



# Identifying the psychological correlates of parents' intentions to enroll their children in learn-to-swim lessons for the first time

Kyra Hamilton<sup>a,b,c,\*</sup>, Jacob J. Keech<sup>a</sup>, Daniel John Phipps<sup>a,c</sup>, Amy E. Peden<sup>d,e</sup>, Martin S. Hagger<sup>a,b,c,e,f</sup>

<sup>a</sup> School of Applied Psychology, Griffith University, Australia

<sup>b</sup> Health Sciences Research Institute, University of California, Merced, USA

<sup>c</sup> Faculty of Sport and Health Sciences, University of Jyväskylä, Finland

<sup>d</sup> School of Population Health, Faculty of Medicine and Health, University of New South Wales, Kensington, NSW, Australia

<sup>e</sup> College of Public Health, Medical and Veterinary Sciences, James Cook University, Townsville, QLD, Australia

<sup>f</sup> Psychological Sciences, University of California, Merced, CA, USA

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## ABSTRACT

**Introduction:** While enrollment in swimming lessons is associated with lower drowning risk in children, many parents do not enroll their children in formal lessons. To understand these decisions, the current research investigated the social cognition factors that drive parents' intentions to enroll their children for the first time. **Methods:** Using a mixed methods design, beliefs about enrolling one's child in swimming lessons were elicited in a sample of 22 Australian parents. A second sample of 323 then rated the extent to which they agree with each of these beliefs and completed measures of an extended theory of planned behavior (TPB) model including autonomous motivation, risk perception, and role construction. **Results:** Results showed a range of behavioral, normative, and control beliefs to significantly predict intention to enroll. In the model, subjective norm, perceived behavioral control, risk perception, and role construction all predicted intention to enroll. Autonomous motivation had an indirect effect on intention via the TPB constructs. **Conclusions:** Targeting beliefs that non-enrollment places a child at risk, that enrollment is under a parent's control, that others would want parents to enroll their child, and that it is the responsibility as a parent to enroll their child may be viable messages for intervention. **Practical implications:** Current results signpost several potential belief-based targets for interventions encouraging enrollment in swimming lessons. However, as qualitative data also indicated structural barriers to enrolment, such strategies should be paired with attempts to ensure swimming lessons are affordable and accessible to the wider population.

## 1. Introduction

As the third leading cause of unintentional injury death worldwide, drowning accounts for over 236,000 deaths each year (World Health Organization, 2021). In Australia, on average, 279 people have died due to unintentional drowning each year across the last decade (Royal Life Saving Society – Australia, 2023), with estimates of hospitalizations due to nonfatal drowning incidents approximately three times higher (Peden et al., 2018). Drowning as an injury mechanism is of particular concern to public health researchers and water safety practitioners, given drowning is considered, for the most part, preventable (Australian Institute of Health and Welfare, 2015). Thus, governments, in

combination with health and drowning prevention sectors in Australia, have placed a strong emphasis on the reduction of drowning deaths, with a key aim being to reduce the number of drownings by 50% by 2030 (Australian Water Safety Council, 2021).

While several high-risk populations, locations, and activities have been identified for reducing unintentional drownings, one key life stage that has been flagged by experts is children 0–14 years of age. As per the current national framework for swimming and water safety (Royal Life Saving Society – Australia, 2019), children in this age group should be increasingly focused upon acquiring the skills and knowledge needed to remain safe in the water, including in recognizing dangerous situations, treading water, and swimming for at least 50 m. However, despite a

\* Corresponding author at: School of Applied Psychology, Griffith University, 176 Messines Ridge Road, Mt Gravatt, Queensland, QLD 4122, Australia.  
E-mail address: [kyra.hamilton@griffith.edu.au](mailto:kyra.hamilton@griffith.edu.au) (K. Hamilton).

clear framework and development benchmarks, as well as recommendations from the World Health Organization of the importance of teaching school-aged children swimming and water safety skills (World Health Organization, 2017), evidence indicates many children do not meet the minimum recommended requirements by age 14 (Peden & Franklin, 2012; Willcox-Pidgeon et al., 2020).

One reason for falling short of this goal may be that, despite swimming being the most popular children's out-of-school organized physical activity in Australia, some children still do not attend organized classes (Australian Sports Commission, 2018; Willcox-Pidgeon et al., 2020). A lack of participation in learn to swim has been linked to social determinants of health, with barriers including cost, access, cultural appropriateness, and previous negative aquatic experiences (Franklin et al., 2015; Peden & Franklin, 2020; Willcox-Pidgeon et al., 2020). This lack of participation in out-of-school lessons is especially important given the limited learn to swim instruction provided during school time. In New South Wales, where this study takes place, the New South Wales Department of Education offers opportunities for students in Years 2 to 6, who are unable to swim 25 m with confidence in deep water, to attend daily 45 min lessons for 10 consecutive days to develop water safety awareness, and focus on competitive strokes. A five day survival swimming program is available to all students in the primary school setting (NSW Department of Education, 2024). Such programs deserve praise, yet are not sufficient to teach a child to swim if this is the only instruction they receive (Peden & Franklin, 2012; Willcox-Pidgeon et al., 2020).

