The Transforming Toybox
Examining the U.S. Infant Toy Market
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The authors examined technological and traditional infant toys to understand the U.S. toy market facing today's care givers. They found significant differences in the two types of toys in terms of their developmental targets—with more traditional toys aimed at physical development and more technological toys aimed at cognitive development. Given that the toy market is so vast and that technological toys sometimes come with considerable costs, they argue for the need to understand more precisely how toys are marketed to prevent exploitation based on the pursuit of a so-called "brainy baby." **Key words**: educational toys; gender-specific toys; developmental toys; technical toys; traditional toys; toy marketing

From motor milestones to language acquisition and developing social relationships, the experiences that happen during infancy set the stage for the rest of our lives (Institute of Medicine and National Research Council 2015). In particular, play (both with and without physical toys) is, according to research, an essential component of infancy, which significantly affects an infant's physical, cognitive, and socioemotional development (Healy, Mendelsohn, and Council on Early Childhood 2019; Landry et al. 1998; Ruff and Rothbart 1996). At the same time, care givers' perceptions and beliefs, as well as the ways in which toys are marketed (Al Kurdi 2017; Hassinger-Das et al. 2021), have an impact on the types of toys that care givers purchase for their children (Boe and Woods, 2018). This leads us to two important questions: what do the toy boxes of today contain, and how well do today's toys promote child development as evidenced from play research?

Toys designed for young children made up approximately 10 percent of the U.S. toy market in 2021, which was valued at approximately \$38.2 billion (The Toy Association 2022). Despite the broad impact of and the high demand for toys for infants from birth to twenty-four months of age, America's toy indus-

try often does not consult experts in child development when designing toys (Gardner et al. 2012). Indeed, although research is limited, extant evidence about care giver and child use of technologically "enhanced," battery-operated toys can result in significantly different interactions than those with traditional toys (Bergen et al. 2009; Zosh et al. 2015).

We aim to expand the literature examining the marketplace for technological and traditional toys in the United States, specifically for toys that target the infant population from birth to twenty-four months, given the long-lasting impact that this early stage has on an infant's future development.

Technological Versus Traditional Toys

For decades, research has suggested that toys play a unique role in supporting children's play activities (Rubin and Howe 1985). Primarily, traditional, nonelectronic toys foster three types of play: pretend play, object play, and physical play (Hassinger-Das et al. 2017). In pretend play with dolls or figurines, for example, children take on roles and develop an understanding of the minds and feelings of others (Youngblade and Dunn 1995). Play with objects, such as building blocks, helps children develop spatial skills (Verdine et al. 2017) and allows them to express themselves creatively (Trawick-Smith et al. 2015). Finally, toys used in physical play, including play with balls in such sports as basketball and soccer, both supports children's physical health and fosters the development of their motor skills (Hassinger-Das et al. 2017). With traditional toys, research suggests that children's cognitive and language development are significantly impacted by care givers providing toys (as well as shared book readings). The presence of toys also affects how mothers talk with their children while playing (Tomopoulos et al. 2006).

At the same time, the number of technological toys in the marketplace continues to increase, and these toys are often marketed as educational, even though this term is not subject to any meaningful definition (Hassinger-Das and Hirsh-Pasek 2019; Healey, Mendelsohn, and Council of Early Childhood 2019; Jennings and Cook 2021). The research regarding technological toys suggests that the technological enhancements have implications for care giver–child interaction and play behaviors (Healey, Mendelsohn, and Council of Early Childhood 2019; Wooldridge and Shapka 2012), quality of language used and nature of topics (Zosh et al. 2015), and overall attention, gestures, and vocalizations

during play (Miller et al. 2017). Research suggests that children have fewer opportunities to engage in pretense and direct their activities when playing with technological toys than with traditional toys (Bergen et al. 2009). Some features of technological toys can also distract from their intended educational purposes; for example, toy speech and noises can detract from play focused on supporting spatial skills (Zosh et al. 2015).

