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Discordance between Age and Size Based Criteria of Child Passenger Restraint Appropriateness

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Abstract

Objectives—In this study we sought to accomplish the following objectives: 1) to calculate the percentage of children considered appropriately restrained across eight criteria of increasing restrictiveness; 2) to examine agreement between age- and size-based appropriateness criteria; 3) to assess for changes in the percentage of children considered appropriately restrained by the eight criteria between 2011 (shortly after updates to United States (U.S.) guidelines) and 2015.

Methods—Data from two cross-sectional surveys of 928 parents of children younger than 12 years old (n=591 in 2011, n=337 in 2015) were analyzed in 2017. Child age, weight, and height were measured at an emergency department visit and used to determine if the parent-reported child passenger restraint was considered appropriate according to eight criteria. Age-based criteria were derived from Michigan law and U.S. guidelines. Weight, height, and size-based criteria were derived from typical restraints available in the U.S. in 2007 and 2011. The percent appropriate restraint use was calculated for each criterion. The kappa statistic was used to measure agreement between criteria. Change in appropriateness from 2011 to 2015 was assessed with chi-square statistics.

Results—Percent appropriate restraint use varied from a low of 19% for higher weight limits in 2011 to a high of 91% for Michigan law in 2015. Agreement between criteria was slight to moderate. The lowest kappa was for Michigan law and higher weight limits in 2011 ($\kappa=0.06$) and highest for U.S. guidelines and lower weight limits in 2011 ($\kappa=0.60$). Percent appropriate restraint

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use was higher in 2015 than 2011 for the following criteria: U.S. guidelines (74% vs. 58%, $p<0.001$), lower weight (57% vs. 47%, $p=0.005$), higher weight (25% vs. 19%, $p=0.03$), higher height (39% vs. 26%, $p<0.001$) and higher size (42% vs. 30%, $p=0.001$).

Conclusions—The percent of children considered to be using an appropriate restraint varied substantially across criteria. Aligning the definition of appropriate restraint use with current U.S. guidelines would increase consistency in reporting results from studies of child passenger safety in the U.S. Potential explanations for the increased percentage of children considered appropriately restrained between 2011 and 2015 include adoption of the updated U.S. guidelines and the use of child passenger restraints with higher weight and height limits.

Keywords

Child restraints; child safety; child seat; children; booster seat; infant seat; seat belt laws

INTRODUCTION

Automobile collisions are a leading cause of morbidity and mortality among children in the United States (U.S.). According to analysis of Fatality Analysis Reporting System data, the MVC-related morality rate in 2010–2014 was 0.94 per 100,000 U.S. children younger than 15 years of age.(Wolf et al. 2017) Motor vehicle-occupant nonfatal injury rates for the same timeframe were 284.33 per 100,000 children younger than 15 years of age.(CDC 2014) Among children involved in fatal crashes, 20% were unrestrained or improperly restrained and these behaviors were associated with increased fatality rates.(Wolf et al. 2017) Other research demonstrates that proper restraint use reduces the risk of serious injury to children in crashes substantially (Arbogast et al. 2004, Arbogast et al. 2009, Durbin et al. 2005, Henary et al. 2007, Stewart et al. 2014).

In an effort to minimize automobile collision-related morbidity and mortality among children, emphasis has shifted from age- to size-appropriate restraint use. The American Academy of Pediatrics (AAP) and the National Highway Traffic Safety Administration (NHTSA) updated the U.S. child passenger safety guidelines in 2011, stressing the importance of child size in restraint selection and determining when to transition from one stage of restraint to the next (e.g., from rear-facing to forward-facing) (Durbin 2011, Durbin 2011, NHTSA 2014). Although every state legislates the use of child restraints, legal requirements vary widely and still primarily are based on age.(Insurance Institute for Highway Safety - Child Restraint Laws) For example, a five year old child in South Dakota may legally use a seat belt alone but an eight year old in Tennessee and Wyoming is required to use a booster seat.(Insurance Institute for Highway Safety - Child Restraint Laws)

