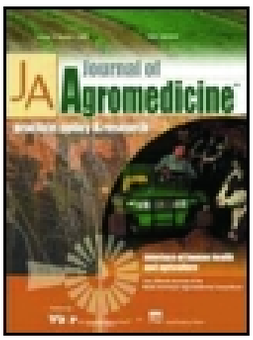

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Age and Gender-Based Patterns in Youth All-Terrain Vehicle (ATV) Riding Behaviors

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ABSTRACT. Injuries to youth on all-terrain vehicles (ATVs) have been increasing exponentially in recent years. Youth under age 16 years are four times more likely to require emergency room treatments. This study explored the relationships and differences in ATV risk and safety behaviors based on age, gender, and age at ATV driving/ riding initiation. Data was collected from 180 farm youth between 10 and 19 years of age. The study brought to light an important factor that influences risky ATV behaviors of youth, namely their age at ATV driving and riding initiation. The sooner that youth (boys and girls) were exposed to ATVs, including riding with their family or friends, the sooner they started driving ATVs themselves, and the more likely they were to indulge in several ATV risk behaviors when older. This effect was more pronounced for boys than girls. Overall, girls in this study were equally likely to engage in many of the risky ATV behaviors like taking and giving rides on single seat ATVs, driving adult-sized ATVs, driving ATVs on public roads, and driving ATVs really fast. However, they were less likely to wear protective attire, leaving them more vulnerable to injuries and fatalities during crashes. Implications of the findings and future directions are discussed.

KEYWORDS. All-terrain vehicle safety; Youth ATV risky behaviors; personal protective equipment use; Injury prevention; Youth safety.

INTRODUCTION

With the introduction and rapid rise in popularity of all-terrain vehicles (ATVs) in the 1980s, a dramatic increase in ATV related injuries has been observed, including a large proportion of pediatric injuries and fatalities.[1] Children are injured at a significantly higher rate on ATVs than adults, with the majority being youth under 16 years-of-age operating adult-sized ATVs.[2-4] ATV operators under 16 years are nearly four times more likely than those over 16 years to experience an injury requiring emergency department treatment.[1,2] Georgia ranks 11th in ATV injuries (youth 0-16 years) with 225 deaths reported between 1982 and 2007.[1] Georgia is one of the five states with no laws related to ATV safety. Risk factors for ATV injuries include age, male gender, driving age-inappropriate ATVs, rider inexperience, on-road use, driving on uneven terrain, alcohol intoxication, excessive speed, use of three-wheeled rather than four-wheeled ATVs, and lack of helmet use.[2,5-8] Other factors that place youth more at risk of ATV injury include carrying passengers on single seat ATVs and the number of days per week the ATV was ridden (risk of exposure).[6,7,9]

Although ATVs may not traditionally be included as farm machines, they have many uses on the farm as a substitute for pick-up trucks, horses, and even walking. Increasing numbers of ATVs are used on all types of farms and ranches including row crops, cattle, etc. They are commonly used by adults and youth to inspect crops and livestock, inspect and repair irrigation systems and

fence lines, and herd livestock, among other things. ATVs are attractive to children due to their durability and speed; however, these machines were not designed to be used as toys. ATVs are inherently unstable, and their balance and steering mechanisms rely on the driver's ability to maneuver his or her body weight.[10,11] Young children may not possess the physical strength, fine-motor control, coordination, or cognitive skills to safely handle these adult-sized off-road machines,[11-14] which can weigh over 500 pounds and attain speeds in excess of 50 mph.[15,16] Young, inexperienced drivers often increase these dangers through risk taking behaviors and poor decision-making.[15] The wide tires on an ATV give the appearance of stability, fostering a false sense of security in inexperienced riders. When an ATV rolls over, it is highly likely that it will roll over the vehicle operator. With most ATVs weighing up to 1100 pounds, the injuries sustained by operators are potentially severe, leading to impaired functionality or loss of life. Each year substantial numbers of ATV crashes result in traumatic brain injury (TBI), spinal cord injuries, quadriplegia, paraplegia, and skull fractures.[17] Multiple riders on an ATV that has only one seat is frequently cited as a potential contributing factor in both fatal and non-fatal crashes and has been strongly discouraged by ATV authorities.[2,18] Safety concerns have been raised by many agencies, leading to the development of major coalitions aimed at this issue and to statements by major health care organizations including the American Academy of Pediatrics (AAP) and the American Academy of Orthopedic Surgeons (AAOS). A 1989 model bill introduced by AAP is a standard for the goals of ATV safety legislation[19]. Components of this bill include: (1) prohibition of children under age 16 from operating ATVs; (2) license, insurance, and registration requirements for ATV operators; (3) a ban on ATV use on public roads; (4) motorcycle style helmet, eye protection, and safety clothing requirements; (5)

