37, Sc.3)
Station design		Platform	*This looks as if it's okay to cross as the platform is in the middle of the tracks?(*F24, Sc.4)
		Rail tracks	*Two tracks , no third freight line, low risk crossing early on in the warning phase* (M45, Sc.2)

Note. Provided in parentheses after each quote are participant's gender (M = Male and F = Female), age and the concerned scenario.

7. Discussion

This study used specific crossing scenarios to examine the mechanisms underpinning pedestrian decision-making at LCs. The results revealed that only a small number of pedestrians reported intentions to transgress in similar situations, which should alert the relevant authorities that the crossing behaviour of different users varies considerably and is dependent on contextual factors. Furthermore, this methodology is justified compared to a large body of the existing study designs that examine isolated effects of single factors on crossing decisions (Sposato, Bien-Aime, & Chaudhary, 2006), demonstrating that multiple and different factors may influence crossing decisions differently from one situation to another. Nevertheless, consistent predictors of crossing likelihood were identified for all scenarios, which subsequently informs on strategies to address behaviours on a global level.

7.1. Transgression likelihood and perceived risk according to the status of the automatic controls

In line with evidence from other observational studies (Metaxatos & Sriraj, 2013b; Stefanova, Burkhardt, Wullems, et al., 2015), pedestrians reported more intentions to transgress before gates have activated (only sound and lights flashing) than after. However, the results do not support the hypothesis that while in the process of closing, pedestrian gates may increase pedestrian's confidence by providing an indication on the time to train arrival similarly to countdown road timers at road intersections (Huang & Zegeer, 2000; Paschalidis et al., 2015; Vujanić et al., 2014). One possible explanation for this may be that the duration of the closing of the pedestrian gates is quite short, not explicitly indicated (as for road traffic controls), and may vary from one LC site to another (between 3 and 9 sec.), thus increasing the uncertainty about the remaining time to train arrival and decreasing the perceived control of pedestrians.

In addition to the measured transgression likelihood, this study provides empirical evidence that transgressions of the light and sound are associated with significantly lower perception of risk, both related to being hit by a train and to being sanctioned, compared to the perceived risk after the gates have

activated. Alternatively, it is also possible that pedestrians are not aware of the illegal nature of crossing while the lights and sound are active, given that they reported more risk of being sanctioned once the gates were moving than before.

7.2. Transgression likelihood and perceived risk according to train's visibility and position

Unlike what was previously suggested (Beanland et al., 2013; Clancy et al., 2007), the presence of a visible train did not have an impact on crossing intentions nor on the perceived risk of a being involved in a crash (H2a,b). Moreover, participants reported being equally likely to cross and perceived similar risk of being hit by a train while the gates were closing and no train was visible compared to while the gates were closed and a different number of trains were visible in different positions (H3a,b). These results could be due to difficulties in estimating the distance between the train and the suggested crossing trajectory, given that the recorded scenarios only provided a limited field of view in both directions, which is also supported by qualitative results (see Table 10). Previous research suggests that the estimated distance to train arrival may have more weight on decision-making than seeing a stopped or a moving train (Read et al., 2016; Stefanova, Burkhardt, Filtness, et al., 2015). Research should be undertaken in naturalistic setting allowing for the objective measure of time and distance to train arrival at the LC.

On the contrary, the presence of a train was associated with higher perceived risk of being sanctioned (Sc.2, 3, 4) compared to crossing while a train was not visible (Sc.1, 2). Indeed, according to participants' comments, the likelihood to receive a sanction was clearly associated with the presence of traffic officers at station, whereby it is likely that they associated the presence of a train with the presence of more rail staff. If the simple presence of a train increases the perceived risk of a sanction, then more rail staff at stations and other measures raising public awareness about sanctions could have the same effect. In any case, efforts should be made to increase the perceived certainty of receiving sanctions than increasing the severity (e.g., amount) of the sanctions (Nagin, 1998; Paternoster, 1987).