Despite evidence of the protection offered by restraints and laws requiring their use, sub-optimal restraint practices are common. Past work by Durbin et al. has estimated that approximately 50% of children under sixteen do not use age-appropriate restraints (Durbin et al. 2005). More than a decade later, there has been limited improvement in restraint use over time nationally.(Li et al. 2016) Booster seat use among 4 to 7 year olds has remained below 47% since 2006 with a decline between 2013 and 2015, restraint use for all children

under 13 years decreased between 2013 and 2015, and premature transitions to booster seats among 1 to 3 year olds increased.(Li et al. 2016)

In this study, we determined the percentage of children considered appropriately restrained by age, weight, height, and size using data collected from parents of children in two Michigan emergency departments (EDs) in 2011 and 2015. We then quantified the discordance between different age- and size-based definitions of child passenger restraint appropriateness of increasing restrictiveness.(Klinich et al. 2016) Lastly, we compared the percentages of children considered appropriately restrained based on each criterion in 2011 and 2015. We hypothesized that higher percentages of children would be considered appropriately restrained across criteria in 2015 than in 2011, when the updated guidelines for child passenger safety in the U.S. were first published.

METHODS

In 2017, we conducted a secondary analysis of data collected by Macy et al. from November 2011 to April 2012 (Macy et al. 2014) and again between May and September 2015 for two 2-site, cross-sectional surveys of parents seeking emergency care for their children 11 years old and younger who were shorter than 57 inches tall. Parents were recruited from Michigan Medicine's (MM) C.S. Mott Children's Hospital ED and the Hurley Medical Center (HMC) ED. The MM Pediatric ED is located in a suburban, tertiary care, academic hospital with a predominantly white and privately insured patient population. The HMC ED is located within an urban community hospital where higher proportions of patients are African American and covered by Medicaid compared with MM. Parent-reported restraint use was largely accurate, with 95.3% sensitivity and 63.6% specificity compared with direct in-vehicle observation among a subset of children in 2011 discharged during their recruitment shift (Macy et al. 2014). The Institutional Review Boards of the University of Michigan Medical School and HMC approved the studies.

Study Population

Parents of children younger than 12 years old (1 to 11 years old in 2011 and birth to 10 years old in 2015) who arrived to the EDs during peak hours (2 PM–9 PM) on weekdays and weekends when research assistants (RAs) were scheduled to recruit participants were potentially eligible for the study. Parents were not approached if their child was: critically ill or injured (Triage Category 1 or treated in a resuscitation bay); evaluated for suspected child abuse; or in the process of admission. Parents were excluded if they were <18 years old, did not speak English, their child was taller than 57 inches, or required a special restraint. For the purposes of these analyses, we excluded 37 cases where parents did not indicate their child's usual restraint or indicated their child never used a restraint and 32 cases with missing information on the child's weight or height.

Measures

Parents who indicated their child used a restraint were provided sketched examples of child passenger restraints¹¹ and asked to select the child's most frequently used restraint from the options. ED staff measured child weight as part of clinical care and trained RAs measured

child height (in whole inches) using a measuring tape. Child age and gender were obtained from the ED record.

We considered the parent-reported usual child passenger restraint to be appropriate for the child's age, weight, height, and size using eight criteria described below. Lack of information on the specific brand and model of restraint system each child used prevented us from being able to determine the appropriateness of individual seats. Therefore, we estimated weight and height appropriateness using two thresholds based on the maximum weight and height limits for typical rear-facing convertible car seats, forward-facing car seats, and booster seats on the U.S. market in 2007 (lower limits) and 2011 (higher limits). Maximum weight and height limits were determined using the online child restraint system product listings published on AAP's [healthychildren.org](https://www.healthychildren.org) website (Appendix A) (AAP 2014). The weight thresholds for restraints from 2007 align with the scoring system used by Klinich et al in their 2016 rating of child passenger safety laws relative to best practice recommendations (Klinich et al. 2016). We utilized the second, higher, set of weight and height thresholds because newer restraints, designed to accommodate heavier and taller children, have been introduced to the market.

Criterion 1: Age-based appropriate restraint use per Michigan law. Michigan law requires children under four years old to use a car seat (either rear- or forward-facing), children between four and seven years old to use a car seat or booster seat, and children eight years old and older to use a seat belt (MSP 2015). We considered children to be using a legally-appropriate restraint if they were reported to use an earlier stage restraint past the point it was legally required (e.g., a 9-year-old using a booster seat). Michigan law did not change during the study period.

