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RESEARCH

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Parents, Pals, or Pedagogues? How Youth Learn About Water Safety

Kevin Moran

While investment in water safety education appears sound, little is known about how youth construct their understanding of water safety principles and what formative influences impact on their beliefs and practices. Year 11 students (n = 2,202) from 41 high schools took part in a nationwide survey on youth water safety knowledge, attitudes, and behaviors. The self-completion written questionnaire was undertaken in school time in the second term of 2003. Data were analyzed using a range of sociodemographic variables, including gender, socioeconomic status, and ethnicity. The formative influence of peers, family, and schooling on the water safety of youth who took part in the study varied considerably. Several key findings suggest that males construct their understanding of water safety and drowning risk differently from that of females. Notably, ten times as many male youth identified peers as the primary source of water safety understanding; however, males reported observing much higher incidence of unsafe practice among their friends. Females were more likely to identify parents and schools as their primary source of water safety knowledge. Ways of addressing these differences are discussed.

A consensus exists among the aquatics education community that the teaching of water safety knowledge and skills will shape positive water safety attitudes and perceptions and lead to safe behavior in, on, and around water. Such beliefs are considered particularly relevant to the education of children and youth because they are consistently overrepresented in the drowning statistics of most developed countries. Globally, drowning ranks among the top three causes of child and youth death from unintentional injury (WH0, 2008) and is the second leading cause of injury-related death among children and youth, exceeded only by deaths from motor vehicle incidents (Brenner, 2002). While investment in water safety education appears sound, little is known about how youth are informed about water safety. Previously reported work by the author (Moran, 2008a) has provided evidence on the variability of youth water safety skills and knowledge, but what formative influences might have shaped their understanding of water safety requires further exploration. Such exploration may shed light on ways to best address shortcomings in youth water safety knowledge and thereby reduce their risk of drowning.

Among many possible "significant others" who operate at an interpersonal and community level in young people's lives, the influence of peers on youth perceptions of water safety may be particularly important. Previous studies have

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shown that youth spend half as much time with their parents as they spend with their peers (Brown, 1990; Savin-Williams & Berndt, 1990). It might be that the formative influence on water safety knowledge of peers and peer norms is greater than that of parents or teachers, but evidence is needed to substantiate such claims. Current evidence of the role of peers from studies of other youth health risk behaviors is equivocal. While peers are often blamed for the onset of negative risk behaviors such as cigarette smoking (Evans, Dratt, Raines, & Rosenburg, 1988) and illegal drug use (Jenkins, 1996), other studies have found that friends may protect fellow adolescents from risk (Ennett & Bauman, 1994; Maxwell, 2002). Little is known about the influence of peers on the youth drowning risk, especially the extent to which youth understanding of water safety is informed by peers, the extent to which peers encourage risky practices, and the extent to which at-risk behaviors are the social norm among peer groups during aquatic activity.

Equally so, little is known about family input into youth water safety, the extent to which families inform youth understanding of water safety, and the extent to which they supervise, regulate, or encourage safe participation in aquatic activity of their children. Some evidence from pediatric exercise science suggests that parents exert considerable influence on their child's physical activity behavior (Brustad, 1993, 1996; Taylor, Baranowski, & Sallis, 1994; Welk, Wood, & Morss, 2003). Whether such influence extends to safety considerations associated with specific forms of activity such as swimming and other aquatic recreational activities is less well understood.

At a community level of influence, education, and schooling are generally believed to be important contributors to youth water safety, and many developed countries have a long history of swimming and lifesaving teaching in the school curriculum (Moran, 1999). In spite of the widespread promotion of aquatics education in schools, little is known about youth perceptions of how teachers and schooling have contributed to the students' understanding of water safety. Some evidence exists about school water safety education from a provider perspective (Moran, 1999, 2002). Further evidence on how youth view the role of schools and teachers might provide some insight into ways of best addressing youth drowning prevention through water safety education.