According to a study by Sosa (2016), the quality of verbal interaction, including care giver words, conversational turns, and care giver responses, was lower during play with technological toys compared to play with traditional toys. In another study, researchers found that play with technological toys elicited less language interaction between mothers and children during play and a lower quality of overall interaction measured by responsiveness, teaching, and encouragement than traditional toys (Wooldridge and Shapka 2012). It may be that traditional toys provide more flexibility in how care givers and their children choose to play and thus facilitate more exploration.

How Do Care Givers Make Toy Purchasing Decisions?

But how do care givers decide whether to purchase technological or traditional toys for their infants? Two major factors appear to affect care givers' decisions about what toys to purchase: environmental factors (including beliefs about parenting, emotional reactions, child preferences, demographics, and cultural considerations) and toy marketing (including advertising materials, safety information, and cost) (Al Kurdi 2017; Fallon and Harris 2001; Fisher-Thompson 1993; Fisher-Thompson, Sausa, and Wright 1995; Freeman 2007; Magatef and Momani 2020; Martin. Eisenbud, and Rose 1995; Lam and Leman 2003; Okita 2004; Ruwindah and Handayani 2019).

Environmental Factors
Care givers develop their relationships with their infants based on past experiences and beliefs about parenting, relationships, and children in general. These experiences and beliefs are also influenced by cultural factors, and they can have long-lasting effects on the care giver–infant bond (Kochanska, Bolt, and Goffin 2019). One way in which care giver beliefs, attitudes, and preferences affect infants concerns the types of toys care givers purchase (Michael Cohen Group 2019) and how they use these toys to facilitate and support play (Chak 2007).

In particular, previous research has focused on how attitudes and beliefs about gender influence the toy purchasing decisions made by care givers—and how these purchases provide infants with some of their very earliest information about gender roles (Boe and Woods 2018). Beyond reinforcing gender stereotypes, playing only with same-gender toys might lead to male and female children developing different skill sets (Weisgram 2018), such as female children's play with baby dolls fostering nurturing behaviors (Leaper and Bigler 2018) and male children building spatial skills through puzzle play (Levine et al. 2012). As one result of these diverging skill sets, fewer females than males pursue careers in STEM (science, technology, engineering, and mathematics) occupations (Hill, Corbett, and St. Rose 2010).

Research with Indonesian parents suggests that the parents' ages also influences how they view the role of gender in making toy decisions. Oktaviani and Ichwan (2021) found that younger parents (those in their thirties) were more likely to eschew gender-specific toys in favor of giving their children more choice and opportunity to play with a wide variety of toys, whereas older parents (those in their forties) were more likely to pick toys targeted for their child's gender.

Care givers' own gender socialization shapes the ways in which they purchase gender-typed toys for their children; in fact, gender stereotypes are reinforced when parents encourage children to play with only same-gender toys. In a 2018 study, parents of children aged three to six and living in Austria indicated that same-gender and gender-neutral toys were better for their children to play with than cross-gender toys (Kollmayer et al. 2018), which means that parents found a male child playing with a baby doll less desirable than the same child playing with a gender-neutral art kit. Similar findings have shown that parents support male and female children playing with masculine and gender-neutral toys but allow only female children to play with feminine toys (Campenni 1999; Wood, Desmarais, and Gugula 2002). The research about how care giver perspectives impact toy selections and, in turn, impact infants' experiences with gender provides an important clue for fully understanding the potential effect of toys on child development. In short, we must also understand care giver perspectives—and the factors that inform those perspectives.

Toy Marketing
In addition to environmental factors, care givers' toy selections are also influenced by the ways in which toys are marketed (Hassinger-Das et al. 2021; Hogan 2007). Through product development and marketing, toy manufacturers and

retailers hope to foster consumer trust (Hogan 2007). To develop this trust, companies focus on areas such as safety, dependability, and attentiveness to customers' wants and needs. This can look different depending on the product, but, for example, Hains detailed how Mattel attempted to increase trust (and decrease brand resistance) by introducing the Fashionistas line of dolls in 2016 as a counter to the issues many parents had with the traditional Barbie figure. Mattel focused on media coverage, not to appeal to the children who would play with the new dolls, but to show Millennial parents how the dolls aligned with their values regarding representation and social justice (Hains 2021).