7.3. Descriptive norms about unsafe behaviour and comparative risk judgements

This study addresses a significant gap in the literature by shedding light on the extent to which different groups of pedestrians perceive unsafe behaviour as common among other pedestrians of the same and different demographic groups (descriptive norms). As expected, participants perceived youth (under 25 years old, H4b), and adults aged between 26-55 as more likely to transgress than themselves. As this was true for all scenarios and reported by all participants, risk-taking at LCs appears to be normalized as a commonplace behaviour among young people and adults up to 55 years old.

Finding out whether the perceived prevalence of others' unsafe behaviour was realistic was not among the aims of this study. Instead we were interested in examining whether participants associated others' behaviour with higher risk compared to how risky they estimated their own behaviour. We hypothesised that participants would perceive the behaviour of other demographic groups of users as riskier and more "reckless" compared to their own "calculated" actions (Stefanova, Burkhardt, Filtness, et al., 2015). However, the results only partially supported this assumption (H4b), revealing that mainly the youngest participants perceive other older pedestrians as being more at risk of a crash compared to themselves, albeit such comparatively optimistic views were not expressed in all crossing scenarios. This could be explained by a common perception that older pedestrians are more prone to errors because of reduced attentional resources or mobility, as demonstrated by the comments provided by participants. Although there is some evidence which supports that elderly are more error-prone users (Clancy, Kerr, & Scott, 2006; McPherson & Daff, 2005), more research is necessary to estimate whether such common perceptions are realistic. The key point here is that even though a large part of the participants perceived others as higher risk-takers, they did not anticipate negative consequences for others more than they did for themselves. It appears therefore, that there may be a common perception that transgression at LCs are unlikely to have negative or fatal consequences.

Regarding our last hypothesis (H4c), only the youngest participants (under 25 years old) considered themselves as less likely to receive a sanction (CO) if they were to cross in the some of the scenarios than other pedestrians of the same and different age groups. On the contrary, female participants perceived elderly to be more likely to avoid sanctions (CP) in one specific scenario. Independantly of whether they exressed CO or CP, these participants had a biased (unrealistic) perception about sanction likelihood, since the risk is ultimately the same for anyone crossing illegally independantly of age, gender or crossing situation. Contrary to previous evidence, this biased perception does not seem to be related to a normalised belief that young people in general avoid sanctions by receiving warnings instead (Stefanova, Burkhardt, Filtness, et al., 2015). The perceived risk could rather be influenced by past experience associated with positive outcomes (e.g., I never got caught) than by the perceived outcomes of the behaviour of specific demographic groups of others. Although these results provide evidence that biased perceptions of risk about being issued a sanction exist among pedestrians, the exact factors that contribute to this biased context-specific perception (Guppy, 1993) remain unlcear and are to be further examined.

7.4. Explaining transgression likelihood looking at the contribution of multiple interacting factors

The last aim of this study was to identify the specific precursors of unsafe behaviour for each scanario and to analyse similarities and differences. Only a small number of factors were found to be

consistent predictors of transgression likelihood in all scenarios, whereby emphasising the important role of context-specific factors on decision-making. In line with previous findings (Clancy et al., 2007; Metaxatos & Sriraj, 2013b), past experience with unsafe crossing motivated by the willingness to save time (e.g., being in a hurry to catch a train and to cross) was a significant predictor of transgression likelihood in all scenarios, suggesting that habits associated with positive outcomes are resistant to most situational cues in the environment. Past experience and habits are likely to leed to quick and effortless decision-making as supported by research on pedestrians' intention to violate at road crossings (Xu et al., 2013). The fact that past habits, as banal as avoiding the heat (see Table 8), predicted transgression likelihood in the largest number of virtual scenarios supports the assumption that goals (e.g., saving time) not only contribute to the formation of habits, but can also be inferred from habitual responses (Wood & Neal, 2007). For instance, it may be that pedestrians are more likely to engage in unsafe crossing because of habits and not because of real time pressure constraints. Different strategies of behaviour modifications may be used to control habitual responses such as avoiding triggering cues or conditioning to respond differently to the available cues (Wood & Neal, 2007). For example, strategies that involve questioning the benefits of unsafe behaviour and finding alternative actions could be a promising type of measures to be considered (Baer, Stacy, & Larimer, 1991).