To design public health strategies to encourage enrollment in formal swimming lessons, it is first important to understand the beliefs and social cognitions of those who have, to date, opted not to enroll their children in out of school learn-to-swim programs. A prominent model for understanding social cognition beliefs is the theory of planned behavior (TPB) model (Ajzen, 1991). The model posits that intention is the most proximal predictor of behavior and intention, in turn, is determined by three forms of social cognition beliefs: attitude, underpinned by behavioral beliefs and defined as an individual's evaluations of what they view as the likely positive or negative outcomes of a behavior; subjective norm, underpinned by normative beliefs and defined as an individual's perception of whether important others would approve or disapprove of a behavior; and perceived behavioral control, underpinned by control beliefs and defined as an individual's beliefs about whether a behavior falls under their control or capacity.

To date, evidence supports the TPB in explaining a range of health behaviors (McEachan et al., 2011) and, in particular, parent-for-child behaviors (Hamilton et al., 2020). With respect to drowning risk and prevention, the model has predicted behaviors such as parents supervising children near pools (Hamilton et al., 2019a), swimming after consuming alcohol (Hamilton & Schmidt, 2014), and driving into floodwaters (Hamilton et al., 2022). Despite the evidence in favor of the TPB and its value as a parsimonious framework of behavior from relatively few determinants, the model still faces regular criticism in that model constructs do not present a complete set of determinants for intention, and in turn, behavior. Contemporary research into the determinants of health behavior has therefore invested efforts into examining theoretically and empirically relevant additional constructs that may improve the explanatory power of the TPB.

One key example of this is the integrated behavior change model (Hagger & Chatzisarantis, 2014; Hagger & Hamilton, 2020), a core component of which is the inclusion of *autonomous motivation* in the TPB. Autonomous motivation is drawn from self-determination theory (Deci & Ryan, 1985), and is defined as motivation emanating from oneself, where action is viewed as consistent with one's image of self and enacted by choice rather than as the result of external reinforcement or pressures. In the integrated behavior change model, autonomous motivation is hypothesized to predict intention both directly, and with effects modelled through the TPB constructs; a proposition supported by empirical evidence (Hagger et al., 2017; Hamilton et al., 2017; Phipps

et al., 2020).

Another construct that may be of value in supplementing the TPB is *risk perception*. The risk perception construct is drawn from the health belief model and is defined as a combination of an individuals' perceptions around their vulnerability to the negative consequences of a behavior and how likely they believe they are to encounter these negative consequences. Across health behavior research, risk perception has predicted a range of behaviors (Brewer et al., 2007; Janz & Becker, 1984). However, in the drowning research context, the construct has demonstrated mixed findings, as while risk perception has been shown to account for a modest association with intention, it also has accounted for only small or even null effects in regression models when also considering TPB constructs (Hamilton et al., 2019a; Hamilton & Schmidt, 2014; Pearson & Hamilton, 2014). The mixed findings are in contrast to the weight placed on risk perception in theory as a predictor of behaviors where there is an inherent risk or potential negative outcome (Ferrer & Klein, 2015; Janz & Becker, 1984).

It is also important to consider that many TPB studies focus on health behaviors targeted towards the self (McEachan et al., 2011), rather than making health decisions for important others, as is the case in the current context of enrolling ones child in swimming lessons. Thus, it may be valuable considering additional influences that come into play for parents acting on behalf of their children. A core concept in this space is *role construction*, a combination of a parents beliefs about what is desirable for their child, their responsibilities around achieving these desired outcomes, and the perceptions and actions of significant others and similar reference groups (Hoover-Dempsey & Sandler, 1995). While limited, research supports the concept of role construction (Bracke & Corts, 2012) and its potential effects on parents actions toward their children's health and safety (Combs & Ickes, 2021; Thomson et al., 2012), including in the context of drowning prevention (Hamilton et al., 2019a).

### 1.1. The current study

The aim of the current study was to investigate the beliefs and social cognition factors underpinning parents' intention to enroll their child (primary school age; approximate ages 5–12 years) in formal swimming lessons outside of the school context for the first time. In doing so, we aimed to provide formative data that may guide future research as well as inform behavior change interventions targeting this important behavior in line with current global and Australian water safety guidance (Australian Water Safety Council, 2016; Royal Life Saving Society – Australia, 2019; World Health Organization, 2017). We sought to achieve this in the current research using a mixed method design. First, using TPB belief elicitation methods, we collected qualitative data on the behavioral, normative, and control beliefs underlying parents' intention to enroll their child in an out-of-school swimming program for the first time. We then identified, through quantitative survey methods and regression analysis, the degree to which the endorsement of each elicited belief was related to parents' intention to enroll their child in a swim program. Finally, adopting an extended TPB model that included autonomous motivation, risk perception, and role construction, we used structural equation modelling to test the social cognition factors that predicted intention to enroll one's child in swimming lessons for the first time. Specifically, we hypothesized autonomous motivation would positively predict attitude, subjective norms, and perceived behavioral control. In turn, attitude, subjective norm, perceived behavioral control, risk perceptions, and role construction were all hypothesized to be associated with stronger enrollment intentions.