Criterion 2: Age-based appropriate restraint use per U.S. guidelines published in 2011 by the AAP (Durbin 2011) and NHTSA (NHTSA 2014). Taken together, these guidelines recommend children under two use rear-facing car seats, children two through four years old use forward-facing car seats, children five to 11 years old use booster seats until reaching a height of 57 inches. All children enrolled in the study were shorter than 57 inches. Again, we considered children to be using a guideline-appropriate restraint if they continued to use an earlier stage restraint past the transition age (e.g., a 2-year-old using a rear-facing car seat).

Criterion 3: Lower maximum weight limits. We used the following parameters: rear-facing car seat up to 30 pounds, forward-facing car seat between 31 and 40 pounds, booster seat between 41 and 80 pounds, and seat belt above 80 pounds.

Criterion 4: Higher maximum weight limits. We used the following parameters: rear-facing car seat up to 35 pounds, forward-facing car seat between 36 and 65 pounds, booster seat between 66 and 100 pounds, and seat belt above 100 pounds.

Criterion 5: Lower maximum height limits. We used the following parameters: rear-facing car seat up to 30 inches, forward-facing car seat between 31 and 43 inches, booster seat

between 44 and 56 inches. All children eligible for the studies were shorter than 57 inches, the height at which many children are considered tall enough to use an adult seat belt alone.

Criterion 6: Higher maximum height limits. We used the following parameters: rear-facing car seat up to 36 inches, forward-facing car seat between 37 and 50 inches, booster seat between 51 and 56 inches.

Criterion 7: Size based on lower maximum weight and height limits. Children using a rear-facing car seat were considered to do so appropriately if they were below both the weight and height limits. Children using forward-facing car seats and booster seats were considered to do so appropriately if they were within either the weight or height parameters for the later stage restraint, as this represents children who grew out of the earlier stage restraint by either weight or height. Children using a seat belt were considered to do so appropriately if they were above the booster seat upper weight limit.

Criterion 8: Size based on higher maximum weight and height limits. We took the same approach as described for Criterion 7 but used the higher weight and height limits.

Statistical Analyses

Descriptive statistics were calculated for each variable. We determined the number and percentage of children using a restraint for which they were too small (prematurely transitioned), within the weight range (appropriate), or too heavy or too tall. Appropriateness was calculated for each of the eight study criteria as a percentage by dividing the number of children using a restraint considered to be appropriate by the total number of children using that type of restraint. We also determined appropriateness rates stratified by restraint type and study year. Agreement between appropriateness criteria was assessed with the kappa statistic. We interpreted agreement from the Kappa statistics as slight (0.01 to 0.20), fair (0.21 to 0.40), moderate (0.41 to 0.60) and substantial (0.61 to 0.79) (Landis et al. 1977). We compared appropriateness rates for each criterion by study year (2011 vs. 2015) using chi-square statistics. P-values < 0.05 were considered statistically significant. Survey responses were exported from Qualtrics© to Excel (Microsoft Corporation, Redmond, WA) and converted into Stata 13.1 (Stata Corp, College Station, TX) for analysis.

RESULTS

In 2011, 744 potentially eligible parents were approached, 654 finished the survey, and 591 children had weight and height recorded. In 2015, 456 potentially eligible parents were approached, 343 completed the survey, and 337 children had weight and height recorded. The full dataset used for these analyses included 928 children with complete restraint and size information, which represents 77% of the 1,200 potentially eligible participants. Sample demographic characteristics for the two study periods are presented in Table 1. In 2011, we recruited parents of children 1 to 11 years old. In 2015, we recruited parents of children younger than 11 years old. Compared with 2011, the 2015 sample had lower percentages of 2 to 4 year olds and 5 to 11 year olds and lower percentages of children restrained in booster seats and seat belts. The 2015 sample had greater percentages of parents who were younger

than 25 years, self-identified as non-Hispanic, black or African American, and self-reported family income below \$25,000.