The next variable that predicted decreased transgression likelihood in all scenarios was the perceived risk of being hit by a train, whereby emphasising the need to take extra measures to increase risk awareness (provided that the risk of unsafe crossing was perceived as low overall).

Descriptive norms, about different demographic groups of others, were the last factor predicting unsafe crossing intentions in all scenarios consistent with research on pedestrian road crossing behaviour (Zhou et al., 2016). Future research with larger number of participants of different demographic groups should examine whether same-sex norms predict transgression likelihood as suggested by evidence on the predictors of seatbelt non-use (Litt, Lewis, Linkenbach, Lande, & Neighbors, 2014). Although, the importance of descriptive norms has been demonstrated in a plethora of studies, many researchers insist on the dynamic nature of this construct reminding that contextual characteristics may motivate a person to adopt a new norm, disregarding or modifying the old one (Rimal & Lapinski, 2015). However, the results from this study support that descriptive norms play an important role in decision-making at LCs independently of the crossing context. To change the perceptions that unsafe crossing is a commonplace behaviour, messages providing personalized normative feedback have been found to reduce a number of risk-taking behaviours among which alcohol consumption among heavy drinking college students (Neighbors, Larimer, & Lewis, 2004). Importantly, evidence from a recent study by Bertholet et al. (2016)

supports that such a measure is effective in reducing drinking habits among young males who overestimate the amount of drinks their peers consume, but not among those who underestimate or are realistic about the consumption of their peers. Furthermore, the same authors note that normative feedback messages might have a "boomerang effect" among people who incorrectly underestimate others' unsafe behaviour. Similarly, inappropriate feedback may increase unsafe crossing at LCs, leading pedestrians to perceive such behaviour as a lot more common than what they initially thought. In fact, some researchers argue that it is unrealistic optimism (rather than CO) that leads to reduced attention to the available risk information (Radcliffe & Klein, 2002), less proneness to preventive behaviour (O'Brien, VanEgeren, & Mumby, 1995), and more risk-taking behaviours (Dillard, McCaul, & Klein, 2006; Dillard, Midboe, & Klein, 2009). According to Delhomme et al. (2009), people perceive differently preventive messages depending on the comparative risk judgements they hold. Therefore, it is important to carefully examine how realistic are pedestrians in their judgements about the frequency of others' behaviour before designing safety interventions.

Regarding the context-specific predictors of transgression likelihood, the generally perceived likelihood to be issued a sanction was a significant predictor of decreased transgression likelihood only in the first scenario, whereas the context-specific likelihood (reported for each scenario) did not influence crossing intentions. Even though participants reported more risk of being sanctioned in the presence of a train, this did not seem to influence their risk-taking intentions. This might suggest that the fear of sanctions plays a role in intention formation only among those who cross safely at first place (Guppy, 1993). Further research is necessary to examine the extent to which increased sanction awareness would influence the decisions of people who already cross safely and of those who usually violate the rules, and to what extent the presence of rail staff or other enforcement measures (e.g., cameras) can reduce crossing intentions of the latter group.

Factors associated with precautionary behaviour predicted transgression likelihood in the least and the riskiest scenarios. Not surprisingly, pedestrians who take extra measures looking for an approaching train (even if the controls are not active) are unlikely to transgress even in the least risky scenario. On the contrary, poor vigilance for active controls and crossing wearing earphones predicted transgressions in the presence of two trains (Sc.5). To increase risk awareness of pedestrians likely to cross unsafely in particularly dangerous situations, more emphasis should be put on strategies to reduce distraction and increase vigilance for active controls as well as for approaching trains. For example, the recording from a CCTV camera of a near-miss which occurred in Brisbane in 2013 became a safety campaign demonstrating a close call that a pedestrian had with a train, crossing after a first train had passed through the LC and

oblivious to the activated signals while wearing earphones (ABC News, 2013). More research is necessary to evaluate the effectiveness of similar interventions on a national and international level.