## 2. Methods

### 2.1. Elicitation study

An elicitation study was conducted on 22 parents of primary school

age children (i.e., children of approximate ages 5–12 years old) who had never enrolled their child in formal swimming lessons outside school and who resided in New South Wales, Australia. Full demographic information for the sample is presented in Table 1. Participants were sourced from an independent research panel company in September 2019. Participants were asked six open-ended questions, two about their behavioral beliefs (“What do you see as the advantages/disadvantages of enrolling your child in formal swimming lessons outside of school?”), two about their normative beliefs (“Please list the individuals or groups who approve or think you should enroll/disapprove or think you should not enroll your child in formal swimming lessons outside of school?”), and two about their control beliefs (“Please list any factors or circumstances that would help you/make it difficult for you to enroll your child in formal swimming lessons outside of school?”). Responses were analyzed using the NVivo software to group recurring themes and beliefs elicited from the sample, and to determine the frequency of these beliefs. Elicited beliefs are presented in Table 2.

### 3. Main study

#### 3.1. Participants and Procedures

The sample for the main study consisted of 323 parents of primary school age children (approximate ages 5–12 years) who had not enrolled their child in formal swimming lessons and who resided in Australia. Participants were recruited via a panel company from November 2019 to January 2020 and were required to complete an online survey via the Qualtrics platform. Full demographic information for all participants is presented in Table 1.

**Table 1**  
Participant demographic characteristics.

Demographic characteristic	Phase 1 (N = 22)	Phase 2 (N = 323)
Gender		
Male	9 (40.9%)	102 (31.6%)
Female	13 (59.1%)	220 (68.1%)
Other	0 (0.0%)	1 (0.3%)
Marital status		
Married registered	16 (72.7%)	147 (45.5%)
Married de facto	3 (13.6%)	65 (20.1%)
Separated/divorced	1 (4.5%)	41 (12.7%)
Widowed	0 (0%)	2 (0.6%)
Never married	2 (9.1%)	68 (21.1%)
Employment status		
Full-time work	12 (54.5%)	129 (39.9%)
Part-time/casual work	5 (22.7%)	72 (22.3%)
Full-time student	0 (0%)	7 (2.2%)
Part-time student	0 (0%)	7 (2.2%)
Unemployed/home duties	5 (22.7%)	108 (33.4%)
Household income (annual)		
Nil – \$18,200	0 (0%)	22 (6.8%)
\$18,201–\$37,000	4 (18.2%)	46 (14.2%)
\$37,001–\$80,000	7 (31.8%)	105 (32.5%)
\$80,001–\$180,000	10 (45.5%)	135 (41.8%)
>\$180,001	1 (4.5%)	15 (4.6%)
Highest educational attainment		
Completed junior school (yr 10)	1 (4.5%)	50 (15.5%)
Completed senior school (yr 12)	2 (9.1%)	38 (11.8%)
TAFE certificate/diploma	5 (22.7%)	111 (34.4%)
Undergraduate degree	8 (35.4%)	86 (26.6%)
Postgraduate degree	6 (27.3%)	38 (11.8%)
Language Spoken at Home		
English	17 (77%)	294 (91%)
Other	5 (23%)	29 (9%)
Age		
Mean (SD)	36.2 (5.6)	36.9 (7.2)
Minimum	26	20
Maximum	49	60

**Table 2**

Key beliefs of parents toward enrolling their child in formal swimming lessons in the next six months.

Beliefs	Theme	Non-Enrollers (N = 22)	
Advantages	Child will know how to stay safe in water	50 %	
	High quality training from a professional instructor	27 %	
	Child will become a stronger swimmer	18 %	
	Child will learn a new life skill	18 %	
	Keeps child active	14 %	
	Child will be able to swim socially with friends	14 %	
	Child will build water confidence	14 %	
	Child enjoys swimming	14 %	
	Disadvantages	Cost	50 %
		The time required	41 %
No disadvantages		27 %	
People who would approve		Family	27 %
	Lifesaving societies and lifeguards	27 %	
	The child’s other parent	18 %	
	Friends	14 %	
	The government and child welfare groups	14 %	
	Teachers/school	14 %	
	No-one	59 %	
People who would disapprove	Facilitators	Affordable lessons	59 %
		Assistance with picking up and dropping off child	14 %
		Convenient class times	14 %
Barriers		Cost	55 %
		Lack of time	45 %
		Lack of available classes that fit our routine	18 %
		Work commitments	14 %

#### 3.2. Measures

**Behavioral beliefs.** Behavioral beliefs assessed advantages and disadvantages to enrolling and were measured using 10 questions derived from the elicitation study (Ajzen, 2006). Responses were provided on 7-point scales.

**Normative beliefs.** Normative beliefs assessed important others approval or disapproval to enrolling and were measured using seven questions derived from the elicitation study. Responses were provided on 7-point scales (Ajzen, 2006).

**Control beliefs.** Control beliefs assessed barriers to enrolling and were measured using four questions derived from the elicitation study. Responses were provided on 7-point scales (Ajzen, 2006).