prohibiting passengers on ATVs; and (6) banning ATV operation while intoxicated. The US Consumer Product Safety Commission (CPSC) considers that an adult size ATV has an engine size of 90cc and greater and suggest youth be at least 16-years-old to operate an adult-sized ATV. Studies have found that adult-sized ATVs were associated with 90% of pediatric fatalities.[1] Since the expiration of the consent decree between the CPSC and ATV manufacturers in 1998, there seems to be escalating numbers of both injuries and deaths without further legislation regulating ATV use.[3] The purpose of this study was to describe ATV usage patterns as well as risk and safety behaviors of farm youth. The study explored the relationships and differences in ATV risk and safety behaviors based on age, gender, age at ATV driving and riding initiation.

METHODS

This cross-sectional study was part of a larger National Institute for Occupational Safety and Health (NIOSH)-funded longitudinal randomized control study on youth farm safety, with detailed methodology available elsewhere.[20] Pre-intervention measures related to youth ATV behaviors were used for this analysis. Farm families in South Georgia who had children between 10 and 19 years-of-age were randomly selected for the larger study. Families were recruited from statewide farm publications, youth organizations (e.g. FFA), local newspapers, farmer referrals, and through the cooperative extension network. For this study, all youth who had driven an ATV were included. All youth lived or worked on a farm. Data were collected from 180 youth. When there were multiple children from the same household who were eligible, up to two youth per

household were included. The research study was approved by the Institutional Review Board at the University of Georgia.

During a home visit, youth were given questionnaires to independently complete, place in separate envelopes, seal and mail to researchers. Questions related to youth ATV driving and riding behaviors and use of safety gear were asked. Youth answered a yes or a no to whether they had: 1) driven adult-sized ATVs; 2) driven on public roads; 3) driven ATVs fast; 4) tried wheelies or jumps with an ATV; and 5) given a ride to others on single seat ATVs. An ATV risk behaviors composite score was computed by adding the youth's answers to the above five questions with 1 point for each positive answer.

Youth answered yes or no to whether they used each of the safety equipment while operating ATVs: 1) long sleeves, 2) boots, 3) helmets, 4) gloves, and 5) eye protection. A composite score for ATV safety gear was computed by adding the youth's response to the above five questions with 1 point for each positive response.

Youth were also asked about how old they were when they first rode with someone and drove an ATV themselves. Youth were also asked that if they had been a rider on an ATV and it did not have a separate seat, who was driving the ATV? Youth checked all options that applied. Options included father, mother, male adult relative, female adult relative, brother, sister, adult friend, friend older than you, friend your age.

RESULTS

Of the youth surveyed, 61% were male and 39% were female. The mean age of both girls and boys was 14 years. For age-based analysis, the sample was split at mid-point such that 50% of the youth were in the younger category and the other half were in older category. Younger youth ranged in age from 10 through 13 years, and older youth ranged from 14 through 19 years. Almost all (96%) of the youth had driven an ATV. All youth in this study either lived or worked on a farm and were, therefore, more likely to use ATVs.[9] Youth were not asked whether they used ATVs for work or recreation. Past studies suggest that the majority of farm youth use ATVs for both work and recreation, so it was assumed that study youth used ATVs for both purposes.[21] Majority of youth started driving ATVs at a very young age. The mean age for ATV driving initiation was 7 years for boys and 8 years for girls. Of boys, 43% reported they were 6 years or less when they first drove an ATV, compared to 30% of girls. About 89% of boys and 91% of girls reported driving ATVs 30 or more times per month, implying at least once a day on an average.