Rates of appropriateness for each criterion stratified by restraint type and study year are presented in Appendix B. Among children whose parents reported they used a restraint considered legally appropriate, 72% were in a guideline-appropriate restraint, 58% were considered appropriate by lower weight limits, 71% by lower height limits, and 74% by lower size limits. Kappa statistics for concordance across the appropriateness criteria are displayed in Table 2. Concordance was lowest between state law and higher weight, height, and size limits. There was fair agreement between Michigan law and U.S. guidelines ($\kappa = 0.34$ in 2011 and $\kappa = 0.38$ in 2015). There was moderate agreement between U.S. guidelines and lower weight limits ($\kappa = 0.45$ in 2011 and $\kappa = 0.46$ in 2015), between U.S. guidelines and lower height limits ($\kappa = 0.60$ in 2011 and $\kappa = 0.57$ in 2015). In 2015, there was also moderate agreement between U.S. guidelines and higher weight limits ($\kappa = 0.53$) and higher size limits ($\kappa = 0.52$).

In the sample from 2011, 87% of parents reported use of a restraint that was considered appropriate based on Michigan law, with 10% of the sample reporting use of a restraint longer than legally required (for example using a booster seat for an 8-year-old). In the sample from 2015, 92% of parents reported use of a restraint that was considered appropriate based on Michigan law, with 8% of parents reporting use of a restraint longer than legally required. The percentage of parents who reported their child used a booster seat or seat belt before reaching the legal age to do so was 13% in 2011 and 8% in 2015 ($p = 0.016$).

When considering the restraint appropriate for the child's age based on U.S. guidelines, we found 56% appropriateness in 2011 and 72% appropriateness in 2015. An additional 2% reported use of a restraint beyond the age thresholds from the U.S. guidelines in both years. The percentage of parents who reported their child used a forward-facing car seat, booster seat, or seat belt before reaching the recommended age to do so per the U.S. guidelines was 42% in 2011 and 26% in 2015 ($p < 0.001$).

Premature transitions were common in 2011 relative to the weight limits set for this study and improved in 2015. Among parents who reported their child used a forward-facing car seat, about half did so before their child weighed 31 pounds (58% in 2011; 49% in 2015) and more than 80% did so before their child weighed 36 pounds (82% in 2011; 84% in 2015). Among parents who reported their child used a booster seat, more than one quarter did so before their child reached 41 pounds (37% in 2011; 28% in 2015) and more than 80% did so before their child weighed 66 pounds (88% in 2011; 85% in 2015). Among parents who reported their child used a seat belt, more than two thirds did so before their child weighed 81 pounds (79% in 2011; 67% in 2015) and about 90% did so before their child weighed 101 pounds (89% in 2011; 94% in 2015).

Few parents reported use of a restraint for which their child was considered too heavy based on the lower weight limits. The proportions of children reported to use a rear-facing car seat above 30 pounds were 6% in 2011 and 2% in 2015. The proportions of children reported to

use a forward-facing car seat above 40 pounds were 7% in 2011 and 5% in 2015. The proportions of children reported to use a booster seat above 80 pounds were 5% in 2011 and 7% in 2015.

For car seats and booster seats, premature transitions by height were less common than premature transitions by weight (results not shown) and more children were using a restraint for which they were considered too tall than too heavy; 23% of rear-facing car seat users were taller than 30 inches and 6% of forward-facing car seat users were taller than 43 inches. All parents who reported their child uses a seat belt did so before their child was 57 inches tall.

Higher percentages of children were considered to be appropriately restrained in 2015 compared with 2011 by the following criteria: U.S. guidelines, weight (both lower and higher limits), higher height limits, and higher size limits (Table 3). Despite improvements, appropriateness rates in 2015 were still below 60% for lower weight limits and higher weight, height, and size limits. Figure 1 illustrates the patterns of parent-reported child passenger restraint use by lower and higher weight limit categories for the two years in reference to the relevant weight-appropriate restraint choices. Appropriateness rates increased between 2011 and 2015 for rear-facing and forward-facing car seat weight limits. Appropriateness rates were flat for booster seat weight limits.