**Autonomous motivation.** Autonomous motivation was measured using four items assessing parents’ level of agreement about the reason for enrolling their child in formal swimming lessons in the next six months. Responses were provided on 7-point scales (Deci & Ryan, 1985).

**Attitude.** Attitude toward enrolling their child in formal swimming lessons outside of school in the next six months was assessed using four items preceded by the common stem: “Enrolling my child in formal swimming lessons outside of school in the next 6 months would be... 1 = bad to 7 = good”. Responses were provided on 7-point semantic differential scales (Ajzen, 2006).

**Subjective norm.** Subjective norm was measured using three questions prompting participants to rate the extent to which important others would want them to enroll their child in formal swimming lessons outside of school in the next six months. Responses were provided on 7-point scales (Ajzen, 2006).

**Perceived behavioral control.** Perceived behavioral control was measured using four items assessing parents’ perceptions of control and

capability over enrolling their child in formal swimming lessons outside of school in the next six months. Responses were provided on 7-point scales (Ajzen, 2006).

**Risk perception.** Risk perception was measured using two items assessing parents’ level of agreement that not enrolling their child in formal swimming lessons outside of school in the next six months would have risk. Responses were provided on a 7-point scale (Gholami & Schwarzer, 2014).

**Role construction.** The extent to which participants believed enrolling their child in formal swimming lessons outside of school was an important part of their role as a parent was assessed using four items. Responses were provided on a 7-point scale (Hamilton et al., 2016).

**Intention.** Intention to enroll their child in formal swimming lessons outside of school in the next six months was assessed using four items. Responses were provided on a 7-point scale (Ajzen, 2006).

3.3. Data analysis

To test the effect of each set of elicited belief on intentions, multiple regression analyses were conducted using SPSS version 28, with a model fitted for each set of beliefs (i.e., behavioral, normative, and control beliefs) separately, thus three multiple regression models were performed. Next, to assess the proposed extended TPB, a structural equation model was fitted using the lavaan package in R version 4.2 (R Core Team, 2013; Rosseel, 2012). The model was specified such that indicator items for each construct were used to form latent variables for each construct, which were then applied to a structural model testing the hypothesized relations between constructs. Specifically, that autonomous motivation predicted the attitude, subjective norm, and perceived behavior control constructs from the TPB, and attitude, subjective norm, perceived behavioral control, risk perceptions, and role construct predicted enrolment intentions.

4. Results

4.1. Beliefs

Descriptive statistics for each elicited behavioral, normative, and control belief, as well as the belief-intention relationship for each, as a bivariate correlation and when regressed simultaneously on intention is presented in Table 3. Correlational analysis found all behavioral, normative, and control beliefs identified in the elicitation study were correlated with intention to enroll children in formal swimming lessons outside of school in the next six months, with the exception of the control belief regarding work commitments. The elicited sets of behavioral beliefs ( $F(10, 312) = 29.22, p < 0.001, R^2 = 0.484$ ), normative beliefs ( $F(7, 315) = 66.34, p < 0.001, R^2 = 0.596$ ), and control beliefs ( $F(3, 319) = 17.59, p < 0.001, R^2 = 0.142$ ) all predicted a significant portion of variance in parents’ intention to enroll their child in formal swimming lessons outside of school in the next six months. Specifically, intention was predicted by the behavioral beliefs that enrolling their child would “Help my child to know how to stay safe in water,” “Enable my child to swim socially with friends,” and “Teach my child a new life skill,” as well as “Be costly,” albeit with a negative effect; the normative beliefs that family members, the child’s other parent, and friends would want the parent to enroll their child in formal swimming lessons outside of school in the next six months; and the control beliefs that cost, a lack of classes which fit into routines, and lack of time were a barrier to enrollment.

4.2. Testing an integrated behavior change model

Descriptive statistics and bivariate correlations between model constructs are available in Table 4. The model displayed good fit to data ( $\chi^2(259) = 648.40, p < 0.001, CFI = 0.957, TLI = 0.950, RMSEA = 0.068$ ), with all items loading onto their respective constructs as

Table 3

Descriptive statistics for key beliefs and their relationship with intention in bivariate and univariate models.