Jennings and Cook (2021) conducted case studies of toy manufacturer Fisher-Price technological product lines and found that, by focusing marketing on the toys support of children's development and growth, the brand fosters parental trust and shows that technological toy play is integral to child development. Through this type of marketing, Fisher-Price and other toy companies have played a pivotal role in positioning educational play as a critical ingredient for a successful child (Sobe 2009). However, in general, many consumers are not overly familiar with the toy industry, although marketing and media mentions of recalls and negative incidents affect consumer trust and help shape purchasing decisions (Hogan 2007).

Gender-based marketing is one factor that has the potential to affect care givers' purchasing decisions. Sweet conducted a retrospective look at toy catalogs throughout the twentieth century and found that gender-specific marketing declined after the midtwentieth century, and, in fact, only 2 percent of toys in the 1975 Sears catalog were noted as being either for boys or for girls. However, she commented that toy marketing evolved in the later twentieth century (similar to marketing techniques today) to feature more implicit gender cues, such as using pink, purple, and pastel colors for girls and bold, bright, primary colors for boys (Sweet 2013).

Another specific marketing-related factor affecting care givers' purchasing behavior is the cost of toys, though research suggests it may not be the most important. Al Kurdi (2017) surveyed 252 Jordanian parents and found that, out of six factors (use related, emotional related, educational related, cost related, child demographics related, and parent demographics related) they rated cost-related factors second to last in importance for influencing their toy purchasing decisions. The most important factors for parents were use related, such as safety, durability, the ability of the toy to be used in multiple ways, the type of toy (i.e., doll, vehicle), and the length of time that their children would play with the toy.

Cost is one factor that likely differs greatly by care givers' geographic location, cultural background, and socioeconomic status. For instance, a study of Indonesian parents of children aged one to thirteen found that cost was a top consideration (alongside attractiveness of packaging and the availability of knock-off or unlicensed versions of imported toys [Oktaviani and Ichwan, 2021]).

Yet, a recent U.S. study also established that parents ranked cost as one of the least significant factors they consider when buying a toy, while they identified educational qualities as the most important consideration. Richards and colleagues also found that mothers of children aged twelve and younger in the United States reported that they did not regularly use advertisements to get information about what toys to purchase. Their preferred method involved using internet reviews to determine the best toys to purchase. In fact, mothers rated advertising and product catalogs as their least relied upon sources for this type of information (Richards, Putnick, and Bornstein 2020).

However, Hassinger-Das and colleagues demonstrated that U.S.-based care givers in their study can, in fact, be significantly influenced by retailers' toy descriptions. Care givers of infants up to twenty-four months of age were more likely to select technological toys for infants of all ages after reading retailers' toy descriptions than before being exposed to information about toys' developmental benefits. Care givers were also more likely to agree with statements about the accuracy of toy descriptions, the positive effects of toys on development, and the developmental benefits of toys on their purchasing decisions after they read the toy descriptions. The potential detrimental effects of technological toys makes Hassinger-Das and colleagues' finding that care givers were more likely to state that they would purchase technological toys for their infants after reading retailers' descriptions all the more stark. This finding highlights that it is critical for retailers and manufacturers to report accurately the developmental benefits of toys so that care givers can make choices backed by evidence about the benefits versus potential drawbacks of technological toys (Hassinger-Das et al. 2021).

Al Kurdi (2017) also found that, in a Jordanian sample, parents indicated that they read toy advertisements and use them when deciding which toys to purchase. The results across these three studies suggest that exposure to retailers' toy descriptions likely has significant effects on care givers' decision-making processes. However, it is worth noting that Oktaviani and Ichwan (2021) found Indonesian parents in their thirties less likely to pay attention to toy information and warnings online before purchasing than were older parents.

Similarly, with parents of children under ten years of age in the United States, Gardner and colleagues found that parents were indeed influenced by toy advertisements. Parents who viewed a toy advertisement highlighting a toy's benefits for brain development stated that social and cognitive development were less important than parents who viewed an advertisement focused on child development more generally. The authors argued that parents were influenced by the toy advertisements and that a narrow focus on brain development detracts from parents' ability to make connections between toy play and children's developmental outcomes (Gardner et al. 2012).