Majority of boys (94%) as well as girls (91%) said they had driven an adult-sized ATV. Similar percentages of boys (65%) and girls (56%) reported operating ATVs on public roads. Both boys (81%) and girls (76%) confessed to driving an ATV really fast. Boys were significantly more likely to try wheelies and jumps than girls (χ^2=9.60, df =1, N=160, p<.002; yes for 59% boys, 34% girls). Only 9% of the boys and 3% of the girls said they had attended an ATV training course. Both boys (96%) and girls (97%) reported that they had ridden on an ATV that someone else was operating. Only 10% reported the ATV had a separate seat, implying that 90% of the

riding happened on single-seat ATVs with no separate seat for the passenger. On average, boys were 6-years-old and girls were 5-years-old when they first rode with someone on an ATV. By age 6, 60% of the boys and 71% of the girls reported that they had ridden with someone on an ATV. Figure 1 shows who was driving the ATV when boys and girls rode as passengers. Boys were most likely to ride as passengers with friends the same age (59%), closely followed by their fathers (57%). Girls were also most likely to ride with a friend the same age (59%), closely followed by their father (53%) or brother (53%). Girls were more likely to be extra riders on ATVs driven by their brother compared to boys (χ^2=4.53, df=1, N=160, p<.03; 37% boys, 54% girls). There were 89% of boys and 92% of girls who said they had given rides to others on an ATV that they were driving. It was very unlikely (only 7% likelihood) that the ATVs had a separate seat for a passenger.

Age and ATV driving

Inter-correlations between various ATV variables for older and younger youth are presented in Table 1. The ATV safety gear composite was negatively correlated with ATV risky behaviors composite for older boys but not for girls or younger youth. Youth age at ATV initiation was negatively correlated with ATV risky behaviors composite for younger boys as well as girls. The sooner a child started driving an ATV, the more likely he/she was to practice ATV risky behaviors when he/she became older. This relationship was true for older boys but did not reach significance for older girls. The age at ATV riding initiation was positively correlated with age at ATV driving initiation for younger as well as older youth. Youth who were given rides on ATVs at a younger age were more likely to themselves start driving ATVs early. Age at ATV riding

initiation was negatively correlated with older girls' exposure to ATVs. Older girls who started riding on ATVs with others at a young age were likely to have increased ATV driving time (exposure) when they grew up. For younger boys, as they grow older (current age increases), they were more likely to practice risky ATV driving.

Age of ATV initiation for girls and boys

Youth (boys and girls) who reported driving ATVs on public roads had lower ages of ATV driving initiation compared to youth who did not drive on public roads (Table 2). Girls who drove ATVs on public roads were more likely to have started riding on ATVs with others at earlier ages. Similarly, boys and girls who reported currently driving ATVs fast were likely to have started driving ATVs at an earlier age, compared to those who do not drive fast. Girls who drive ATVs fast were more likely to also have started riding on ATVs with others at earlier ages. Boys who reported driving adult-sized ATVs, carrying extra passengers on single seat ATVs, and doing wheelies, jumps etc., had lower ages of ATV driving initiation compared to boys who did not report practicing these behaviors. In summary, boys and girls who reported practicing risky behaviors on ATVs also reported starting to drive ATVs at much younger ages compared to youth who were safer. Girls were more likely to practice unsafe behaviors when they reported starting to ride with others at very early ages.