	M (SD)	Intention		
		r	$\beta$	p
Behavioural Beliefs: <i>If I enrol my child in formal swimming lessons outside of school in the next 6 months, it would...</i>		$R^2 = 0.484^{***}$		
Help my child to know how to stay safe in water	5.99 (1.42)	0.56 <sup>***</sup>	0.35	<.001
Provide high quality training from a professional instructor	5.80 (1.41)	0.43 <sup>***</sup>	0.01	0.939
Help my child become a stronger swimmer	5.99 (1.40)	0.41 <sup>***</sup>	-0.07	0.363
Teach my child a new life skill	5.87 (1.51)	0.54 <sup>***</sup>	0.24	0.002
Keep my child active	6.11 (1.25)	0.40 <sup>***</sup>	-0.13	0.092
Enable my child to swim socially with friends	5.77 (1.50)	0.45 <sup>***</sup>	0.20	0.004
Help my child to build water confidence	6.00 (1.40)	0.49 <sup>***</sup>	-0.00	0.968
Be enjoyable for my child	5.78 (1.50)	0.47 <sup>***</sup>	0.05	0.448
Be costly	5.50 (1.75)	-0.38 <sup>***</sup>	-0.34	<.001
Be time consuming	4.85 (1.76)	-0.25 <sup>***</sup>	0.04	0.462
Normative Beliefs: <i>The following people are likely to think I should enrol my child in formal swimming lessons outside of school in the next 6 months...</i>		$R^2 = 0.596^{***}$		
Family members	5.01 (1.98)	0.75 <sup>***</sup>	0.26	<.001
My child’s other parent	4.73 (2.19)	0.70 <sup>***</sup>	0.38	<.001
Friends	4.62 (1.94)	0.69 <sup>***</sup>	0.25	<.001
Lifesaving societies and lifeguards	5.44 (1.80)	0.35 <sup>***</sup>	-0.04	0.502
The government and child welfare groups	5.01 (1.89)	0.44 <sup>***</sup>	0.01	0.924
Teachers/school	5.11 (1.82)	0.54 <sup>***</sup>	0.01	0.919
Swimming instructors	5.63 (1.71)	0.37 <sup>***</sup>	-0.06	0.281
Control Beliefs: <i>How likely are the following to prevent you enrolling your child in formal swimming lessons outside of school in the next 6 months...</i>		$R^2 = 0.142^{***}$		
Cost	5.37 (1.98)	-0.31 <sup>***</sup>	-0.25	<.001
Lack of time	4.50 (2.02)	-0.31 <sup>***</sup>	-0.32	<.001
Lack of available classes that fit your routine	4.78 (1.97)	-0.17 <sup>**</sup>	0.19	0.016
Work commitments	4.21 (2.15)	-0.11	-	-

Note. r refers to the bivariate correlation between each belief and intention.  $\beta$  refers to each beliefs relationship with intention in a multiple regression model. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

expected (see Table 5). Parameter estimates for the structural model are presented in Table 6, and the model is presented visually in Fig. 1. The model predicted 74% of the variance in intention. Parents’ intention to enroll their children in formal swimming lessons outside of school in the next six months was predicted by subjective norm, perceived behavioral control, role construction, and risk perception. Although there was no direct effect of autonomous motivation on intention, autonomous motivation did predict intention indirectly via subjective norm and perceived behavioral control and exhibited a moderate sized total effect on intention. Attitude did not predict intention.

**Table 4**

Bivariate correlations and descriptive statistics for the motivational and social cognition bases predictions of enrolment intentions.

	1	2	3	4	5	6	$\alpha$	$M$	$SD$
1. Autonomous Motivation	–						0.938	5.37	1.64
2. Attitude	0.663***	–					0.942	5.95	1.39
3. Subjective Norm	0.683***	0.682***	–				0.882	5.23	1.53
4. Perceived Behavioural Control	0.352***	0.410***	0.376***	–			0.772	5.52	1.17
5. Risk Perception	0.557***	0.530***	0.518***	0.303**	–		0.860	3.97	1.84
6. Role Construction	0.725***	0.683***	0.683***	0.387***	0.598***	–	0.934	4.90	1.67
7. Intention	0.670***	0.667***	0.716***	0.471***	0.624***	0.738***	0.985	4.31	2.10

Note. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . Higher scores on each measure indicate a more favourable belief towards enrolling one’s child in swimming lessons.

**Table 5**

Unstandardized factor loadings for model constructs and intention.

Scale	Loading	SE Loading	$p$
<b>Attitude</b>			
Item 1	1.00		
Item 2	1.13	0.08	<.001
Item 3	1.14	0.08	<.001
Item 4	1.07	0.06	<.001
<b>Subjective Norm</b>			
Item 1	1.00		
Item 2	1.67	0.14	<.001
Item 3	1.56	0.13	<.001
<b>Perceived Behavioural Control</b>			
Item 1	1.00		
Item 2	5.24	0.02	0.008
Item 3	4.63	0.02	0.005
Item 4	1.04	0.03	0.001
<b>Intention</b>			
Item 1	1.00		
Item 2	1.04	0.02	<.001
Item 3	1.04	0.02	<.001
Item 4	1.04	0.02	<.001
<b>Role Construction</b>			
Item 1	1.00		
Item 2	1.16	0.047	<.001
Item 3	1.11	0.074	<.001
Item 4	1.16	0.074	<.001
<b>Risk Perception</b>			
Item 1	1.00		
Item 2	1.07	0.07	<.001
<b>Autonomous Motivation</b>			
Item 1	1.00		
Item 2	1.04	0.04	<.001
Item 3	1.09	0.05	<.001
Item 4	0.79	0.05	<.001

**5. Discussion**

In the current study we sought to investigate the beliefs and social cognition factors underpinning parents’ intentions around enrolling their child in out-of-school swimming lessons for the first time. All beliefs elicited in the qualitative research were found to correlate with intention to enroll, except the belief that work commitments were a barrier to enrollment, with a range of behavioral, normative, and control beliefs observed to predict intention. In the extended TPB, subjective norm, perceived behavioral control, risk perception, and role construction, but not attitude, significantly predicted intention. The TPB constructs also significantly mediated the effect of autonomous motivation on intention. Overall, current findings provide useful formative evidence that can inform future behavioral interventions aimed at encouraging parents to enroll their children in learn-to-swim programs.