The Present Study

Based on the research regarding the environmental and marketing factors that influence care givers' purchasing of traditional and technological toys, our descriptive study examines the U.S. marketplace for technological and traditional infant toys to understand how toys are marketed to care givers. We explore the following questions: How are technological and traditional toys similar and different in terms of intended gender specificity, educational claims, price, and targeted developmental domain (i.e., physical, socioemotional, cognitive)? Are toys marketed differently for retailers with differing customer bases?

Materials and Methods

In Fall 2020, we selected for study toys advertised for infants (from birth to twenty-four months) by two major national retailers with both in-person and online shopping options that targeted individuals and families from different socioeconomic backgrounds. The toys were viewed on the retailers' websites because recent research suggests that care givers most frequently purchase toys online (Richards, Putnick, and Bornstein 2020), although the toy descriptions featured by retailers came from the toy manufacturers. The average annual income for a shopper at Retailer 1 was $76,000 (Hanbury 2020), and the customer base was approximately 70 percent White, 12 percent Black, 11.15 percent Hispanic, and 3 percent other races (Statista 2020). The main competitors for Retailer 1 were other mass retailers, dollar stores, fast food restaurants, and gas and convenience stores (Patterson, 2020). For Retailer 2, the average annual

shopper income was $89,000, and the customer base was approximately 60 percent white, 10 percent Black, 20 percent Hispanic, and 10 percent other races (Statista 2018). The main competitors for Retailer 2 were other mass retailers, club retailers, pet stores, and beauty stores (Patterson 2020).

Per retailer, 176 toys were selected (N = 352; 176 traditional toys, 176 technological toys) for coding and analysis. Research assistants coded the first eighty-eight traditional and eighty-eight electronic toys that appeared in searches for toys for children twenty-four months or younger on each retailers' website. Toys were listed by their UPC code, and five duplicates were coded across the retailers. (All analyses were conducted with and without these five duplicates, and they were retained in the dataset due to a lack of significant impact on the findings as a result of their removal.) The variables of interest were: technological or traditional toy features, toy price (the nonsale price of the toy on the retailer's website), intended gender specificity, educational claims, and the primary developmental domain addressed (physical, cognitive, or socioemotional). Setting power to .80, the study was powered to detect medium effects, here reported as $\eta_p^2 = .06$.

Toy Coding
We developed a coding scheme to categorize the toys based on the following four categories: technological or traditional toy features, gender specificity, educational claims, and the primary developmental domain targeted (physical, cognitive, or socioemotional; see figure 1 for examples). For the technological or traditional toy designation, toys were coded as technological if they required batteries or needed to be plugged in. Toys without these requirements were coded as traditional. Regarding gender specificity classification, toys were noted as being targeted for male or female children only if the toy descriptions mentioned specific genders or the toy was offered in different forms to target genders differently (for example, the same blocks that came in blue or pink colors). For educational claims, if the description of the toy mentioned the words "learn," "learning," "teach," "education," or "educational" (as defined by parents in Nelson-Rowe 1994), the toy was coded as featuring educational claims. To capture the developmental domain, toys were coded based on the domain they primarily addressed—for example, was the goal of the toy to have children play physically (e.g., banging things around), cognitively (e.g., learn letters and numbers), or socioemotionally (e.g., interact with others)?

Coding was conducted by five research assistants who were trained for

Figure 1. Percentage of traditional and technological toys within each developmental domain.