Another interesting finding is that previously following others (e.g., 'others crossing') predicted an increased likelihood to transgress in the only scenario where a pedestrian was visibly crossing in the recording (Sc.4), whereas the same predictor decreased the odds of reporting transgression likelihood in the last scenario with two trains. Seeing another pedestrian may have triggered a heuristic-based type of response in scenario 4 associated with the concept of diffusion of responsibility. Diffusion of responsibility is based on the assumption that in a group, people tend to automatically take less responsibility for their actions (Darley & Latane, 1968). In a road crossing context, diffusion of responsibility was found to reduce precautionary behaviour (Harrell, 1991). The fact that participants were less likely to report transgression likelihood in the riskiest scenario if they were used to following others, may suggest that diffusion of responsibility is more prevalent in low risk situations. Finally, the tendency to follow others may increase with the lack of knowledge about safe crossing or about the purpose of the different warning signals. This is supported by the fact that participants who reported transgression likelihood in the fourth scenario (approaching train and another pedestrian crossing) did not recall correctly the available controls at their most frequented LCs. Educational campaigns could insist on the risk of following others at crossings, reminding to pedestrians that the presence of others should not facilitate crossing decisions.

8. Limitations

A number of limitations should be accounted for regarding the collected data and the design of the survey. The sample included only a small number of pedestrians aged over 56 years old (n =20) and therefore the results associated with this age group of users should be regarded with caution. It is possible that older adults experienced difficulties completing the electronic survey, therefore other forms of investigation are recommended for this age group of participants. The use of self-reported measures of transgression likelihood could be a source of biased responses, as people are likely to respond in a socially desirable manner. However the private setting of data collection should have diminished the effect of such biases (Lajunen & Summala, 2003). Although the results should be interpreted with a certain degree of caution, they could be considered generalizable to the larger population of pedestrians in Queensland as the recruited participants were users of all rail lines and over 50 different LCs. Nevertheless, a study with a similar design and a larger sample would most certainly provide a finer-grained understanding of the transgression patterns of different demographic groups of pedestrians. Cultural norms may account for differences in the results from this study and past research conducted in other countries regarding the

influence of descriptive and injunctive norms on decision-making. In addition, variation in LC design between countries should also be considered when interpreting these results.

It is possible that the depiction of key variables such the train's or the control's visibility was influenced by different screen resolutions or types of devices used. Nevertheless, participants were given the opportunity to comment on the scenarios and those who reported difficulties identifying key elements in the scenarios were excluded from the analysis. This limitation is to be overcome in future research, using more objective indicators of the distance to train arrival. Simulated scenarios might be appropriate, providing the opportunity to estimate the differences between the perceived and objective risk of a crash.

9. Conclusion

In conclusion, this study provides a detailed understanding of the cognitive and motivational processes underpinning decision-making at different LCs through the examination of context-specific transgression likelihood and perceived risk for the self and for others. The findings contribute extensively to the existing literature and open up new possibilities for future research. The use of recorded crossing scenarios revealed a multitude of factors influencing intentions to act unsafely informing on context-specific predictors of unsafe behaviour and on common predictors among different scenarios.

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Appendices

Appendix A. Assessment of comparative judgements about transgression likelihood reported by male participants under 55 years old (y.o.)

Significant results from the repeated measures ANOVAs comparing the reported transgression likelihood by male participants under 25 y.o. and between 26 and 55 y.o., with the transgression likelihood they perceived for other pedestrians of different demographic groups.