Method

Participants

As previously reported (Moran, 2008a), the participants in this study were a nationwide sample of 2,202 youth, 4% of a target population of approximately 50,000 year 11 students in New Zealand. All participants (age range 15–19 years, M = 15 years 8 months, SD = 1.85) were enrolled in full time study in 41 high schools throughout New Zealand. Analysis of respondents' gender, socioeconomic status, and ethnicity indicated that the demographic composition of the sample was consistent with that of the national population from which it was drawn (see Table 1).

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Table 1 Characteristics of the Sample by Gender, Socioeconomic Status via School Decile Rating, and Ethnicity

	Sample Population		National Population*	
	n	%	*n*	%
Female	1,031	46.8	24,915	48.9
Male	1,171	53.2	26,035	51.1
Low-decile (1–3)	630	28.6	9735	19.1
Mid-decile (4–7)	637	28.9	23,146	45.4
High-decile (8–10)	935	42.5	18,069	35.5
European	1,339	60.8	30,468	59.8
Maori	406	18.4	10,496	20.6
Pasifika	204	9.3	4,229	8.3
Asian	206	9.4	4,942	9.7
Other	46	2.1	815	1.6

*Source: Ministry of Education, Data Management Unit, July 2003 school rolls.

Instrumentation

A written questionnaire, completed under the direction of survey administrators during school hours, was used to gather data in the second (autumn) school term in 2003. The questionnaire included a range of forced-response questions on student participation in aquatic activities and student perceptions of important influences on their understanding of water safety. A stratified random sampling frame based on school type and geographical region was used to select schools in which to conduct the survey.

Participants were asked to rank the three most important influences on their understanding of water safety from a list that included school, family, peers, clubs or other organizations and the media. Three further questions sought elaboration on school, family, and peer influences. As a proxy measure of peer practice of water safety, respondents were asked to recall whether they had observed eight risky behaviors performed by peers (e.g., swimming outside patrolled areas, not wearing a life jacket, disobeying safety advice). They were also asked to recall whether they had been exposed to six positive water safety actions initiated by their parents/family (e.g., discussing water safety issues as a family, giving water safety advice, providing for swimming lessons). Finally, students were asked to report on their experience of being taught swimming and a range of water safety topics at school (e.g., pool safety, surf safety, river safety).

Data Analysis

Data were analyzed using the sociodemographic variables of gender, socioeconomic status via the decile rating of the school attended, and ethnicity. For ease of interpretation, socioeconomic status is reported in three categories—low-decile,

mid-decile and high-decile school rating, a standard government evaluation based on a range of sociodemographic indicators such as average income per household, that correspond to low, middle, and high socioeconomic status. Ethnic groupings were broadly based on Statistics New Zealand classification and included European, Maori, Pacific Islands (hereafter called Pasifika), Asian, and a category for those who self-identified as of "other" ethnicities than those specified.

Data from the completed questionnaires were entered into Microsoft Excel X for statistical analysis using SPSS Version 15.0 in Windows. Frequency tables were generated for all questions and, unless otherwise stated, numbers and percentages are expressed in terms of response frequency within groups. Mann-Whitney *U* tests (for two independent samples) and Kruskall-Wallis *H* tests (for multiple samples) were used to determine significant differences between groups. Detailed analyses of youth aquatic recreation and their water safety were published in a report titled *New Zealand Youth Water Safety Survey 2003* (Moran, 2003).

Results

Student Perceptions of Important Influences on Water Safety

Mann-Whitney *U* tests found significant differences between male and female responses when the three most important influences on water safety knowledge were analyzed by gender. Table 2 shows that nearly twice as many males identified friends as one of the three most important influences on their understanding of water safety (males 72%; females 39%). Furthermore, males were ten times more likely than female students to identify friends as their most important water safety influence (males 35%, females 3%).