Category	Definition	Example Toys
Toy Features - Technological	Toy requires batteries or must be plugged in to operate	Fisher-Price Deluxe Kick and Play Piano Gym; Fisher-Price Laugh and Learn On-The-Glow Coffee Cup; LeapFrog Musical Rainbow Tea Party; LeapFrog Speak and Learn Puppy; Bright Starts Roll and Glow Monkey
Toy Features- Traditional	Toy does not require batteries or does not need to be plugged in to operate.	Infantino Go Gaga Wrist Rattles (Fox and Owl); Skip Hop Explore and More Roll-Around Hedgehog; Fisher-Price Slow Much Fun Stroller Sloth Toy; Sassy Drool and Chew Keys; Magic Years Jungle Finger Puppet
Gender - Male	Toy description mentions being designed for males or toy is featured in a different form to specifically target males (e.g., blue version versus pink version).	Play Baby Toys Magic Sleep, Blue; Disney Baby Lion King Adventure Musical Baby Crib Mobile, Blue; Bright Starts Take Along Carrier Toy Bar
Gender - Female	Toy description mentions being designed for females or toy is featured in a different form to specifically target females (e.g., pink version versus blue version).	V-Tech Light-Up Baby Touch Tablet, Pink; V-Tech Touch and Learn Musical Bee, Pink; Fisher-Price Princess Mommy Sweet Dreams Storybook; LeapFrog Purrfect Counting Purse with Interactive Teaching Tiara; Bedtime Originals Eloise Pink/Gray Elephant Musical Crib Mobile
Educational Claims - Yes	Toy description mentioned the words "learn," "learning," "education," or "educational."	Fisher-Price Laugh and Learn Smart Stages Learn with Sis Walker; Infantino Discovery Gem Activity Ball; Infantino Go Gaga Super Soft 1st Building Blocks; Lamaze Pile and Play Stacking Cups; Baby Einstein World Explorer Music Sensory Globe
Educational Claims - No	Toy description did not mention the words "learn," "learning," "education," or "educational."	Tiny Tukkins Plush Stuffed Character, Bunny; Evezo Bentley Continental GT, Ride-on Push Car; Munchkin DuckDunk Bath Toy; Fisher-Price Ferris Wheel; Nuby Little Squirts, Bath Squirts
Developmental Domain - Physical	The primary goal of the toy was to play physically, such as banging things around.	Lamaze Grab and Hide Ball Baby Toy; Fat Brain Pop N Slide Shelly Toy; Skip Hop Silver Lining Cloud Rainstick Rattle; V-Tech Baby Twist and Spin Lion Rattle; V-Tech Explore and Crawl Elephant Plush Baby Toy
Developmental Domain - Cognitive	The primary goal of the toy was to play cognitively, such as learning letters and numbers.	Dolce My First Owl Clock Stuffed Animal; Mushie Stacking Cups; Bright Starts Lights and Color Driver Baby Learning Toy; Baby Einstein Magic Touch Curiosity Tablet Wooden Musical Toy; V-Tech Roll and Discover Ball
Developmental Domain - Socioemotional	The primary goal of the toy was to play socioemotionally, such as interacting with a care giver or peer or developing emotions.	LeapFrog Musical Rainbow Tea Party; LeapFrog Chat and Count Emoji Phone; LeapFrog Speak and Learn Puppy; Dolce Activity Zebra Stuffed Animal; Bright Starts Explore and Cuddle Elephant

reliability, that is at least 90 percent agreement with the lead author (and master coder). Then, 20 percent of each coders' toys were randomly selected and checked for reliability against the lead author. All coders maintained at least 90 percent agreement with the master coder. Any discrepancies between the lead author and the research assistants were discussed and resolved.

Results

How Are Technological and Traditional Toys Similar and Different in Terms of Gender, Educational Claims, Price, and Development?

Using Pearson Chi-Squared tests, our analyses showed no significant differences between technological and traditional toys based on gender, $p > .25$. In fact, very few toys were explicitly targeted to specific genders (only 20 out of 352 total toys). Differences did exist in terms of educational claims and targeted developmental domain. A larger percentage of technological toys were designated as educational (70.3 percent) than traditional toys (56.3 percent), $X^2(1) = 7.231$, $p = .007$. Additionally, more traditional toys (84.3 percent) than technological toys (58.1 percent) targeted physical development. Finally, significantly more technological (37.4 percent) than traditional (9.6 percent) targeted cognitive concerns, but the percentages of socioemotional toys were similar for technological (4.5 percent) and traditional (6.1 percent) toys, $X^2(2) = 39.178$, $p < .001$ (see figure 1).

Next, we conducted an ANOVA (analysis of variance) examining toy price, while considering technological status, educational designation, gender specificity, and developmental domain. We found no significant effects of technological status, educational designation, and gender specificity on toy price, ps > .061. We did find that a toy's developmental potential had a significant effect on toy price, $F(1, 330) = 7.080$, $p < .001$, $\eta_p^2 = .041$, with socioemotional toys being significantly more expensive than both physical ($p = .033$) and cognitive toys ($p = .025$).