Perceived likelihood for the SELF					Perceived likelihood for others							
					<25y.o.		26-55y.o.		56-75y.o.		76+ y.o.	
Gender	Age	*N*	SC	*M*	male	female	male	female	male	female	male	female
				SD								
male	<25	44		1.91	3.55***	3.32***	3.20***	2.66***	2.36*	2.09	1.98	1.84
			1	1.34	1.22	1.29	1.28	1.20	1.15	1.18	1.13	1.14
					p<.01		*p*<.001		*p*<.01			
				1.41	3.02***	2.66***	2.59***	2.27***	1.89***	1.73*	1.64	1.55
			2	.98	1.15	1.07	1.12	1.1	.89	.89	.89	.84
					p<.01		*p*<.01					
				1.36	2.86***	2.61***	2.48***	2.25***	1.86**	1.73**	1.59	1.5
			3	.91	1.23	1.12	1.21	1.22	1.04	1.02	.89	.79
					p<.05		*p*<.05					
				1.5	3.2***	2.93***	2.82***	2.34***	2.11***	1.98**	1.75	1.7
			4	1.08	1.3	1.28	1.22	1.11	1.26	1.22	1.05	1.04
					p<.01		*p*<.001					
				1.39	3.02***	2.66***	2.5***	2.23***	1.82**	1.64	1.5	1.41
			5	.94	1.28	1.16	1.13	1.05	.87	.91	.82	.81
					p<.01		*p*<.05					
male	26-55	61		2	3.74***	3.48***	3.21***	2.85***	2.46**	2.23	2.05	1.95
			1	1.39	1.21	1.26	1.3	1.28	1.52	1.44	1.49	1.41
					p<.001		*p<.001*		*p*<.01			
				1.26	3.08***	2.67***	2.38***	2.11***	1.59*	1.48	1.36	1.3
			2	.72	1.21	1.17	1.18	1.08	.97	.89	.81	.66
					p<.001		*p*<.01					
				1.3	2.95***	2.69***	2.44***	2.2***	1.8***	1.66**	1.49	1.44
			3	.8	1.25	1.16	1.19	1.01	1.06	.91	.9	.8
					p<.001		*p*<.01					
			4	1.23	3.13***	2.64***	2.39***	2.07***	1.66**	1.48*	1.36	1.28

	.69	1.19	1.09	1.13	.96	.85	.69	.73	.52
		p<.001		*p*<.001		*p*<.05			
	1.18	3.02***	2.69***	2.36***	2.1***	1.59***	1.44**	1.38	1.28
5	.64	1.13	1.14	1.12	1.06	.92	.74	.82	.74
		p<.001		*p*<.001		*p*<.05			

Note. SC – Scenario number. A significant difference between the reported scores for the self versus others is marked with asterisk/s: * *p*<.05, ** *p*< .01, ***p< .001. A significant difference in the perceived crossing likelihood for other males versus females of the same age group is directly reported under the corresponding cells (*p<)*

Appendix B. Assessment of comparative judgements about transgression likelihood reported by female participants under 55 years old (y.o.)

Significant results from the repeated measures ANOVAs comparing the reported transgression likelihood by female participants under 25 and between 26 and 55 y.o., with the transgression likelihood they perceived for other pedestrians of different demographic groups

Perceived likelihood for the SELF					Perceived likelihood for others							
					<25y.o.		26-55y.o.		56-75y.o.		76+y.o.	
Gender	Age	*N*	SC	*M* *SD*	male	female	male	female	male	female	male	female
female	<25	42	1	2.02	3.29***	3.17***	2.93***	2.83***	2.17	2.12	2.07	2.07
				1.42	1.43	1.41	1.47	1.43	1.41	1.41	1.5	1.47
			2	1.48	2.9***	2.86***	2.26***	2.14***	1.71	1.52	1.52	1.38
				.77	1.32	1.2	1.17	.97	.97	.86	.89	.79
									p< .05			
			3	1.43	2.81***	2.60***	2.26***	2.19***	1.69	1.69	1.45	1.45
				.8	1.23	1.27	1.12	1.11	.86	.92	.83	.83
			4	1.52	2.76***	2.57***	2.31***	2.19***	1.79	1.69	1.6	1.55
				.94	1.34	1.19	1.22	1.17	1.09	1.07	.96	.88
			5	1.48	2.64***	2.45***	2.05***	1.98**	1.52	1.5	1.4	1.43
				.917	1.05	1.1	1.08	1.07	.77	.74	.66	.66
					p<.01							
female	26-55	55	1	2.24	3.55***	3.33***	3.07***	2.91***	2.29	2.18	1.84*	1.84*
				1.4	1.1	1.18	1.15	1.19	1.28	1.3	1.3	1.3
			2	1.45	3.04***	2.82***	2.44***	2.22***	1.6	1.55	1.4	1.42
				.99	1.08	1.14	1.06	1.1	.87	.85	.83	.83
					p< .01							
			3	1.25	2.75***	2.64***	2.16***	2.09***	1.62**	1.55*	1.45	1.44
				.79	1.12	1.11	1.1	1.02	.91	.89	.91	.91
			4	1.47	3.05***	2.91***	2.51***	2.45***	1.71	1.6	1.49	1.47
				.87	1	1	.96	.97	.93	.91	.87	.83
					p<.05				*p*<.05			
			5	1.33	2.96***	2.76***	2.4***	2.29***	1.58	1.58	1.51	1.49
				.77	1.07	1.07	1.06	1.11	.8	.83	.9	.87