Significant differences were found between socioeconomic groups regarding the influence of family ($\chi^2 = 11.99$, $p = 0.002$), schools ($\chi^2 = 13.52$, $p = 0.001$),

Table 2 The Three Most Important Influences on Water Safety Knowledge by Gender

Influences on Water Safety Knowledge		First Choice		Second Choice		Third Choice			
		n	%	*n*	%	n	%	*U*	*p*
Friends	Female	30	2.9	127	12.3	245	22.8	784	< .001
	Male	408	34.8	265	22.6	170	14.5	12.5	
Family	Female	457	42.7	266	24.9	202	18.9	388	< .001
	Male	345	29.5	373	31.9	233	19.9	780.5	
School	Female	313	29.5	375	35.0	207	19.3	323	< .001
	Male	239	20.4	285	24.3	335	28.6	606.5	
Clubs/other organizations	Female	138	13.4	130	12.6	148	13.8	624	0.009
	Male	87	7.4	100	8.5	148	12.6	41.0	

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and other organizations ($\chi^2 = 11.10$, $p = 0.004$) on water safety. Fewer students from low-decile schools than from mid- or high-decile schools reported either the family (28% compared with 39% and 33%) or schools (22% compared with 26% and 27%) as their most important water safety influence. No significant differences were found when the role of friends as the most important influence on water safety was analyzed against ethnicity, but considerable differences were found in the influence of family ($\chi^2 = 39.71$, $p = < .001$), schools ($\chi^2 = 23.41$, $p = < .001$), and other organizations ($\chi^2 = 27.36$, $p = < .001$). Proportionally more Maori and Pasifika students than European and Asian students identified the family as their dominant water safety influence (48% and 46% compared with 32% and 35%).

Peer Influences

Table 3 shows student recall of eight at-risk behaviors that they had observed their peers performing during aquatic activity. Where participants had never been with their peers to observe behaviors, nil responses were recorded and screened out of the data to leave only the observed behaviors.

In descending order of frequency, the at-risk behavior performed by friends were swimming without adult supervision (82%), swimming outside a patrolled area at a surf beach (68%), not wearing a life jacket in a small craft (67%), swimming in prohibited places (53%), encouraging risk (41%), and ignoring water safety directions (40%). Diving headfirst into shallow water (29%) and using alcohol/drugs during aquatic activity (29%) were the least observed behaviors among peers.

Significant differences were found between males and females when the eight observed at-risk behaviors of peers were analyzed by gender (Mann-Whitney *U* test scores between $U = 341186.0$–511766.5, with $p = < .001$ for each behavior). The gender differences were particularly noticeable in the non-wearing of lifejackets (males 72%, females 59%), swimming outside patrolled areas at a surf beach (males 75%, females 61%), encouraging risk-taking behavior in the aquatic environment (males 54%, females 26%), ignoring water safety advice and directions (males 54%, females 25%), swimming in prohibited places (males 64%, females 41%), and diving headfirst into shallow water (males 38%, females 17%).

No significant differences were found in the observance of at-risk behaviors of peers when analyzed by socioeconomic status. With the exception of diving headfirst into shallow water, significant differences were found between ethnic groups in the observation of at-risk behaviors by friends (with Kruskall-Wallis *H* test scores between $\chi^2 = 19.57$–92.42, $p = < .001$ for each behavior). More European and Maori students than Pasifika and Asian students observed their friends not wearing lifejackets (71% and 67% compared with 63% for each) and swimming outside patrol areas (72% for each compared with 62% and 44%). More Maori and Pasifika students than European and Asian students observed their friends encouraging risk-taking (47% and 48% compared with 38% and 26%) and ignoring water safety advice and directions (47% and 55% compared with 38% and 29%). Asian students were least likely of all ethnic groups to have observed any at-risk behavior among their friends in an aquatic environment.