Are Toys Marketed Differently by Retailers with Differing Customer Bases?

Employing Pearson Chi-Square tests, we analyzed the proportion of technological compared to traditional toys by retailer—based on educational designation, gender specificity, and developmental use. We found no significant differences based on toy type between retailers for gender, ps > .347. Retailer 1 featured significantly more technological toys marketed as educational than noneduca-

tionally marketed technological toys, $X^2(1) = 12.425$, $p < .001$. We found no significant relation between educational claims and technological status at Retailer 2, $p = .882$.

Each retailer exhibited a similar pattern of differences between technological and traditional toys in regard to the three types of development (Retailer 1: $X^2(2) = 16.345$, $p < .001$; Retailer 2: $X^2(2) = 24.187$, $p < .001$), with more traditional toys targeting physical development (Retailer 1 = 84.8 percent traditional compared to 58.4 percent technological; Retailer 2 = 83.7 percent traditional compared to 57.7 percent technological) and more technological toys aimed at cognitive development (Retailer 1 = 12.1 percent traditional compared to 37.7 percent technological; Retailer 2 = 7.1 percent traditional compared to 37.2 percent technological), with the percentage of socioemotional toys remaining more similar for both technological and traditional toys (Retailer 1 = 3.0 percent traditional compared to 3.9 percent technological; Retailer 2 = 9.2 percent traditional compared to 5.1 percent technological).

Finally, we conducted an ANOVA examining toy price, while considering retailer, technological status, educational claims, gender specificity, and child development. We found the main effect of retailer not to be significant, noting the average price of toys was higher at Retailer 2 ($24.45) compared to Retailer 1 ($20.30), $F(1, 320) = 1.448$, $p = .230$. We found a significant interaction between gender and retailer, recording the average price of toys marketed for males as significantly more expensive at Retailer 1 ($44.24 compared to $18.84) and toys marketed for females as significantly more expensive at Retailer 2 ($47.74 compared to $18.05), $F(1, 320) = 9.061$, $p < .001$, $\eta_p^2 = .054$. We found a significant interaction between educational claims and retailer, noting the average price of noneducational toys was significantly higher at Retailer 2 ($40.40 compared to $25.57) while educational toys were similarly priced by all retailers (Retailer 1 = $19.75; Retailer 2 = $17.99), $F(1, 320) = 12.283$, $p < .001$, $\eta_p^2 = .037$.

Discussion

The present study examined differences between technological and traditional toys sold by two major retailers serving different consumer bases. Research has suggested that technological toys might interfere with the amount and quality of care giver–child interactions and communication (Sosa 2016; Miller et al. 2017; Wooldridge and Shapka 2012; Zosh et al. 2015) and provide fewer opportunities

to experiment or engage in self-directed play for children (Bergen et al. 2009), all of which might affect children's emotional self-regulation, language development, and learning processes, as well as the overall nature of their play.

Because ours was a descriptive study, we did not generate any initial hypotheses about how technological and traditional toys would differ based on gender specificity, educational claims, price, and developmental intent. The results of our study demonstrated significant differences in developmental targets, suggesting that for all retailers more traditional toys address physical development and more technological toys target cognitive development .

Differences between the Marketing of Technological and Traditional Toys

Gender Specificity

We found no significant differences between traditional and technological toys in terms of toy price, educational designation, or developmental domain based on gender. However, toys targeted for males were more expensive at Retailer 1, while toys targeted to females were more expensive at Retailer 2. It is worth noting that these findings should be interpreted cautiously, because only 5.7 percent of toys were designated for a specific gender for both retailers (2.0 percent male; 3.7 percent female).

Most toys were described using gender-neutral terms, yet some gender-specific terms remain. For example, the Fisher-Price Princess Mommy Sweet Dreams Storybook, a plastic toy with moving parts and an embedded story, stated, "As baby opens and closes the window, she'll see a dreamy night sky and a sweet princess looking back at her. 'Peek-a-boo, Princess!'" Other gendered toys did not feature gender-specific language but offered the same toy in different colors, like the V-Tech Touch and Learn Musical Bee. This toy was offered in pink, in which the bee also had long eye lashes, and in yellow, which did not have any eyelashes.