Use of PPE on ATVs

Older boys were significantly more likely to use PPE such as boots and helmets while operating ATVs than older girls (Table 3). Of older boys, 93% reported as always or sometimes wearing

boots, compared to 69% of the girls. There were 61% of older boys who reported wearing helmets, compared to 35% of older girls. Helmet use among older girls was the lowest, with only one-third of them wearing helmets. Older boys were also more likely than older girls (58% boys versus 45% girls) to wear long sleeves, but it did not reach significance. The overall use of eye protection and gloves was low (one-third of boys; one-fifth of girls). Younger boys were more likely to wear gloves and eye protections compared to younger girls (Table 4). Thirty-five percent of younger boys wore gloves compared to 10% of the girls, and 33% of younger boys wore eye protection compared to 10% of girls. A composite score was computed by adding individual scores on the use of all different protective gear. Gender-based differences in the use of PPE was found for older youth but not younger ones. Older boys were significantly more likely to use protective gear while operating ATVs compared to older girls ($t=-2.85$, $df=65$, $p<.006$) (Table 1.2). Younger boys were more likely than younger girls to use them, but the results did not reach significance.

DISCUSSION

Boys and girls had similar exposure to ATVs. Majority of the youth started operating ATVs at a very young age. Both boys and girls were equally likely to report operating adult-sized ATVs. Studies have shown that ATV operators under age 16-years are nearly four times more likely than those over age 16-years to experience an injury.[1,2,22] Children do not possess the physical strength, motor control, coordination, or judgment to safely handle the heavy, off-road, adult-sized ATVs travelling at high speeds.[11-14] Four-fifths of the study youth were younger than 16 years-of-age, making them more prone to injuries on adult-sized ATVs. Organizations like the

CPSC, AAP, and AAOS recommend that youth be at least 16-years-old to operate an adult size ATV.[1,19] Clearly, professional recommendations on ATV operation based on age and size were not followed by study youth, as reported in previous studies.[21] Similar percentages of boys and girls reported operating ATVs on public roads. Driving on public roads puts youth at risk for two important reasons: (1) low pressure ATVs tires are not designed for driving on paved roads,[23] and (2) drivers are at increased risk of crashes due to other larger vehicles operating on roads at high speeds. More fatal ATV crashes occur on the roadway than off.[23,24]

This study highlights the fact that majority of both girls and boys started riding as passengers at very early ages, mainly with friends the same age, closely followed by their fathers. Girls were also more likely to extra ride with their brothers. Both girls and boys were equally likely to give and take rides on single seat ATVs. The long seat on ATVs seems to invite extra passengers to ride on them.[25] However, the seats are designed with long seats not to carry extra passengers, but to give the single rider enough space to maneuver while riding the vehicle on rough terrain. The presence of passengers can easily and very quickly upset the delicate balance and control that the ATV driver must maintain. In cases where the driver loses balance, the passenger ends up getting crushed under the heavy ATV. Most ATV users are unaware that having multiple riders on ATVs is unsafe.[18] Youth and parent education on the function of the long ATV seats and dangers of extra riding are needed. Both girls and boys in the study had similar exposures to ATVs, but some gender-based patterns in ATV-use were observed. Boys were significantly more likely to try wheelies and jumps and to ride as passengers with others than girls. One reason for this could be that boys are usually physically bigger and stronger than girls, so they may feel more comfortable handling the heavy weight of adult-sized ATVs. Their parents may also be more

comfortable having them operate adult-sized ATVs. Boys are more likely to take risks than girls, as evidenced by automobile and other injury rates.[26,27] Boys are, therefore, more likely to sustain ATV-related injuries or fatalities than females.[21,27] Age of the youth influences their risk behaviors. As boys in the study grew older, they were more likely to indulge in ATV risky behaviors.

This study brought to light an important factor that influences ATV behaviors of youth, namely their age at ATV driving and riding initiation. The sooner the youth were exposed to ATVs including riding with their family or friends, the sooner they started driving ATVs themselves, and the more likely they were to indulge in several ATV risk behaviors when older. This effect was more pronounced for boys. Boys who started driving ATVs at a younger age were more likely to practice risky behaviors including driving adult-sized ATVs, driving ATVs on public roads, driving ATVs really fast, trying wheelies, jumps, and other stunts with ATVs, as well as carrying extra passengers on single-seat ATVs, compared to those who started driving later. Similar trend was observed for girls such that girls who started driving ATVs and riding with others at an earlier age were more likely to practice unsafe ATV behaviors. These early launchers may have several factors in common including a family culture of risky ATV driving and extra riding. One can speculate that it is likely these parents probably started giving rides to their children at very young ages. Since parents play an important role in determining youth readiness, they probably allowed their youth to start driving ATVs early. These parents may also have lower risk perceptions and are more tolerant of their youth indulging in unsafe ATV behaviors like driving adult-sized ATVs and extra riding single seat ATVs. Parents frequently give in to their children's' wishes for a ride, not realizing consequences of severe injury or loss