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Table 3 Observation of Peer Behaviors by Gender, Socioeconomic Status, and Ethnicity

Peer Behavior	Not Worn Lifejacket n (%)	Swam Not Supervised n (%)	Outside Surf Patrol n (%)	Encourage Risk n (%)	Alcohol / Drugs n (%)	Ignored Advice n (%)	Swam in Prohibited n (%)	Dived Headfirst n (%)
Male	703 (72.2)	953 (85.5)	808 (75.2)	575 (54.3)	311 (33.0)	576 (53.9)	687 (63.5)	414 (38.4)
Female	478 (59.8)	775 (78.8)	577 (60.6)	242 (26.0)	218 (24.2)	242 (25.2)	392 (40.7)	166 (17.4)
Low-decile	312 (67.4)	473 (80.0)	401 (69.1)	260 (45.1)	145 (27.4)	255 (43.6)	334 (56.8)	171 (29.0)
Mid-decile	348 (64.8)	511 (82.8)	387 (65.0)	216 (37.0)	174 (31.3)	228 (38.1)	303 (50.3)	164 (27.8)
High-decile	521 (67.3)	744 (83.5)	597 (70.1)	341 (41.2)	210 (27.8)	335 (39.6)	442 (51.8)	245 (28.8)
European	801 (71.1)	1101 (85.5)	895 (71.6)	485 (37.7)	322 (25.0)	468 (37.7)	650 (52.2)	339 (27.2)
Maori	219 (66.6)	346 (87.2)	275 (72.4)	180 (47.1)	131 (36.0)	182 (47.0)	234 (59.8)	119 (31.2)
Pasifika	88 (62.9)	149 (78.4)	116 (62.0)	86 (47.8)	45 (27.4)	101 (54.6)	113 (59.8)	65 (35.0)
Asian	56 (62.9)	108 (58.4)	75 (43.9)	50 (29.2)	26 (17.0)	49 (28.7)	61 (34.9)	45 (25.7)
Other	17 (36.9)	23 (50.0)	23 (50.0)	15 (32.6)	4 (8.7)	16 (34.8)	20 (43.5)	11 (23.9)
Total	1181 (66.6)	1728 (82.3)	1385 (68.3)	817 (41.1)	529 (28.7)	818 (41.1)	1079 (52.8)	580 (28.5)

Parental/Familial Influences

Table 4 shows student recall of family involvement in their water safety via six affirmative water safety actions. The most-frequently reported family interaction related to the giving of water safety advice (85%), followed in descending order by supervision of water-related activity (83%), provision of paid swimming lessons (55%), and encouragement of swimming proficiency (52%). Being prohibited by family from doing water activity because of safety concerns (43%) and family discussion of water safety issues (31%) were the least reported actions.

Significant differences were found between males and females when the six family water safety-related influences were analyzed by gender (Mann-Whitney U test scores between U = 527108.0–570746.0, with p values ranging from < .001–0.011). Table 4 shows that females reported higher family input in the provision of paid swimming lessons (females 60%, males 50%), supervision of aquatic activity (females 90%, males 77%), provision of water safety advice (females 89%, males 82%), and prohibition of aquatic activity for safety reasons (females 47%, males 40%).

With the exception of the family discussion of water safety issues, significant differences were found when familial influences were analyzed against socioeconomic status (Kruskall-Wallis H test scores between χ^2 = 8.73–255.79, with p values varying from <0.001–0.013) and ethnicity (Kruskall-Wallis H test scores between χ^2 = 23.21–266.91, with p = <0.001 for each influence). For example, fewer students from low-decile schools than from mid- or high-decile schools had swimming lessons paid for by family (31% compared with 53% and 72%) or had family encouragement to improve swimming proficiency (42% compared with 54% and 58%).

More European than Maori and Pasifika students reported that parents had provided paid swimming lessons (67% compared with 30% and 23%). Fewer Pasifika students than all other ethnic groups had received paid swimming lessons, had received water safety advice from family, or had been encouraged by family to improve swimming proficiency.

School Influences

Schools were regarded as the most important source of swimming learning (38%), followed by paid lessons (29%) and parents/family (13%). The least reported method of learning to swim was being self-taught or by friends (10%) and by clubs or other groups (6%). With the exception of private lessons, no significant differences were evident in how youth acquired swimming skills, although more females identified paid lessons (females 34%, males, 24%) and parents/family (females 14%, males 11%) as their primary source of learning to swim. More students from high-decile than from low- or mid-decile schools had been taught to swim by paid lessons (42% compared with 23% and 14%). Maori and Pasifika students were most likely to identify school (48% and 59%) and least likely to identify paid lessons (12% and 4%) as the most important source of their swimming instruction.