Note. SC – Scenario number. A significant difference between the reported scores for the self versus others is marked with asterisk/s: * *p*<.05, ** *p*< .01, ***p< .001. A significant difference in the perceived crossing likelihood for other males versus females of the same age group is directly reported under the corresponding cells (*p*<)

Appendix C. Assessment of comparative judgements about transgression likelihood and risk perception reported by male and female participants over 56 years old (y.o.)

Significant results from the repeated measures ANOVAs comparing the reported transgression likelihood and perception of risk by participants over 56 y.o. (n =20), with the transgression likelihood and risk they perceived for other pedestrians of different demographic groups

Perceived likelihood for the SELF			Perceived likelihood for others							
			<25y.o.		26-55y.o.		56-75y.o.		76+y.o.	
	SC	*M*	male	female	male	female	male	female	male	female
Transgression likelihood		*SD*								
	1	1.5	3.2***	3.05***	2.75***	2.55**	2	1.85	1.7	1.55
		1	1.24	1.23	1.2	1.31	1.17	1.08	1.12	1.09
	2	1.00	2.25***	2.15***	1.65*	1.5*	1.3*	1.2	1.05	1.05
		.00	1.16	1.18	.87	.82	.47	.41	.22	.22
	3	1.2	2.6***	2.5***	2.15*	1.85*	1.55	1.4	1.2	1.25
		.69	1.18	1.14	1.18	.93	.82	.88	.69	.78
	4	1.3	2.75***	2.55***	2.25**	2*	1.8*	1.6	1.35	1.3
		.92	1.33	1.31	1.29	1.29	1.1	1.09	.98	.97
	5	1.15	2.85***	2.8***	2.35***	2.15***	1.6*	1.55*	1.35	1.35
		.67	1.38	1.36	1.13	1.08	.88	.88	.81	.81
Likelihood of being involved in a crash	1	2	2.4	2.3	2.4	2.3	2.45	2.5	2.8*	2.8*
		1.25	1.18	1.12	1.09	1.12	1.27	1.27	1.39	1.39

Note. SC – Scenario number. A significant difference between the reported scores for the self versus others is marked with asterisk/s: * $p<.05$, ** $p< .01$, ***$p< .001$

Appendix D. Assessment of comparative judgements about the likelihood of being sanctioned by all participants

Significant results from the repeated measures ANOVAs comparing the reported likelihood of being sanctioned by male and female participants under 25 and between 26 and 55 y.o., with the likelihood they perceived for other pedestrians of different demographic groups