Regarding the TPB, we observed the expected results of subjective norm and perceived behavioral control on intention, but not the hypothesized effect of attitude. Such a finding is inconsistent with theory and previous evidence, where attitude has shown to be a strong predictor of health and parent-for-child behaviors (Ajzen, 1991; Hamilton et al., 2020; McEachan et al., 2011). It could be speculated that general attitudes toward enrolling children in out of school swimming lessons

**Table 6**

Parameter estimates for the expanded theory of planned behaviour model.

Path	$B$	SE $B$	$p$	$\beta$
<b>Direct Effects</b>				
Autonomous Motivation → Attitude	0.550***	0.044	<.001	0.714
Autonomous Motivation → Subjective Norm	0.473***	0.045	<.001	0.741
Autonomous Motivation → Perceived Behavioural Control	0.087**	0.025	0.001	0.476
Autonomous Motivation → Intention	0.002	0.086	0.983	0.002
Attitude → Intention	0.100	0.097	0.306	0.063
Subjective Norm → Intention	0.580***	0.157	<.001	0.304
Perceived Behavioural Control → Intention	1.740*	0.773	0.024	0.261
Risk Perception → Intention	0.219**	0.065	0.001	0.184
Role Construction → Intention	0.381**	0.112	0.001	0.281
<b>Covariances</b>				
Attitude ↔ Perceived Behavioural Control	0.050	0.027	0.060	0.222
Attitude ↔ Subjective Norm	0.232**	0.084	0.006	0.386
PBC ↔ Subjective Norm	0.034	0.020	0.094	0.188
Autonomous Motivation ↔ Risk Perception	1.723***	0.201	<.001	0.648
Autonomous Motivation ↔ Role Construction	1.876***	0.216	<.001	0.800
Risk Perception ↔ Role Construction	1.621***	0.182	<.001	0.677
<b>Indirect and Total Effects</b>				
Autonomous Motivation → Attitude → Intention	0.055	0.053	0.306	0.045
Autonomous Motivation → Subjective Norm → Intention	0.274***	0.070	<.001	0.225
Autonomous Motivation → Perceived Behavioural Control → Intention	0.151***	0.034	<.001	0.124
Autonomous Motivation (Total) → Intention	0.482***	0.095	<.001	0.396

Note. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

were quite positive in the majority of the sample (i.e., 74% have an attitude score higher than 5 out of 7), a finding observed in other parent-for-child drowning prevention behaviors (Hamilton et al., 2019b). While this may be indicative of ceiling effects in the measurement of attitude, it is also possible that, given the value placed on swimming education in Australian culture, attitude did not predict intention as parents in general agree that there is a strong potential value in enrolling children in swimming lessons. This may be a reflection of the success of previous attitude based public health strategies promoting the value of safe swimming, such as the long running ‘Keep Watch’ or “Kids Alive” campaigns for parents (Royal Life Saving Society – Australia, 2021), although the need for a broader approach in future seems needed.

This need for a broader approach is supported by current findings given subjective norm and perceived behavioral control predicted intention. Drawing on the qualitative results, it might be useful for messages to focus on encouraging the beliefs that parents’ friends and family would want them to enroll their children in swimming lessons and fostering the belief that parents are able to accommodate swimming lessons into their and their child’s schedules. However, a key belief associated with being less likely to intend to enroll was having concern over the cost of lessons. Such a finding is consistent with evidence that