of life that it could lead to. After most ATV injuries or accidents, parents usually report being unaware of the gravity of danger posed by these heavy vehicles. Because of the social normalization associated with giving rides to children on ATVs and use of ATVs by young children, the risk perception of parents is low. Just because something is normal, does not mean it is safe. Education on the dangers of ATV riding needs to take a family-based approach. Merely delaying the age of ATV driving initiation by children is not enough; a safety-based paradigm shift in families is needed. If parents themselves practice risky unsafe behaviors on ATVs, they may not see anything wrong with youth using ATVs early or practicing unsafe behaviors on ATVs. It is well known that youth model their parent's behaviors. They do what their parents **do** rather than what their parents tell them to do.[28] There may also be situations where parents are safety conscious but don't know how to change the risky behaviors of their youth. Parents play an important role in ensuring that youth attend formal ATV training courses.

Both individual and summary scores on PPE use indicated that boys were significantly more likely to use protective gear like boots, helmets, gloves, and eye protection while operating ATVs as compared to girls.[21,29-33] These results are in line with past studies that show greater use of PPE by boys than girls. Specifically, older boys in our study were more likely to wear helmets than older girls, which is in line with what Burgus et al. found.[21] The use of helmets among girls was low, with only one-third of girls wearing them. The average helmet-use on ATVs by study youth was between 35%–60%. These results are in line with past studies that estimate a low helmet use on ATVs, averaging about 15–30%.[34-36] Helmet-use seems to be interdependent with risk, such that drivers who ride in more risky environments may be more likely to wear helmets. Since boys are more likely to drive adult-sized ATVs and try stunts, they may perceive a greater

need to protect themselves than girls. Differential parental expectations for boys and girls could be another possible explanation for the variations in PPE use by gender. Past findings suggest that girls are more likely to not be required to wear protective gear by parents compared to boys.[37] Parents may perceive girls to be less likely to take risks, thus not needing extra protection to keep them safe. Access to appropriate PPE is another factor, which is usually determined by parents. Lack of PPE use by girls may also be because of considerations related to appropriate fit for youth of different sizes based on age and gender.[38] Some protective gear like gloves, goggles, and helmets may be too big for petite girls. Results also indicated that younger boys were more likely to wear gloves and eye protection compared to younger girls. Things like boots, goggles, and gloves are ordinarily considered to be part of normal 'male' attire that may make boys 'look cool.' Boys may not consciously wear these gear to protect themselves from injuries; these may just happen to be a part of their daily attire. Girls, on the other hand, are socio-culturally encouraged to look feminine, which may make them averse to wearing the 'masculine-looking' protective gear. It was unclear what the girls normally wore when operating ATVs.

Overall, girls in this study were equally likely to engage in many of the risky ATV behaviors like taking and giving rides on single seat ATVs, driving adult-sized ATVs, driving ATVs on public roads, and driving ATVs really fast. However, they were less likely to wear protective attire, leaving them more vulnerable to injuries and fatalities during crashes. This is in line with past research demonstrating that girls are at a disadvantage, because they are not required to wear PPE in spite of similar exposure to farm work.[37] Estimates show helmet use could potentially reduce the risk of fatal and non-fatal head injuries by 63% and 42% respectively.[24,35,39] New legislation and strict enforcement of helmet laws on ATVs is shown to dramatically reduce

injuries, especially closed head injuries among youth.[12,40] Attending safety training has a positive relationship with ATV safety behaviors including use of PPE.[21] Majority of the youth (boys and girls) in this study had never attended an ATV training course. Studies have also established that parental reminders, supervision, and monitoring increases youth helmet use on ATVs.[41]