Table 5 shows the nature and extent of water safety taught at school. More males, students from low-decile schools than from mid- or high-decile schools,

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Table 4 Familial Influences on Water Safety by Gender, Socioeconomic Status, and Ethnicity

Familial Influences	Given Water Safety Advice n (%)	Supervised Family Water Activity n (%)	Paid for Swim Lessons n (%)	Encouraged Improving Swimming n (%)	Stopped You Doing Water Activity n (%)	Discussed Water Safety Issues n (%)
Male	959 (81.9)	903 (77.1)	580 (49.5)	583 (49.8)	464 (39.6)	334 (28.5)
Female	818 (89.0)	924 (89.6)	622 (60.3)	568 (55.1)	488 (47.3)	352 (34.1)
Low-decile	510 (81.0)	483 (76.7)	193 (30.6)	266 (42.2)	241 (38.3)	181 (28.7)
Mid-decile	549 (86.2)	543 (85.2)	337 (52.9)	343 (53.8)	282 (44.3)	217 (34.1)
High-decile	818 (87.5)	801 (85.7)	672 (71.9)	542 (58.0)	429 (45.9)	288 (30.8)
European	1176 (81.8)	1176 (87.8)	902 (67.4)	779 (58.2)	628 (46.9)	430 (32.1)
Maori	344 (84.9)	331 (81.2)	122 (30.1)	185 (45.7)	154 (38.0)	113 (27.9)
Pasifika	156 (76.5)	153 (75.0)	47 (23.0)	78 (38.2)	86 (42.2)	70 (34.3)
Asian	160 (77.7)	129 (62.6)	104 (50.5)	82 (39.8)	65 (31.6)	56 (27.2)
Other	41 (89.1)	38 (82.6)	27 (58.7)	27 (58.7)	19 (41.3)	17 (36.9)
Total	1877 (85.2)	1827 (83.0)	1202 (54.6)	1151 (52.3)	952 (43.2)	686 (31.2)

Table 5 The Teaching of Water Safety Topics by Gender, Socioeconomic Status, and Ethnicity

Taught Water Safety at School	Not Taught n (%)	Pool Safety n (%)	Surf Safety n (%)	River Safety n (%)	Boat Safety n (%)	Underwater Safety n (%)
Male	245 (20.9)	838 (71.6)	520 (44.4)	310 (26.5)	323 (27.6)	270 (23.1)
Female	150 (14.5)	800 (77.7)	515 (50.0)	287 (27.8)	297 (28.8)	255 (24.7)
Low-decile	167 (26.5)	426 (67.6)	247 (39.2)	144 (22.9)	165 (26.2)	156 (24.8)
Mid-decile	99 (15.5)	495 (77.7)	336 (52.7)	180 (28.3)	171 (26.8)	153 (24.0)
High-decile	129 (13.8)	717 (76.7)	452 (48.3)	273 (29.2)	285 (30.5)	216 (23.1)
European	169 (12.6)	1074 (80.2)	737 (55.0)	404 (30.2)	398 (29.7)	321 (24.0)
Maori	66 (16.3)	311 (76.6)	180 (44.3)	111 (27.3)	119 (29.3)	115 (28.3)
Pasifika	61 (29.9)	127 (62.3)	56 (27.5)	31 (15.2)	55 (27.0)	51 (25.0)
Asian	85 (41.3)	100 (48.5)	44 (21.3)	37 (18.0)	38 (18.5)	29 (14.1)
Other	14 (30.4)	26 (56.5)	18 (39.1)	14 (30.4)	10 (21.7)	9 (19.6)
Total	395 (17.9)	1638 (74.4)	1035 (47.0)	597 (27.1)	620 (28.2)	525 (23.8)

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and Asian students reported that they had not received any water safety education at school.