DISCUSSION

Far more parents reported use of child passenger restraints that were considered appropriate by Michigan law than by U.S. guidelines and size parameters including weight or height. While Michigan law and U.S. guidelines both define appropriate restraint use by child age, state law allows far more children to be considered appropriately restrained while prematurely using restraints before recommended to do so by U.S. guidelines and typical size parameters (Klinich et al. 2016). We also found Michigan law has lower concordance with size-appropriateness criteria than do U.S. guidelines. Work by Staunton et al. demonstrates that the discrepancy between legal requirements and best-practice recommendations is neither a new problem nor a problem unique to Michigan. In 2001, they found 74% of Georgia children were inappropriately restrained but were doing so within the bounds of Georgia's child passenger safety law (Staunton et al. 2005). State laws are effective in increasing the rate of child passenger restraint use (Macy et al. 2012, Mannix et al. 2012, Sun et al. 2010, Winston et al. 2007) and parents rely on laws when selecting restraints (Bingham et al. 2006, Simpson et al. 2002). However, parental reliance on outdated laws that are not aligned with evidence-based best-practices for child passenger safety, (Klinich et al. 2016) may contribute to the premature transition of children out of a restraint that is still appropriate for their size. Although modernizing state child passenger safety laws to better align with U.S. guidelines does not guarantee behavior change, there is potential for laws with higher age limits to encourage some parents to prolong use of each type of child passenger restraint. As of 2017, only California, New Jersey, Pennsylvania, and Oklahoma have updated laws that require rear-facing until age two while the majority of states have laws similar to Michigan (IIHS 2017, Klinich et al. 2016). There are challenges to the passage, enforcement, and parental understanding of laws that specify height and

weight limits for restraint use given the range of restraint systems on the market and difficulties in obtaining measurements of child size roadside.

We found slight to moderate concordance between age and size-based definitions of child passenger restraint appropriateness. When age-based recommendations and manufacturer-specified size limits offer contradictory advice, parents may become confused. Anticipatory guidance during primary care visits where a child's weight is obtained provides an opportunity for healthcare providers to direct families to check the weight and height limits of their child's restraint systems and encourage families to delay transitions until the child reaches the maximum weight and height limits of their current restraint. Although older literature raised concerns that many overweight or obese children were above the upper weight limits for restraints considered appropriate for their age (Basco et al. 2009, Trifiletti et al. 2006) and that heavier children are at increased risk for lower extremity injury in a collision (Zonfrillo et al. 2010), over time there has been an increase in the number of rear-facing and forward-facing child passenger restraint systems that can accommodate larger children than those used in prior studies (AAP 2014).

Our results show an increase in appropriate restraint use between 2011 and 2015 based on U.S. guidelines as well as the higher weight, height, and size limits. This finding suggests that some parents have adopted the updated guidelines for child passenger safety which encourage parents to continue use of an earlier stage, more protective, restraint (such as a rear-facing convertible seat instead of a forward-facing seat with 5-point harness) until the child reaches the manufacturer-specified weight or height limit (Durbin 2011, Durbin 2011). It is also possible that parents have been responsive to newer child safety seat labels and instruction manuals that include messages about delaying transitions. Although age is commonly used as a proxy for size in discourse on child passenger restraint appropriateness, as it is a simpler characteristic to measure (Anderson et al. 2009), the wide variation in child growth patterns (CDC 2000) supports a shift in focus to size for child passenger restraint selection. Helping families to understand when to make a size-appropriate restraint transition has the potential to increase the safety of individual child passengers.

Our study is subject to several limitations. First, we did not ask parents about their reasons for selecting and using their child's usual restraint. Therefore, we do not know if laws, guidelines, manufacturers recommendations, or other factors such as the number of children in the family or the costs of child restraint systems are the primary drivers of behavior. Second, we did not collect information on the specific restraint system each child was using. This information would be needed to determine if a child was using a restraint that was truly appropriate for their weight and height according to manufacturer specifications. Restraint-specific details were beyond the scope of the primary studies from which these data were obtained. We attempted to minimize the impact of this limitation by analyzing two sets of weight and height thresholds for typical child restraint systems on the U.S. market in both 2007 and 2011. Third, we acknowledge that children have a wide range of body types, and even though a child is within the weight and height parameters of our study they may not fit properly in their child passenger restraint system (Park et al. 2016, Reed et al. 2006). Fourth, collection of data in ED settings and the exclusion of non-English speaking parents may also have limited generalizability of these analyses to the full population of child passengers in

the U.S. or in other countries. Children in the ED may be heavier or lighter than the general population due to medical conditions. Fifth, self-report of restraint use may have been affected by misclassification bias due to variation in parental interpretation of restraint categories and images presented as response options. In addition, parents may have reported use of a recommended restraint due to social desirability bias. Age-appropriateness may have been more susceptible to social desirability bias than size-appropriateness given emphasis on age in current Michigan law and older U.S. guidelines and may contribute to lower concordance between age- and size-based criteria. Finally, our calculations of appropriateness do not account for children who use a restraint other than the usual restraint as reported by their parent, and thus overestimate appropriateness to some degree.