CONCLUSION

This study helps identify some age- and gender-based patterns in safety gear use and ATV-related risk and safety behaviors of youth. A multifaceted approach, combining engineering, legislation, and education is needed to prevent youth ATV injuries. Findings suggest that the age at ATV driving and riding initiation has an important influence on future ATV risk and safety behaviors for both boys and girls. Parents seem to be primarily responsible for determining the age of ATV driving and riding initiation for children. Parents have a great deal of power when they partner with children to support their safe behaviors. Since family-based socialization processes have a large influence on ATV risk and safety behaviors, comprehensive family-based interventions that are tailored for youth by age and gender are needed. Parental education on the importance of following age and size recommendations for youth ATV use, setting good safety examples for youth, encouraging youth to attend ATV safety trainings, and requiring their youth (especially older girls) to use appropriate PPE is needed. Policy changes and laws prohibiting operation of ATVs on public roads and wearing helmets by youth are needed. Engineering considerations need deliberate forethought of specific gender-related needs including size of the ATV seat and the design, fit, comfort, ergonomics, and appeal of ATV protective gear for girls operating ATVs. Making PPE more attractive by including pictures of popular celebrities, more

colors options, or ornamentation may make them more appealing to girls. Making ATVs more stable and installing crush protection devices fitted on existing ATVs have been demonstrated to enhance safety and need to be promoted.[42]

The study relies on self-reports from youth, which could be a potential limitation. Other limitations include a volunteer sample, the racial homogeneity of the sample, and the limited geographical area in which the youth lived. A definition of what "driving fast" means was not provided, so it may have been interpreted differently by respondents. Future research needs to focus on further understanding of the role of demographic and personality factors that influence ATV risk and safety behaviors. Of special interest would be to explore the family dynamics related to risk perceptions and safety practices. Developing and testing interventions that involve and engage families in affecting youth ATV safety behaviors is needed.

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TABLE 1. Inter-Correlations Between ATV risky behavior, Use of Protective Gear, ATV Driving and Riding Initiation and ATV Exposure.

Variable	Mean (SD)	ATV risky behavior	Use of safety gear	Current age	Age at ATV driving initiation	Age at ATV riding initiation	ATV exposure
Younger youth							
Boys							
ATV risky behavior composite	3.70(1.46)	--	.209	.461**	-.396**	-.136	.206
Safety gear composite	3.02(2.15)		--	.323**	-.277	-.058	-.173
Current age	11.37(1.14)			--	.040	.200	-.089
Age at ATV driving initiation	7.10(2.54)				--	.774**	-.189

Age at ATV riding initiation	5.54(3.45)					--	-.017
ATV exposure	19.61(25.41)						--
Girls							
ATV risky behavior	3.29(1.34)	--	.103	.181	-.665**	-.434**	.196
Use of safety gear	2.31(2.10)		--	-.052	.025	.200	.111
Current age	11.65(1.10)			--	-.013	.011	-.088
Age at ATV driving initiation	7.47(1.93)				--	.682**	-.353
Age at ATV riding initiation	5.00(3.04)					--	.000
ATV exposure	11.63(19.22)						--

Older Youth							
Boys							
ATV risky behavior	4.04(1.29)	--	-.413**	.041	-.424**	-.108	.059
Use of safety gear	3.63(2.23)		--	-.046	.165	.061	-.216
Current age	15.93(1.38)			--	.033	-.091	-.002
Age at ATV driving initiation	7.60 (3.28)				--	.807**	-.264
Age at ATV riding initiation	5.94(3.04)					--	-.271
ATV exposure	16.49(21.84)						--
Girls							
ATV risky	3.72(1.28)	--	-.335	-.170	-.365	-.181	.118

behavior							
Use of safety gear	2.27(2.20)		--	-.143	-.118	.047	.017
Current age	16.26 (1.81)			--	.176	.448**	-.333
Age at ATV driving initiation	7.65(1.96)				--	.555**	-.264
Age at ATV riding initiation	4.50(2.50)					--	-.540*
ATV exposure	19.78(26.45)						--
*p<.05. **p<.01							

TABLE 2. Prevalence of risky behaviors for boys and girls by age at ATV driving and riding initiation