Most students reported that they had studied pool safety (74%) at school, followed in descending order by surf safety (47%), boat safety (28%), river safety (27%), and underwater safety (24%). While not statistically significant, slightly more females reported having been taught pool safety (females 78%, males 72%) and surf safety (females 50%, males 44%). No significant differences in water safety education were found between different socioeconomic groups although fewer students from low-decile schools than from mid- or high-decile schools had been taught pool safety (68% compared with 78% and 77%) or surf safety (39% compared with 53% and 48%). No significant differences were found between recall of water safety topics taught by ethnicity although Pasifika and Asian students reported less surf safety education than either Maori or European students (28% and 21% compared with 44% and 55%). Asian students also were the least likely ethnic group to have been taught any river, boat, or underwater safety.

Discussion

The principal findings of this study suggest that youth understanding of water safety is informed, or perhaps misinformed, in many different ways. Analysis of the single most important influence on water safety revealed considerable gender differences. One third of males identified friends as their dominant influence, a rate ten times that of females (males 35%, females 3%). The male dependence on friends is problematic in that it places a premium on the knowledge base and practice of contemporaries. Previous evidence of poor male water safety knowledge (Moran, 2008a) and frequent risky behaviors by males (Moran 2008b) suggests that male peers are unlikely to be the best source of sound water safety knowledge for many males. Not surprisingly, males reported more frequent observation of at-risk behaviors by their friends across all aquatic settings. Of particular concern is the widespread reports by youth of friends swimming outside surf patrols (males 75%, females 60%), not wearing life jackets when boating (males 72%, females 60%), and encouraging others to take risks in the aquatic environment (males 54%, females 26%). The prevalence of the latter, encouragement of risk-taking behaviors, reinforces previous findings on the unfortunate incidence of the three "Ds"—drinking, drugs and dares—that are more likely to influence adolescent males than females (O'Flaherty & Pirie, 1997). Changing such entrenched at-risk behaviors among groups of male youth presents a particular challenge to parents, lifeguards, and water safety educators alike. Given the acknowledged importance of friends in informing male water safety practices, it might be appropriate to promote peer responsibility ("buddy care") as an integral part of male water safety education promoted in schools and via other community agencies.

Socioeconomic status and ethnicity did not greatly influence student perceptions of important water safety sources, although more Maori students and those from low-decile schools cited friends and fewer cited schools, as their most important water safety influence. Not surprisingly, more students from low-decile schools identified with school swimming instruction, whereas more students from high-decile schools identified with paid lessons. The reliance on low-decile schools for the learning of swimming skills among the more economically

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disadvantaged in society may place unrealistic expectations on those schools least able to provide such education. One New Zealand study has found that low- and mid-decile primary schools are least likely to offer aquatic education programs (Moran, 2002). Given the dependence on school swim programs as a source of swimming skills reported above, assistance and resources that specifically target low-decile schools may help offset this inequity. Similar conclusions have been expressed in other studies (Moran, 1999, 2002).

On the evidence of what youth reported of their formal education, the influence of schools on youth understanding of water safety practice appeared somewhat equivocal. Although four out of five students (81%) reported that they had been taught some water safety, disparities in provision of that instruction were clearly evident. One in four Asian students (41%), almost a third of Pasifika students (30%), and more than one quarter of students from low-decile schools (27%) had not been taught any water safety at school. Given the popularity of surf beaches for youth recreation in New Zealand (Moran, 2008b), it was concerning that less than one half (47%) reported having been taught any surf safety. Even fewer students (28%) recalled having been taught any boating safety, river safety (28%), or underwater safety (24%), a cause for concern given that almost half of the respondents had used rivers and engaged in underwater activity in the previous year (Moran, 2008b).

Disparities were also evident when individual water safety education topics were analyzed by socioeconomic status and ethnicity. Few students from low-decile schools had been taught surf safety or river safety. Less than one quarter of Pasifika (24%) and Asian students (21%) reported being taught any surf safety education. Previous studies (Moran, 1999, 2002) had indicated several reasons for these inequities, including the high-cost nature of aquatics education, a lack of pool facilities among low-decile schools, and the prevalence of user-pay programs offered by some external water safety providers. To remedy inequities in the provision of water safety education identified by students in this study, considerable investment appears justified in schools that cater for socioeconomically disadvantaged youth.