However, even though many retailers have moved away from explicit gender-based marketing, such as by removing "girl" and "boy" designations from toy aisles (Masunaga 2015), children do not need explicit gender labels to have gender-based toy preferences. Halim and associates (Halim et al. 2014) found that preschool-aged children from diverse racial and socioeconomic backgrounds demonstrated rigidity in their gender-related behaviors—girls wanting only to wear pink and boys avoiding all "girly" clothes—that were not related to their

care givers' gender-typed clothing preferences. The influence of gender rigidity in children's preferences for particular toys (and their care givers' purchase of these preferred toys) may thus be hiding in plain sight.

It might be that the lack of gender-specific marketing enables care givers to choose a larger variety of toys for their children, because research suggests that care givers are less likely to select cross-gender toys (Kollmayer et al. 2018) and more likely to select only masculine and gender-neutral toys for both male and female children (Campenni 1999; Wood, Desmarais, and Gugula 2002). Or it could be that care givers still look for traditionally male- and female-coded toys, such as dolls or pastel-colored and sparkly toys for girls and trucks and primary-colored and rugged toys for boys, without the need for gender-specific language in toy marketing. This is an area ripe for future investigation, and these findings should be considered exploratory, given our very stringent coding method, in which toys were coded only as targeting male or female children specifically if the toy descriptions mentioned a specific gender or the toy was offered in different forms to target genders differently.

Educational Claims

Manufacturers' descriptions highlighted educational claims about toys in different ways, from including "learning" in the name, like the Fat Brain Toys Dimpl Baby and Toddler Learning Toy, to descriptions of the areas the toy will impact, like the Bright Starts Mix and Match Sesame Street Wooden Stacking Toy, which was described as encouraging "the development of fine motor skills as your little one practices hand-eye coordination and spatial reasoning." There were no significant differences between the educational designations of technological and traditional toys by retailers. This is interesting because previous research suggests that care givers look specifically for educational features when making toy purchases. Richards, Putnick, and Bornstein (2020) found that educational qualities were the most important consideration when buying a toy among U.S. mothers of children under twelve. Al Kurdi (2017) also found that educational qualities—particularly toy features that foster creativity—were important to Jordanian parents.

However, we found some differences between retailers. Noneducational toys were more expensive at Retailer 2, while educational toys were similarly priced at both retailers (Retailer 1 = $19.75; Retailer 2 = $17.99). Retailer 1 did feature significantly more technological toys marketed as educational than not. Retailer 1 targets a consumer base with a lower average annual income than

Retailer 2, and this discrepancy in toys offered might relate to a larger trend in the desires of families from different socioeconomic backgrounds regarding the desirability of technology (Rideout and Robb 2020).

Although many wealthier families have pulled away from exposing young children to technology, some lower income families have pushed for greater access to technology for their children (Bowles 2018). In fact, lower-income parents consider supporting their children's education a major reason to adopt new technology (Rideout and Katz 2016). In a survey of 1,440 U.S. parents of children aged eight or younger, 38 percent of lower-income parents endorsed the idea that technology helps their children learn "a lot," as compared to only 17 percent of higher-income parents (Rideout and Robb 2020). This technological divide might be one factor driving the differences between the two retailers in terms of educational toy offerings.

Toy Price

Retailer 2 serves, on average, a higher socioeconomic consumer base, and accordingly, the mean price of toys was slightly higher at that retailer ($24.45) than at Retailer 1 ($20.30). Regardless of retailer, socioemotional toys were more expensive than both physical and cognitive toys. But socioemotional toys were the smallest subset, and thus, these differences should be viewed cautiously. Yet, according to previous research, the differences in price might not make a meaningful difference to parents in light of all the other considerations they make when selecting toys for their children (Al Kurdi 2017; Richards, Putnick, and Bornstein 2020).