Perceived risk for the SELF					Perceived risk for others							
					<25y.o.		26-55y.o.		56-75y.o.		76+y.o.	
Gender	Age	*N*	SC	*M* *SD*	male	female	male	female	male	female	male	female
male	<25	44	1	2.09	2.68**	2.61**	2.55*	2.43	2.39	2.32	2.25	2.23
				1.19	1.19	1.22	1.21	1.16	1.18	1.21	1.18	1.19
			2	2.36	2.98**	2.82*	2.73	2.66	2.57	2.5	2.43	2.39
				1.36	1.32	1.35	1.24	1.23	1.26	1.3	1.28	1.29
			4	2.32	2.82**	2.59	2.57	2.55	2.43	2.43	2.36	2.41
				1.36	1.26	1.2	1.18	1.17	1.2	1.26	1.27	1.24
					p<.05							
female	<25	42	1	2	2.43**	2.36*	2.33*	2.40*	2.31	2.29*	2.12	2.24
				1.21	1.32	1.39	1.3	1.38	1.33	1.34	1.31	1.34
			2	2.14	2.79**	2.67**	2.6*	2.55*	2.4	2.36	2.29	2.24
				1.35	1.31	1.31	1.36	1.38	1.38	1.37	1.47	1.42
			3	2.52	3*	2.98*	2.74	2.81	2.64	2.63	2.48	2.5
				1.38	1.36	1.38	1.39	1.34	1.34	1.32	1.38	1.36
			5	2.29	2.86***	2.81**	2.74**	2.74**	2.57	2.5	2.45	2.45
				1.29	1.24	1.27	1.23	1.25	1.17	1.21	1.21	1.23
	26-55		3	2.44	2.35	2.27	2.22	2.2	2.07*	2.04*	2.02**	2.04*
				1.37	1.23	1.26	1.24	1.2	1.21	1.2	1.17	1.18

Note. SC – Scenario number. A significant difference between the reported scores for the self versus others is marked with asterisk/s: * $p<.05$, ** $p< .01$, ***$p< .001$. A significant difference in the perceived likelihood to be sanctioned for other male versus female pedestrians of the same age group is directly reported under the corresponding cells (*p<)*

Appendix E. Assessment of comparative judgements about the likelihood of being involved in a crash by all participants

Significant results from the repeated measures ANOVA comparing the reported likelihood of being involved in a crash by participants of all age and gender groups, with the likelihood they perceived for other pedestrians of different demographic groups

Perceived likelihood for the SELF					Perceived likelihood for others							
					<25y.o.		26-55y.o.		56-75y.o.		76+y.o.	
Gender	Age	*N*	SC	*M* *SD*	male	female	male	female	male	female	male	female
male	<25	44	1	2.20	2.41	2.43	2.41	2.41	2.59	2.66	2.80**	2.75*
				1.32	1.01	1.06	1.04	2.41	1.1	1.21	1.26	1.26
			2	2.43	2.73	2.75	2.84	2.82	2.91*	2.89*	3.02**	2.98*
				1.38	1.04	1.1	1.05	1.14	1.19	1.28	1.3	1.3
			3	2.64	2.93	2.86	2.98	2.95	3.02	2.98	3.18**	3.05
				1.25	.99	1.06	.99	1.18	1.17	1.24	1.2	1.21
female	<25	42	1	2.07	2.36	2.33	2.38	2.38	2.48**	2.52**	2.6**	2.6**
				1.36	1.42	1.42	1.34	1.37	1.33	1.33	1.38	1.38
			2	2.31	2.62	2.67	2.67	2.67	2.83**	2.88***	3.07***	3.14***
				1.37	1.39	1.37	1.31	1.31	1.28	1.29	1.38	1.35
			4	2.6	3	2.9	2.93	2.95	3.17	3.19	3.31*	3.29*
				1.43	1.36	1.37	1.35	1.37	1.34	1.36	1.33	1.36
			5	2.31	2.88**	2.88*	2.81*	2.88**	2.95***	3***	3.17***	3.24***
				1.42	1.38	1.43	1.38	1.36	1.36	1.36	1.39	1.42
female	26-55	55	1	2.11	2.2	2.16	2.2	2.18	2.36	2.38	2.55*	2.53*
				1.11	1.12	1.1	1.06	1.05	1.06	1.02	1.11	1.1
			2	2.38	2.53	2.51	2.51	2.51	2.75	2.75	2.85**	2.84**
				1.34	1.3	1.21	1.15	1.15	1.23	1.23	1.25	1.24
	.		5	2.64	2.87	2.85	2.87	2.84	3.02	3.02	3.13*	3.13*
				1.26	1.2	1.2	1.12	1.2	1.09	1.09	1.13	1.13

Note. SC – Scenario number. A significant difference between the reported scores for the self versus others is marked with asterisk/s: * $p<.05$, ** $p< .01$, ***$p< .001$.