Our results have implications for future investigations of child passenger restraint use. We demonstrate wide variation in the percent of children considered to be using an appropriate restraint across different criteria. Parent-reported restraint use was considered most appropriate relative to the ages referenced in Michigan law and least appropriate relative to child size. In future studies of child passenger safety in the U.S. variation across studies could be reduced through aligning the definition of appropriate restraint use with current U.S. guidelines. The increases in the percentages of children considered to be using an appropriate restraint over time suggest parents may be positively influenced by the dissemination of updated child passenger safety guidelines and the availability of safety seats that accommodate larger children. Modernization of child passenger safety laws could be used to place even greater emphasis on the recommendations to extend the use of child restraint systems.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1: Parent-reported restraint use within lower and higher weight limit categories by survey year.

Bar segments represent the restraint type in use within weight categories, for lower weight limits in the top panel and higher weight limits in the lower panel, separately for each survey year. The boxes surrounding groups of bars indicate the restraint type considered appropriate for children within the weight ranges.

Table 1:

Sample demographic characteristics

	Year of Data Collection			
	2011		2015	
	N	%	N	%
	591		337	
Site				
HMC	297	50.2	169	50.1
Child age, years				
<2 years	99	16.8	118	35.0
2–4 years	237	40.1	122	36.2
5–11 years	255	43.1	97	28.8
Child gender				
Male	319	54.0	180	46.3
Ever unrestrained	48	8.1	49	14.5
Usual restraint				
Rear-facing car seat	35	5.9	95	28.2
Forward-facing car seat	207	35.0	116	34.4
Booster seat	265	44.8	95	28.2
Seat Belt	84	14.2	31	9.2
Parent Race/Ethnicity				
White, Non-Hispanic	361	61.1	177	52.5
Black, Non-Hispanic	153	25.9	113	33.5
Other race or Hispanic	54	9.1	40	11.9
Missing	23	3.9	7	2.1
Parent Age, years				
18–24	71	12.0	83	24.6
25–29	98	16.6	81	24.0
30–34	101	17.1	75	22.3
35–39	66	11.2	50	14.8
40+	69	11.7	37	11.0
Missing	186	31.4	11	3.3
Highest Education Level				
Less than High School	50	8.5	36	10.7
High School	202	34.2	130	38.6
Technical/associate's degree	161	27.2	83	24.6
Bachelor's degree or higher	172	29.1	86	25.5
Missing	6	1.0	2	0.6
Annual Household Income				
<25,000 or public assistance	227	38.4	177	52.5

	Year of Data Collection			
	2011		2015	
	N	%	N	%
25,000 to 49,999	131	22.2	59	17.5
50,000 to 99,999	124	21.0	47	13.9
100,000	88	14.9	47	13.9
Missing	21	3.5	7	2.0

Table 2:

Kappa Statistics Comparing Concordance Across Criteria

	Age by U.S. guidelines	Lower weight limits	Higher weight limits	Lower height limits	Higher height limits	Lower size limits	Higher size limits
2011							
Age by Michigan law	0.34	0.34	0.06	0.31	0.10	0.31	0.11
Age by U.S. guidelines	---	0.45	0.22	0.60	0.39	0.47	0.39
2015							
Age by Michigan law	0.38	0.18	0.10	0.35	0.15	0.29	0.17
Age by U.S. guidelines	---	0.46	0.32	0.57	0.53	0.39	0.52

Note: Light gray shading = slight agreement; Medium gray shading = fair agreement; Dark gray shading = moderate agreement.

Table 3:

Appropriateness by Year

Criterion	2011 (n=584 [*])	2015 (n=277 [*])	p-value
Age in Michigan law	87%	91%	0.12
Age by United States guidelines	58%	74%	<0.001
Lower weight limits	47%	57%	0.005
Higher weight limits	19%	25%	0.03
Lower height limits	60%	66%	0.075
Higher height limits	26%	39%	<0.001
Lower size limits	65%	69%	0.18
Higher size limits	30%	42%	0.001

* Analysis limited to data collected on children 1 to 10 years old, as both surveys included children in this age range.