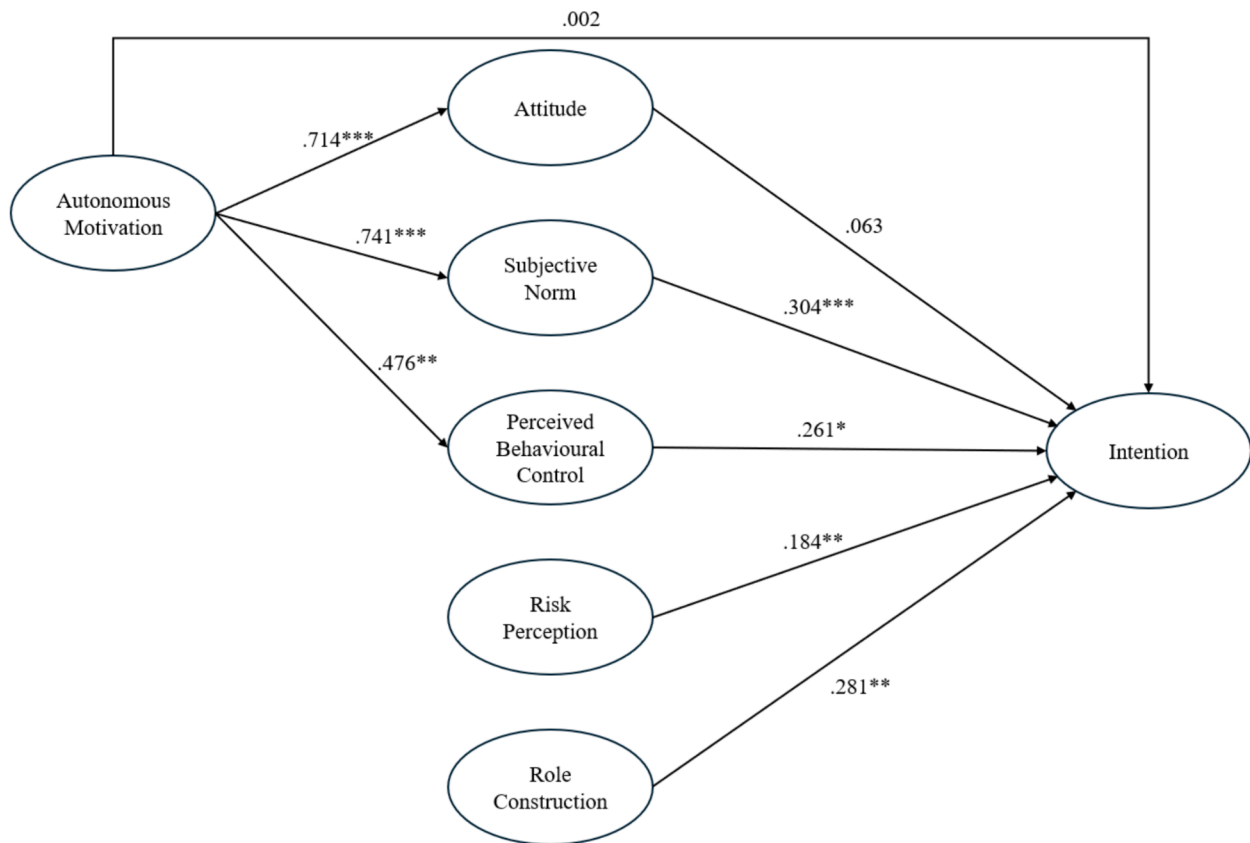


Fig. 1. The structural model predicting enrolment intentions with an extended theory of planned behaviour model. Note. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

enrollment and general swimming efficacy in children is associated with socio-economic factors (Willcox-Pidgeon et al., 2020). Thus, while targeting beliefs to improve enrollment may prove efficacious, governments and interest groups should also take steps to ensure swimming lessons are financially and practically accessible to all.

In support of including additional constructs in the TPB, autonomous motivation had a significant effect on attitude, subjective norm, and perceived behavioral control, and a significant indirect effect on intention. This is in line with the integrated behavior change model and the tenants of self-determination theory (Deci & Ryan, 1985; Hagger & Chatzisarantis, 2014), and indicates those who view enrolling their child in swimming lessons as something they believe is personally important are more likely to in turn hold beliefs in favor of enrollment. This may be of particular importance for behavior change, as behaviors stemming from autonomous motivation are more likely to be maintained than behaviors motivated by external pressures (Ryan et al., 2008). In light of this, public health strategies around improving enrollment should focus on helping parents to internalize the value of swimming lessons, such as by fostering feelings of ownership, control, and interest when considering their child’s swimming lessons (Deci & Ryan, 1985).

Support for the integration of additional social cognition beliefs in the TPB was also found with both risk perception and role construction significantly predicting intention. The significant effect of risk perception on intention aligns with evidence suggesting perceptions of risk may be an important determinant of behavior where action or inaction carries an inherent risk or potential negative outcome (Ferrer & Klein, 2015; Janz & Becker, 1984). This could be the case in the current research, as parents may believe that not enrolling their children in swimming lessons poses an increased risk of drowning related injury or death. Although it might seem useful to try to increase the salience of these risks, there is a danger of using fear appeals without providing efficacy messages (Peters et al., 2013), such as informing parents how they can enroll their children in swimming lessons.

Similarly, role construction also predicted intention with effects beyond those already accounted for by the TPB, in line with previous evidence and theory (Bracke & Corts, 2012; Hamilton et al., 2019a; Hoover-Dempsey & Sandler, 1995). Thus, it appears parents who believe enrolling their child in out-of-school swimming lessons is in line with what they perceive as society’s expectations of them as a parent, are in turn more likely to hold intentions to enroll their child in the future. Together with the observed effect of subjective norm, these results signpost the potential for strategies targeting parents’ normative beliefs around the perceptions of significant others and society as a whole as a viable target for prospective public health interventions, while simultaneously ensuring structural barriers to access (such as cost and availability) are addressed (Willcox-Pidgeon et al., 2020).