Asian students surveyed reported the least amount of water safety education with only one-fifth of students having been taught surf safety (21%), river safety (18%), or boat safety (19%). This lack of water safety education among Asian students, almost half (45%) of whom were recent arrivals (< 5 years residency), can be explained by their lack of time in the New Zealand education system, and possible language barriers to learning within current water safety programs. A recent Australian study has made similar observations and suggested a need for further awareness-raising within the Chinese community in New South Wales on safety measures for rock fishing, home pool fencing requirements, and the importance of using of life jackets (Mitchell & Haddrill, 2003).

Evidence of the influence of families on youth in this study like the role of schools, also was somewhat equivocal. Families are considered to be especially important since parents often act as gatekeepers in determining what physical activity their offspring do and what resources they provide (Welk, Wood, & Morss, 2003). Most students reported that families had provided positive input to their water safety by supervising aquatic activity (83%). Fewer than half of the respondents (43%) reported that family members had prevented them doing water

activity because of concerns for their safety. Whether this response reflects an attempt by youth to assert independence from familial control or indicates a lack of input from family with regard to their teenager's water safety was difficult to ascertain. What it may have suggested was that reliance on familial control to directly regulate youth aquatic activity is unlikely to substantially reduce youth drowning risk.

Females reported greater positive input from families than males across all possible actions. In particular, females reported greater direct family input via the supervision of aquatic activity, the provision of water safety advice, and the prohibition of aquatic activity. These differences are difficult to explain. They may be the manifestation of a greater protectiveness on behalf of family members/parents toward their female offspring or a reflection of greater female acceptance of, and male adolescent resistance to, parental authority. Whatever the reasons, the lack of family input into male youth aquatic activity suggested that attempts to influence youth water safety behavior through the family may not be an effective means for minimizing youth drowning risk.

Results from this study should be interpreted with some caution in light of several methodological limitations. The self-reporting of student experiences (such as participation in water safety activities in school) and observations (such as seeing friends perform risky behaviors) might not accurately express true learning opportunities. In addition, the use of peer practice of water safety as a proxy measure of their knowledge of water safety may not be an effective measure of peer influence or social norms. Further qualitative research (such as focus group discussion and in-depth interviews) may confirm the apparent reliance of male youth on their male peers for water safety knowledge and provide further support for the suggestion that reciprocal learning and a buddy approach to water safety education may be able to capitalize on the male predisposition to learn from their same-sex peers.

Conclusion

The formative influence of peers, family, education, and previous experience on the water safety of youth who took part in the study varied considerably. Several key findings suggested that males construct their understanding of water safety differently from how females construct their understanding. Schools were not perceived by many male youth to be a source of water safety knowledge, which suggested that current teaching practices may not be meeting male needs in this critical part of their education. Peer-oriented pedagogies that promote self-care through reciprocal learning (Mosston & Ashworth, 2002) might successfully capitalize on the male dependence on peers for their understanding of water safety. Whether such change can address the substantial deficiencies previously identified in male water safety knowledge, attitudes, and behaviors was uncertain.

Although more females identified adult sources such as family and schools as their primary source of water safety understanding, parents generally did not appear to exert as much direct control over youth during their aquatic recreation as might be commonly expected. The lack of parental prohibition of aquatic activity for safety reasons suggests that the shaping of a sound practice of water safety

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through parental intervention might not be as effective a form of social control as it might otherwise be in other areas of youth safety (such as driving safety or drug use).

A perceived lack of input by schools is particularly problematic since schools often provide the only setting where the water safety needs of all youth, irrespective of their ethnicity or socioeconomic status, may be addressed. Clearly, in the minds of many students, the current provision of water safety education in schools did not appear to perform this task adequately. The consequence of this inadequacy might be that those from disadvantaged sectors of society are at greater risk of drowning than others from more privileged backgrounds, as previously postulated by Smith and Brenner (1995). Water safety programs specifically targeted at low-decile schools may offer the best opportunity to address this social and educational inequity.

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