Developmental Uses

At both retailers, traditional toys more often targeted physical development than technological toys. Many traditional toys do require a variety of fine and gross motor skills to operate. For example, to use the Fisher-Price 2-in-1 Flip and Fun Activity Gym, infants need to reach and grab hanging toys, described by the toy maker as: "Exciting toys [that] encourage your little one to reach, grasp, and bat, helping to develop important motor skills like dexterity and hand-eye coordination." At the same time, infants more likely use technological toys when they are sedentary, toys such as the V-Tech Light-Up Baby Touch Tablet that afford infants the opportunity to "press the eight learning app buttons [to] introduce . . . letters, shapes, counting, numbers, instruments, animals, first words, and music."

Conversely, a significantly greater percentage of technological than traditional toys targeted cognitive development. This aligns with the idea that care

givers adopt new technologies to support their children's educational (and primarily cognitive) development (Rideout and Katz 2016). It remains to be seen exactly how care givers view the links between technological toys and digital media, but both technological toys and digital media have similar potential pitfalls. For example, research suggests that care givers are less physically responsive and communicative when engaging in play with technological toys with their children (Sosa 2016; Miller et al. 2017; Wooldridge and Shapka 2012; Zosh et al. 2015). Similarly, children learn more from digital media, such as videos and apps, when they promote interaction between care givers and children (Hassinger-Das et al. 2020; Lauricella et al. 2010).

The socioemotional toys we studied focused on play that involves interacting with a care giver or peer or that involves developing emotions. For example, for the LeapFrog Musical Rainbow Tea Party, the description focused on interaction: "Your child can invite a friend over and have tea for two with the toys in the set. The kids can pretend to pour their favorite flavored tea into cups and the teapot will magically empty out on its own." The percentages of socioemotional toys were similar across both technological and traditional toy types, although slightly more were traditional, which seems somewhat misaligned with research that suggests technological toys are less likely to encourage care giver–child interaction and conversation (Sosa 2016; Miller et al. 2017; Wooldridge and Shapka 2012; Zosh et al. 2015). However, the percentages of toys that primarily support socioemotional development were so small for both toy types that it is likely these data were unable to capture any meaningful differences.

This does not mean that toy makers ignored socioemotional development, it was just not their primary focus. They paid more attention to physical and cognitive concerns. For example, the Fisher-Price Little People Caring for Animals Smart Stages play set mentions learning to care for animals in the description, but the primary focus is on cognitive development by introducing "counting, colors, animal sounds, and more with three Smart Stages levels that grow along with your child."

Limitations and Future Directions

One of the potential limitations of this study is our focus on the U.S. toy market. We think it important to research the global toy market to see if similar patterns prevail and how cultural and other contextual factors affect toy marketing in

different areas of the world. We also think it important to note that this study was well powered to detect medium-effect sizes, but some of the effects we found were between small to medium in size. This leads us to caution readers when interpreting these particular findings.

Additionally, while several major retailers have removed gender-based toy labels (Masunagas 2015), just because the labels are removed does not mean that the stereotypes are gone. Today, there are still aisles where you can find mostly pink toys and dolls, and other aisles containing primary-colored building blocks and action figures. These aisles might not be labeled as "boys' toys" and "girls' toys," but the toys can still be identified in this manner. The toys in this study likely suffer from the same issue; a doll might not be labeled as targeting female children, but care givers might still perceive it that way. Thus, it will be important to research concerning care givers' beliefs about how gender affects their reactions to toy marketing and their purchasing decisions.

Finally, seeing how care givers' own socialization shapes their purchasing behaviors for gender-specific toys (Boe and Woods 2018), we wonder if a similar pattern might occurr regarding affinity for technology, in which some care givers are especially open to adopting new technology and others less so or not at all. These previous experiences of care givers might interact with the marketing of infant toys in many ways, and this requires additional investigation.

Conclusions

Given that the toy market is so vast, it is important for developmental research-ers and the public to know exactly which toys are marketed to the care givers of infants. The technological revolution has taken every aspect of life by storm, and the toy industry is no exception. This led us to ask how the changing landscape of technological and traditional toys relates to gender, educational designation, price, and child development. By investigating the toy market for infants with these specific variables in mind, our findings offer a holistic view of today's U.S. toy landscape.

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