### 5.1. Strengths, limitations, and future directions

The current study had several notable strengths, including a mixed method design and a strong, theory-based framework. However, the research is inherently not without its limitations. First, the outcome measure of the current research was participants’ intention to enroll their children in out-of-school swimming lessons for the first time, rather than actual enrollment. While intention is often considered as one of the most proximal predictors of behavior, it is important to note that intentions do not always translate into action, and despite having good intentions, other barriers may be present that make enrollment challenging. Thus, future research may seek to extend current findings to investigate the extent to which the tested model also predicts actual enrollment in the future, and the extent to which control beliefs moderate this effect. Second, the current research focused on the prediction of enrollment intentions in a sample of those who had, to date, never enrolled their child in swimming lessons. While this is an inherently valuable sample, particularly in the context of meeting drowning reduction goals, it does not fully encompass factors that may lead to

children falling short of swimming benchmarks, such as dropping out of swimming lessons without acquiring all necessary skills or negative experiences during swimming lessons (Peden & Franklin, 2012). Future research may seek to address this by using the current model to investigate the factors underpinning the continuation of classes to achieve desired outcomes. Finally, it is important to consider that data for the current research were collected in the spring-summer and prior to the COVID-19 pandemic. It may be that during cooler periods of the year parents and children place less value of swimming and face other challenges to encouraging enrollment (Mahony et al., 2017) such as cold weather, illness or seasonal facilities, common in rural and remote areas. Similarly, the COVID-19 pandemic may have presented additional barriers or changes in parental circumstance, priorities, and social norms (Ananthapavan et al., 2023).

## 5.2. Conclusions

The current study sought to investigate, using a rigorous mixed methods approach, the beliefs and social cognition factors underpinning parents' intentions to enroll their children in out-of-school swimming lessons for the first time. A range of behavioral, normative, and control beliefs elicited in qualitative research were found to be associated with enrollment intention. In the expanded TPB, subjective norm, perceived behavioral control, risk perception, and role construction all had direct effects on intention to enroll, while autonomous motivation predicted intention indirectly with effects modelled through TPB constructs. Given a significant proportion of children under 14 years of age are not meeting the desired minimum swimming competencies (Peden & Franklin, 2012; Willcox-Pidgeon et al., 2020), this research presents a valuable step for developing theory-based drowning prevention strategies and progressing towards national drowning prevention goals. In particular, current findings indicate the potential efficacy of strategies to encourage enrollment by educating parents on the risks of non-enrollment, fostering normative and role-based beliefs in favor of enrollment, and reducing perceptions of difficulty and barriers to enrollment. However, the repeated indication that cost may be a barrier to enrollment flagged in qualitative research likely also indicates such strategies to change beliefs may be best used when in combination with strategies to reduce the structural barriers to enrollment.

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### CRedit authorship contribution statement

**Kyra Hamilton:** Conceptualization, Data curation, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Writing – original draft, Writing – review & editing. **Jacob J. Keech:** Conceptualization, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing, Data curation, Formal analysis. **Daniel John Phipps:** Formal analysis, Writing – original draft, Writing – review & editing. **Amy E. Peden:** Conceptualization, Funding acquisition, Investigation, Methodology, Writing – original draft, Writing – review & editing. **Martin S. Hagger:** Conceptualization, Funding acquisition, Investigation, Methodology, Writing – original draft, Writing – review & editing.

### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Data Availability:

All research data and analysis scripts are available at <https://osf.io/v26gq/>.

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**Dr Kyra Hamilton** is currently a Professor at the School of Applied Psychology at Griffith University. Her main areas of research are health psychology and behavioral medicine with particular interests in health behavior motivation, self-regulation, and change. She focuses on behaviors of national and international importance to understand and intervene to change the beliefs, attitudes, motivations, and behaviors of individuals, health professionals, and policy makers. She is particularly interested in understanding the multiple effects of motivational, volitional, and automatic processes on health behavior and applying integrative models of behavior change as well as translation of research findings into policy and practice.

**Dr Jacob Keech** is a Lecturer in Psychology in the School of Applied Psychology at Griffith University in Queensland, Australia. Broadly, he conducts research in the field of Health Psychology, with specific research interests focus on improving quality of life through enhancing physical and psychological health and wellbeing. His research aims to achieve this by exploring factors that may reduce the impact of stress on health and quality of life, and through the use of psychological theories to understand and change health behaviors.

**Dr Daniel Phipps** is post-doctoral research fellow at Jyväskylä University, Finland. His research is focused on the testing and extension of models of health behavior. Specifically, his research aimed to expand upon common models of social cognition in health behavior, integrating concepts such as motivation and self-regulation, and investigating the contexts and situations in which behavior is like to be enacted as the result of considered decision making as compared to as the result of automatic or habitual processes.

**Dr Amy Peden** is a Senior Research Fellow in the School of Population Health at the University of New South Wales in Sydney, Australia. As an injury prevention researcher and advocate, she specializes in adolescent injury and specifically drowning prevention - epidemiology of fatal and non-fatal drowning, risk factor identification and evaluation of drowning prevention interventions. Dr Peden regularly appears in and writes for media on the topic of drowning prevention.

**Dr Martin Hagger** is a Distinguished Professor in the Department of Psychological Sciences at University of California, Merced, USA. His research studies the relations between theory-based psychological constructs and health behavior, and how health professionals can use knowledge of these determinants to promote health behavior change through intervention. He is also interested in developing and advancing psychological theory through theoretical integration, particularly the integration of constructs and processes from social cognition theories, theories of motivation, and dual-process and dual-phase models. Further he is interested in research synthesis, particularly testing predictions of psychological theory across multiple populations, contexts, and behaviors using meta-analysis.