	Boys					Girls				
Variable	M	SD	t	Df	P	M	SD	t	Df	P
Drive ATV on public road										
Age at ATV driving initiation			2.90	85	.005			5.54	56	.000
Drive on public road	6.79	2.69				6.63	1.70			
Not drive on public road	8.64	2.99				8.96	1.33			
Age at ATV riding initiation			.645	74	.521			2.15	48	.04
Drive on public road	5.55	3.08				4.04	2.50			

Not drive on public road	6.06	3.57				5.68	2.90			
Drive an ATV fast										
Age at ATV driving initiation			3.20	86	.002			3.61	56	.000
Drive an ATV fast	6.91	2.66				7.11	1.82			
Not drive ATV fast	9.38	3.32				9.25	1.36			
Age at ATV riding initiation								2.78	48	.008
Drive an ATV fast	5.43	3.19	1.73	74	.087	4.18	2.69			
Not drive ATV fast	7.07	3.27				6.58	2.31			
Drive an adult sized ATV										
Age at ATV driving initiation			2.06	86	.04			-.813	56	.420

Drive an adult sized ATV	7.22	2.90				4.53	2.72			
Not drive adult sized ATV	10.25	2.22				6.80	2.78			
Age at ATV riding initiation			.169	74	.87			1.77	48	.084
Drive an adult sized ATV	5.72	3.31				4.53	2.72			
Not drive adult sized ATV	6.00	2.31				6.80	2.76			
Try wheelies, jumps										
Age at ATV driving initiation			2.48	86	.015			1.75	56	.085
Try wheelies, jumps	6.76	2.72				6.95	2.06			

Not try wheelies, Jumps	8.31	3.05				7.87	1.80			
Age at ATV riding initiation			0.099	74	0.921			.281	48	.780
Try wheelies, jumps	5.70	3.20				4.61	2.81			
Not try wheelies, Jumps	5.77	3.37				4.84	2.81			
Carried an extra-rider on single-seat ATV										
Age at ATV driving initiation			2.56	86	.012			1.34	55	.186
Carried an extra-rider on a single-seat ATV	7.11	2.74				7.46	1.96			
Not carried an extra-rider on single-seat ATV	9.81	3.85				9.00	1.00			
Age at ATV riding initiation			.645	74	.521			1.31	48	.195

Carried an extra-rider on a single-seat ATV	5.64	3.23				4.61	2.74			
Not carried an extra-rider on single-seat ATV	6.39	3.50				6.50	3.11			

TABLE 3. Use of ATV Safety Gear by Age and Gender

	Boys		Girls			
Variable	Yes % (n)	No % (n)	Yes % (n)	No % (n)	χ^2	P
Long sleeves						
Younger	58 (25)	42 (18)	45 (13)	55 (16)	1.23	.34
Older	68 (28)	14 (13)	46 (12)	54 (14)	3.24	.06
Boots						
Younger	79 (34)	21 (9)	66 (19)	35 (10)	1.64	.20
Older	93 (38)	7 (3)	69 (18)	31 (8)	6.38	.02
Helmet						
Younger	44 (19)	56 (24)	52 (15)	48 (14)	.40	.63

Older	61 (25)	39 (16)	35 (9)	65 (17)	4.42	.05
Gloves						
Younger	35 (15)	65 (28)	17 (3)	90 (26)	5.56	.03
Older	42 (17)	59 (24)	19 (5)	81 (21)	3.57	.07
Eye protection						
Younger	33 (14)	67(29)	10 (3)	90 (26)	4.74	.05
Older	34 (14)	66 (27)	15 (4)	85 (22)	2.85	.16

Table 4 Difference in use of ATV Safety Gear Composite by Boys and Girls

Variable		M (SD)	t	df	P
ATV safety gear composite					
Younger	Boys	2.49(1.55)	-1.91	70	.06
	Girls	1.83(1.26)			
Older	Boys	2.98(1.68)	-2.85	65	.006
	Girls	1.85(1.41)			

Figure 1. Diagram showing percentages of who was driving the ATV when boys and girls rode as passengers.